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Proceedings of the 21st European Conference on Research Methodology for Business and Management Studies

A Conference hosted By University of Aveiro Portugal

2-3 June 2022

Edited by

Dr. Manuel Au-Yong-Oliveira

Professor Carlos Costa

Proceedings of the

21st European Conference on Research Methodology for Business and Management Studies
ECRM 2022

A Conference

Hosted By

University of Aveiro
Portugal
2-3 June 2022

Review Process
Papers submitted to this conference have been double-blind peer reviewed before final acceptance to the conference. Initially, abstracts were reviewed for relevance and accessibility and successful authors were invited to submit full papers. Many thanks to the reviewers who helped ensure the quality of all the submissions.

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Preface

These proceedings represent the work of contributors to the 21st European Conference on Research Methodology (ECRM 2022), hosted by University of Aveiro, Portugal on 2-3 June 2022. The Conference Co-chairs are Dr. Manuel Au-Yong-Oliveira and Professor Carlos Costa, both from University of Aveiro, Portugal.

ECRM is a well-established event on the academic research calendar and now in its 21st year the key aim remains the opportunity for participants to share ideas and meet. The conference was due to be solely held at University of Aveiro, Portugal, but due to the global Covid-19 pandemic it was moved online also, to be held as a hybrid event. The scope of papers will ensure an interesting conference. The subjects covered illustrate the wide range of topics that fall into this important and ever-growing area of research.

The opening keynote presentation is given by Dr José Martins, a Senior Researcher at AquaValor – Centro de Valorização e Transferência de Tecnologia da Água, with the title of, *The use of Mixed Methodologies as a Path to Study ICT Adoption and Continuous use.* The second day of the conference will open with an address by Dr Zélia Breda and Dr Filipa Brandão both from University of Aveiro on the subject, *Sociometric Analysis in the Study of innovation in Hospitality and Tourism.*

With an initial submission of 76 abstracts, after the double blind, peer review process there are 22 Academic research papers, 1 PhD research papers and 3 work-in-progress papers published in these Conference Proceedings. These papers represent research from Bahrain, Canada, China, Czech Republic, Finland, Germany, Greece, Lithuania, Malta, Poland, Portugal, Russia, South Africa, Sweden, the United Kingdom, and the USA

We hope you enjoy the conference.

Dr. Manuel Au-Yong-Oliveira & Professor Carlos Costa
University of Aveiro
Portugal
June 2022

ECRM Conference Committee

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Biographies

Conference and Programme Chairs

Professor Carlos Costa is a full professor and entrepreneur based at the University of Aveiro, Portugal. Carlos started out doing an undergraduate degree in regional and urban planning (University of Aveiro). This was followed by a specialization in tourism, at the master's and doctoral level, at the University of Surrey, in the UK. Carlos is now Head of Department, at DEGEIT – the largest department of the University of Aveiro. With publications at the highest level, Carlos also enjoys writing down-to-earth articles for the media and for the general public. As the Director of the PhD in Marketing and Strategy, as well as of the PhD in Tourism, both at the University of Aveiro, Carlos is an inspiration to colleagues and students alike – to perform beyond their dreams and achieve new entrepreneurial heights, whatever the domain may be.

Dr Manuel Au-Yong Oliveira is an Assistant Professor at the University of Aveiro (Department of Economics, Management, Industrial Engineering and Tourism – DEGEIT), in Portugal, where he lectures at the undergraduate, master's and doctoral levels on marketing, strategy, innovation, technology and on research methods. Manuel did an MBA at Cardiff Business School, in Wales (1992-1993) and has a Ph.D in Industrial Engineering and Management (FEUP), for which he was awarded a distinction for his thesis on innovation. Manuel has ten years of work experience with multinational corporations as well a varied experience working with smaller more entrepreneurial enterprises. At present, Manuel is the Director of the Master's Degree in Management at the University of Aveiro. Manuel is also a member of the Executive Committee of his department - DEGEIT - University of Aveiro. Manuel has a passion for teaching and education.

Keynote Speakers

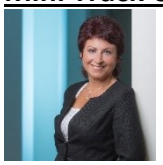
Filipa Brandão holds a PhD in Tourism and a Master's degree in Tourism Management and Development from the University of Aveiro. She is Assistant Professor at the Department of Economics, Management, Industrial Engineering and Tourism of the University of Aveiro, where she teaches various courses at the undergraduate, master's and doctoral levels and is Vice Director of the Master in Tourism Management and Planning. She is a full researcher at GOVCOPP - Research Unit in Governance, Competitiveness and Public Policy - University of Aveiro and Associate Editor of the Journal of Tourism & Development (SCOPUS). Filipa is the author of books, book chapters and articles published in international journals. She has integrated several research and consultancy projects in Tourism and Leisure innovation and has organized national and international scientific events. Her research interests and scientific production focus on innovation in tourism, regional development, tourism networks, social network analysis, planning and management of tourist destinations, and urban tourism.

Zélia Breda Assistant Professor and Director of MA in Tourism Management and Planning,University of Aveiro. Member of Research Unit Governance, Competitiveness and Public Policies (GOVCOPP); founding member/vice-president of Observatory of China and Portuguese Institute of Sinology. Authored/co-authored national/international papers/communications on tourism development, networks, tourism in China and Goa (India), gender and tourism, and internationalisation of tourism economy.

José Martins is currently a Senior Researcher at AquaValor – Centro de Valorização e Transferência de Tecnologia da Água, Invited Assistant Professor at the Polytechnic Institute of Bragança and External Researcher at INESC TEC Research Center. He has published over 90 articles in indexed journals and event proceedings focusing on the Information Systems, Management Information Systems, Software Engineering and Human-Computer Interaction topics. Currently he is the supervisor of several Master Degree dissertations and PhD theses. During his research career, he has participated in several research projects and is currently a member of various research projects aimed at merging information systems and technologies with other fields of study. Throughout his professional career José has also worked as an information systems and technology senior consultant where he directly participated in several international projects. At the present time José Martins dedicates most of his time to his lectures and to his research activities where he tries to, not only develop innovative digital solutions focused on the use of natural mineral water as a health and wellness trigger, but also to understand the factors and (in)direct

impacts of ICT adoption at the individual and firm levels, and how IS solutions can be idealized, specified and developed in order to fully address their audience's needs and requirements.

Mini Track Chairs



Asta Valackienė is a professor at the Mykolas Romeris University, Faculty of Public Governance and Business, Vilnius. She gained her PhD in Social Sciences (Sociology) in 2001. Her research interests include Methodology of Science and Research, Responsible Research and Innovation. Asta is a Member of Management Committee of COST ACTION 17127 Programme as National representative from Lithuania. A Member of UNESCO Unitwin Network Baltic and Black Seas Circle Consortium in Education Research (BBCC) Association. She has authored numerous Research Studies, Books, Handbooks and has published over 80 scientific papers.

Hamed Taherdoost. Ph.D. is a senior member of the IEEE, IASED & IEDRC, working group member of IFIP TC 11, professional member of IFERP, and member of ACT-IAC and CSIAC, and many other professional bodies. He has authored over 130 scientific articles in authentic journals and conferences, seven book chapters, and six books in the fields of technology and research methodology. He is the editorial, reviewer, and advisory board member of some authentic peer-reviewed journals publishing with Taylor & Francis, Elsevier, Inderscience, MDPI, EAI, & IGI Publishing, and has served as an editor of book & proceedings for prestigious publishers. He has been a Technical Program Committee, Scientific Committee, and Organizing Committee of many international conferences.

Biographies of Contributing Authors

Susana Aldeia is a full-time Assistant Professor at the ISAG/EBS European Business School. She holds a Phd in Taxation and a DEA from the Vigo University (Spain) in Tax Law; a postgraduation in Taxation from the IPCA and a degree in Accounting, also from the IPCA.

Anna Bagirova is a professor of economics and sociology at Ural Federal University (Russia). She explores issues of labour economics and sociology of labour. Her research interests include also demographical processes and their determinants. She is a doctoral supervisor and a member of International Sociological Association.

Dimitrios Belias; Assistant Professor at Department of Business Administration, University of Thessaly, Greece. Also a Postdoctoral Research Fellow at Department of Business Administration and Tourism, Hellenic Mediterranean University, Greece. Main research interests: are in the areas of Management, Human Resource Management, Organizational Behavior, Tourism Business Administration, Educational Management, Service Quality and Tourism and Hospitality Management.

Pedro Bem-Haja. PhD in Psychology (University of Aveiro) and researcher at CINTESIS at the same university. His research preferences are divided into two major areas. The area of research methodology, impact assessment and Statistics, and the area of central and peripheral measures of the nervous system, with studies in the Health settings, Educational, Forensics and Labour.

Basia Dennis Bless is a PhD candidate and research supervisor in the Wits Graduate School of Governance. As a supervisor, he observed that postgraduate students struggle to effectively conduct and use literature review. Therefore, this publication provides insights on how to effectively use literature review as a research method.

Evandro Bocatto BSc. in Psychology (PUCC) and MSc. in Business Administration (EAESP/FGV), Brazil. Master of Research and Ph.D. in Management Sciences (ESADE), Spain. Associate Professor at MacEwan University, Edmonton, Canada. Has published at International Journal of Sociology and Social Policy, The Electronic Journal of Knowledge Management, International Journal of Business and Economic Development.

Felix Budde, M. Sc., studied mechanical engineering and industrial management at the University of Bremen and started working in applied research at Fraunhofer IPK in Berlin in 2021. There he is involved in national and international research and consulting projects in the field of strategic as well as sustainability management of organizations and innovation institutions.

Renata Činčikaitė is a senior Researcher of Logistics and Defense Technology Management Research Group at General Jonas Žemaitis military academy of Lithuania and Associate professor at Vilnius Gediminas technical university. Her research interests are related to sustainable urban development, sustainable transport development, social security, formation and evaluation of strategic decisions.

Fabian Hecklau, M. Sc., studied industrial engineering (Otto-von-Guericke University Magdeburg) and started working in applied research (Fraunhofer IFF in Magdeburg). Since 2015, works for Fraunhofer IPK (Berlin) Involved in international research and consulting projects in the strategic management of organizations and innovation institutions. Head of the Competence Center Innovation Systems & Structures at Fraunhofer IPK since 2020.

Gamze Gül Hizal: Studied Industrial Engineering/Management (Technical University, Berlin) Working for Fraunhofer IPK (Berlin) since 2020, in national and international research and consulting projects in sustainable manufacturing, blended learning and strategic management. Experiences in developing KPI Management Systems and Assessment concepts, Quality Management tools/methods and Project Management. National and International Working Experience, especially in the aviation industry

Niklas Humble is a PhD student at the Department of Computer and System Science at the Mid Sweden University in Östersund, Sweden. Research interests include Programming education, Design science, AI, Learning analytics, and Game-based learning.

Ali M. A. Kamali, from Bahrain, a professional and researcher in various business fields, including project management, IT & IS, and supply chain management. I am a results-oriented, high-energy person with 25 years of hands-on experience. I could achieve my objectives by focusing on results at the intersection of technology and business.

Anna B. Kimberley is a senior lecturer in Human Resource Management, Business Communication and International Business. Researcher and published author, with particular interest in qualitative research methodology within social sciences and education (Narrative Analysis, Phenomenological Interpretative Analysis. Her research areas combine cultural diversity, cross-cultural communication, identity studies, and sensemaking.

Regina Lenart-Gansiniec , Associate Professor at Jagiellonian University in Krakow. As a scientist, she conducts research within strategic management, focused on organizational learning and knowledge management, crowdsourcing and organizational unlearning. Reviewer and member of the Editorial Board of many recognized scientific journals and scientific conferences in Poland and in the world (Scopus, Web of Science).

Susana Cristina Henriques Leal is Assistant Professor in Polytechnic Institute of Santarém. She holds a PhD in Management from University of Coimbra (2013), under the topic of Organizational Behavior and Corporate Social Responsibility, and a Master in Statistics and Information Management from Nova University Lisbon. She has a degree in Management. She conducts research activities on Sustainability, Corporate Social Responsibility, Ethics, Leadership, Organizational Commitment, Psychological Capital, Individual Performance, Quality of Life at Work, and on Social Economy topics. She lectures in undergraduate, postgraduate and master courses of Management and is currently full

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Marie-Louise Mangion is a senior lecturer within the Department of Public Policy at the University of Malta. She received her PhD in 2011 from the University of Nottingham. She worked for twenty-one years with the public sector on research, policy and EU affairs. Her research interests include policy design, evidence-based policymaking, competitiveness, tourism policy.

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Terri McGarry is a business analyst working in the international freight forwarding industry. She has held senior HR positions in logistics and hospitality sectors in the UK and Germany. She received her master's degree in human resource management from Liverpool John Moores University in 2021. Her main research areas were in organisational behaviour and wellbeing.

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Anthony Mitchell. Currently Associate Editor, Electronic Journal of Research Methods (EJBRM) and Retired Professor of Operations Management, Ashridge Executive Education, Hult International Business School. Recently at Ashridge Business School - 1988 to 2016 and 2016 to 2021 Adjunct Professor. Previously at Gallaher Limited (1975 - 1988), Touche Ross & Company (1974 - 1975) and GEC-Marconi Co. Ltd. (1967 - 1973).

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Michael Amponsah Odei, Research focuses in the areas of strategy, innovation and entrepreneurship. First, I am interested in how firms can access knowledge from their environment for instance from universities, customers, and competitors to acquire new ideas to create successful innovations. Lastly, I am interested in entrepreneurial activities of emerging and well-established firms, particularly in adoptingnew businessmodelsforsuccessfulinnovation

Noel Pearse is the Research Co-ordinator in the Rhodes Business School, Rhodes University, South Africa. He lectures in Leadership, People Management, Strategy Implementation, Change Management and Research Design. His current research interest is in the application of qualitative research methods to analysing leadership and leadership development processes.

Martin Rich is Associate Dean for the Undergraduate Programme at Bayes Business School. He has over twenty years of experience in building innovative approaches to teaching and learning into an established business school. Martin's approach to learning places an emphasis on developing students' abilities as independent researchers. He is a regular ECRM participant.

Rosa Rodrigues. PhD in Management, specialization in Human Resources and Organizational Behavior from ISCTE-IUL. Professor at the Instituto Superior de Gestão – Economics & Business School where teaches in the Bachelor and Master degrees. Research areas include organizational behaviour, human resource management, work and organizational psychology, psychological evaluation, soft skills, and test construction and validation.

Luana Santos is a masters student associate in the Research Center for Science and Technology in the Arts (CITAR) and member of the project HAC4CG. She is currently doing a masters in Sound Design at the School of Arts, Universidade Católica Portuguesa. Her current practice and research interests lie in sound, technology and ecology.

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Kambidima Wotela is an Andrew W. Mellon Foundation Scholar and a William and Flora Hewlett Foundation Fellow. He studied demography and population studies for all his degrees. He teaches systems thinking, evaluation, as well as research and analytical methods at the WITS Graduate School of Governance. One of his current research stream is on approaches to research supervision.

Simangaliso Bayabonga Zulu: Marketing Management PhD candidate and Research Assistant (School of Management, IT and Governance, University of KwaZulu Natal). Research focus is on brand management, consumer behaviour, tourism marketing, online marketing, and research methods. Also an adjunct lecturer at the same institution, supervising research projects for cohort of postgraduate diploma students in supply chain and marketing field.

Seeking Differentiated Instruction in Higher Education: An Analysis of the Literature

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Abstract: This research is a part of the Erasmus+ internationally funded InDo research project, involving a consortium led by an Italian higher education institution. An objective of the project is to include desk and field research on the topics of Understanding by Design and Differentiated Instruction, which led to this article having been produced, for knowledge transfer purposes. To carry out this research study, the Boolean operators "Understanding by design"; "Differentiated instruction"; "Higher education" and, "Cross-disciplinary material" applied to the title, abstract, and keywords in the Scopus database were used. Using all operators simultaneously returned no results. Only the Boolean operators "Differentiated instruction" AND "Higher education" and the operator "Cross-disciplinary material" alone brought results. 24 articles were found on Differentiated instruction and Higher education. This group of articles was previously analyzed in a Bibliometric way, using the "Bibliometrix" package from the free software R Studio. Regarding the searches for the term "Cross-disciplinary material", the Scopus database returned only 1 result, which was combined with the 24 articles previously identified, totaling a total of 25 articles related to the two themes. Given the difficulty of access - articles, books, and book chapters with restricted access - 6 investigations were excluded, leaving 19 potentially relevant articles, which were read in their entirety. From the analysis of the 19 articles selected for full reading, 1 investigation was excluded for not fitting the parameters of this research, resulting in a total of 18 articles that were analyzed using a meta-synthesis. *After the analysis performed, it can be seen that the main theory used has been differentiated instruction coupled with issues such as standardized assessments for the identification of learning styles, personalized feedback instruments, online applications, the perception of self-efficacy, as well as concern for the development of analytical models for differentiated instruction. Less expressively, other theories that emerge from the analysis performed, are the flipped classroom, Universal Learning Design, a diagnostic assessment and interdisciplinary education.*

Keywords: Understanding by design, Differentiated instruction, Higher education, Cross-disciplinary material, Bibliometrix, R Studio

1. Introduction

This research is a part of the Erasmus+ internationally funded InDo research project, involving a consortium led by an Italian higher education institution. An objective of the project is to include desk and field research on the topics of Understanding by Design and Differentiated Instruction, which led to this article having been produced, for knowledge transfer purposes.

The main focus of the article is, in fact, differentiated instruction in Higher Education. We hence achieve part of the research objectives of the InDo international research project.

Why aim for differentiated instruction and learning? The reason is that differentiated learning experiences enable engagement with content that is aligned with individual needs and preferences, leading to high and deep levels of thinking and understanding, as discussed below.

Considering the factors necessary for developing differentiated instruction, Leppan et al. (2018) point out that existing learning analytics models have weaknesses in considering only technical aspects of data collection, analysis, and intervention. In this regard, they propose a model for differentiated instruction based on an analytic process that takes into account educational theory, ethical learning, analytic code of practice, adaptive education systems principles, and the layered abstraction of online learning design.

Universal Learning Design must address students on an individual basis.

The authors do not generally see this happening right now on a large scale in higher education - differentiated instruction by design. Hence our work herein seeks to fill this gap and to encourage higher education lecturers to embrace the approaches and techniques discussed in the article.

Theories that emerge from the analysis performed, are the flipped classroom, Universal Learning Design, a diagnostic assessment and interdisciplinary education.

2. Method

To carry out this research, the Boolean operators "Understanding by design"; "Differentiated instruction"; "Higher education" and, "Cross-disciplinary material" applied to the title, abstract, and keywords in the Scopus database were used.

Using all operators simultaneously returned no results. Only the Boolean operators "Differentiated instruction" AND "Higher education" and the operator "Cross-disciplinary material" alone brought results. Figure 1 summarizes the search results, the selection of articles, and the analyses performed.

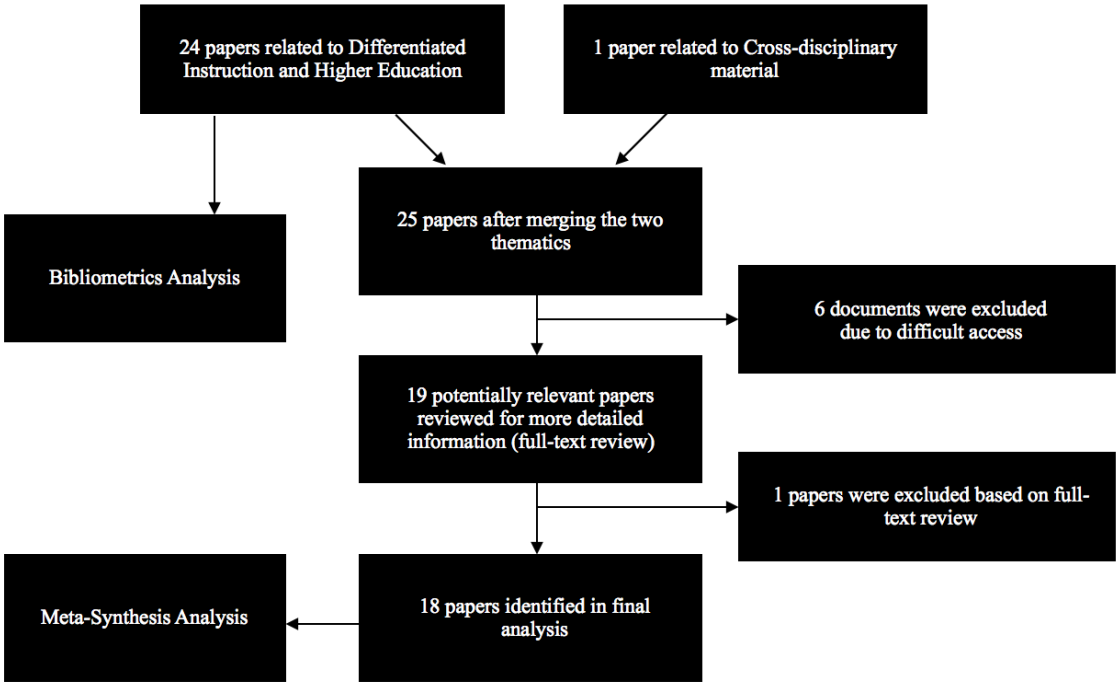

Figure 1: Summary of results, article selection, and research design.

As shown in figure 1, 24 articles were found on Differentiated instruction and Higher education. This group of articles was previously analyzed in a Bibliometric way, using the "Bibliometrix" package from the free software R Studio. Regarding the searches for the term "Cross-disciplinary material", the Scopus database returned only 1 result, which was combined with the 24 articles previously identified, totaling a total of 25 articles related to the two themes.

Given the difficulty of access - articles, books, and book chapters with restricted access - 6 investigations were excluded, leaving 19 potentially relevant articles, which were read in their entirety. From the analysis of the 19 articles selected for full reading, 1 investigation was excluded for not fitting the parameters of this research, resulting in a total of 18 articles that were analyzed using a meta-synthesis (Walsh & Downe, 2005).

3. Bibliometric Analysis: Differentiated instruction and Higher education

Table 1 shows the summary of the bibliometric analysis of Differentiated instruction and Higher education. One can see that the area is relatively recent - 20 years since the first research - and that there is not a great profusion of research done on the topic. In other words, over the past 20 years, only 24 investigations have been done, so on average 1.2 investigations have been done over these 20 years. Adding to this, investigations have been done

by 54 authors, with cooperation prevailing, as only 6 investigations have been done by individual researchers, compared to 48 investigations done collaboratively.

Table 1: Summary of the search on differentiated instruction and higher education.

Description	Results
Main Information about data	
Timespan	2002:2022
Sources (Journals, Books, etc)	24
Documents	24
Average years from publication	5,33
Average citations per document	12,58
Average citations per year per doc	1,807
References	950
Document types	
article	20
book	1
book chapter	1
conference paper	2
Document contents	
Keywords Plus (ID)	58
Author's Keywords (DE)	97
Authors	
Authors	54
Author Appearances	54
Authors of single-authored documents	6
Authors of multi-authored documents	48
Authors collaboration	
Single-authored documents	6
Documents per Author	0,444
Authors per Document	2,25
Co-Authors per Documents	2,25
Collaboration Index	2,67

Figure 2 shows the evolution of the annual scientific production, in which it can be observed that since the first publication in 2002, there was a hiatus of investigations between 2003 and 2011 and that interest in the theme began to increase in 2019, reaching its peak in 2021, with 7 investigations. In the same direction, figure 3 presents the most relevant authors and the distribution of their research over time, confirming the increase in interest in the theme between 2019 and 2020.

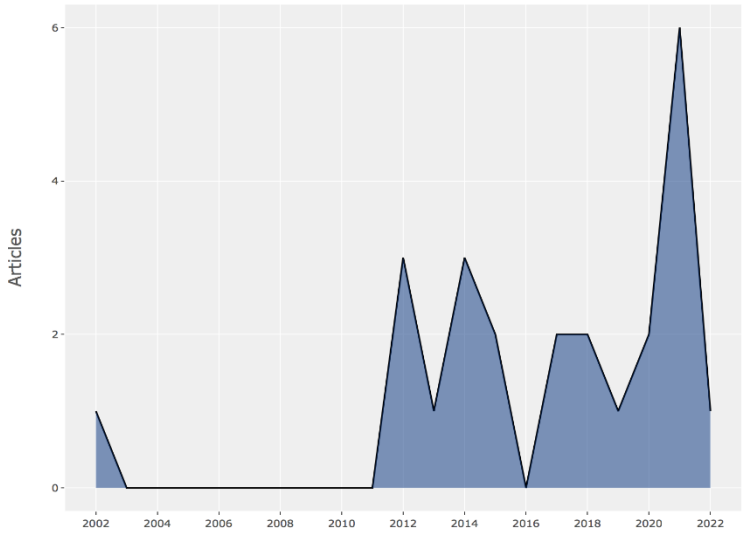

Figure 2: Annual Scientific Production.

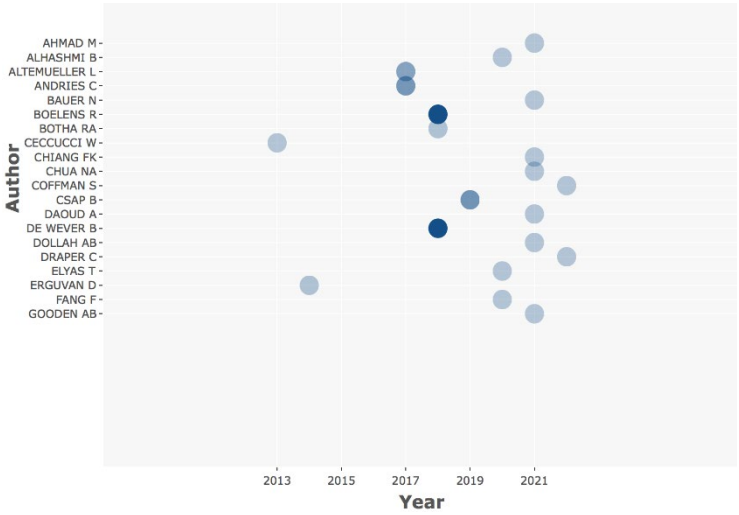

Figure 3: Annual Production x Most Relevant Authors.

Figure 4 presents the most cited sources, having at least one citation each, while figure 5 presents the scientific production by countries, highlighting the United States, Mexico, South Africa, Saudi Arabia, and China.

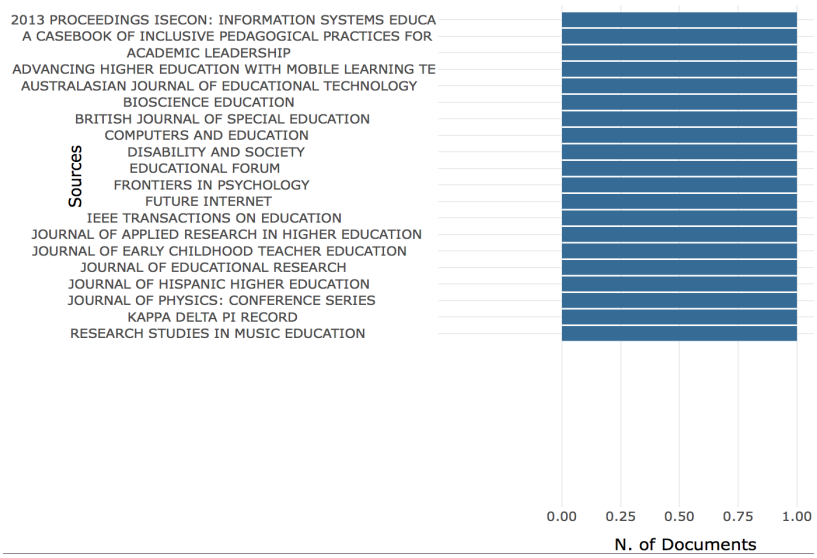

Figure 4: Most relevant sources.

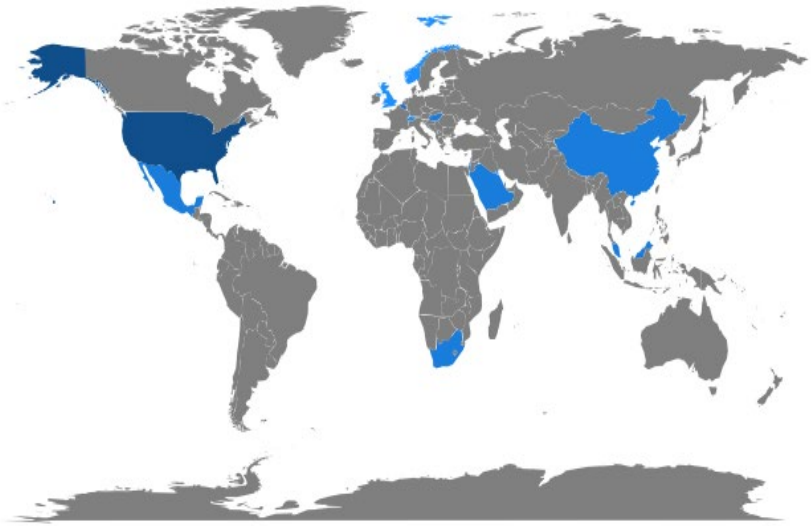

Figure 5: Country Scientific Production

In a complementary way, figures 6 and 7 present the WordCloud formed from the most used keywords and the relationship between the keywords, the authors, and the most relevant sources, respectively. In this sense, from figure 6, it is possible to see that the most important keywords are students, higher education, and teaching and learning strategies.

Regarding figure 7, characterized as a three-field chart, in which the keywords are on the left, the authors in the middle, and the sources on the right, it is possible to see that the most relevant topics are differentiated instruction, higher education, Mandarin learning and the use
of virtual learning tools such as Classkick.

Figure 6: WordCloud of the most relevant keywords

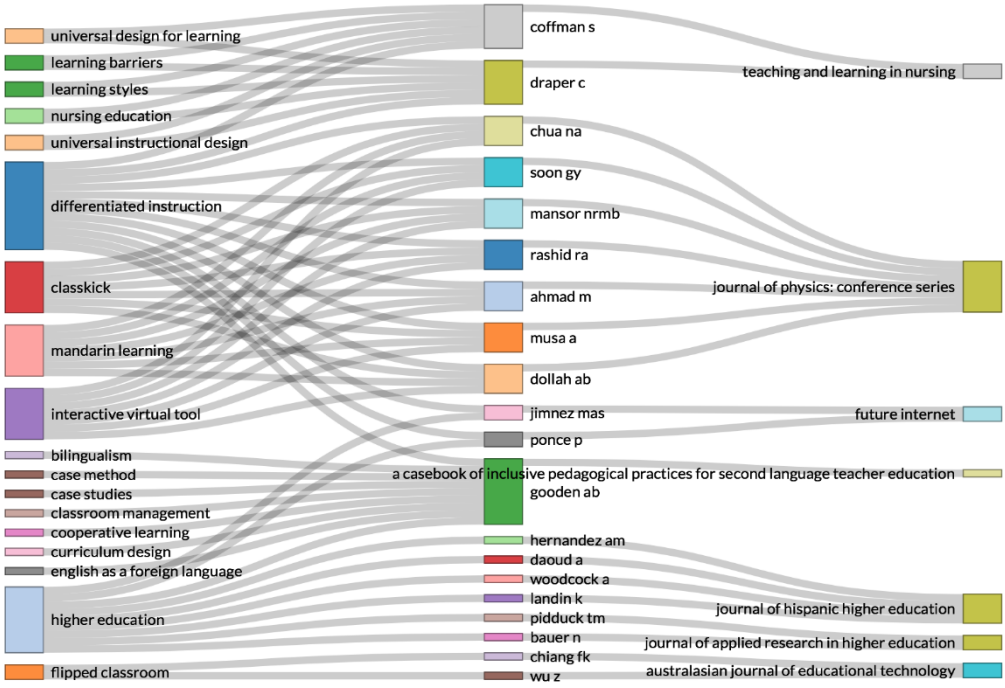

Figure 7: Three-field chart keywords, authors, sources

4. Meta-Synthesis Analysis - Differentiated instruction-related investigations

In reporting their experiences on the development of a course to model the pedagogical practices of future early childhood education teachers Griess *and* Keat *(*2014) *realized that individualized instructional materials accompanied with assignments were insufficient. Given the heterogeneity in terms of experiences, training, goals, and expectations of early childhood education teacher candidates, they decided to implement differentiated instruction with a focus on content, the teaching process, the expressed products of learning, and the environment, taking into account cultural differences. In a conclusion, they point out that differentiated learning experiences enable engagement with content that is aligned with individual needs and preferences, leading to high and deep levels of thinking and understanding.*

Such an outcome can be evidenced in foreign language teaching. Sangermán Jiménez *and* Ponce *(*2021) *conducted a case study with 527 Mexican high school students, regarding the subject of Spanish grammar, to investigate the results of an intervention based on a new teaching method composed of the fusion of differentiated instruction and standardized tests. They point out that the fusion of standardized tests to measure the students' current state of competence, as well as their learning styles, provides important information to support the development of differentiated instruction. They also point out that 96% of the students who participated in the intervention benefited from it, increasing their scores in the Spanish grammar subject.*

Mok *(*2012) *points out that the use of graded exercises based on differentiated instruction generates higher levels of engagement and motivation in students. More specifically, the use of exercises with increasing degrees of difficulty accompanied by guides with detailed explanations of the solutions - to be used only after solution attempts - were better received by information systems students than traditional exercises, in which a single exercise is directed to everyone equally.*

Regarding motivation and engagement, Watson *and* Knight *(*2012) *found similar results when describing the successful implementation of the weekly use of summary sheets of laboratory projects for 116 English students from Biomedical and Biochemical Sciences courses.*

They point out that the use of such summary sheet allowed for a greater understanding of student development without, however, requiring detailed and time-consuming formative assessments. In addition, they point out that the use of such a tool enhances the recognition and support of students' learning activities, engaging them in

their projects, increasing confidence in their abilities, and improving motivation in their assignments, as it provides quick feedback and differentiated instruction during laboratory classes.

Taking into consideration the use of a web-based instructional tool for teaching English at a higher education institution in Kuwait, Erguvan *(*2014) *presents a case study on students' perceptions of the strengths and weaknesses of such a methodology.*

After conducting interviews with 8 students, the author shows that the students have positive perceptions about the tool, mainly because it provides differentiated instruction. In this way, the tool constitutes a motivational factor in that it contributes to learning by combining a variety of activities that would otherwise be difficult in traditional classes. Another important finding is that the variety of materials and exercises was perceived as a contributing factor to the achievement of English competencies. On the other hand, students pointed out plagiarism (i.e., copying answers from the Internet to solve the activities) as one of the weaknesses of the methodology.

In the same direction, Chua et al. *(*2021) *when evaluating the use of Classkick - a web and mobile application in which students can use and get instant help from their teachers and classmates - in teaching Mandarin to 35 non-speaking students, found empirical evidence pointing to the fact that the use of Classkick for the provision of differentiated instruction has positive influences on student learning, especially concerning the acquisition of grammatical and oral skills.*

Lang *and* Ceccucci *(*2014) *describe an experiment conducted with 72 Information Systems course students to assess students' perceptions of using screencasts to learn the basics of Microsoft Office and Google sites during - or in place of - traditional classes. The results found by the authors suggest that students prefer technical lessons through the screencasts with step-by-step, over traditional classes. Additionally, they identified four practices for increasing the effectiveness of screencasts during lessons, particularly for working with students in a one-to-one relationship, namely: (1) ensuring that students can use screencasts during class; (2) interspersing the use of screencasts with group work; (3) encouraging students to follow screencasts in real-time; (4) encouraging students to review screencasts after class.*

Regarding the use of differentiated instruction in the context of a blended learning environment - face-to-face and online - Boelens et al. *(*2018) *found empirical evidence suggesting that the most adopted strategy has been to provide additional support for product development. Adding to this, they identified three instructor profiles related to (1) disregard, who believe there is no need to provide additional support to students, (2) adaptation, who believe that increased support to students is sufficient to meet their educational needs, and, (3) transformation, who believe that blended learning arrangements should be completely redesigned. Other important findings made by the authors relate to the fact that such beliefs appear to be connected to particular organizations and work trajectories and that focusing on such beliefs becomes crucial to unlocking the full potential of blended learning.*

In investigating efficacy beliefs and the necessary choices of differentiated instructional strategies for effective teaching in inclusive classrooms using a sample of 191 Israeli teacher candidates Wertheim *and* Leyser *(*2002) *found empirical evidence suggesting that the personal teaching efficacy factor is related to instructional choices. Adding to this, the study participants showed a greater predisposition for choosing general instruction than for differentiated instruction. They argue that teacher candidates' confidence in their abilities to instruct, manage, and assess student progress in inclusive settings are more likely to develop when they are provided with opportunities to implement the acquired skills in the classroom.*

Considering the factors necessary for developing differentiated instruction, Leppan et al. *(*2018) *point out that existing learning analytics models have weaknesses in considering only technical aspects of data collection, analysis, and intervention. In this regard, they propose a model for differentiated instruction based on an analytic process that takes into account educational theory, ethical learning, analytic code of practice, adaptive education systems principles, and the layered abstraction of online learning design.*

5. Flipped Classroom related investigations

Hodges *and* Weber *(*2015) *present the concept of the flipped classroom, characterized as a structured system of teaching in which students are responsible for their learning. In this system, they argue that the teacher has the role of facilitator of learning based on the discoveries made by the students, enabling a shift of emphasis from classes for obtaining knowledge to the application and development of new knowledge. More specifically, students are encouraged to explore class content through videos and presentations, outside the classroom, to prepare for applications and enrichment activities during class.*

Similarly, Altemueller *and* Lindquist *(*2017) *argue that the flipped classroom assists teachers in providing differentiated instruction to meet the learning needs of struggling students. Such a methodology shifts the responsibility for their learning to the students, and also increases cooperative learning as students help each other rather than passively waiting for teachers to disseminate knowledge. Additionally, they point out that this methodology allows for immediate and regular formative feedback.*

In empirical terms Chiang *and* Wu *(*2021) *found evidence, through a case study conducted with students of Research Methods in Technology Education, that points to the fact that the flipped classroom, namely by the 3-CI model (i.e., learning activities organized in three stages, before class, during class, and after class) that emphasizes student-student and student-instructor collaborations, leads to increased student satisfaction, engagement, and collaboration.*

6. Research related to Universal Learning Design and other themes

Coffman *and* Draper *(*2022) *present pioneering research on the use of Universal Learning Design for Nursing, using a literature review, in which they show that, although this framework has been used in K-12 education, it can be applied to Nursing (i.e., High Education), bringing benefits such as more flexible curricula and the inclusion of a variety of learning practices, materials, and activities. They argue that the use of this framework enables the development of particular learning strategies, as well as the overcoming of learning barriers, given its flexibility.*

In this same perspective, Griful-Freixenet et al. *(*2017) *when investigating the role of the Universal Learning Design (ULD) framework in meeting the learning needs of Belgian students with some disabilities, found evidence suggesting that students' perceptions of meeting their learning needs align with the principle of multiple means of engagement of Universal Learning Design (i.e., lecture notes, PowerPoint slides, alternative text formats, instructor-developed materials). On the other hand, they point out that meeting the learning needs of some students through Universal Learning Design, may lead to the dissatisfaction of other students, so Universal Learning Design must address students on an individual basis despite curricular changes, which affect everyone equally.*

Csapó *and* Molnár *(*2019) *present a detailed analysis of the eDia System, an online diagnostic and formative assessment system, under the premise that identifying what students already know constitutes one of the most important factors in learning. In addition, they argue that diagnostic assessments provide useful information for personalized learning, in which there is an adjustment between teaching and the personal needs of the students. However, the authors point out that although some analyses have been done using the eDia System, there is still a dearth of studies that make such analyses practical for developing analytical modules for creating data-based indicators and for supporting students' long-term cognitive development.*

Hernandez et al. *(*2021) *examined bilingual teacher candidates' perceptions of their teaching experiences during the Covid-19 pandemic in English language instruction for k-12 students in the state of California.*

The results found by them suggest that the rapid changes and uncertainty in the educational program brought about by the pandemic led to difficulties in accessing online learning, active engagement with peers/teachers, and differentiated instruction. In this sense, they argue that synchronous, face-to-face interactions should be preferred over asynchronous ones, as they allow for greater student engagement and monitoring of student progress and social-emotional needs.

Regarding interdisciplinary education Black *(*2018) *found evidence to suggest that both students and instructors perceive it as positive. However, while students perceive it as an opportunity to apply new ideas and technologies to existing knowledge, instructors perceive it as an opportunity to enhance communication between people.*

7. Conclusion - What does the analyzed literature tell us?

After the analysis performed, it can be seen that the main theory used has been differentiated instruction coupled with issues such as standardized assessments for the identification of learning styles, personalized feedback instruments, online applications, the perception of self-efficacy (Boelens et al., 2018; Chua et al., 2021; Erguvan, 2014; Griess & Keat, 2014; Lang & Ceccucci, 2014; Mok, 2012; Sangermán Jiménez & Ponce, 2021; Watson & Knight, 2012; Wertheim & Leyser, 2002)*, as well as concern for the development of analytical models for differentiated instruction* (Leppan et al., 2018)*.*

Less expressively, other theories that emerge from the analysis performed, are the flipped classroom (Altemueller & Lindquist, 2017; Chiang & Wu, 2021; Hodges & Weber, 2015)*, Universal Learning Design* (Coffman & Draper, 2022; Griful-Freixenet et al., 2017)*, a diagnostic assessment* (Csapó & Molnár, 2019) *and interdisciplinary education* (Black, 2018)*.*

As a suggestion for future work a survey of higher education institutions to see the extent of the implementation of differentiated instruction would be useful. Our intuitive and extensive experience indicates that although excellent teachers may exist in higher education, and who tend to individual needs of students, they still for the most part may not consider individual learning styles such as those enunciated by Felder and Solomon (1993): diagnostic of learning styles of the students - how will knowledge best be transmitted / captured, processed, understood and internalised? Notions of 1) active vs. reflective learners, 2) sensing vs. intuitive learners, 3) visual vs. verbal learners, 4) sequential vs. global learners. Such research involving a good representative sample may shed light on where academia is and where it needs to go in the near future – to remain relevant and, above all, be inclusive.

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Parental Leave as a Potential Demographic Policy Instrument in Russia: Mixed-Methods Research

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Abstract: In many countries, parental leave is an effective demographic policy measure. Its regulation is considered an important determinant of the birth rate. In Russia, the parental leave system is not flexible; however, the legislation provides for one of the longest parental leave in the world—36 months. According to a popular stereotype in Russia, as parental leave is longer than in other countries, there is no need to debate its effectiveness. This very reason may explain a lack of parental leave research in Russia. Our paper aims to demonstrate how mixed-methods research can be applied to study parental leave in Russia. In 2021, to analyse the problem in the Sverdlovsk Region (one of the largest), we did the following: 1) surveyed 500 parents with both children under the age of 12 and currently living parents (i.e., grandparents); 2) surveyed 500 grandparents with grandchildren under the age of 12. In both surveys, we used river sample. To increase the randomicity of the sample, we recruited respondents using multiple channels and sampled them with equal probability into the population analysed; 3) conducted focus groups with parents having both children under the age of 12 and currently living parents and with grandparents having grandchildren under the age of 12. Our mixed-methods research yielded the following results. 1. The parents surveyed view mothers as primary leave-takers. They also refer to grandmothers (most often, maternal ones) and fathers as potential leave-takers. 2. Grandparents' opinions on leave-takers are also diverse; their responses vary as much as parents' ones. However, they are more restraint in terms of their own role as potential leave-takers. 3. As focus groups revealed, "if a need arises", parents are willing to delegate the right for parental leave to grandparents, who agree to take it. Our methodology is based on the mixed-methods research strategy. It allowed us to identify social attitudes towards the existing parental leave system in Russia and to draw attention to its transformation. The results may be of use when developing new mechanisms for the Russian state demographic policy.

Keywords: Demographic policy, parental leave, mixed-methods research, grandparents, parents

1. Introduction

In many countries, parental leave is an effective demographic policy measure. Its regulation is viewed as one of the most important birth rate determinants. The increasing number of parental leave studies (Moss et al, 2019; Meil et al, 2019; Kurowska, 2019; Koslowski, 2019) proves that the topic has a scientific and practical relevance. Closer attention is traditionally paid to maternal leave and its influence on the women's professional self-realisation (Bartoš and Pertold-Gebicka, 2018; Wood and Neels, 2019). At the same time, researchers more and more often explore fatherhood and paternal leave (Duvander and Johansson, 2012; Gíslason and Eydal, 2011; Lappegård, 2008; Rostgaard and Lausten, 2014).

To enhance demographic policies, many countries introduced additional elements in parental leave systems for increasing their flexibility—an opportunity to use parental leave by other relatives of the child, to choose shorter leave with higher payments and vice versa, to use parental leave by both spouses simultaneously, and others.

In Russia, the parental leave system is not flexible; however, the legislation provides for one of the longest parental leave in the world—36 months. According to a popular stereotype in the country, there is no need to debate the parental leave effectiveness as it is longer than in any other country. This mentality may explain a lack of parental leave research in Russia.

A recent negative birth rate dynamic in Russia also contributes to the urgency of studying parental leave as a potential demographic policy measure. Despite various support measures for families and parents, the Total Fertility Rate has consistently declined. In 2015, it accounted for 1.777, whereas in 2019–2020 it fell to 1.505.

The study aims to demonstrate how parental leave in Russia may be studied through mixed-methods research and to bring attention to the long-delayed transformation of the parental leave system in Russia.

There are at least two reasons why a strategy based on mixed-methods research was chosen. Firstly, it is known that using both qualitative and quantitative data help avoid drawbacks of each of these methods and arrive at a more thorough understanding of the research question (Johnson, 2008). Among these drawbacks, which are

compensated by using mixed-methods research, are the following: for qualitative methods – providing limited generalisability and only soft data, studying few people, being highly subjective, minimising the use of researcher's expertise due to the reliance on participants; for quantitative methods – being impersonal and dry, not recording participants' words, providing limited understanding of the context of participants, being largely researcher-driven (Creswell, 2014).

Secondly, mixed-methods research is used in demographic studies quite infrequently because the major method for exploring demographic processes is statistical analysis. The attempt to adopt mixed-methods research is due to the fact that parental leave in Russia has almost not been studied, and the methodology is yet to be designed. In this context, using mixed-methods research may be considered a pilot project, which will show whether it is appropriate or inappropriate for further studies.

2. Data and Methods

To design this research, there was chosen convergent design, which presupposes conducting qualitative and quantitative studies simultaneously. As each of these methods yields specific results (qualitative data reveal major trends, quantitative data find underlying causes of processes and phenomena), their combination allows approaching the problem from different perspectives (Creswell, 2014). Figure 1 schematises convergent design applied to this study.

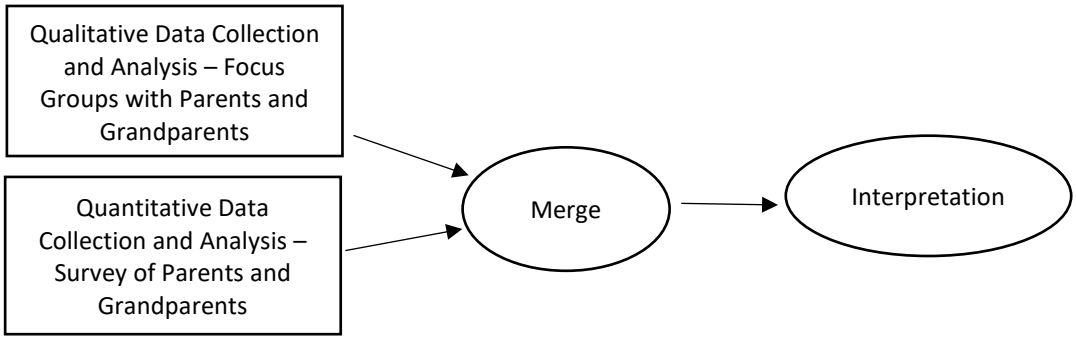

Figure 1: Convergent Design for Studying Parental Leave as a Potential Demographic Policy Instrument in Russia

The study used data from a series of sociological studies carried out in the Sverdlovsk Region (one of the largest Russian regions) in 2021:

1. a survey of 500 parents with both children under the age of 12 and currently living parents (i.e., grandparents);
2. a survey of 500 grandparents with grandchildren under the age of 12.

The study used river sample, and the questionnaire was posted on several websites, which ensured the maximum coverage of the target population; these are websites of regional mass media and social media communities. To distribute the questionnaire, public organisations, which work with families, parents, and children, were referred to. There were collected 563 responses from parents and 547 responses from grandparents. Further, there were randomly chosen 500 responses in each category, which allowed increasing the randomicity of the river sample.

For the analysis, there were chosen questions aimed at studying parents' and grandparents' opinions on potential leave-takers for their subsequent children/grandchildren. These questions were formulated in the same way so that opinions among two generations of families from the Sverdlovsk Region could be compared. The question was: "You probably know that parental leave may be taken not only by mothers but also by other family members. Who would you entrust this right to in your family?" Respondents were offered up to three options.

While processing data from two surveys, the following procedures were used:

1. calculating the number of potential leave-takers, which is the number of options chosen for the question mentioned above. With the maximum number of options being three, respondents could also choose fewer answers (1, 2, or even 0);

2. combining databases of parents and grandparents for evaluating the significance of statistical differences between opinions on the number of potential leave-takers among two family generations.

For the analysis, there were used descriptive statistics, frequency analysis, correlation analysis with Spearman's, Cramér's V, and phi coefficients. To evaluate whether statistical differences are significant, the non-parametric Mann-Withney and Kruskal–Wallis test were used. Data were processed and analysed through IBM SPSS Statistics 23.0.

Additionally, there were carried out focus groups with parents having children under the age of 12 and their currently living parents and/or those of the spouse (N=3) and with grandparents having grandchildren under the age of 12 (N=3); each focus group included from 5 to 8 participants. Because of the COVID-19 pandemic, all focus groups were conducted via Zoom video platform. Although this format of a group interview is unusual, it complied with the homogeneity principle; for each focus group, respondents of the similar age and social status were selected.

For the further analysis, there were chosen questions related to using parental leave within the family. In particular, grandmothers were asked the following question: "You probably know that parental leave may be taken not only by mothers but also by other family members. How would you feel if your family entrusted this right to you?" For parents, the question was reformulated: "If a need arose, who would you entrust the right for parental leave to among your family?"

The logic of the study is presented in Figure 1.

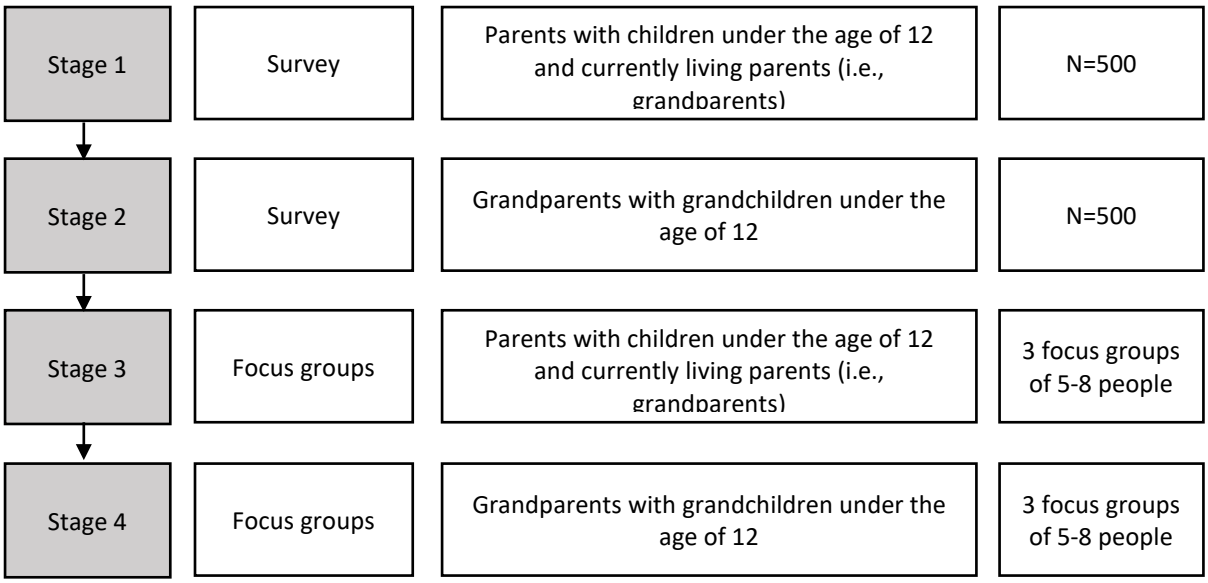

Figure 2: Logic of Parental Leave Study

3. Results

The sociological survey of parents and grandparents yielded the following results.

- Parents' opinions on potential leave-takers are diverse; they consider a mother as a primary leave-taker, and quite often they also mention a grandmother (especially maternal) and a father. Table 1 presents these data.

Table 1: Frequency of parents' choices of potential leave-takers

Potential leave-takers	Share of respondents, %
Mother	81.8
Father	34.0
Maternal grandmother	52.0
Paternal grandmother	13.8
Maternal grandfather	5.0
Paternal grandfather	1.4

Potential leave-takers	Share of respondents, %
Aunt	6.2
Uncle	0.2

In this case, respondents could choose up to 3 options; thus, the number of choices testifies to the diversity of parents' ideas on potential leave-takers in the family. Figure 3 presents the distribution of respondents according to the number of options chosen. Therefore, there is approximately an equal number of parents who rely on a wide, average, and narrow—which is normally limited to the mother and typical for Russia—circle of leave-takers.

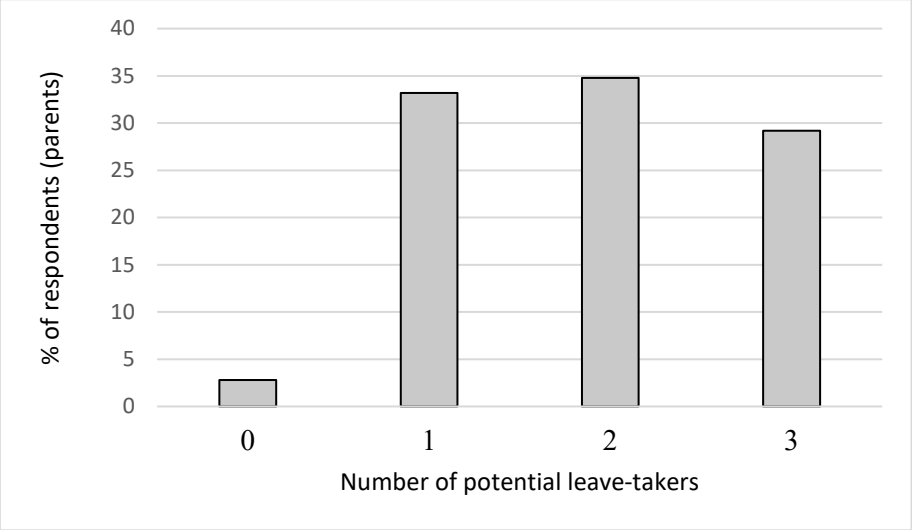

Figure 3: Parents' answers on the number of potential leave-takers

2. Grandparents' views on leave-takers are as much diverse; their answers range as much as parents' ones. However, grandparents less often choose themselves as potential leave-takers. For example, Table 2 shows that they consider a mother as a potential leave-taker more frequently than parents; therefore, they less frequently choose other relatives for this role. Most notably, there is a marked shift towards choosing just one potential leave-taker (a mother) (Figure 4).

Table 2: Frequency of grandparents' choices of potential leave-takers

Potential leave-takers	Share of respondents, %
Mother	92.8
Father	24.8
Maternal grandmother	36.0
Paternal grandmother	13.6
Maternal grandfather	2.8
Paternal grandfather	1.0
Aunt	1.8
Uncle	0.0

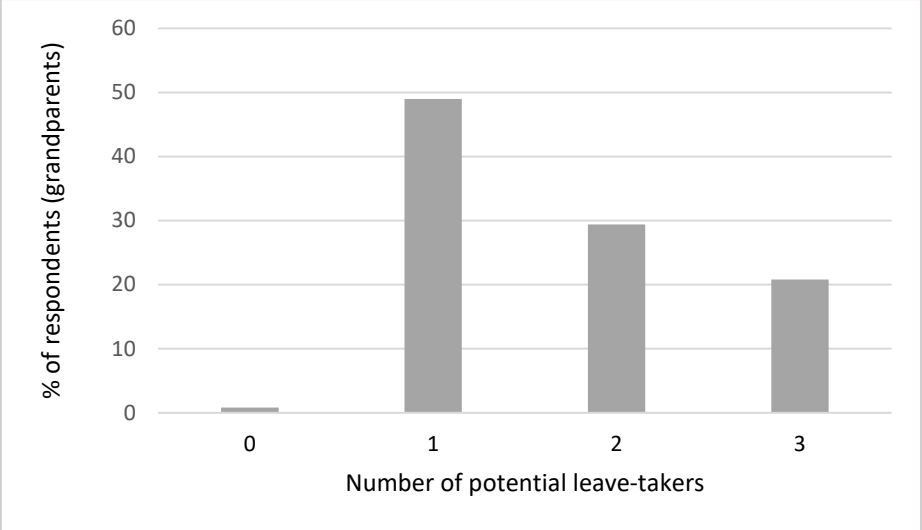

Figure 4: Grandparents' answers on the number of potential leave-takers

3. Based on the non-parametric Mann-Withney U Test, there was analysed the significance of statistical differences between opinions on the number of potential leave-takers among two family generations. Results are presented in Tables 3 and 4.

Table 3: Ranks for the variable "Number of potential leave-takers" (Mann-Withney U Test)

Family generations	N	Mean Rank	Sum of Ranks
Parents	500	535.60	267800.00
Grandparents	500	465.40	232700.00
Total	1000		

Table 4: Test Statistics for the variable "Number of potential leave-takers" (Mann-Whitney U Test)*

Statistics	Total points
Mann-Whitney U	107450.000
Wilcoxon W	232700.000
Z	-4.092
Asymp. Sig. (2-tailed)	0.000

* Grouping Variable: Family Generation

Table 5 compares descriptive statistics on parents and grandparents. Evidently, parents' views on the circle of potential leave-takers are more diverse than grandparents' ones.

Table 5: Statistics for the variable "Number of potential leave-takers"

Parents			Grandparents		
Number of potential leave-takers	%	Cumulative %	Number of potential leave-takers	%	Cumulative %
0	2.8	2.8	0	0.8	0.8
1	33.2	36.0	1	49.0	49.8
2	34.8	70.8	2	29.4	79.2
3	29.2	100.0	3	20.8	100.0
Total	100.0			100.0	
Mean	1.90		1.70		
Std. Dev.	0.853		0.802		
Median	2		2		
Mode	2		1		

The most prominent differences in views, which were statistically proved through comparing proportions of columns in crosstabs and significance of phi coefficients, are presented in Figure 5. It is apparent that more often grandparents attribute the role of the sole leave-taker to mothers and less often to fathers; they also regard

themselves as potential leave-takers much less frequently. The immediate circle, whose help may be used by parents, is much wider for parents as compared to grandparents.

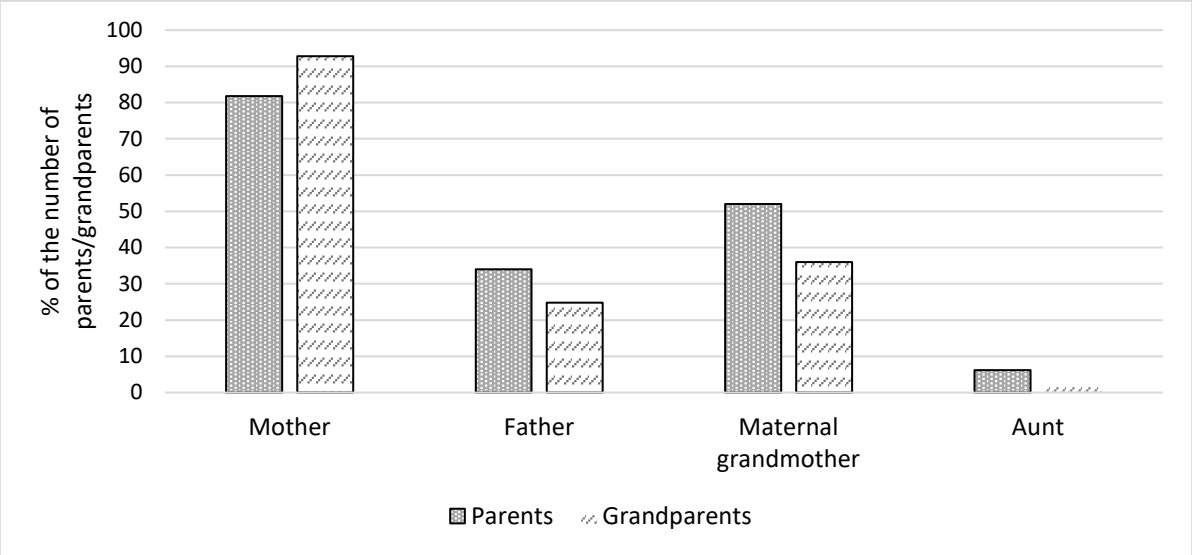

Figure 5: Statistically significant differences between opinions on leave-takers. Comparison of parents and grandparents

4. The correlation analysis based on parents' answers showed that the number of potential leave-takers was related to certain demographic characteristics of parents (Table 6). For example, the older parents are, the fewer the number of potential leave-takers. Additionally, the larger number of children also leads parents to rely on the narrower circle of actual helpers during parental leave. At the same time, Table 5 reports that there is no relationship between the number of potential leave-takers and parents' education, financial status, or gender.

Table 6: Correlations between the number of potential leave-takers and demographic characteristics of parents

Demographic characteristics	Correlation Coefficient	
	Value	Asymp.Sig
	Spearman's rho	
Age	-.089	.047
Number of children	-.155	.000
	Cramer's Coefficient	
Education	.038	.394
Financial status	.008	.856
Gender	.053	.235

5. The correlation analysis revealed that grandparents' views on the number of potential leave-takers were related to only one socio-demographic variable—their education (Table 7). Their age, the number of children and grandchildren, and any other objective socio-demographic characteristics proved not to be related to grandparents' ideas on the number of potential leave-takers.

Table 7: Correlations between the number of potential leave-takers and demographic characteristics of grandparents

Demographic characteristics	Correlation Coefficient	
	Value	Asymp.Sig
	Spearman's rho	
Age	-.053	.235
Number of children	-.014	.748
Number of grandchildren	.065	.145
	Cramer's Coefficient	
Education	.146	.006
Financial status	.087	.507
Gender	.057	.658

To explore the specificity of the relationship between the grandparents' level of education and the number of potential leave-takers, a non-parametric Kruskal Wallis Test was used. Results are shown in Tables 8 and 9.

Table 8: Ranks for the variable "Number of potential leave-takers" (Kruskal Wallis Test)

Level of education	N	Mean Rank
Secondary general or lower	32	280.88
Vocational	166	231.68
Higher	302	257.63
Total	500	

Table 9: Test Statistics for the variable "Number of potential leave-takers" (Kruskal Wallis Test)*

Statistics	Total points
Chi-Square	5.856
df	2
Asymp. Sig.	.050

* Grouping Variable: Education

Table 10 groups answers of grandparents according to their level of education. Most notably, conservative ideas (i.e., about a sole potential leave-taker) are mostly shared by those with vocational education (54.4%), less often by those with higher education (47.4%); among grandparents with the lower level of education this opinion is even less frequent (37.5%). Thus, grandparents with vocational education have more traditional beliefs, which is proved by another statistical measure—the median. (The mean in this case would not be a reliable characteristic of distribution because means are highly varied).

Table 10: Statistics for the variable "Number of potential leave-takers"

Secondary general or lower			Vocational			Higher		
Number of potential leave-takers	%	Cumulative %	Number of potential leave-takers	%	Cumulative %	Number of potential leave-takers	%	Cumulative %
0	0	0	0	1.2	1.2	0	0.7	0.7
1	37.5	37.5	1	55.4	56.6	1	46.7	47.4
2	37.5	75.0	2	26.5	83.1	2	30.1	77.5
3	25.0	100.0	3	16.9	100.0	3	22.5	100.0
Total	100.0			100.0			100.0	
Mean	1.88		1.59			1.75		
Std. Dev.	0.793		0.779			0.810		
Median	2		1			2		

6. Focus groups with parents allowed us to identify reasons why parental leave—despite parents having more diverse views on leave-takers than grandparents—is still predominantly taken by mothers. Firstly, it is widely believed that a mother plays a key role in taking care of a child, who needs her especially at earlier stages of the development. A mother, in turn, also needs her child because childcare gives her a gamut of positive emotions. Secondly, parents claim that children are their personal responsibility, which cannot be delegated to grandparents even as part of parental leave. Finally, many parents are not sure that grandparents would be able to handle childcare physically because of their age. In case of emergency, parents are still willing to delegate the right for parental leave to one of the grandparents—as a rule, to the maternal grandmother (Table 11).

Table 11: Parents' opinions on leave-takers

Leave-takers	Reasons for using parental leave	Codes
Mother	Child needs mother at earlier stages of development	"I'm also conservative… Everything might happen, but no one can do it better than a mother. They feel these needs" (Andrey) "In this matter, I hold more conservative views. I think that a mother is a big influence on her child, specifically at an early age, when they breastfeed and change diapers…" (Dmitriy)
	Mother needs to derive pleasure from motherhood	"I love babies so much… That's why I want to enjoy this period myself because it's so short" (Oksana) "I also believe that a baby should stay with a mother because it's the smell of the baby, the way they smell, these first breastfeeds… An amazing experience" (Natalie) "Well, if possible, a baby should stay with a mother. I wish all mothers this" (Galina) "I also think parental leave should be taken by mothers. Otherwise, she will…it's my opinion, she will stop being a mother [laughing]. She has to be on parental leave, love her child, and develop those warm feelings herself" (Natalie)
	Personal responsibility for children	"I would definitely use it myself, for sure. It's like an adult decision, you have to be held responsible for it" (Anna) "Generally, I think that your children are your duty" (Michael) "Again, considering my today's state, I'm independent, so I will not delegate it to anyone" (Nadezhda) "Honestly, I wouldn't have delegated it because my child was intelligent, and I wouldn't have given this right to anyone" (Marina)
	Social conventions	"I support the idea that a mother should be with a child. If there's time for that, then it's the mother that should be with her child, not anyone else" (Anastacia) "Parental leave should be taken by a mother herself. I stayed with both of my children myself" (Julia)
Maternal grandmother	Mother has trust in her mother	"If something extraordinary happened, if I got sick, for example, I would trust my mother because she knows how to treat children" (Marina) "I would put my mother first because we have more similarities in the way we communicate and bring up. It's easier for me to ask her rather than my mother-in-law" (Oksana) "If I was forced to choose, it would definitely be my mother because our values coincide more. My child would be in good hands" (Marina) "There's no doubt, it would be my mother. But practically she took this responsibility. I woke up early and left for work, so she quitted her job and stayed with my elder daughter" (Olga) "I'm certain that my mother will ensure the safety and health of my children" (Galina) "I would trust my mother, of course. She is the closest person I have and my friend" (Marina)
Paternal grandmother	Other family members are busy	"I would probably delegate it to the grandmother because the father has a lot to learn [laughing]. To my mother-in-law because my mother is still employed" (Marina)

7. Grandparents hold strongly conservative views. The majority of them claimed that they wouldn't have taken parental leave because, firstly, parents have to take responsibility for their children themselves, and secondly, a child in this period particularly needs mother's care. Similar to parents, grandparents believe that parental leave should be primarily—or, according to most of the answers, exclusively—taken by mothers (Table 12).

Table 12: Reasons why grandparents would not like to take parental leave

Reasons	Codes
Child needs mother	"I think that a mother herself should take leave because it's only her who knows best what her child needs. She is with her baby from the very first day, and the baby trusts the mother more" (Irina) "I would say a mother should take parental leave. Everything you put in your child until they turn 5 is a foundation for future development. I guess a child should be with a mother. She is the most important person" (Alyona)
Children are parents' own responsibility	"When parents are alive, it's weird to switch like that" (Constantine) "I'm strongly against it. Children must be brought up by parents. I would never agree to that" (Alla) "My opinion is that taking care of children is parents' responsibility, not grandparents'. I mean being on parental leave and staying with children" (Luybov)
Happiness from parenting	"I also think that children, especially babies, should be brought up by parents. They have to see their children grow up. They can miss out on it, on everything that happens in their children's lives" (Svetlana) "Parents have to take care of their children themselves. That's what it has to be like, they have to live that moment, at least the first year" (Lyubov) "I'm strongly against it because children should be first and foremost raised in the family. It's crucial for a mother to develop those parental feelings" (Svetlana)
Health	"I would probably agree to it, but it could be difficult for me because of my health condition" (Rimma)

8. Nevertheless, while holding focus groups, grandparents (as well as parents) reported that they would be ready to take the responsibility and use parental leave in case of emergency. The following are examples of grandparents' thoughts:

"Sure, if something tragic happens, grandparents will help; they will take care" (Konstantin).

"If it's necessary, you'll always be around for your daughter and definitely will use this right. You have to do what you have to do" (Valentina).

"If it was necessary, I would probably agree" (Tatyana).

"Basically, I babysit them, which allowed my daughter to work part-time. So I would probably be okay with that" (Nina).

4. Discussion

Results of several stages prove that Russian society is dominated by traditional views on childcare and parental leave usage. Quantitative results of the study demonstrated that both parents and grandparents tend to agree that childcare during parental leave is mostly a prerogative of mothers. In turn, qualitative results allowed identifying reasons behind this mentality. Among reasons, respondents provide child's needs and mother's needs to take care of her child. Additionally, both generations claim that it is necessary for parents themselves to be responsible for children meaning that a mother being on parental leave is a manifestation of that responsibility per se. Interestingly, a child's need for mother's care was mostly mentioned by men, whereas women reported that they would like to use the right themselves to experience the joy of motherhood.

Still, parents refer to other relatives of the child as potential leave-takers and do it more often than grandparents. In this context, the younger the family generation, the less conservative stereotypes.

When choosing potential leave-takers, parents more often prefer maternal grandmothers (not fathers, for example). In many European countries (e.g., Belgium, France, Sweden, Hungary, Norway, Estonia), paternal leave has been widely popular for decades (Koslowski et al.). Researchers claim that giving fathers a right for leave and engaging them in childcare aim to reduce stress for women while balancing family and work and to ensure gender equality.

Results show that, despite the Russian legislation provides for the same opportunity, even parents themselves quite rarely choose to take it. There is a popular opinion that women know best how to take care of a child. Respondents said the following in support of the idea:

"I would probably delegate it to the grandmother because the father has a lot to learn [laughing]" (Marina).

"I think that a woman would be more comfortable [with raising children], and it's clear for her" (Marina)

"If delegating it to the husband, I don't know, it seems unreal" (Svetlana).

According to results, conventions in Russian society do not allow the only element of flexibility in the parental leave system to function properly.

5. Conclusion

The study developed a methodology based on the mixed-methods research strategy. Results reveal the potential of applying this strategy to further studies of parental leave system as a potential instrument of the demographic policy. Quantitative results let us identify major social attitudes towards the existing parental leave system in Russia and bring attention to the urgency of its transformation. In particular, the range of parents' opinions on potential leave-takers is much wider than that of grandparents. Results also showed a negative correlation between parents' views and the number of children and parents' age—the younger parents are and the fewer children they have, the wider their circle of potential leave-takers. At the same time, grandparents are more conservative when it comes to the number of potential family members who can take parental leave and their opinion on who can potentially become a leave-taker (except the mother).

At the same time, qualitative results revealed fundamental causes of social attitudes towards leave-takers. Focus group results indicated that both parents and grandparents attributed a key role in childcare to the mother. They argue that a child needs mother's care, whereas a mother has to feel the pleasure of motherhood. It is also believed that having a child is a conscious decision; thus, it is a parent's duty to raise children, not grandparents' one. However, in case of emergency, parents are ready to delegate the right for parental leave to one of the grandparents (more often, to maternal grandmothers). Grandparents, in turn, are also ready to take parental leave if it is needed.

Results may lay the foundation for developing radically new mechanisms of the state demographic policy in Russia. However, to formulate specific plans for transforming parental leave, more profound research, which would focus on exploring the potential effectiveness of this measure for the Russian demographic policy, is needed.

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The Relationship of the Change Context with the Resilience of Hotels: Proposal for a Research Framework on Hotels During the Covid-19 Crisis

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Abstract: COVID-19 pandemic has brought many changes to the way that the tourist sector operates. Almost all of the tourist businesses are affected by the impact of the measures which were taken in order to deal with the effects of COVID-19. As a result there is high uncertainty on the internal and external environment that the management of tourist businesses would have to take into consideration. Indeed, the change context (internal and external environment) is unstable and this creates uncertainty. For this reason, this publication aims to develop a research framework which links the change context with the level of resilience of hotels during the COVID-19 crisis as well as the impact that this has on the performance. For this reason the paper recommends the use of Melián-Alzola et al (2020)'s research framework which is going to be enriched with the measure taken for COVID-19, which is its key contribution on the academia and the practitioners.

Keywords: uncertainty, environment, tourist industry, resilience, change management

1. Introduction

The tourism sector is exposed to numerous threats and opportunities which lead to changes. Just to name a few these are: the climate change, the financial crises and political changes (Calgaro et al, 2014). It has also been affected from the COVID-19 crisis (Senbeto & Hon, 2020) which resulted on tremendous changes on the tourism environment, affecting hotel occupancy rates and the internal operations (Courtney, 2020). Indeed, tourism is a sector which is very vulnerable on any type of crisis, while Glaesser (2006) claims that tourism is one of the first sectors which will be affected from major crisis. This brings the need to examine the resilience of tourism organizations on such threats (Filimonau & De Coteau, 2019) and their ability to change in order to meet the new challenges and uncertainties as a result of the changes on their environment (Attila, 2016).

Overall, the tourism industry has shown that it is able to adjust (including its organization culture) on any change which comes from the internal and the external environment (Belias et al., 2017; Belias, Velissariou & Rossidis, 2018). An example is the use of high-end technologies in order to cope with the COVID-19 crisis; such as the use of robots instead of employees, which minimizes the exposure of the personnel to COVID-19 (Belias & Vasilliadis, 2021). Nonetheless, besides of the high level of readiness and the ability to resilience from any past crisis, the case of the COVID-19 pandemic has created major fears and uncertainties on the tourism industry (Jian et al., 2020), which brings the need to further investigate on how the tourism industry can cope with the uncertainty created from the changes on the internal and external environment due of the COVID-19 crisis.

At this point, it is essential to point out that organisational resilience contributes not only to organisational survival during harsh times but also it contributes to the competitiveness of a business during a crisis. Nonetheless, despite the fact that resilience has been widely accepted as an important factor for sustainaining an organization during a crisis (Bhamra, et al., 2021), there is a gap on hotel resilience overall (Chowdhury, 2019). Several authors such as Jiang and Wen (2020) and Melián-Alzola et al (2020) have argued that the COVID-19 crisis has generated a number of unprecedented changes on hotels that should be the subject of analysis in terms of how hotels can be resilient during the COVID-19 crisis (Melián-Alzola et al., 2020).

Hence, the scope of this paper is to examine the readiness of the tourism industry to have an effective change management in order to reduce the uncertainties on its internal and external environment. This is a literature

review which aims to recommend a framework for future research. The publications used for the purpose of this research were identified from various publications which were collected from databases such as Science Direct, and Google Scholar. The authors have used keywords such as “hotel resilience & COVID-19” and other similar keywords. The authors have selected the related papers based on criteria such as whether the publication has relied on an empirical evidence, how much its content related with the topic and its contribution, for example by introducing a research framework.

2. Change Management

Organizational change, as a concept, has been of great concern on both the academia and the business community worldwide. The concept of organizational change has been studied since the 1950s. It has followed different models adapted to the requirements and data of each market (Bejinariu, et al, 2017). Undoubtedly, a basic condition for the survival of an organization is its immediate adaptation to the changes imposed on it by the environment in which it operates. Change is the transition from one organisational condition/status to another or from a given set of conditions to a different one (Rossidis, Belias & Aspridis, 2020). This transition is nothing more than a process of adapting and repositioning the individual or the organized groups or the whole organization in a new environment where it will improve its effectiveness and create value (Kuroda & Gokhale, 2014).

Most planned organizational changes are attempted in order for the business to meet the requirements or opportunities that have already arisen in the external environment (Rossidis, Belias & Aspridis, 2020; Rossidis, Belias & Vasiliadis, 2021). On the other hand, there are cases where the company has anticipated the change of a situation and tries to adapt in order to be able to deal with it successfully. In general, all the changes attempted in a tourist company serve various purposes which could be grouped into four categories that relate to all areas of operation of an organization (Doppelt & McDonough,2017). These purposes are:

- Commercial purposes: They include all the necessary actions needed to increase competitive advantage (increase market share, open to new markets, find new contracts with tour operators etc.), while many tourist organisations are trying to stay close with the latest trends, such as the concept of sustainability and Green hotels (Siyambalapitiya et al, 2018).
- Technological purposes: They include the actions for the introduction of new technology in the company and they aim at the modernization of the company and the increase of productivity (adoption and familiarization with new technology, etc.) (Hristova et al, 2019).
- Innovative goals: These goals offer the opportunity for something new to arise in the organization or the market. They include the actions which a business should perform in order to be renewed and modernized. Often these goals are not imposed by external pressures, but express the philosophy and ambition of the company to be a pioneer (compliance with social and legal requirements, achieving social acceptance, etc.); such as the case of using robots on hotels as mentioned by Belias & Vasilliadis (2021).
- Organizational goals: They include the appropriate actions for the smooth and efficient operation of the business. They aim to increase efficiency and identify talented people (Koutiva et al., 2019; Belias et al., 2017b) who will be organized and active in order to be able to implement the company's vision (increase staff productivity, prevent the departure of useful executives-associates, increase motivation, recovering from a disaster etc.) (Filimonau, 2020).

The concept of organizational change refers to any element of the organization whether it concerns the formulation of the organization's own strategy or individual elements of management. At this point, it should be noted that the changes can be large or small. Large-scale changes are: the review of the structure, the merger into markets, the restructuring of the business process, the change of policy, the introduction of new technology, the organizational culture for an organization (Bejinariu, et al, 2017). However, there are also small-scale changes that affect some parts of the organization such as: the new division of labour, the change of organization chart, the upgrade of a hotel (for example from 3 to 4 stars), a new service to a hotel (Ulus & Hatipoglu, 2016).

3. The effect of the change context on the organizational resilience

The reasons that force an organization to make any kind of change come from the environment in which it operates. This happens because of the following reason: if the managers do not listen to the market demand, they will not be able to ensure the viability of the organization. The interest and attention of the executives should focus on the emerging trends and all those events that will affect the company and its strategy and ensure

its sustainability by enabling the resilience of the organisation towards the changes made from COVID-19 (Köseoglu et al, 2020).

The case of organisational resilience during the COVID-19 crisis is determined to a large extend from its ability to understand the dynamics of the change context in order to enable the appropriate strategies which will allow the organisation to survive from this difficult situation (Jiang and Wen, 2020). Especially as far as the hospitality industry is concerned, it is essential to understand the continuous changing environment where the hotels operate and to determine which factors will determine the sustainability of a hotel so as to regulate the resilience strategy (Melián-Alzola et al., 2020). For this reason it is essential to understand the various models which contribute on the understanding of the external and internal environment.

External Environment: It is the place where the company seeks opportunities and potential threats.

- Changes in the technological dimension: In a tourism organization, the most common changes that take place are related to technological trends or technological achievements that take place outside the market, which may have a significant impact on the tourist organization and its strategy. These trends can be an opportunity for companies to take advantage of them and introduce them effectively in the sector in which they operate (Belias et al, 2021).
- Changes in the political / legal dimension: The political and legal environment is often highly fluid, as it is influenced by factors that often have nothing to do with the organization's activity. The changes can come either by passing new laws or by adding or deleting legislative or regulatory restrictions and so on. An example is the following: the changes on the regulations and protocols for the operation of hotels due to the COVID-19 pandemic, but also due to the lockdowns (Courtney, 2020)
- Changes in the economic dimension: Undoubtedly, the economic environment of a country depends on the global economy since we are not talking about closed-type economies. One of the main reasons that affect the organization and lead it to significant changes is the financial size of the market; as the general economic developments that take place are likely to affect the smooth operation of a tourism organization (Glaesser, 2006)
- Changes in the socio-cultural dimension: It refers to the wider social and cultural environment of the organization. The most important socio-cultural factors that influence a market are the distribution of income, the level of education, the way of life of modern man, leisure. Undoubtedly, social and cultural values influence the way the consumer acts and this is more obvious during the COVID-19 crisis (Peluso & Pichierri, 2021).
- Changes in the demographic dimension: It includes the size of the population, its geographical distribution, its age structure as well as the distribution of income. Significant demographic trends, observed in recent years, create new conditions in the wider environment of modern organizations such as slowing down the birth rate, moving from mass markets to more specific small markets, green tourism etc. (Peluso & Pichierri, 2021).

Besides that, it is essential to understand the value of using Porter's five forces as a valid model that can help to explain tourist organisations behaviour and resilience. Appiah et al (2021) have argued that the microenvironment analysis – well known as Porter's five forces – is still a valid tool that it can help the academia and practitioners to better understand the resilience that a sector has in a major crisis, such as the COVID-19 crisis. Through understanding issues such as the negotiation power between the industry and its suppliers/customers, it is easier to understand the dynamics which will be developed as a result of a crisis. In the tourism industry, the five forces model can explain not only how the sector will behave during the COVID-19 crisis but also determine the level of resilience of the sector on this crisis (Madsen & Grønseth, 2022).

Besides the external environment, there is also the case of internal environment that has to be taken into consideration. The Internal Environment is all the elements that the organization has at its disposal, ie the resources to use them in order to achieve its goals (Daft & Marcic, 2019).

The variables of the internal business environment are located within the organization and are at its disposal to be used with the ultimate purpose of achieving the goals set by the organization itself. These are:

1. Human resources: It is the most basic power that an organization has on its disposal, since without it there is no organization.

2. The installations: It concerns the facilities, the mechanical equipment, the stocks of raw materials for a tourist business.
3. The technological forces: It has to do with the level of technology that the company has.
4. The financing forces: The financing of the organization can come from the share capital, from the profits or from the loan funds (Uğurlu, 2020).

4. Organizational Resilience and Change Management and Uncertainty on the Environment for Tourist Businesses in the Era of Covid-19 – Current Literature

Every 10 years, new viruses are observed that can cause a pandemic. The Coronavirus Pandemic 2019 (COVID-19) is an ongoing pandemic caused by the SARS-CoV-2 coronavirus and was first identified in Wuhan, China in December 2019. The most important factor that affected the economic developments in the world in 2020 in general, is the coronavirus pandemic (Ntalakos et al., 2022). The tourism industry could not, of course, remain unaffected as it is an important source of revenue for the global economy (Belias & Trihas, 2022). According to the United Nations World Tourism Organization (UNWTO), the global tourism industry is losing $ 320 billion. The losses from this year's pandemic were three times greater than the losses incurred in the global tourism crisis of 2009. The number of tourists decreased by 300 million, which means a decrease of 56% compared to the same period last year since due to the general lockdown tourists were scared and numb. The outbreak of the coronavirus has led to the suspension of most domestic and international travel, causing a significant reduction in revenue and liquidity problems to all tourism operators. Travelers, as well as businesses, are faced with uncertain prospects. This situation seems to have a significant impact on tourism as it is estimated that around 6 million workers will lose their jobs worldwide. Also significant will be the loss of revenue for hotels and restaurants (85%), for travel agencies (85%), for long-distance rail services (85%) but also for cruises and airlines (90%). (Unric, 2022).

Currently, while the tourist industry has managed to recover, it seems that a new wave is coming which is the Omikron variant. The world status currently with the top-10 countries in terms of cases as it is on 23 December 2021, is described in Figure1.

#	COUNTRY	Total Cases	Total Deaths	Total Recovered	Active Cases
	World	277,525,937	5,393,668	248,672,730	23,459,529
1	USA	52,510,978	833,029	40,908,146	10,769,803
2	India	34,765,974	478,759	34,208,926	78,291
3	Brazil	22,222,928	618,128	21,414,318	190,482
4	UK	11,647,473	147,573	9,922,450	1,577,420
5	Russia	10,292,983	300,269	9,097,521	895,193
6	Turkey	9,228,825	50,957	5,858,445	289,422
7	France	8,798,028	122,116	7,651,414	1,024,498
8	Germany	6,915,353	110,234	5,992,800	812,319
9	Iran	6,177,885	121,211	6,016,224	20,350
10	Spain	5,645,095	55,937	4,997,068	559,090

Figure 1: Top – 10 Countries in terms of Coronavirus Cases (Worldmeters, 2022)

From the above table it is not only understood how severe is the COVID-19 pandemic but also how much it affects countries which have a leading role on tourism, such as Spain, France, Turkey, UK and USA. Thus, Covid-19 pandemic has a severe impact on tourism as a whole.

It is well accepted that the COVID-19 crisis has brought many changes that the tourist industry has to face. Those changes are the results of the high uncertainty on the internal and external environment of the tourist industry due of the COVID-19 crisis (Melián-Alzola et al., 2020). This concept has attracted the interest of the academia that has produced a number of publications on this issue.

It is important to mention that this is a new concept and hence the existing literature is limited. Jian et al (2020) have made a research on a sample of 613 tourists from Korea and China where hotel brand trust is a major

element which will convince tourists to book to a hotel during the COVID-19 crisis, even if they have to pay more than before the crisis of the COVID-19. The sample is quite concerned over the safety during their stay and the compliance with the continuous changing COVID-19 protocols. However, the fact that hotels and their management have a difficulty on compliance, is not due to the inability to change but mostly due to the continuous changing environment; for example Ertac & Cankan (2021)'s research argues that in terms of health and safety guidelines the hotel owners are often confused rather than helped. Another finding of this research was that that the government interventions and support play a significant role on dealing with the uncertainties and increasing the resilience and readiness of the tourist organisations. More precisely, on the one hand the governments are taking decisions for lockdowns and travel bans but on the other hand they are offering the necessary financial support in order to ensure the sustainability of the tourist sector. Therefore, the changes made on the tourist industry in order to cope with this crises depend to a large extent on the government decisions, intervention and support.

An interesting point which was made by Peluso & Pichierri (2020) is that special attention must be given on changes so as to accommodate tourists who feel vulnerable on the COVID-19 virus. This will enable them to trust the hotel and to increase its resilience towards the COVID-19 crisis. This could help tourists who have medical problems or aged tourists as well as anyone who feels that he/she is under threat from the virus. For this reason it is essential to make the necessary changes in order to reduce the uncertainty for the guests and the employees.

A crucial issue concerning resilience is the way that an organization has to cope with the changes needed to be made in order to deal with the uncertainties of the environment. Overall, a resilience-oriented management approach means that a hotel must be well-prepared not only to react when a change will have to take place, but also to anticipate the changes so as to optimize the opportunities which may derive (Brown et al, 2018). Organizational resilience is a concept which is related with the ability that a hotel has to cope with a crisis and to optimize the changes that need to be made. In few words, it must be well prepared in order to take advantage of a crisis and to turn it into an opportunity. This can be made by being able to adaptive and agile on any types of changes. However, it is important to mention the Prayag et al (2019) report that argues that the concept of resilience-oriented management approach on the tourism industry has not been widely examined and it should be under consideration when it comes for change management on tourism businesses. Another argument is that resilience on important tourist businesses, such as hotels, has a positive impact on the overall resilience of the destination and its ability to gain a competitive advantage during a crisis. Indeed, Jiang and Wen (2020) argue that the COVID-19 pandemic has brought to the surface some unprecedented effects on the tourism industry; hence the academia and practitioners should focus on how the tourist companies can become more resilient in order to cope with the changes brought from the COVID-19 crisis. Similarly, Melián-Alzola et al., (2020) have supported the above arguments by claiming that by understanding the changing context and how it affects the tourists and the hotels, a hotel will be able to predict how these changes will affect its resilience; thus the hotel could enable the necessary changes which will ensure its resilience.

5. Proposal on how to measure the ability of the tourism industry to make the necessary changes so to deal with the threats and opportunities deriving from the external and internal environment

An important insight has been made by Melián-Alzola et al (2020) who have developed a model for predicting the resilience of the hotels on changes needed to be made due to the COVID-19 and the changes that it has brought on the internal and external environment of the organizations. More precisely, Melián-Alzola et al., (2020) have mentioned the fact that the resilience of a hotel on the crisis depends on many factors, (including the hotel size etc.).Nevertheless, it depends mostly on the experience that the hotel has on previous changes and how it handled them. For this reason Melián-Alzola et al., (2020) suggest that the hotels must have a solid change strategy in order to understand the dimensions of each change. This could affect the hotel resilience and its impact on organizational performance. Hence, this paper is providing an answer on how the change context has an impact on change resilience and also on how this will affect its performance during a change.
For this reason they have produced the following research model:

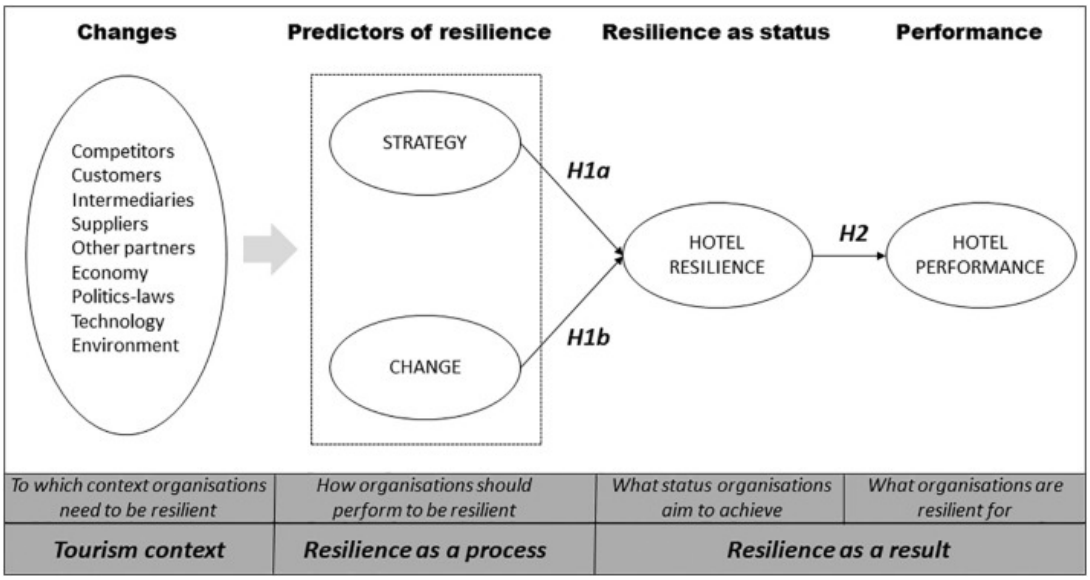

Figure 2: Resilience – Change Model (Melián-Alzola et al. (2020))

As it is described by this model, Melián-Alzola et al (2020) have taken the changes which have occurred in the internal and external environment (this is the tourism context), in order to examine how the organization shall react in terms of change management and strategy; then they measure whether the hotel is ready to cope with those changes (hotel resilience) and what can be the possible outcome on its performance. At this point, it is essential to argue that this model is important because it links the external environment with two key dimensions of resilience. The first dimension is the prediction of the resilience (the context of changes is a predictor of resilience for a hotel) and the second dimension describes whether a hotel has managed to achieve the status of change

The research model has relied on a number of variables which are the following:

- Changes occurring on the internal and external environment: This includes changes coming from competition, customers' behaviour, intermediaries (such as a tour operator bankruptcy), effect of other partners (such as new tourism clusters), suppliers (such as a new airliner), the economic context (such as changes on the currency rates and an financial crises), changes on the political and legal context (such as new regulations), changes on the technological context and on the natural environment.
- The types of strategies followed by the tourist business. These involve: changes in the business environment (such as new needs of tourists), maintenance of a continuous strategic vision, designs and updates its business strategy to adopt to the changing environment, reflection of past experiences and the development of relationships based on trust with partners and/or external agents.
- The types of changes which include that the organization needs to stimulate knowledge development and continuous learning, to provide high quality products and services, to be committed to quality management and stakeholder satisfaction, continuous improvements on the services and products, new product development, resources reduction and new procedures.
- Resilience can occur when adopting to changes in the environment, recovering and strengthening at strategic and operational level, adopting to new environmental conditions etc.
- Performance can be measured in terms of average sales growth, average market share growth, hotel image and reputation and customer loyalty.

There have been other researches on how the tourist sector can recover from the COVID-19 crisis, and also how it is able to understand the nature of the changes which have occurred due to the COVID-19 crisis and its impact on the environment. Nonetheless, Melián-Alzola et al (2020)'s model can be a starting point for a future research which will assess the readiness of hotels and other tourism business to change as a result of the impact of COVID-19 on the internal and external environment of those organisations. Melián-Alzola et al (2020) have used the questionnaire which produced from this model in the case of hotel managers in the Canary Islands. Despite of the high levels of reliability (Cronbach's alpha for each construct ranges between 0.806 and 0.899.) the results of this research are important but they cannot be generalized due to the nature of the sample. The research was taken in the Canary Island just before the outbreak of the COVID-19 pandemic, while the research focused only

on luxurious hotels. Hence, this measurement model can be upgrade for a future research which will include the following:

- To include the COVID-19 impact on the environment and on the changes. More precisely, as far as the changes are concerned, the research can include a group of variables which are related with the COVID-19 crisis, such as the impact on tourist demand, the changes on the legal and political environment (such as new regulations). The research can also refer on Jian et al (2020) factors of fear and uncertainty among the customers and the employees of the potential that they may catch up with COVID-19 virus. In addition, the change management, as a predictor of resilience, must include the changes made in order to accommodate the COVID-19 regulations, such as social distance etc. Also the model should take into consideration the expansion of the changes; since authors such as Belias et al (2021) have noticed a wide range of innovations used from some tourist businesses in order to deal with the COVID-19 outbreak. Finally, as far as the performance of the model is concerned, the variables may include the cases of COVID-19 reported among the staff or the guests/clients during their stay (infected during their stay); thus the model should examine the effectiveness of the changes made in relation with COVID-19.
- A research besides the enrichment of the questionnaire can take place among various tourist businesses. Melián-Alzola et al (2020) have focused on luxurious hotels in the Canary Islands. A future research can expand in sample of other tourist businesses, including villa rental, car rental, outdoor activities etc. To sum up, the above can be the basis of a future research in order to examine the effect of COVID-19 on the environment of the tourist industry as well as what changes the tourist businesses have to make so as to cope with uncertainty.

6. Conclusions

COVID-19 has brought high levels of uncertainty among the tourist professionals (Belias et al., 2020, Belias, Rossidis & Valeri, 2021). Indeed, it is fair to say that it has changed the way that the tourist industry operates. However, it is important for the tourist businesses to be able to deal with those uncertainties (Belias & Trichas, 2022). This can happen with a proper change management plan which will strengthen the resilience of the tourist business (Rossidis, Belias & Vasiliadis, 2021b).

The existing literature is limited but it is indicating the adaptation on the new situations. The compliance with the regulations and government's guidelines is the only way to recover from the crisis. The hotel businesses must be ready to adopt into this new environment and to minimize the uncertainty created from COVID-19. For this reason this paper suggests a research framework which relies on the work of Melián-Alzola et al (2020). The suggestion includes the enrichment of the model with changes made due to COVID-19 pandemic as well as its usage for the tourism businesses. In that way the academia and practitioners would be able not only to measure the resilience of the tourist businesses but also the effectiveness of coping with the uncertainties caused from the COVID-19 crisis.

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Wine Tourism Market Research: Bringing the Psychophysiology lab to the Field

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Abstract: Wine tourism is of growing academic and business interest, being also acknowledged as an important driver of rural development. Successful management and marketing decisions, matching visitor demand, requires solid market data. The questionnaire-based survey is one of the most popular approaches to collect quantitative data in tourism, with statistics playing an important role in supporting management decisions. One of the advantages of this data collection method is the possibility of obtaining large amounts of data from large numbers of tourists in a relatively easy, economic, broadly accessible and not too time-consuming way. However, given the subjective character of self-report responses, which are highly influenced by aspects such as social desirability, conscious data processing, validity and reliability of the measures used, many experts argue that questionnaires are insufficient to fully understand human behavior, attitudes and feelings. One way to obtain more objective data is through the use of psychophysiological indicators such as peripheral nervous system measurements, usually collected in the laboratory. The artificial character of this collection method (in the lab) is recognized, however, as its main disadvantage. In the present work, an innovative methodology (through peripheral nervous system measures) for collecting objective data in wine tourism contexts is proposed, thus overcoming the subjectivity of survey data and the possible bias resulting from the collection of objective measures in artificial laboratory contexts. Visitors at two Bairrada wineries wore small portable and wireless sensors to capture their electrocardiogram and electrodermal activity during guided visits to the premises. A small hand-held push button allowed them to register any moment they found particularly interesting or exciting. Signals were recorded on a smartphone by the experimenter, who was part of the visitor group, and who also registered different stimuli and activities along the visit. Additionally, psychophysiological data were complemented by an interview and survey data to enhance the interpretation of results. Preliminary results will be presented, illustrating the potential of this method to produce important and valid evidence in wine tourism, to inform stakeholders about their market and allow better management decisions.

Keywords: EDA, ECG, portable wireless sensors, wine tourism, market-informed management decisions

1. Wine tourism

Wine tourism is an area of growing academic and business interest (Charters and Ali-Knight 2002, Massa and Bédé 2018), also acknowledged as an important driver of rural development (Hall et al 2019, Kastenholz and Costa 2009). Wine tourism can be understood as a visit to vineyards, wineries, festivals and others related to wine, with wine tasting and/or contact with the attributes of a wine region being the main attractions for visitors (Hall et al 2019). However, wine tourism can also be conceptualized in a more holistic, ecosystem logic (Salvado and Kastenholz 2017), or as 'terroir tourism', valuing the broader exploration of wine-growing territories, in addition to aspects purely related to wine (Holland et al 2014), with wine sometimes actually being only one (not always essential) part of the tourist experience (Kastenholz et al 2021). Wine tourism is, indeed, more than an activity exclusively focusing on tasting wines, encompassing other activities, such as learning about the history of wine and its production, or the historical heritage of the region, the appreciation of local food and other local products (e.g., handicrafts), the enjoyment of landscape, the involvement with local communities and a whole way of life (Robles 2021). Additionally, not all visitors of wine regions are the same and some are simply 'curious' about wine, as much as about other features of the destination (Charters and Ali-Knight 2002).

In this context, scientific evidence to help make more successful management and marketing decisions, matching heterogeneous visitor demands (e.g. developing the most appealing and memorable experience designs targeting particular visitor groups), is increasingly valued by political, economic and social agents.

2. Market research and the limits of questionnaire-based surveys

The questionnaire-based survey is one of the most popular approaches to collect quantitative market data in tourism, commonly used by both academics and tourism managers, with statistics playing an important role in management and marketing decision-making (Finn et al 2010). One of the advantages of this data collection method is the possibility of obtaining large amounts of data from a big number of tourists in a relatively easy,

economic, broadly accessible and not too time-consuming way, which is particularly true for online surveys. However, on-site surveys are also popular to obtain relevant, specific experience- and context-dependent data. In this vein, visitor surveys are key tools for designing better targeted and more successful and sustainable tourism products, for example via segmentation studies (e.g., Dolnicar 2002, Carneiro et al 2013, Kastenholz et al 2018), or by assessing determinants of online travel purchase (e.g., Amaro and Duarte 2015), drivers of destination loyalty or place attachment (e.g., Alves et al. 2019, Kastenholz et al. 2013, Kastenholz et al 2020), or factors contributing to appealing and memorable experiences (e.g. Zatori 2018). Survey results may help find ways for increasing sales of local products (Kastenholz et al 2016) or generally increased expenditure levels at the visited destination (Eusébio et al 2013). Such studies also permit longitudinal comparison of visitor profiles and attitudes (Sæthórsdóttir 2013). However, given the subjective character of self-report responses about behaviors, perceptions, feelings and attitudes, which are highly influenced by aspects such as social desirability or conscious data processing, many experts question the validity and reliability of the measures used, arguing that questionnaires are inadequate or at least insufficient (Patten 2016) to fully explain human behavior, attitudes and feelings.

3. Psychophysiological indicators and field data collection

One way to obtain more objective data is through the use of psychophysiological technics like electrocardiogram (ECG) and electrodermal activity (EDA) recordings, as a measure of peripheral nervous system activation. In fact, instead of asking people if they liked or were excited about a certain experience or product, with these techniques we can monitor their physiological reactions to them, which can be a reliable indicator of the person's interest, emotional activation or amount of attention paid to specific situations or stimuli (Bailey 2017). Among other psychophysiological markers, heart rate variability (HRV), derived from the ECG signal, represents one of the most stable and reliable markers of autonomic activity (Camm et al 1996). Typically, a spectral (or frequency domain) analysis of the HRV involves decomposing the signal into frequency bands and calculating the absolute power values in each band (Shaffer and Ginsberg 2017). The most common analysis using the frequency bands is based on the Low Frequency (LF)/High Frequency (HF) ratio - also called "balance" - which is used to reveal the amount of sympathovagal modulation of the heart rate (Shiga et al., 2021). In this analysis, a low LF/HF ratio reflects parasympathetic dominance that translates into self-regulating and self-soothing behaviours (Porges 2007), while a high LF/HF ratio indicates sympathetic dominance, which mediates arousal responses (Bootsma et al 1994) or an approach-motivated appetitive state (Shiota et al 2011). Interestingly, there is evidence which suggests that a high power in the HF band is a psychophysiological marker of inhibitory control (Thayer et al 2012), and there is also literature that shows that a low power in the HF band is associated with impulsivity in consumer behaviour (Kittaneh et al 2016).

Electrodermal activity (EDA) reflects the sweat gland activity resulting from sympathetic receptor stimulation (Shiota et al 2011). According to the literature, there are two main components of EDA: the tonic component, which relates to the overall level, slow risings and declinations of the signal over time, and the phasic component, which refers to the faster changing components of the signal in response to discrete events (Braithwaite et al 2013). Skin conductance level (SCL) is the most common measure of the tonic component and is considered to be the 'gold standard' when measuring physiological arousal (Lole et al 2012). In addition to the vast psychological literature linking SCL to emotional arousal, a tourism study showed that SCL is related to emotional arousal in exploring a touristic street in Jerusalem (Shoval et al 2018).

These psychophysiological measurements are usually collected in the laboratory, where individuals may be confronted with images or videos (e.g., promotional materials from the wine tourism context) to assess emotional activation resulting from stimulus processing. However, the artificial character of this collection method is commonly pointed out as its main disadvantage. Therefore, it is important to develop and validate methodologies that allow reliable psychophysiological data collection in the field, while participants experience the target contexts. In the present work, an innovative methodology (through peripheral nervous system measures, complemented by minimal self-report indicators) for collecting objective data in wine tourism contexts is proposed, which helps to overcome the subjectivity of the data collected exclusively via questionnaire and the bias resulting from the collection of objective measures in artificial contexts.

4. Methodology

4.1 Case study and context

The present study is part of a broader project, entitled '*TWINE: co-creating sustainable Tourism & WINe Experiences in rural areas*', which aims to understand the opportunities of co-creation of attractive and sustainable wine tourism experiences as the conditions of successful and sustainable wine tourism destinations in Portugal's Central region: Bairrada, Dão and Beira Interior. The present paper uses data collected only in the Bairrada route.

The Bairrada region is located on the Portuguese coastline, more specifically between the cities of Aveiro and Coimbra. It is known for its long winemaking tradition and stands out as the main Portuguese sparkling wine region, represented mostly by small wineries. Bairrada was demarcated as certified wine region in 1979 and offers a wide range of experiences in addition to those related to wine, namely local gastronomy (e.g., suckling pig), hotsprings, culture and nature. The Bairrada Wine Route was created in 1999 and has today more than one hundred members, from producers, restaurants, accommodation units, to tour operators, who seek to promote the region through wine tourism in an integrated way, namely developing various activities and attractions related to wine, also connecting them to other attractions and services (Brás et al 2010; Correia et al 2004).

4.2 Data collection

Within the here presented exploratory framework, two female visitors (aged 26 and 56) at the São Domingos winery (Bairrada, Portugal) wore a small portable and wireless device (https://biosignalsplux.com/) to capture their ECG and EDA at a sampling rate of 1,000 Hz, during guided visits to the premises. Signals were recorded on the OpenSignals smartphone app (https://biosignalsplux.com/products/software/opensignals.html) by the experimenter, who was part of the visitor group, and who also registered the different stimuli, activities, and places along the visit. Additionally, psychophysiological data were complemented by a short interview and survey data, collected at the end of the visit, to allow an adequate interpretation of the results and validate the proposed methodology.

4.3 Data processing and analysis

Signal processing was performed using AcqKnowledge 4.4 software (Biopac). The ECG raw signal was bandpass filtered between 1-30Hz and Heart Rate Variability (HRV) was subsequently derived and analysed using the classical HRV spectral bands: low frequency (LF), and high frequency (HF) bands, which have fixed boundaries (0.04–0.15 Hz and 0.15–0.40 Hz, respectively). Through this frequency analysis, the dependent variables 'Sympathetic', 'Parasympathetic' and 'Balance' were calculated. The sympathetic variable is the proportion of the heart rate change triggered by the activation of the sympathetic nervous system, the parasympathetic variable is the proportion of the heart rate change triggered by the activation of the parasympathetic nervous system and the sum of these two components is equal to 1. Balance (Sympathetic-Vagal) is the ratio between the power in the low frequency band and the power in the high frequency band (LF/HF). HRV analyses were carried out for several time windows according to the specific stages of the visit. The duration of all time windows was kept the same throughout the entire analysis.

Regarding EDA, considering the interest in autonomic activation changes over time, the tonic signal (SCL) was derived from the raw signal using the AcqKnowledge (Biopac) algorithm.

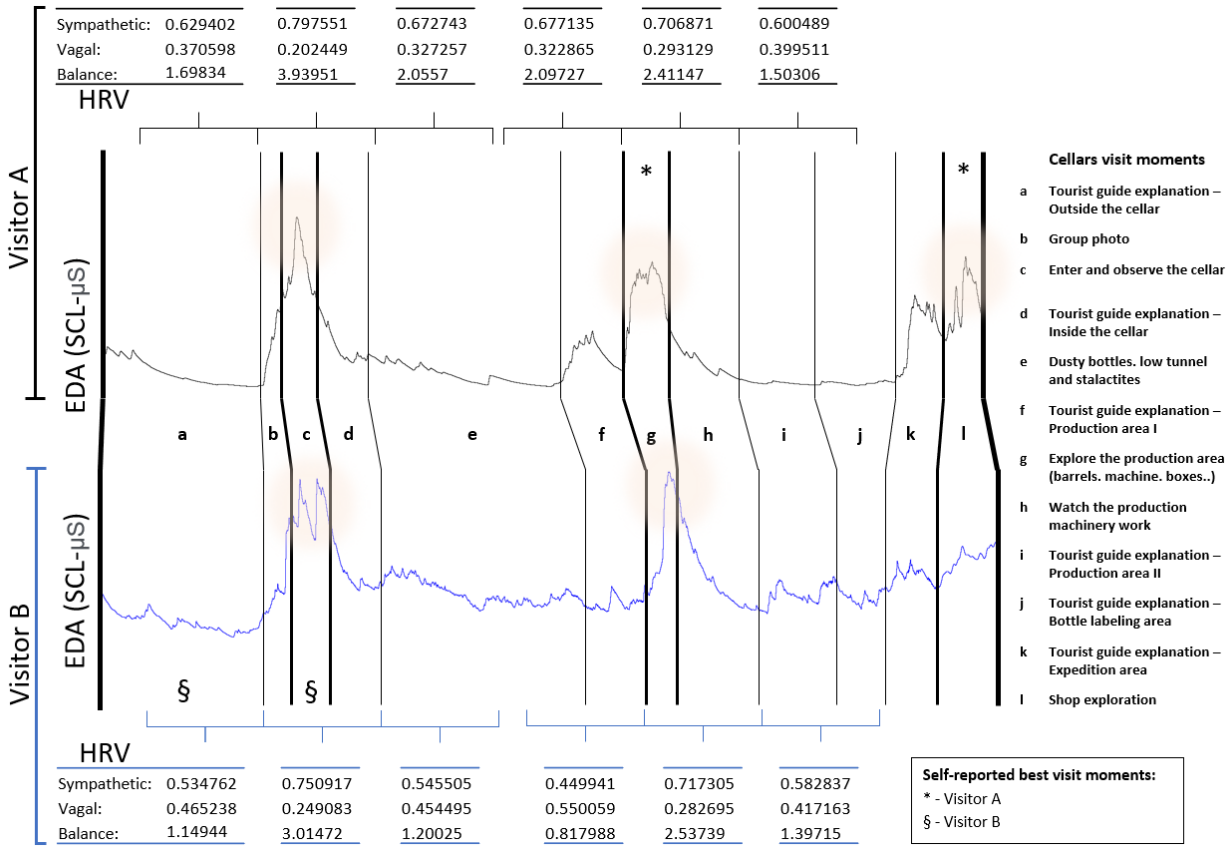
5. Results

The results of the analysis conducted with the two visitors can be seen in Figure 1. The SCL graph was divided in nine focus areas that correspond to specific moments of the visit. Through visual data analysis, we can verify that the skin conductance level varies over time, with some moments of the visit generating greater electrodermal activity caused by the activation of the sympathetic nervous system than others. Interestingly, most of the visit moments which are associated to higher EDA appear to be shared by the two visitors, with an almost superimposable SCL graph. In fact, the moments registering the highest SCL values were the entrance and observation of the wine cellar, the exploration of the production area with visualization of the barrels, machines and wine boxes, and, in the case of visitor A, also the shop. Another relevant result is the fact that the first activation peak observed started during a moment that is not directly wine-related, which was the group photography, and the moments in which visitors witnessed the explanation of the guide are characterized by less physiological activation. The HRV data are congruent with the EDA data, since the moments with the highest

SLC are also the ones with the highest proportion of sympathetic activity in the cardiac signal. The explanation moments by the guide result in a balance close to 1, with a sympathetic-vagal preponderance around 50/50. The highest balance value, which refers to a greater sympathetic component in the cardiac signal, was recorded at the entrance and when observing/ exploring independently the cellars, with the sympathetic component reaching 80% in visitor A and 75% in visitor B.

When we considered the data from the interview and from the completion of the self-report questionnaire, we found that the moments in which participant A reported the greatest satisfaction (*) were while exploring the production area and the shop. This result shows a psychophysiological-behavioural agreement, since two out of the three SCL peaks observed were in the areas reported as preferred. Regarding visitor B, we can see that the highlighted moments (§) were the explanation outside the cellar and the entrance and observation of the cellar. In the first case, no enhanced psychophysiological activity was observed. It seems, in this case, that the subjective interest reported by the participant was not matched by greater sympathetic activity, which may indicate that the moment did not involve emotional arousal.

Figure 1: Overview of HRV and SCL results from two visitors during the various moments of the cellar guided visit.



6. Discussion

According to literature from the experience economy context, consumers seek, above all, consumption experiences that 'dazzle their senses', 'engage them personally', 'touch their hearts' and 'stimulate their minds' (Schmitt 1999). This should be even truer for tourists, looking for enjoyable, unique and personally meaningful experiences, tourism businesses and destinations need to understand to successfully target them (Morgan et al 2009, Volo 2009). As a matter of fact, sensations and emotions have been identified as highly relevant for satisfactory and memorable tourist experiences (Agapito et al 2014, Kastenholz et al 2012, Tung and Ritchie 2011). Therefore, knowledge about the tourist's emotional reaction towards different experiences and stimuli is essential to inform stakeholders' management decisions and provide a valuable information to successfully design appealing experience opportunities and optimize marketing strategies (Volo 2009). Usually, this reactivity on destination and service attributes is assessed using self-report questionnaires, which have raised some validity and reliability issues (Baumeister et al 2007, Cunha et al 2021). To overcome these limitations, the

present study aimed to explore the possibility of using recordings of ECG and EDA in an ecological wine tourism setting to assess the psychophysiological activation during a wine cellar visit.

The results indicated that both measures provide useful information about the emotional reaction during the various moments of the visit and allow to distinguish different patterns of activation associated to specific activities. For example, it was clear that higher sympathetic activation was registered during moments where participants could freely explore different areas of the cellars compared to when the guide was giving explanations. In fact, wine tourism experiences generally place visitors in a passive posture (for example, visiting the cellar, buying wine, eating at the cellar) (Madeira et al 2019). However, tourist destinations and businesses are now increasingly aware of the benefits of a more participatory, co-creative design of tourist experience opportunities (Campos et al 2018, Carvalho et al 2021). The present results reinforce the added value of tourists' active participation, providing them personalized opportunities of free exploration (Minkiewicz et al 2014), as a crucial factor of appealing, distinctive and memorable on-site tourism experiences (Carvalho et al 2021).

The physiological activation patterns also allowed to highlight particular moments of the visit that engaged the tourists, but that were not considered in the self-report questionnaire, such as the group photography that was taken in the beginning of the tour. These moments, that imply social interaction and sharing of meaningful experience-extensions, actually deliver opportunities for 'mixing in memorabilia' that are particularly powerful when perceived as unexpected (Ellis and Rossman 2008).

Importantly, the psychophysiological patterns were consistent with the preferences reported by the visitors, which constitutes a cross-validation of the obtained results.

This is a preliminary investigation using only two cases, which provided quite promising results. More studies are needed to consolidate the methodology and the use of these techniques in the field, and to promote their usability by the tourism stakeholders.

7. Conclusion

The findings stress the importance of wine tourism experience opportunities that businesses and wine routes may design to improve overall satisfaction and memorability of such experiences, and consequently their market success (Ellis and Rossman 2008, Kastenholz et al 2021, Morgan et al 2000). According to the results of the present exploratory study, moments of autonomous and co-creative exploration should be more important than overly guided, and typically more standardized experiences (Minkiewicz et al 2014, Carvalho et al 2021). This could be an important clue for the destination managers and suppliers as facilitators of engaging and memorable wine tourism experiences, in which tourists assume a central and active role.

This approach requires a paradigm shift, however, since winery visits, which are the context of the present study, are marked by the central role of the guide, as the host and leader of the entire experience, also controlling the framework of time of the entire visit. However important also the guide may be, particularly if able to meaningfully interact with visitors (Weiler and Black 2015), results suggest a new paradigm, in which the tourist assumes the central role, while guides may become 'choreographer to co-creator of tourist experiences' (Weiler and Black 2015) or actually even step back and leave visitors with their own, personalized exploration opportunities. In any case, findings suggest suppliers to rethink the ways they interact with visitors and provide relevant information for the visit, without depriving them of their leading role in the visit co-creation.

In any case, additional evidence is needed for consolidating these results and it would be most interesting to additionally distinguish diverse experience and visitor contexts (e.g. distinguishing visitors according to age, level of education, motivation, travel group, etc.)

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A Psychoanalytical Approach to Management Research: The Psychoanalytical Problem, its Resolution, and Derivate Research Method

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Abstract: Karl Popper has locked the reasoning of many researchers on a particular kind of rational thinking, that is, hypotheses stating and testing. For this reason, social sciences started to privilege a specific theory of personality. It is accurate to state that the common-sense knowledge, and resultant human "irrational" action, can be explained and even confronted by testing its assumptions. Nevertheless, Popper's categorization is not the only one possible. It neglects the irrationality of unconscious' intentions, a competing drive that directs human actions. In this paper, we discuss that, in accordance, management research and practice have strict relations with theories of personality that neglect the unconscious. For that reason, it assumes that humans are self-interested organisms like guinea pigs, neglecting this complementary supposition: the unconscious's intentions, structure, and dynamics that also drive human behavior, thinking, feeling, perceiving, and learning. The crucial integration of objective knowledge with the unconscious dynamic supposes the addition of the *psychoanalytical problem* to Popperian's psychological problem. Thus, the derivate capacity to explain human and social action understood as intention, plan, and act must consider conscious and unconscious intentions. The psychoanalytical approach to management research also provides ingenious methods like the awareness-enhancing interviews we present.

Keywords: Psychoanalysis, Qualitative Methodology, Phenomenology, Awareness-enhancing questions

> *Hume's philosophy… represents the bankruptcy of eighteenth-century reasonableness [and] It is, therefore, important to discover whether there is an answer to Hume within a wholly or mainly empirical philosophy. If not, there is no intellectual difference between sanity and insanity. The lunatic who believes that he is a poached egg is to be condemned solely on the ground that he is in the minority…* (Bertrand Russell)

1. Introduction

To respond to David Hume's criticism of the principle of induction differentiating common-sense from objective knowledge, Karl Popper (1972) has locked the reasoning of many researchers on a particular kind of rational thinking, that is, hypotheses stating and testing. Consequently, social sciences started to privilege a specific theory of personality. It is accurate to state that the common-sense knowledge, and resultant human "irrational" action, can be explained and even confronted by testing its assumptions, logic, and supportive evidence. However, Popper's categorization of the irrational common-sense knowledge, or untested belief, is not the only one possible. The irrationality of unconscious intentions may also direct human actions. The lunatic may blame the mirror for distorting his poached egg image if confronted.

The psychoanalytical interpretation of managerial activity has been around for over a century. To refer to a few authors: Alfred Adler in the 1920s talked about the will to power; Karen Horney in the 1930s denounces the hazardous hypercompetitive environments; in the 1950s, Wilfred Bion identified regressive forces within leader-subordinate relationships; Viktor Frankl in the 1960s reforms the concept of freewill adding responsibleness to it; Maslow in the 1970s advocated for democratic management; Erich Fromm in the 1980s perceived that bureaucratic situations demanded conformity; Eugene Enriquez in the 1990s explained the organizational culture's creation through the lenses of Freudian theory; and, more recently in the 2000s, Manfred Kets de Vries laid organizations back to the couch interpreting phenomena like the *folie a deux*. The community's way to communicate this knowledge have been addressing four different domains: (1) present the psychoanalytical interpretation of organizational contexts (e.g., Gabriel & Carr, 2002; Kets de Vries, 1991), or (2) demonstrate psychoanalytical facts (e.g., Schwartz & Hirschhorn, 2009); (3) validate methodological tools psychoanalytically based (e.g., Van IJzendoorn, 1995); and, (4) introduce psychoanalysis as an interesting competing approach in management studies (e.g., Arnaud, 2012; Gulati, 2007).

We identify that mainstream management research and practice follow other traditions. We refer to the behaviorist (i.e., learning is behavior change) and cognitive (i.e., computer metaphor or learning is data processing) approaches. Both are attractive due to their claim that they provoke evidence or data-based decision-making by using formal rationality. The reason for this submission is that both traditions: (1) follow the Popperian method; (2) seem more *logical*, parsimonious, and easier to apply; and (3) are implemented in organizational settings with ease. This paper exposes a neglected ontology and advocates for a psychoanalytical approach to management with scientific rigor and relevance.

1.1 The origins and repercussions of the matter

When John B. Watson denied the possibility of observing the mind with the five senses, he was trying to mimic Physics. Watson and other behaviorists aimed to predict and control behavior and assumed that rationality was nothing but a reaction to stimuli. The behaviorist influence on management is worrisome. Businesses institutionalize rewarding systems reinforcing the "good" behavior they appreciate. The derivate organization behavior is reduced to a paranoid relationship between the principal (the shareholder), the agent (the manager), and the employees.

The unclear distinction between *explaining* and *understanding* phenomena in social sciences creates miscellaneous. The attempt to *explain* a social phenomenon fundamentally applies the logical Popperian schema of causality. Conversely, the new impulse to the idea of *understanding* shows that intentional behavior exists in a determinate context. Alfred Schutz (1972(1953), p.319) redefines the social and human "action" as an intended human behavior that is "devised by the actor in advance." The conscious and intentional social actor uses the "in-order-to motive" to anticipate future results of current plans and acts differently from the common-sense knowledge that disregards hypothetical causal relations.

However, *individuals' unconscious* intentions are also action drivers. The unconscious is developed and reinforced during upbringing and, therefore, the paper advances the idea that context and individual psyche are interrelated. In Sigmund Freud's view, individual psychology is, at the same time, social psychology.

Table 1 below considers two different research objectives and categorizes the derivate use of natural and social sciences. In italic in Table 1, we highlight our focus. The table helps us to realize that the *nature* of the unconscious cannot be classified as a part of the natural sciences because the unconscious is both nature and nurture interrelated.

Table 1: Research objectives and derivate scientific views

Research objective	Science branch	Promoters
To explain	Natural Sciences (outer reality)	e.g., Popper
To understand	Social Sciences (inner and outer realities)	
	- Conscious level of intentions	e.g., Schutz
	- *Unconscious level of intentions*	*e.g., Freudian psychoanalysis*

2. The partiality of the psychological problem

To address this incomplete understanding, we return to the quotation made by Bertrand Russell on David Hume's criticism of the principle of induction. "The lunatic who believes that he is a poached egg is to be condemned solely on the ground that he is in the minority…." With this kind of statement in mind, Popper (1972) launched himself to the challenge of answering the problem of induction.

Popper was trying to answer Hume's interest in human knowledge, specifically on Hume's question of whether any of our beliefs and which one of them can be justified by sufficient reasons. Hume (Popper, 1972, p.3) raised two problems: a logical problem (i.e., "H_L – Are we justified in reasoning from [repeated] instances of which we have the experience to other instances [conclusions] of which we have no experience?") and a psychological problem (i.e., "H_{PS} – Why, nevertheless, do all reasonable people expect, and *believe*, that instances of which they have no experience will conform to those of which they have experience?").

In order to solve the logical problem, Popper used a procedure in which whenever logical problems were at stake, all the subjective or psychological terms were translated into objective terms (e.g., a belief becomes a statement; an impression becomes an observation statement). Therefore, regarding the psychological problem, the author says (Popper, 1972, p.6):

> *"Once the logical, H_L, is solved, the solution is transferred to the psychological, H_{PS} on the basis of the following principle of transference: what is true in logic is true in psychology[...] This is admittedly a somewhat daring conjecture in the psychology of cognition or of thought processes."*

In that sense, what we ask is: what did Popper have in mind when he referred to "psychology"? The first answer comes from the mentioned quotations. Popper referred to the "psychology of cognition or thought processes," or computer analogy from cognitive psychology, the ontological idea that humans are information-processors. The metaphor combines the cognitive emphasis on internal processes with the behaviorist belief that these processes are fundamentally simple. The second answer refers to the Popperian view of learning processes. Bonet and Casaburi (1997, p.13) explain Popper's view as in the following:

> *"For Popper, all kinds of learning have dogmatic and critical phases. In forming conjectures, the dogmatic stage shares some properties with imprinting [referring to Konrad Lorenz's findings]. The critical stage submits conjectures to empirical observations for refutation. So, learning is a process of trial-and-error elimination, which is very closely related to falsificationism… it is worth mentioning that the problem of learning led Popper to the solution of the problem of induction, and it was not the other way round…."*

If changeable imprinting is possible, the solution to the problem of induction will refer to an unlearning mechanism (empirical observation for refutation). As a computer processing data, the stored content is retrieved to pass through a "program" (or hypothesis testing), leading to newly restored conclusions. In other words, the firstly stored content is the first conjectures. The program submits these conjectures to empirical observations for refutation. Finally, new knowledge is acquired if the conjectures are refuted, becoming the new dogma. Popper (1994) ensured that discarding the hypothesis is a simple operation that can be solved in rational debate. So, why widespread irrationalities we observe in organizations are not being solved by a simple rational debate?

These statements brought severe concerns to intellectuals and scientists of social and human issues. The statements are tremendously restrictive to a cognitive, neural network-like aspect of the mind. The cure to the poached-egg lunatic would consist of *demonstrating* that he is not such a thing.

In opposition, phenomenologists like Churchill and Wertz (2001) would refer to the necessity of recognizing that each theory is partial in its attempt to understand the complexity of the lifeworld. It is surprising, thus, to observe that management research relies mainly on the simplistic assumptions about how human beings, compared to computers, work. Management, thus, becomes amoral, science-like, which is to say, not concerned with the complicated debate about values that, according to Popper (2014), should belong to the territory of Philosophy.

Again, this is problematic because the answer would be biased towards nurture (i.e., *tabula rasa*) instead of nature (i.e., psychodynamics). In effect, Freudian tradition, more Socratic-dialectic oriented, proposes an irrevocable connection between the two. Table 2 organizes such distinctions and highlights the paper's focus in italic. Ontology discusses the nature of human existence and results in approaches to the psyche and thus to understand the way individuals think, learn, and how management may take advantage of such insight.

Table 2: Derivations from ontological approaches

Ontological approaches					
Nature	**Nurture**	**Approaches to the psyche**	**Thinking**	**Learning**	**Management advantage**
Associations, trial and error	Adaptive to context	Behaviorism	Irrelevant	From simple to complex operations, reinforcing behaviors	Control to perform
Cognitions, insights	Adaptive to context	Cognitive Psychology	Formal rationality, problem-solving	Information from hypothesis testing	Performance
Associations through cognitions	Adaptive to context	Computer metaphor	Formal rationality, efficiency in problem-solving	Information from hypothesis testing from simple to complex	Performance
Impulses, structure, and dynamics	*Context offers conditions for nature to evolve*	*Psychoanalysis of organizational settings*	*Rationality influenced by psychodynamics*	*Provided a healthier context, nature fulfills potentialities*	*Awareness to emancipate both individual and context*

By explaining the connections between nature and nurture, Freudian psychoanalysis is subversive for criticizing every time *nurture* (e.g., a coercive social or organizational context deteriorates the capacity of *nature* to evolve, *nurture* must be confronted and improved.

In the social level of analysis, a Marxist framework describes management academics as *ideologists* who serve interest groups and implement socialization processes in business schools that consequently indoctrinate managers with ideas and vocabularies that aim to control the culture of the work setting. Marxists believe this construction creates a fake scientific aura that supports introducing and using domination techniques (Alvesson & Deetz, 2006). Therefore, it is reasonable to understand why these approaches were left out of the management research mainstream.

3. The psychoanalytical problem

Popper failed to understand that objective knowledge can objectively hypothesize and test unconscious intentions. The possibility to hypothesize is why psychoanalysts refer to the unconscious as subjective–concrete inner reality to differentiate from the reality, or objective–concrete outer reality.

Undoubtedly, two of the most rational minds of recent history were Sigmund Freud and Karl Marx, who could *see* indirect evidence of invisible phenomena, invisible only to the senses. Therefore, it is inaccurate to rely entirely on Popper's but build another psychoanalytical problem. The psychoanalytical problem explains why it is possible to add complexity to understanding what a human being is and how this complex human can analyze him/her complexities by relying on unconscious intentions as reliable data for research. As we realized that the term "psychological" in Popper refers to the psychology of cognition, its solution remains within limited conceptualization. We ask then: What about the psychoanalytical (subjective-concrete inner reality) problem? Or, in other words: What about the psychoanalytical aspect of the psychological problem? The psychoanalytical view provides a distinct ontology for human beings. Humans are not always able to use trial and error through self-reflection. Besides, many human problems include subjective issues, such as values, power, ideologies, impulses, relationships with others, and context, which cannot be solved through a naïve trial and error operation. The psychoanalytical problem could be stated as: H_{PsA}, *why, nevertheless, do all reasonable people believe they are acting without any other irrational and unconscious influences but based only on their conscious state*?

Consequently, why are bio-psychological features that make part of human subjectivity neglected in the analyses of human and social actions? Moreover, and here is where it becomes complicated, the *principle of transference* suggested by Popper (i.e., "what is true in logic is true in psychology") cannot be guaranteed any longer because the psychoanalytical problem assumes that the unconscious part of the mind is illogical and timeless. To the unconscious, A can be B, and what happened in the past can be reoccurring in the present repeatedly (i.e., the compulsion to repetition). We mean a subjective structure that provokes and/or reacts to the objective world by unconscious intentions. Unconscious intentions are different from conscious intentions as they cannot produce a logical plan of subsequent acts aiming at an outcome foreseen by the actor in advance.

4. The psychoanalytical solution

“The human dilemma is that which arises out of a man’s capacity to experience himself as both subjective and objective at the same time”, states May (1967, p.8). To cope with this dilemma, individuals must acknowledge that they are subject to illness and death, have limited intelligence and experience, are gifted by a psychological structure and other deterministic forces but, at the same time, realizing they have the subjective freedom to choose how they relate to these limitations and deterministic forces. After acknowledging biological and psychological limitations, the next step is to question the context features. In other words, how can contexts make individuals' development more fruitful?

Considering these bio-psycho *a priori* structures and dynamics in a context leads to a research model incorporating the psychoanalytical problem. Bio-psycho structure and dynamic generate unconscious intentions that are applied in the context. The researcher, aware of these structures and dynamics, deconstructs the sequence of unconscious intentions (logical or illogical ones) and the resultant act in the subjective (e.g., thoughts, beliefs) or objective (e.g., behavior, narrative) realities and, thus, can interpret these actions. However, how can the researcher know that his/her interpretation is accurate? To address this question, we must have in mind the criterion used by the psychoanalyst, which is: the termination of the symptom after psychoanalytical

interpretation. The psychoanalyst hypothesizes reasons for the symptom-based on what he/she knows about psychological structure and dynamics, in general, applied to the patient in specific. The psychoanalyst delivers the hypothesis, waits, and observes the symptom's evolution or its cessation. Psychoanalysts, critical thinkers, and neo-Marxists like Erich Fromm, Max Horkheimer, and Jürgen Habermas explain the process. At first, they distinguish what is lawful in social and human actions and what reflects relations of dependency that are ideologically frozen but are, in principle, changeable. The information delivered about legal interdependencies (e.g., psychodynamics and social dynamics) creates a process of reflection in the mind of those affected by the symptom. This process can change the state of non-reflected conscience, bringing it back to the initial conditions of what is lawful, and thus recovers the appropriate functioning. In this sense, critical knowledge of the law can, through reflection, if not break the frozen ideology, at least make it impractical (Habermas, 2005).

Back to Russell's illustration of the lunatic, it seems that by considering the psychoanalytical problem, the psychoanalyst will have better knowledge about mechanisms and the capacity to provide theory-based assumptions about meanings that lead the lunatic to believe he was a poached egg. By providing this information to the patient, he may understand and reflect on the origins of his delirium and hopefully come to terms with that symptom. The psychoanalyst Fromm (2014) and the sociologist Horkheimer (Horkheimer, 2000(1937)) recognize the need for individual self-reflection in order to emancipate. These authors know that a non-reflective social revolution, often Marxist-driven, can lead to nothing but a totalitarian government as it has occurred in recent history. Emancipation is the solution to totalitarianism. The argumentation of the expert, the soft talk, is a powerful instrument the analyst or researcher has that impact, reorient, and change human action through self-reflection.

It is essential to state, however, a limitation. Konrad Lorenz argues that the greater the organic system is, the greater the level of integration. In this sense, human beings have a high level of complexity, and we are still far from understanding their totality. Thus the best methods to analyze them are observation, description, and, at most, hypothesize causalities, since restricting them into potential rational minds, experimentally assessable, is pseudo-knowledge proved false (Lorenz, 1974). Every causal hypothesis in human and social issues, even if repeated in time and place, is still only a hypothesis, or at most a *stronger* conjecture. This realization is why we clarify that an interpretation is nothing but a more robust interpretation instead of the truth or establishing a causal relation. Even if such an interpretation dissolves the symptom, it is still just a more robust interpretation. In summary, addressing the psychoanalytical problem opens horizons in interpretive research. The psychological and the psychoanalytical problems do not exclude each other but work in parallel to generate possible convergences of assumptions, theories, and concepts.

5. Integrating phenomenology and the psychological problem

To establish the path to explaining the psychoanalytical problem, we will address subsequent approaches that seem to bring light to it. The path is following the opinion of Giorgi (2000), who criticizes experimental psychology’s reductionism and argues for a phenomenologically based methodology that could support a more authentic human science of Psychology that would investigate the full range of behavior and experience of people in such a way that the aims of rigorous science are fulfilled. The Phenomenology Philosophy made significant efforts to study the consciousness of the individuals incorporating some of the aspects neglected by Popper.

Phenomenology had its origins in the work of Edmund Husserl, who during the early 1900s began to develop a "philosophy as rigorous science.” Unlike the misguided allusion of getting "closer" to the natural sciences, Husserl started from understanding the distinct nature of human experience, which could provide rational or objective if taken with equal scientific rigor. This knowledge would enable humanity to shape its destinies freely. The author pointed out that phenomenology "aimed to complement and contextualize empirical scientific investigations by clarifying the 'essence' of study regions such as nature, animal life, and human psychic life" (Churchill & Wertz, 2001, p.249). In Husserl's reasoning, such clarification would be propaedeutic to any objective inquiries made at the empirical level.

In phenomenology, experience results from one's mental life, consciousness, world contacts, and interactions with other people. As Bonet and Casaburi (1997, p.22) make clear: "Consciousness is intentional, that means that all our mental objects, such perceptions, concepts, judgments, values, and feelings, refer to things, which

may or may not exist. It also means that this reference has its origin in our interests. At each moment, our experience provides us with knowledge and with purposes."

At this point, there is a significant differentiation to be made which addresses the core features of the psychoanalytical problem: if one considers the face-value of the statement which says that "consciousness is intentional" and "based on our interest," one will assume to have the total control of his/her owns actions. If that is the case, neurotic or psychotic symptoms would be a farce.

Schutz adds information to these inconsistencies by observing a secondary type of motives, the "(genuine) because-motive" referring to the point of view of the actor concerning his past experiences (e.g., contextual features where the actor was brought up, his/her childhood experiences), which influences him/her to act the way he/she does (Schutz, 1972(1953), p.319). The actor is conscious of only the ongoing process of acting, the in-order-to motive of the action, in other words, the Popperian psychological problem. However, Schutz (1972(1953), p.321) suggests that "Only by turning back to his accomplished act or the past initial phases of his still ongoing action or to the once established project which anticipates the act *modo future exacti* can the actor grasp retrospectively the 'because-motive' that determined him to do what he did or what he projected to do. Nevertheless, the actor is not acting anymore; he is an observer of himself." In this statement, Schutz touches the Popperian psychological problem when referring to the "because-motive" as a conscious intention. However, his concept differs from the psychoanalytical problem. We focus on which unconscious intentions drive behavior and decisions.

The psychoanalytical method settled the unconscious as the depository of hidden wishes and impulses that govern behavior. The psychoanalytical methodology allows the analyst to work with unconscious intentions and meanings. The analyst or researcher provides information to the patient or participant about the psychological functioning, including unconscious/hidden intentions. If accurate, such interpretations provoke a process of self-reflection in the participant's mind, enabling him/her to understand the unconscious drives of his/her actions, which would lead to cessation of the symptoms.

The initial step of the research procedure is to interpret the patient/participant's unconscious reasons for his/her action. With such a step, alienation can be confronted and, change in actions can occur after self-reflection. The change of the symptom consists of another criterion of research reliability.

Herbert Marcuse (2012(1974)) and Erich Fromm (1992) consider that in the case of alienation, Freudian theory suits the individual level of analysis, while Marxist theory addresses the social level. In that sense, claims for a more humanized organization (i.e., conscious about human features and their relation to context) make much more sense. Anderson (2017), for example, calls for an industrial organization in which every working person would be an active and responsible participant, where work would be attractive and meaningful, where capital would not employ labor, but labor would employ capital. In management terms, there is psychoanalytical justification for actions like participatory management, two-tier board of directors, open-book management, profit sharing, stock options, employee ownership, cooperatives, among others.

The resultant research methodology follows a path from the inconsistencies of the positivist view of science, passing through the phenomenological understanding of humans (i.e., the subjectivity applied to context), to the possibility of analyzing human and social actions through the lenses of the psychoanalytical approach.

In summary, the basic assumption is that objective knowledge, in order to confront common-sense knowledge, must come from two considerations: (1) the hypothesis-testing, trial and error, that confronts the common-sense knowledge in action and, also, (2) from the interpretation of unconscious intentions and meanings being them impulses (e.g., social interest, libido, aggressiveness, meaning creation, self-actualization), defense mechanisms (e.g., transference, rationalization, regression, identification, denial, projection, withdrawal), needs (e.g., hygienic, belonging, status, self-actualization), among others.

6. Psychoanalytical interpretation and management research

The distinct ontological root and epistemological derivation permit the construction of the different methodology. For psychoanalytical research, extra care is needed, that is, the answer to questions: Is the symptom terminated after the interpretation? Are the causes in nurture changed or improved to allow nature

to develop? In that sense, if the researcher's interpretation is accurate, it is expected to change either on the mind of the affected (i.e., cognition, meaning, feelings), on the behavior, or in the context (or conditions). In order to test the interpretation's accuracy, the research may directly ask the participant researched about his/her or the group's opinion about the appropriateness of the interpretation and the capacity the interpretation must bring change and development.

6.1 Reorienting existent methods

If a two-way meaning-making aim to access the unconscious intentions, a tool called awareness-enhancing statements or questions can be used. To Erskine (1997, p.22), "inquiry begins with the assumption that the therapist knows nothing about the client's experience and therefore must continually strive to understand the subjective meaning of the client's behavior and intrapsychic process. The process of inquiry involves the therapist being open to discovering the client's perspective while the client simultaneously discovers his or her sense of self with each of the therapist's awareness-enhancing statements or questions."

The objective of this tool is to incite through the way the questions are structured information about unconscious drivers. Both researcher and participant do not know in advance, but they discover together the intentions and meanings of what was unconsciously taken into consideration while acting. The interviewer must be empathic with the interviewee's subjective experience to effectively discover and reveal the internal phenomena and uncover the criteria used for acting. For example, awareness-enhancing questions applied to decision-making could be:

- Tell me about how the managerial decisions were taken…
- While taking the decision, what was considered? What was the framework used? Why was it used?
- Did you have in mind anything that you were afraid to mention? Why is that?
- What did you observe?
- What did you think?
- What did you feel?
- What do you think and feel now?

This kind of inquiry permits to work with both the "in-order-to" and the "because" motives.

7. Conclusion

We consider mistaken the attempted made by academics, including Popper, to damage the scientific status of Psychoanalysis and Marxism. Freud and Marx never claimed to have found the conclusive theory; in fact, they were, like every other scientist, working through conjectures and looking for refutations in order to refine their assumptions and logical constructions.

Neo-Freudians like the quoted and neo-Marxists saw progress, creativity, and learning, improving these theories and opening space for development once structure and dynamics are respected.

We join, thus, Manfred Kets de Vries' argument that unconscious dynamics have a significant impact on life in organizations, explaining the neglected but needed solution to the psychoanalytical problem. Once awareness about the complexities of human beings is addressed and explained, the management researcher and practitioner can use a broader scope of theories, practices, and research methodologies to understand management as social and human phenomena expressed by social and human actions in organizational settings. The capacity to access psychodynamics depends on the researcher's creativity in using differently established methodological tools or developing new ones.

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KPI for the Evaluation of Growth Scenarios for the Strategic Organizational Development

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Abstract: Today's world faces constant change and increasing complexity. This also influences companies in their actions. In order to ensure growth and resilience, technology companies must innovate and strive for internal adaptability within the organization. A field of tension can be observed between the values of effectiveness and efficiency. Effective actions lead to the company and its products becoming better by doing the right things. Efficient actions allow the company and its products to become less costly by doing the things right. The expression of these values in the field of tension changes over the life cycle of a company. Strategic organizational development can thus only take place sustainably in balancing effective and efficient values. Based on these ideas, a performance indicator model was developed to promote value balance by assigning concrete parameter to several perspectives. Balance is not a static condition, but the basis for healthy and above all sustainable growth. Without balance, too much of a good thing is done and destructive exaggerations are the result. The model takes a holistic, systemic and balancing position. The main aim of this paper is therefore to describe the development, application and critical evaluation of this key performance indicator model to validate the underlying research methodology. The key performance indicator model is to be understood as a thought model, with the help of which the alignment of a company and its employees is to be achieved. The model is used to evaluate growth scenarios. As part of a case study, the organization, culture and environment of an exemplary company were examined with the help of representative workshops and expert interviews. The results of the status quo analysis were able to confirm the basic principles and logic of the key performance indicator system. Based on the information about the environment and organization gathered in the workshops and interviews, the KPI model was applied as an example to evaluate growth scenarios of an exemplary company. Finally, interviews were conducted with top managers with many years of management experience to evaluate the KPI system and examine its general validity. The applicability of the KPI model could be conclusively determined for innovation-driven technology companies in the transition between the growth and maturity phase.

Keywords: Strategic Organizational Development, KPI Model, Methodology Validation, Innovation-driven Technology Company, Sustainable Leadership

1. Introduction

Today's organizations are confronted with existential transformation pressure that provoke their operational performance strength as well as strategic innovation and substitution power. The externally increasing hyper-complexity can only be met with adequate internal complexity (Beer, 19XX). The associated variety and sustainable functionality will have to reach a higher level. Examples illustrate that this is doable and that at the same time a new understanding of leadership is necessary. The actions of organizations must extend far beyond the short-term and dynamically varying success factors and anchor strategic clarity and sustainability. Leadership must therefore master the initiation and establishment of sustainable strategic future potential in addition to the operational design of an efficient and resilient organizational system. In this sense, professional leadership is organizational design and development whose status quo and progress must be clearly measurable.

The key performance indicator model presented in the following diagnoses and quantifies the initial situation of organizations as well as their development progress. It was conceived as a multi-perspective system of parameters considering the real current competitive and action environments of innovation-driven technology companies. We assume that this will be valid for most organizations in the medium to long term.

The paper focuses on the description, application and validation of the KPI model as a research methodology.

1.1 Research Background

Organizations are to be understood as complex social systems (Willke, 1999, p. 178). For Rüegg (1989) Complexity is defined by a high number of connections between the parts of a system mixed with a highly dynamic change in these connections. Therefore, the omnipresent increase in complexity influences companies in their actions. One needs to take a systemic perspective onto these systems and develop the ability to

transform (Dörner et al., 1983, p. 17; Senge, 2008; Sterman, 2000, p. VII). In order to ensure growth and resilience, technology companies must innovate and strive for internal adaptability within the organization. For this transformation is the answer to an increase in complexity.

A field of tension can be observed between the values of effectiveness and efficiency. A metaphor for the difference between these two values can be found in the way the human brain works. Here, "What you gain in speed (safe and fast execution of a routine) [Efficiency], you lose in behavioral flexibility (e.g., to change habits) [effectiveness]." Korte, 2019, p. 92. Effective actions lead to the company and its products becoming better by doing the right things. Efficient actions allow the company and its products to become less costly by doing the things right. The expression of these values in this field of tension changes over the life cycle of a company (Förster, 2005; Pümpin & Prange, 1991). Strategic organizational development can thus only take place sustainably in balancing effective and efficient values.

1.2 KPI System for the Strategic Organizational Development of Innovation-driven technology companies

Based on these ideas, a key performance indicator model was developed to promote value balance by assigning concrete parameter to several perspectives. The model takes a holistic, systemic and balancing position. The key performance indicator model is to be understood as a thought model with the help of which the alignment of the company and its employees is to be achieved. It serves as a model for evaluating growth scenarios.

The system of leading key performance indicators is intended to help align the organization, i.e. to lead, by directing the awareness of managers and employees to the important factors. This model is to be used in the further course for the evaluation of growth scenarios.

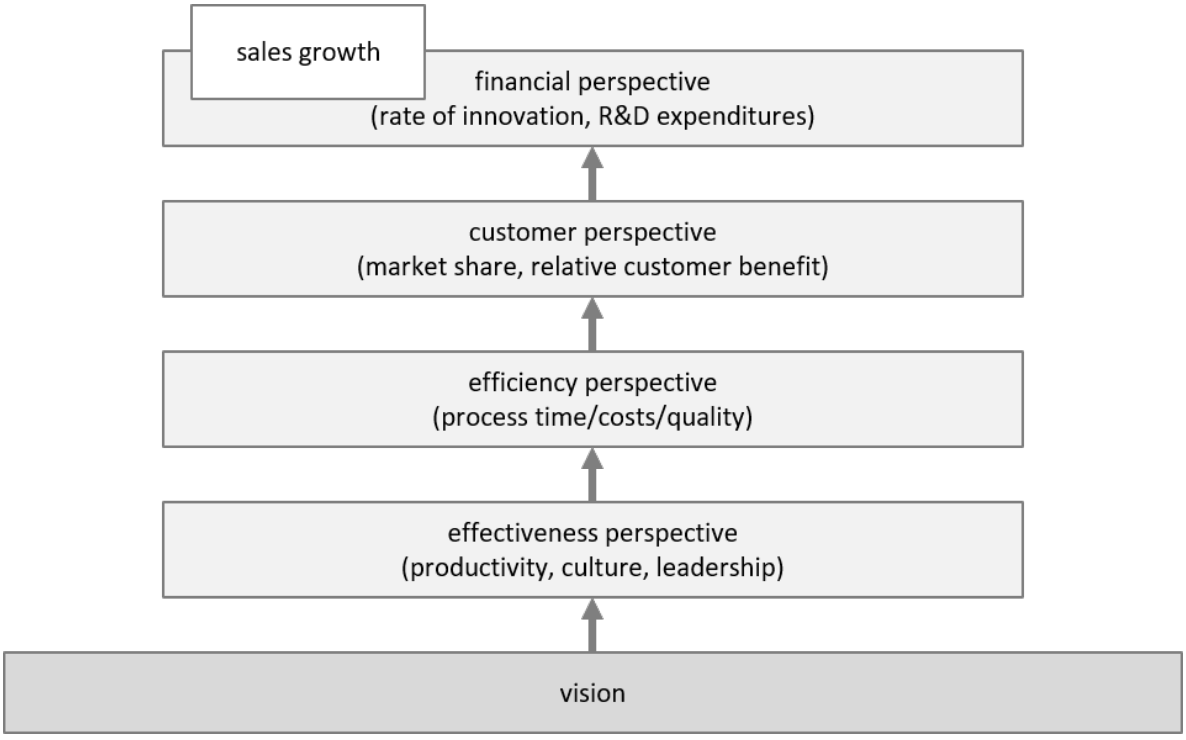

Figure 1: Multi-dimensional KPI model logic

In business practice, classic business management targets and control variables dominate. Development and employee-oriented indicators are hardly ever defined (Gebhardt, Hofmann & Roehl, 2015, p. 27). However, corporate success is multidimensional and cannot be defined by a single indicator (Sackmann, 2017, p. 379). According to Malik (2009, p. 186), financial ratios should be replaced or supplemented by pre-control ratios of earnings that look further into the future. This means that key performance indicators are needed to evaluate different perspectives: market position, innovative strength and productivity (Malik, 2006).

The field of tension between efficiency and effectiveness should be developed in a maximally positive way (Förster, 2005). The systemic understanding pleads for viewing complex systems in their entirety. All

relevant aspects of organization and production as well as internal and external aspects must be included. All elements are still interconnected in the system. There are numerous relationships and dependencies. Thus, efficiency and effectiveness are interdependent and positively related. Efficiency and low costs in production result in the long term from the strengthening of quality, service, innovation, exchange and cooperation, enthusiasm and a focus on solving customers' problems (Peters & Waterman, 1982, p. 321).

The system of performance indicators follows the following logic (see Figure 1). It is composed of four perspectives based on the model of the Balanced Scorecard (BSC) according to Kaplan and Norton (1997): Effectiveness, Efficiency, Customers, and Finance. These four perspectives each look at specific areas that are important for measuring the performance of a company.

The system strikes a balance between short-term (operational) and long-term (strategic) goals, monetary and non-monetary, between lagging indicators and leading indicators, and between external and internal performance measures (Kaplan & Norton, 1997, p. VII).

The scope of application is to be defined as innovation-driven technology companies. The indicators were chosen to promote the development of organizations into growth companies and to balance efficiency and effectiveness.

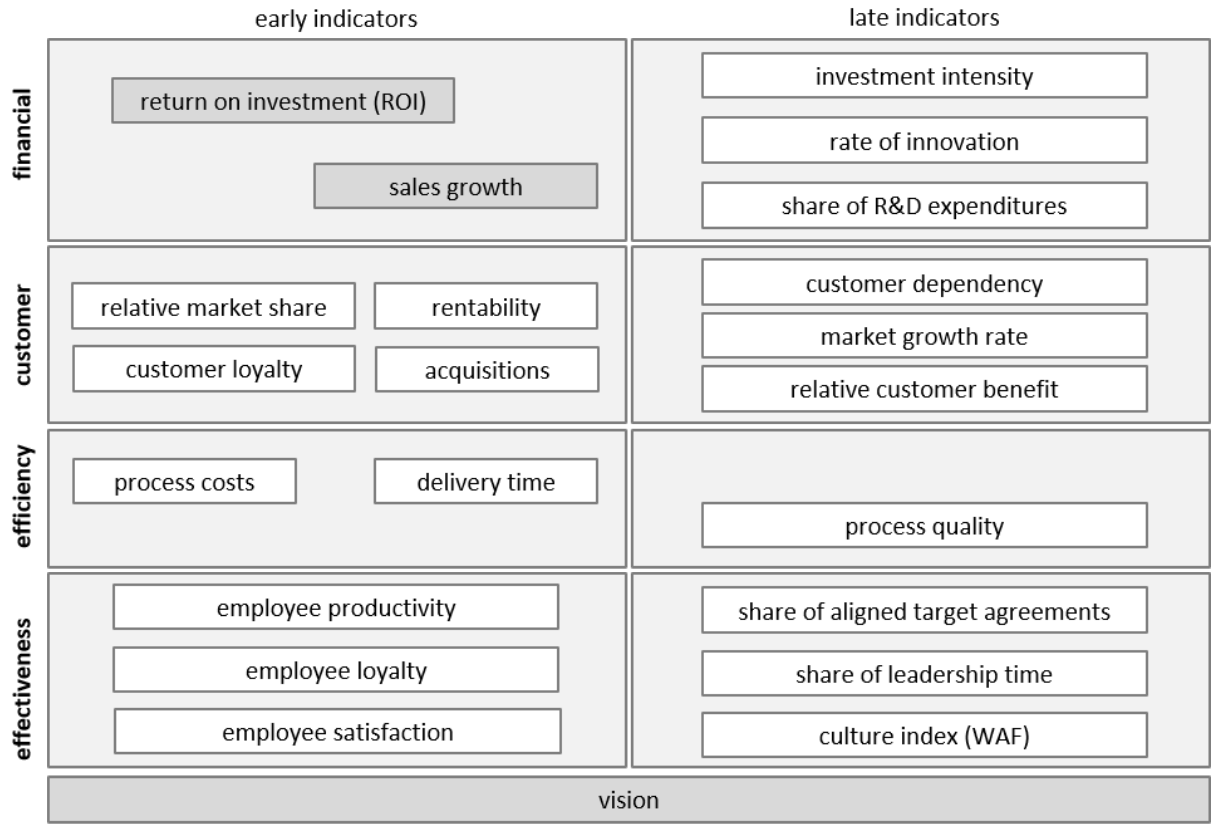

Figure 2: Detailed KPI model

The basis of the system is the conscious vision and profession of leadership. The management influences the organizational culture and the orientation of the employees with its vision. Leadership and corporate culture have a far-reaching influence on the way employees act in the company. The vision thus provides indicators against which the organization can be aligned. The effectiveness perspective includes leadership metrics that are primarily intended to measure organizational culture and alignment by leadership, in order to lead to high employee productivity. The efficiency perspective measures the process parameters of production, i.e. times, costs and quality, and therefore provides a statement about the company's professionality and efficiency. These factors are reflected in the customer perspective in market share and customer satisfaction. A look at the financial figures then shows the results of the other three perspectives in the form of sales growth. The investment intensity and the innovation rate are also included here.

The task of these key performance indicators is to focus the attention of the company on those factors that should lead to a competitive breakthrough for the organization (Kaplan & Norton, 1997, pp. 157-158). The leadership metrics thus manage to balance efficiency and effectiveness. They contribute significantly to directing the focus of managers as well as employees to a vision, a common goal. The performance measurement system helps organizations to become more mature as they grow and vice versa. It contributes to balancing the multidimensional success variables and is suitable for securing strategic considerations.

Figure 2 shows the detailed system of management parameters with its dependencies. In the figure, only simple causal effects are displayed, which is on purpose. In spite of the requirement discussed earlier to understand systems as dynamically complex and subject to feedback, a modeling in the form of an effect graph was deliberately omitted here. Although such a representation would emphasize the complexity of the interrelationships, it would also greatly reduce the informative value and comprehensibility of the picture. Also, such a modeling requires a much more extensive data base than is available in this work.

The chosen metrics for identifying healthy growth and their relationships to each other can be found in many places in the literature (Förster, 2005; Kaplan & Norton, 1997; Klein, 2013, 2015; Malik, 2013; Nußbaum, 2019).

The system thus takes a holistic view of the processes in technology companies and considers balanced, effective and efficient values without ignoring customer and financial aspects. In the figure, the core variables of the system are highlighted in bold. According to Malik (2013), these variables are of central importance for the success of companies.

1.3 Objectives

This section aims at clarifying the objectives of this paper. Based on the prior context, the following question arises: “How must organization development of technology companies be designed, to enable and promote growth in an effort to be financially sustainable?” To address this question, the KPI model shown before was developed as the respective research method. To find out if this method supports the research question, the model needs to be questioned and critically evaluated.

The main aim of this paper is therefore to describe the development, application and most important the critical evaluation of this key performance indicator model as a research method.

2. Methodology

To validate if the developed KPI model is able to support the research question stated in the introduction the method was applied to a practical example. This was done with the intention to validate the model methodology in a real application case.

The subject in the application of this model are innovation-driven technology companies, i.e. companies that deal with modern technology (Duden online, 2020b) and thus inevitably need innovations to grow and survive. The unit of investigation of the case study will be defined more precisely in the following. In terms of systems theory, this defines the boundary of the system under investigation. The example company is a technology company of medium size and structure. The company develops, designs and manufactures semi- and fully-automatic machines for the production and testing of micro-optical and opto-electronic components for photonics applications. The machines are produced in single and small batch production. The company can be categorized as an SME with round 150 employees. In recent years, the company has experienced strong growth in sales as well as the number of machines produced and of employees.

2.1 Overall Approach to Method Application and Validation

The overall approach of the method validation is shown in Figure 3. Firstly, a literature review was conducted. With the help of the information found the model itself as well as the individual performance indicators were derived. This part of the development followed a top-down-approach. As part of a case study, the organization, culture and environment of an exemplary company were examined with the help of representative workshops and expert interviews. Based on the information about the environment and organization gathered in the workshops and interviews, the KPI model was applied as an example to evaluate growth scenarios of an exemplary company. Finally, interviews were conducted with top managers with many years of management experience to evaluate the KPI system and examine its general validity.

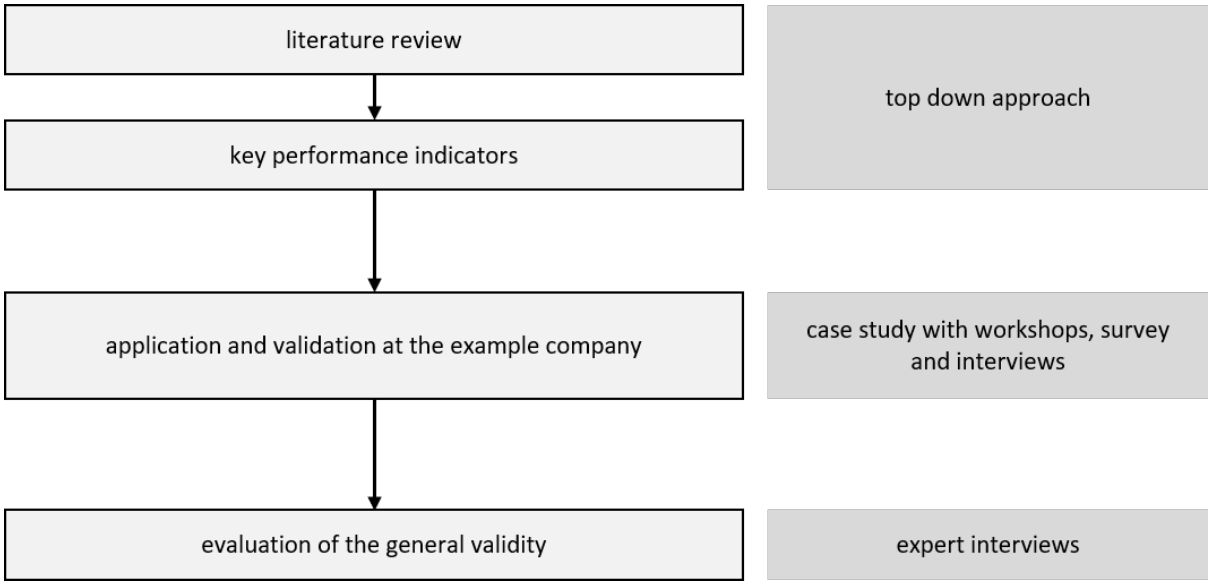

Figure 3: Overall approach to method application and validation

2.2 Application Case Study

In the following, the way in which the case study was conducted will be described. The presentation of the methodology should make the decision for the chosen approach transparent and comprehensible.

A case study based qualitative approach was chosen to validate the KPI model. Case studies are suitable where corporate activities and structures are to be recorded and analyzed holistically. In contrast to quantitative methods, case studies allow the analysis of highly complex issues. The company as a complex social system is a suitable object of investigation. (Meyer, 2003, pp. 476-478)

The case study has two objectives. First, the case study will be used to gather evidence that confirms the model assumptions. Second, the model will be applied to the company in the case study as an example. The subject of the study is first of all an example company of medium-sized size and structure.

Figure 4 shows the methodological procedure of the case study. The example company was analyzed to determine internal strengths and weaknesses. External opportunities and risks were collected in an environment analysis. The findings of the company and environment analysis are incorporated into a SWOT analysis. Based on this, scenarios are then developed, which are evaluated using the KPI system.

During that pilot application, several workshops and interviews were held. Approximately 10% of the workforce took part in the workshops. The participants were deliberately selected according to their area of activity, employment duration at the company and job level.

2.3 Validation Expert Interviews

In the following, the methodology used for validating the research method will be described.

It is advised for confirmatory case studies to examine several cases in order to analyze the transferability to other cases. The cases considered should be either very similar or just very different (Meyer, 2003, p. 476). In order to be able to make statements about the general validity of the indicator system, a few identical or several completely different companies should be surveyed.

The criterion according to which various cases are to be examined in the context of this work is the position of the companies in the life cycle. The approach followed was to survey companies in different phases as far as possible. In consequence, a statement can be made about in which phase the model can be applied in companies.

The main case study regarding the application in the example company is supplemented by further expert interviews. The aim of the interviews is to evaluate the key performance indicator model on the basis of the

experiences of the interview partners. The interview partners were managing directors and top managers, who were able to contribute their experience from companies at different stages of development. Each interviewee was asked to take the perspective of the type of company they represent.

This evaluation allows a statement about the general validity and applicability across the life cycle. The aim is to investigate whether the system of indicators can be applied solely to growth companies as intended, or whether it can also be transferred to companies in other phases.

The interviews were conducted as semi-structured discussions lasting between 0.5 and 1.5 hours. After an introduction and classification of the company by the interview partner, a presentation of the management metrics system took place. A large part of the interviews consisted of the evaluation and criticism of the key performance indicator model by the interview partner. Experts from companies in the pioneer, growth and maturity phases were interviewed. The interviewees all have many years of management experience in top management.

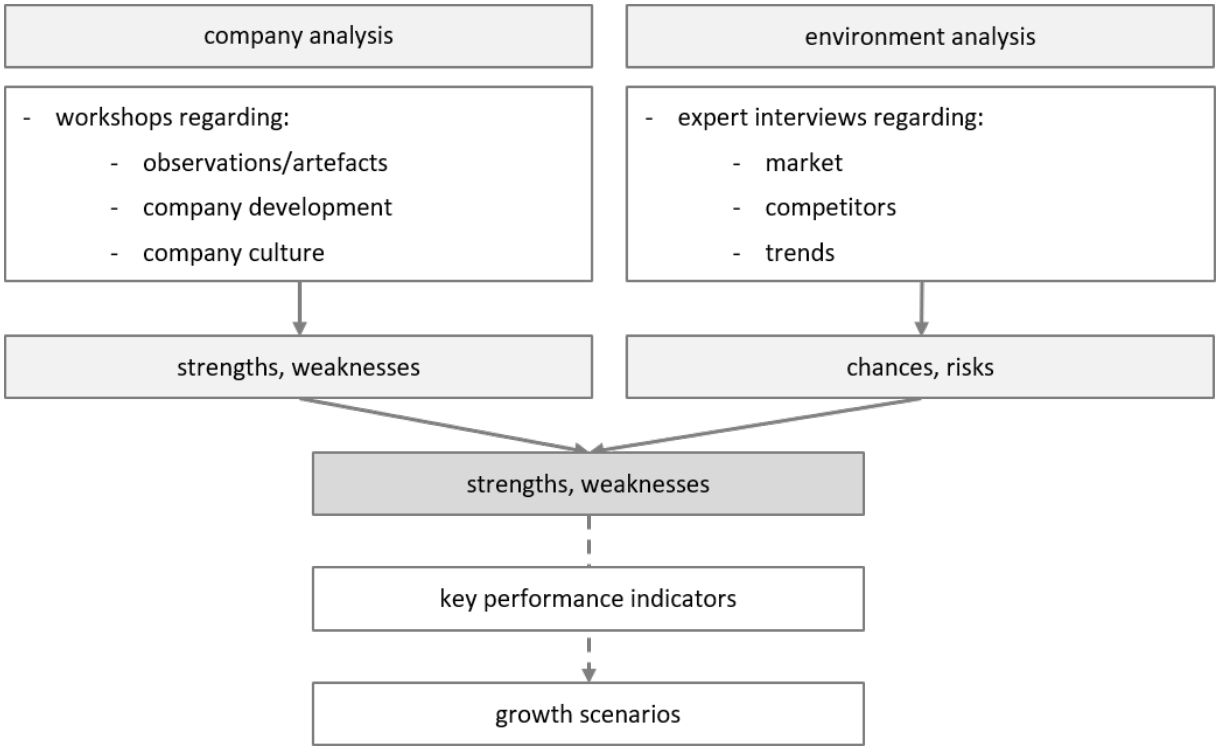

Figure 4: Methodology of the case study

3. Results

After focusing on the methodology for application and validation of the research method the key finding with respect to the central research question are presented.

3.1 Application

As part of the application case study, the organization, culture and environment of an exemplary company were examined with the help of representative workshops and expert interviews. The results of the status quo analysis were able to confirm the basic principles and logic of the key performance indicator system. Based on the information about the environment and organization gathered in the workshops and interviews, the KPI model was applied as an example to evaluate growth scenarios of an exemplary company.

3.2 Validation

The following sections describe the results of the validation expert interviews. The perspectives of pioneer, growth and mature companies will be presented.

3.2.1 Pioneer company perspective

The model matches with the experience of the interview partner from the pioneer company. In its current form, its applicability is seen primarily for somewhat more mature companies. A large number of the parameters cover important aspects of organizational development, e.g. proportion of management time, delivery time and employee satisfaction. The conflict between creativity (effectiveness) and coordination (efficiency), which is the basis of the model logic, is also observed in the pioneer company. In principle, the logic of the model can thus be confirmed.

However, there are shortcomings in the application in the pioneering phase. The parameters are not directly applicable in the pioneer phase, since the corresponding values are not systematically recorded to the required extent. For a pioneer company, qualitatively described, tactical milestones as well as further pre-control variables (burn rate, monthly R&D expenditures against liquid funds, etc.) are missing. Other important aspects in the pioneer phase are liquidity management and funnel management. The latter helps to generate a forecast of expected sales by documenting and forecasting orders and potential sales. In addition, in the pioneering phase, order growth instead of sales growth is the key performance indicator. Basically, it is becoming apparent that due to the considerable up-front investments made by the pioneering company in the initial phase, other key performance indicators are required that are not currently covered by the model.

In contrast, employee satisfaction and loyalty, for example, are very important parameters in the early phase, since a small company depends on every single employee. This results from the lack of competence redundancies in the system. Furthermore, customer acquisition, as it currently exists in the KPI model, is a central point. Due to the still small number of customers, every installation at the customer's must be a success, the customer must be fully supported. The young company lives and learns from the customer feedback generated in this way. Hence, the delivery time is not to be neglected.

Applicability would be increased if the thought model could be adapted to each phase. The efficiency perspective could further be supplemented by the parameter of "product functionality".

According to the interviewee, the metrics system is suitable for use in the growth and maturity phase. On the one hand, the inclusion of such key figures is only possible there in a systematic way. On the other hand, early indicators and qualitative milestones are missing for the pioneering phase. The model is not generally valid; each phase requires a different approach to organizational development and correspondingly different leadership personalities. However, a generalized model with adaptable variables would be conceivable.

3.2.2 Growth company perspective

The example company was viewed as representative of companies in the growth phase. In the main study, the current organizational culture was examined and classified using the outlined culture model. In the process, it was possible to confirm the changes and influences by various management personnel. It also became clear during the workshops that the company follows the life cycle model, changes in corporate culture and communication were observed. It was also clear that the company was striving for efficiency while neglecting the well-established value of effectiveness.

The expert interview with the management revealed that the complexity of the company and its environment makes it difficult to create a fixed, rigid model. The variability and the amount of internal dependencies pose great challenges for the KPI model. For the application in the concrete case of the example company, the system of key figures is too huge and unmanageable. There are too many key figures that would deal with too many topics. Also, the causal relationships in the system are not clear. Thus, the model needs a clearer structure and more concise message in the case of application in the growth company.

3.2.3 Mature company perspective

In the interview with a top manager, the key figure system was examined from the perspective of the mature company. Initially, the model fully corresponds to the experiences of the interview partner, and the changes over the life cycle could be confirmed. The developed model logic was said to reflect reality, however, most of the time companies do not act according to this logic. In practice, the first step is to look for areas of growth, and only then to clarify the manner of implementation. Profitability is more important than the implementation process involving employees. However, the parameter "employee competence" or a "strengths" perspective is

missing from the key performance indicator model. This would make it possible to emphasize and raise awareness of the importance of resources and competencies.

The applicability of the system in the mature company depends on the acceptance of the model logic. The system should first be used as a basis for discussion in order to reach a consensus on the management system in top management. The structure of the KPI system then supports organizational development in the mature company, and the implementation and recording of the KPIs is part of everyday life there. However, it could be supplemented by a parameter that actively promotes willingness to change and "restlessness" in the workforce. Particularly in mature companies, employee satisfaction and loyalty tend to be high. Here, the addition of a "provocation box" suggests itself, which challenges precisely this satisfaction and could promote efficiency and the will to change in the efficiency-dominant mature company.

The performance indicator system can serve as a thought model for the individual pioneer at the beginning and later as a moderation basis for consensus finding or a design system for the entire management in the mature company. The model presents many facets that need to be considered from different perspectives throughout the life cycle.

Whether the growth was sustainable often only becomes apparent decades later. For the growth phase, one could be fully operational and any strategy is defined by the market. One either hollows out future potentials or synchronously creates more of them in balance and extends the phase of the organization or founds new companies.

4. Discussion

Finally, the results will be interpreted to critically discuss the research methodology of the KPI model. First, the model's benefit will be considered, and then its universal validity will be examined.

4.1 Validation Outcomes and Model benefit

The results of the as-is analysis were able to confirm the basic principles and logic of the key performance indicator system.

Finally, interviews were conducted to evaluate the system of indicators and to examine its general validity. The criterion for the investigation was the phase allocation of the interviewed companies. The comparison with the experts' experience shows that the model is suitable for the organizational development of companies in the growth and maturity phase. However, the representatives of the example company expressed doubts about the attempt to represent the immense complexity of organizational development in a model. The application for companies in the pioneering phase, on the other hand, can be ruled out. The applicability can thus be conclusively determined for innovation-driven technology companies in the transition between growth and maturity phase.

Overall, it can be seen that the system of indicators is too detailed for the pioneering phase and also for the growth phase and is too strongly oriented to concrete variables. In contrast, it is more suitable for the maturity phase. In summary, the critical assessment was reflected in the experts' assessments. Instead of the meticulous interpretation of individual parameters, the system should be understood more as a thought model. The system supports organizational development at the transition between the growth and maturity phases. However, in concrete application, it poses difficulties in dealing with the complexity inherent in the system in connection with the requirements of everyday challenges. Finally, it would also be interesting to examine the generality of the model on the basis of a company in the degeneration phase. Here, however, no possibilities for interviews have arisen.

Furthermore, the model benefit is to be discussed. The key performance indicator system is essentially a thought model, a mental support for decision-making. The system parameters make it clear where action is required in the company.

The model can provide support in that it stimulates reflection and helps to recognize interrelationships and to classify them in the network of variables. It supports the application of systemic thinking to one's own strategic problems. It directs awareness to the dynamics of possible future scenarios and helps to find one's way in

complex systems. The system of parameters can serve as a thought model and help to play through options in organizational development.

The model does not have to be interpreted in a static and mathematically precise way. It is a tool for reflection, for playing through options for action and future scenarios. The system and its management parameters should be understood dynamically. The parameters can and should be adapted to changed conditions as needed.

The model is not a detailed representation of the inner processes of an organization. It only allows a certain degree of reliance on the interdependencies outlined in it. On the one hand, it illustrates the complexity of the interrelationships of strategic organizational development, but it cannot fully represent the complexity inherent in the system. This would require a comprehensive analysis of the interdependencies of many different levels in several companies.

The KPI system may be too detailed and overloaded for the practice of medium-sized companies. Small owner-managed companies tend to act more intuitively and less to support their strategy by elaborate data collection. The complexity of the system "organization" brings difficulties. A simple representation of the effects of different factors is almost impossible. A complex representation, on the other hand, depends too much on assumptions and may be too detailed for practical use. One possibility would be to assess connections in a case study and develop an impact graph from it (see Berner, 2017; Brüger, 2018). With the help of a weighting of the variables, the core variables with high relevance in the company under consideration could be identified. Another more holistic and general modeling takes place through the Strategy Map by Malik (2013, p. 180).

One could also pursue the question of why executives in the start-up and growth phase work so little consciously on their organization and thus shape the path of the future, but are rather driven operationally. Neurologically, after all, it's like any preventive action. And so is recognizing complexity. Do executives in particular lack complex thinking and understanding? Is the KPI model also an indicator of leadership maturity in a hyper-complex world?

4.2 Outlook

Conclusively, perspectives for further research can be identified as the KPI system as discussed in this paper still leaves much room for adjustments and further investigations. The modeling of an efficiency graph with a comprehensive analysis of all variables offers itself. It is conceivable that in this way, the complexity of the issue under consideration in the company could first be shown and then made controllable. Weighting and reduction of complexity could be achieved by analyzing the number of relationships between the variables. The management metrics system probably cannot live up to its claim. The subject is too complex, too large, to be covered by a single model. Instead, it is important to use the model as an orientation and to test one's individual scenarios against it.

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Technology Audit: Procedure for the Assessment of the Technological Maturity of Applied R&D Organizations

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Abstract: Applied research and development (R&D) organizations – or research and technology organizations (RTOs) in a broader sense – strive to develop technological solutions that translate results from research and science into state-of-the-art products and services. This can only be achieved if technological resources and competences are effectively and efficiently used to build up competitive advantages. Therefore, the assessment of the technological capability can provide applied R&D organizations with information on strengths and weaknesses in their specific technology areas, on the basis of which technology strategies can be derived to contribute to the development and training of substantial (core) competences, which in turn improve the quality of unique and differentiating products and services. The main objective of this paper is to describe the technology audit as a procedure for evaluating the technological maturity of applied research organizations. Hence, the focus will be put on the technological capabilities needed to execute the intended research activities on the way to becoming a reference in the respective technology area. In addition, the aim of the application of the procedure is to provide a detailed insight into the working methods of research institutions with focus on the R&D portfolio (e.g. complexity of R&D projects). Furthermore, the sustainable impact of R&D projects of the applied R&D organization (e.g. optimizations of customers processes) will be discussed, as well as the used & developed technologies and the necessary competences to generate innovative solutions for the Brazilian industry.

Keywords: Technology, Technological Capability, Technological Resources, Technological Competences, Technology Evaluation, Strategic Technology Management, Research and Technology Organizations, RTO, Applied R&D

1. Introduction

The *technology audit* presents a suitable methodology and approach for the assessment of the technological maturity of an applied R&D organizations and in a broader sense also of RTOs within a workshop procedure (Rubenstein and Geisler 1991; Porter 1978). In the following, it will only be referred to the term *RTO* which will here denote RTOs in a broader sense as well as applied R&D organizations. The technology audit mainly focusses on the analysis of projects within the R&D service areas of the RTO in order to get a comprehensive understanding of the used technologies, research competences, developed technologies as well as the established technological partnerships of the RTO.

The methodology of the technology audit has been developed over a long period of time and has been updated constantly. This paper provides a brief summary of the methodology itself and is the condensed outcome of previous research work. The derivation of the methodology as well as the previous academic work that lead to this paper can be found in the following publications: (Hecklau et al. 2019a; Hecklau et al. 2019b; Hecklau et al. 2019c; Hecklau et al. 2020a, 2020b, 2020c).

2. Method of technology audit

The technological performance of RTOs is analyzed and subsequently assessed with the help of the technology audit assessment procedure. For this purpose, a standardized procedure is available in addition to various models, such as the maturity model or the assessment dimensions model, as well as the tools and templates (see chapter 3). This procedure enables a structured assessment of the RTO to be audited. The three main steps and a fourth optional step are described in Figure 1 below.

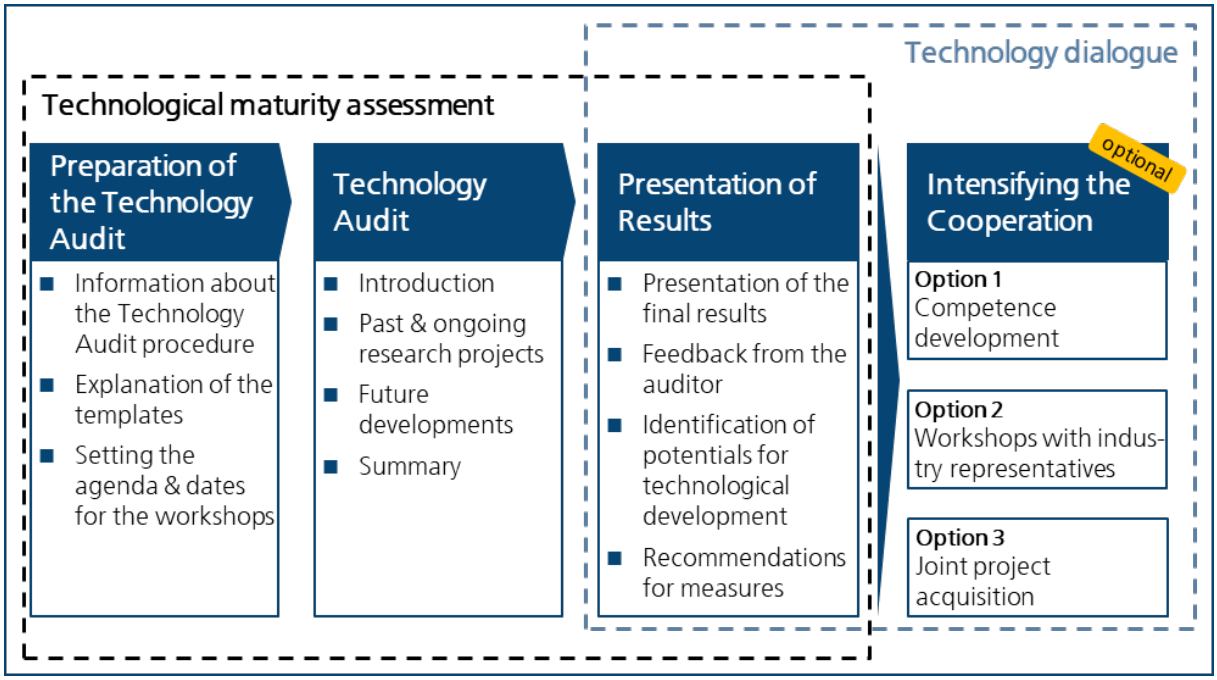

Figure 1: Technology audit procedure

The procedure consists of two main parts. In the mandatory part of the *technological maturity assessment*, the technology audit takes place. For this purpose, there is a *preparatory session*, the *technology audit workshop*, and the *final presentation and discussion of the auditor's assessment results*. The second and optional part is called the *technology dialog*. The aim of this part is a further cooperation between the technology auditor and the organization to be audited. For this purpose, for example mutual competence development is aimed based on the results of the assessment of technological maturity. Activities to initiate joint research activities, such as workshops with industry representatives or joint project acquisitions, are also possible. It is important that the neutrality of the auditor is ensured despite of any intended further cooperation.

The individual steps of the technology audit procedure are described in detail below.

2.1 Preparation of the technology audit

Before the technology audit process begins, it needs to be determined who will take on the role of technology auditor and perform the assessment of the technological maturity of the RTO to be audited. To this end, a technology expert who is active in a similar thematic focus as the RTO is assigned. It is important to ensure that the technology auditor is also active in the field of applied research and is familiar with the relevant specifics of RTOs. Furthermore, the auditor must have broad expertise and experiences. In addition to the auditor's neutrality, he should have excellent communication skills.

In the first workshop, the *preparation of the technology audit*, the auditor receives information from the RTO in order to obtain an overview of the R&D portfolio, research competencies, products & services, and other technical information. Moreover, information on the main activities, technological equipment, and employee competencies is provided so that the auditor can gain a comprehensive initial overview. In a preparatory workshop, which can be conducted on-site or online via video call, the RTO and the technology auditor have the opportunity to talk directly for the first time. On the one hand, the procedure and the underlying method of the technology audit are presented in detail, and on the other hand, the provided documents are discussed. There is the possibility to clarify the first open technical questions. Furthermore, the auditor can request missing or further information from the RTO, which is necessary for the preparation of the technology audit workshop. This step serves to guarantee the quality of the later assessment, as it can be ensured that all necessary information is available.

2.2 Technology audit workshop

In the step of the *technology audit workshop*, the technology auditor analyses the various service areas of the RTO on-site and determines the technological maturity.

In this two-day workshop, a total of four sessions are conducted, each focusing on a different thematic block: Session 1: Introduction to the technology audit; Session 2: Analysis and evaluation of past and ongoing research projects; Session 3: Future developments; and Session 4: Summary.

In order to allow for an in-depth and open discussion, there are no strict definitions or time limitations for each session. Instead, a generous block of time will be set for each session, during which the content can be worked on flexibly. The following Figure 2 summarizes the agenda for the two days of the *technology audit workshop*.

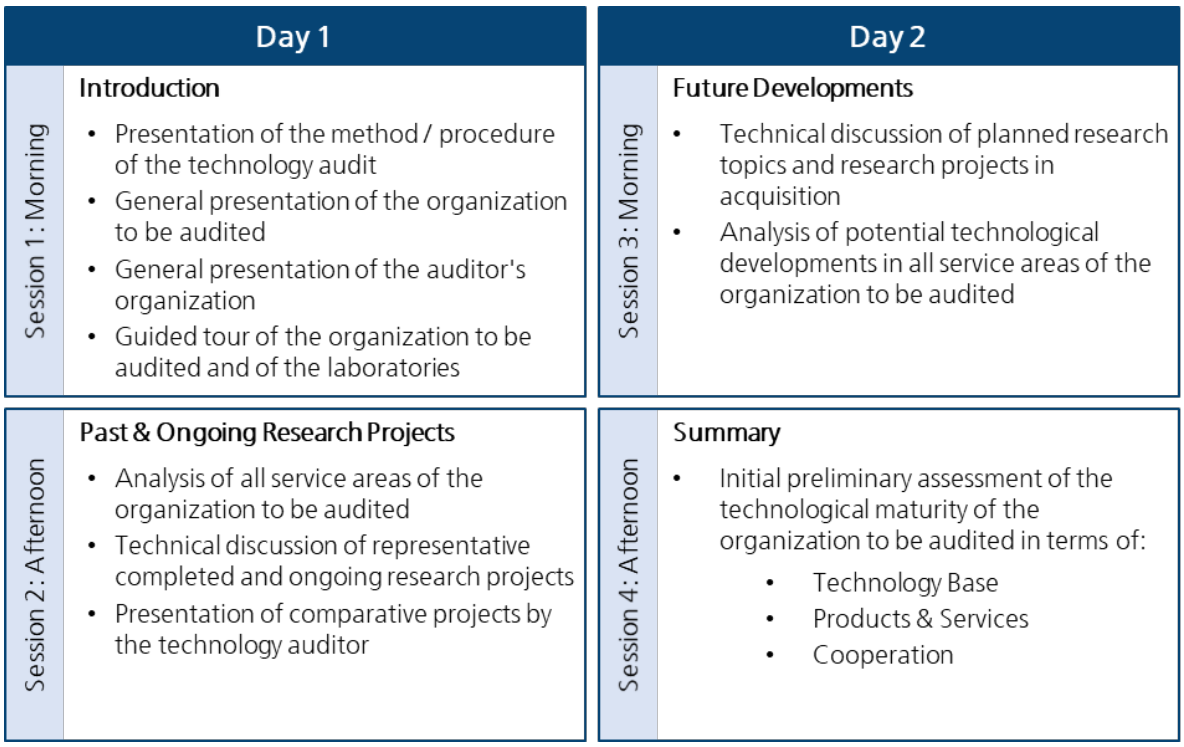

Figure 2: Agenda for the technology audit workshop

The four sessions mentioned above provide the framework for the technology audit workshop and are described in detail below.

2.2.1 Session 1: Introduction to technology assessment

In the first session of the technology audit workshop, basic information is discussed. First, the technology audit procedure and the underlying analysis and assessment methodology are presented. It is important that the technology auditor and the organization to be audited develop a common understanding of the goals of the workshop as well as the approach. The organizations then introduce themselves to each other. In a general presentation of the RTO, basic information such as organizational size, service areas or organizational structure is presented. The auditor also introduces the own organization and provides insight into the own research areas. To create an understanding of the technology base of the RTO, a tour of the organization and the laboratories is conducted. As RTOs basically work on R&D projects with a focus on technological developments. The technology auditor has the opportunity to analyse the technology in detail and to understand how they are embedded in the infrastructure. In addition, there is the possibility to interview employees of the RTO on the respective machines they operate and thus gain insight into the technological competencies.

2.2.2 Session 2: Analysis and evaluation of past and ongoing research projects

In this session, all service areas of the RTO are analyzed. A pragmatic and goal-oriented approach is the selection and discussion of specific and representative research projects that have been carried out in the respective service areas. In this way, a very comprehensive overview of the research activities of the entire organization can be obtained via the analysis of a limited number of research projects. The focus in this session will be on past and current research projects. The technologies and competencies used on the one hand and the technological results in the form of, for example, prototypes on the other are particularly important in the analysis of the research projects. This focus enables the subsequent evaluation of technological maturity

according to the defined evaluation dimensions (see chapter 3). In order to be able to evaluate the technological capability and thus technological maturity, a suitable benchmark must be selected for comparison (Werner and Sourder 1997) with regard to which the maturity level is subsequently evaluated. The expertise and research activities of the technology auditor are the basis for this purpose. The auditor uses the research achievements of the own organization (e.g. concrete technological results from own research projects) as a benchmark and presents these during the session. The final technological assessment of the RTO refers to the auditor's own reference projects that were presented. During this session, the technology expert gets a deep insight into the individual service areas of the RTO as well as the technological equipment and the competencies of the team.

2.2.3 Session 3: Future developments

In this session, future technological developments of the RTO are discussed. The focus is set on the analysis of planned research topics that can be realized through possible research projects that are currently being acquired. On the one hand, it will be discussed how the technology base can be secured. The central question is which further technologies need to be acquired to ensure that a high level of research services can continue to be offered in all service areas in the future. On the other hand, it is discussed which technological innovations will be targeted as a result of research activities of the RTO in the future. In order to be able to understand future envisaged technological developments, technology roadmaps and other tools are used, which the RTO uses for planning and forecasting.

2.2.4 Session 4: Summary

This session offers the possibility to summarize the findings of the previous discussions. The technology auditor has the last chance to address and clarify any open questions. Once the auditor has gained a comprehensive insight into the activities of all service areas, representative research projects, technologies used, own technological developments, competencies and collaborations, an initial and preliminary assessment of the technological maturity can be made. In doing so, the technology auditor evaluates the three defined assessment dimensions: Technology base, products & services, and cooperation. This initial assessment is further refined in the subsequent steps and can be adjusted again by the technology auditor for the final assessment.

2.3 Presentation of results

After the technology audit workshop, the technology auditor prepares a report containing the results of the analysis and the assessment of the RTO's technological capability within the following two weeks. For this purpose, the technological maturity of the RTO is evaluated and compared with reference projects and research achievements of the technology auditor, that have been discussed and presented during the technology audit workshop. The report also includes further detailed analyses of the technology base, products & services, as well as synergistic collaboration with partners at the technological level.

In the next step, the presentation of results, the final assessment and the results of the technological maturity of the RTO are presented in an online meeting via video call or alternatively on-site at the audited RTO. These results are discussed in detail and the auditor gives advice for a concrete action plan to improve the technological maturity. In addition, the RTO has the opportunity to comment on the assessment. The goal of the *presentation of results* is to obtain a common understanding about the final assessment and to identify concrete improvement potentials. The step *presentation of results* forms the interface between the formal assessment of technological maturity and the optional continuation of the cooperation between the technology auditor and the audited organization.

2.4 Intensifying the cooperation

After the technology auditor and the RTO have discussed in detail their respective research activities and learned about their technological strengths and weaknesses, there is the possibility of further collaboration. To this end, the knowledge gained, and the relationship built up to this point can be used to work towards common goals. There are several options for how to deepen the collaboration. For example, efforts can be made to further improve technological competencies on both sides. Competence development workshops can be held for this purpose. In addition, joint research ideas can be further developed, leading to joint research proposals, which would enable funding for the substantive cooperation. It is also conceivable that potential customers can be acquired jointly and that the bundled competencies of the technology auditor and the RTO can be particularly appealing to the potential customer.

3. Elements of the assessment procedure

The methodology of the technology audit for the technological assessment of RTOs consists of several elements. Besides conceptual elements that provide the framework for the methodology, further tools and templates are available as key elements of the technology audit. The most important ones are described in the following chapter.

3.1 Conceptual elements

Conceptual elements, which are described in this chapter, are basic concepts that are used within the technology audit procedure. Besides the assessment dimensions, which are analyzed and assessed in detail during the technology audit workshop, the maturity model is another crucial conceptual element. The maturity model allows a standardized assessment based on five maturity levels.

3.1.1 Assessment dimensions & assessment elements

Three main dimensions form the basis for the assessment. These dimensions target the RTO's technology base, products and services, and collaborations. Within the assessment dimensions, further assessment items are defined. These concretize the dimension and enable a targeted assessment within the technology audit. The three main dimensions are shown in the figure below.

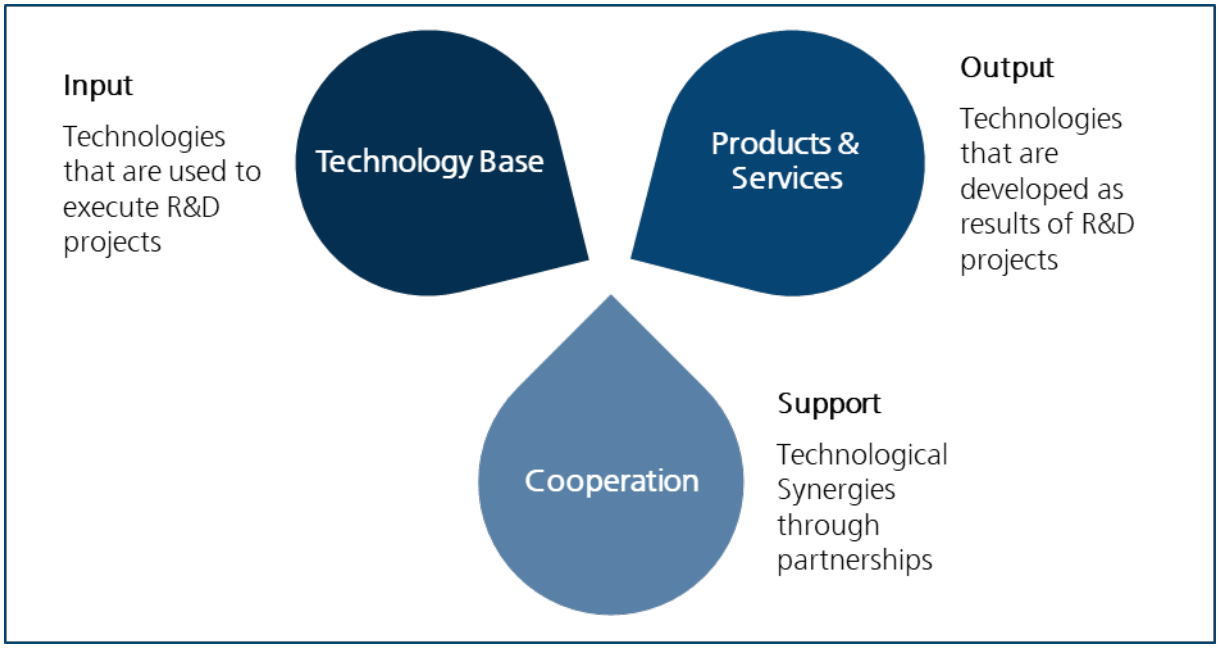

Figure 3: Dimensions of the technology audit

On the one hand, the *technological base* of the RTO will be analyzed and assessed. This dimension serves as the "input-dimension" as technologies as well as competences, that are available and actually used for the execution of R&D projects, are evaluated. The output-dimension, which is called *products & services*, focusses on the results of the executed R&D projects. In this dimension, technologies that are developed as products or technological services are analyzed and assessed. In the third dimension, the *cooperation*, technological synergies through partnerships are evaluated. In this context, partners that support the execution of R&D projects are put into focus.

In the following chapter, the three dimensions will be further explained and operationalized.

- Technology Base

As the dimension *technology base* focusses on the technologies and competences of the RTO that are available and used to execute R&D projects, the leading question for assessing this dimension can be formulated as follows: *Is the RTO capable of executing R&D projects in its defined technology & service areas on a state-of-the-art level?* To answer this leading question, three main items can be identified and operationalized with other key questions.:

- Core competences: Does the RTO possess the necessary core competences to cover its defined research areas and to deliver its defined products & services?
- Technologies, equipment and infrastructure: Does the RTO possess the necessary technologies, core equipment and infrastructure to cover its defined research areas and to deliver its defined products & services?
- Future technology developments: Is the RTO aware of future technology developments and does it have a strategy to evolve competences and infrastructure accordingly?

- Products & Services

As the dimension *products & services* is mainly focusing on the results of research, development and innovation projects and on the creation of innovative solutions, the leading question is the following: *Is the RTO actually executing R&D projects in the defined R&D / service areas and transforming technologies into innovative applications / products with a high impact and clear benefits for the industry?* The following items and operational key questions are analyzed and assessed:

- Execution of R&D projects: Is the RTO de facto executing and delivering R&D projects with an ambitious degree of complexity in all of its defined research / service areas?
- Transformation of state-of-the-art technologies into products and services: Is the RTO transforming state-of-the-art technologies into innovative applications, products and services with a high impact and benefit for the industry?
- Potential new technological solutions, products and services: Is the RTO aware of potential new technological solutions, products and services to increase its competitiveness and pursue a unique selling proposition on the market?

- Cooperation

On the *cooperation* dimension, the level of integration of the RTO within the regional, national, or even international innovation ecosystem is analyzed and assessed, in order to get access to complementary research competences from partners, which are needed for the project execution. In this sense, the leading question would be: *Does the RTO actively insert itself into an attractive innovation ecosystem and create strategic synergies with high-level R&D partners to expand its own field of actuation and its impact?* The following further items and operational key questions support finding an answer to it:

- Cooperation with external R&D partners: Does the RTO cooperate with external R&D partners to create interdisciplinary synergies and develop new technologies & applications on a higher complexity level?
- Integration & usage of technologies from externals: Does the RTO actually integrate and use technologies or solutions from partners or technological service providers in its own R&D projects?
- National / international players as new partners: Is the RTO aware of national and international players in relevant technology fields and strategically pursuing new attractive partnerships?

3.1.2 Technological maturity model

For the assessment of the dimensions, a technological maturity model is developed, which consists of different levels. It forms the basis for the evaluation of an RTO within the scope of the technology audit. The spectrum comprises various gradations between minimal technological maturity and very high technological maturity. Each level is described individually and specifically for each of the assessment dimensions in order to ensure the highest possible degree of standardization and thus a high degree of comparability between different RTOs.

After the technology auditor analyzed the different service areas of the RTO by deeply analyzing several R&D projects, technological equipment and research competences, the expert needs to assess the technological maturity of the RTO for each dimension and, if necessary, for each service area. For the evaluation of the dimensions, a Likert-scale is used. The purpose of its application is to give the auditor's subjective discretionary judgments greater accuracy. This is done with the help of a uniform and systematic procedure. (Likert 1932; Neukirch, Semmler 2011)

Therefore, a generic technological maturity model has been created, which consists of 5 different levels, starting with maturity level 1 – minimal technological maturity – and ending with the highest maturity level 5 – very high technological maturity.

The generic technological maturity model is visualized in the following figure.

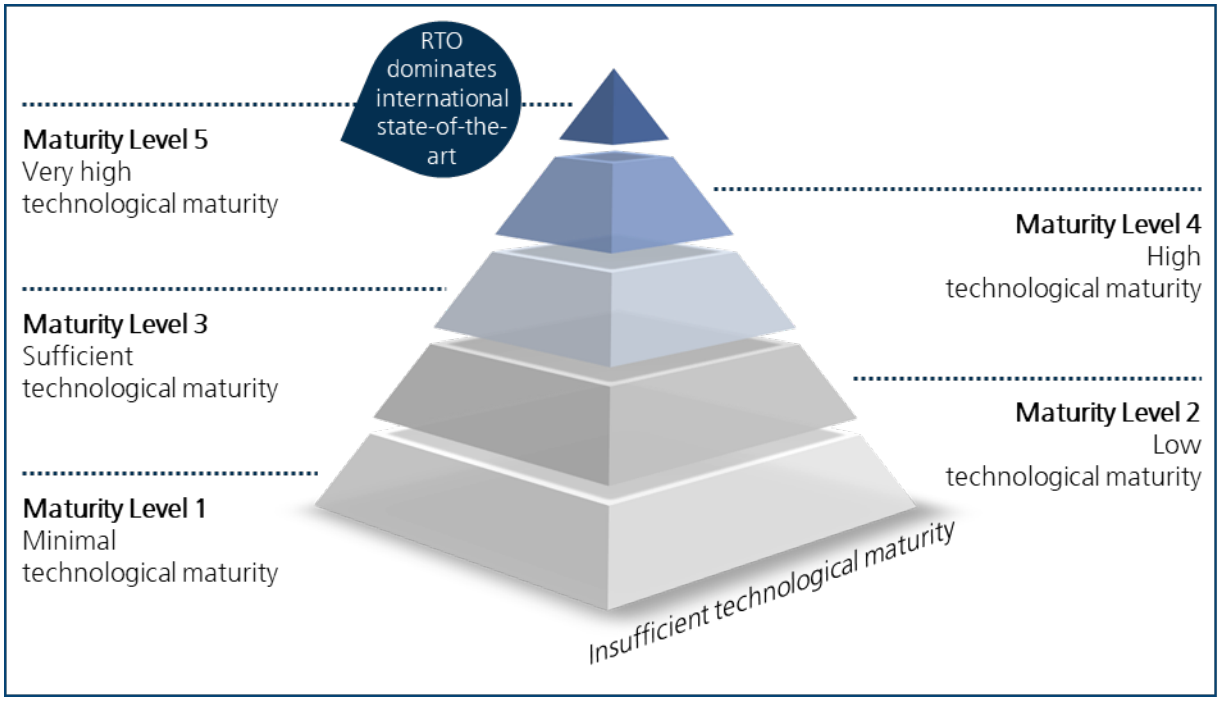

Figure 4: Technology maturity model

If an RTO reaches the technological maturity level 3, which means, that the technological maturity is sufficient, the organization is considered operational with all the necessary technologies, equipment, research competences and strategic technological partnerships to execute R&D projects in its defined service areas. If an RTO reaches a technological maturity level of 4 or higher, it means it is already very mature and is able to execute complex R&D projects and develop very innovative technological solutions.

As the generic model needs to be detailed for each of the three assessment dimensions, the following table explains the operationalized technological maturity level for each dimension.

Table 1: Technological maturity levels of all three Dimensions

Maturity Level	Dimension Technological Capability	Dimension Product & Services	Dimension Cooperation
Level 1	The RTO has **basic knowledge & basic equipment** for its defined technology fields. There are **no strategies for further development** of the technological capability existent.	The RTO **started executing first basic R&D projects to deliver potential new technological solutions, products and services.** There are **no strategies for further development** of products & services existent.	The RTO has **few technological partnerships** and **low achievements of the organization's goals** were made through cooperation. There are **no strategies for further development** of the cooperation with strategic technological partners existent.
Level 2	The RTO has **some knowledge & first experiences** in executing R&D projects as well as the **basically necessary scientific equipment** for its defined technology field. A **basic plan for further development** of its technological capability exists.	The RTO **is executing R&D projects of low complexity to deliver potential new technological solutions, products and services.** A **basic plan for further development** of products & services exists.	The RTO has **some technological partnerships** and **some achievements of the organization's goals were made** through cooperation. A **basic plan for further development** of the cooperation with strategic technological partners exists.
Level 3	The RTO has all **main competences & scientific equipment to master R&D projects of medium complexity** in its defined technology field. A **systematic plan for further development** of its technological capability exists.	The RTO **is executing R&D projects of medium complexity to deliver potential new technological solutions, products and services.** A **systematic plan for further development** of products & services exists.	The RTO has **good technological partnerships** and **good achievements of the organization's goals were made** through cooperation. A **systematic plan for further development** of the cooperation with strategic technological partners exists.

Maturity Level	Dimension Technological Capability	Dimension Product & Services	Dimension Cooperation
Level 4	The RTO has **broad competences & scientific equipment** to cover its **entire defined R&D service portfolio on a high-quality level**. The RTO is able to master R&D projects of **high complexity** to fulfil all requirements of current industrial demand. A **systematic plan for further development** of its technological capability **exists and is followed ambitiously**.	The RTO **is executing R&D projects of high complexity to deliver and transform state-of-the-art technologies into new technological solutions, products and services.** A **systematic plan for further development** of products & services **exists and is followed ambitiously**.	The RTO has **very valuable technological partnerships** and **very good achievements of the organization's goals were made** through cooperation. A **systematic plan for further development** of the cooperation with strategic technological partners **exists and is followed ambitiously**.
Level 5	The RTO has competences on **international state-of-the-art level & innovative scientific equipment** and is specialized in **specific focal areas**. The RTO is recognized as a **national reference** to master high complexity R&D projects and go **beyond the requirements of current industrial demand**. A **sophisticate strategy with clear goals for further development** of its technological capability **exists and is followed ambitiously**.	The RTO **is executing innovative R&D projects of high complexity to deliver and transform state-of-the-art technologies into new technological solutions, products & services** in **specific focal areas.** The RTO is recognized as a **national reference** to deliver products & services **beyond the requirements of current industrial demand**. A **sophisticated strategy with clear goals for further development** of products & services **exists and is followed ambitiously**.	The RTO has **outstanding national and international technological partnerships** and **high achievements of the organization's goals were made** through cooperation. A **sophisticated strategy with clear goals for further development** of the national and international cooperation with strategic technological partners **exists and is followed ambitiously**.

When analyzing and assessing the technological maturity of the RTO, the definitions in the above-mentioned table help the technology auditor to choose the most suitable technological maturity level of each assessment dimension. If the different service areas of the RTO are too distinct, it is also possible to define maturity levels not only for each assessment dimension, but also for every single service area. As this leads to a big number of maturity levels, it is advised to cluster the assessment of service areas with a similar technical maturity level.

3.2 Tools and templates

Further important elements of the technology audit methodology are the tools and templates that are used along the process. In the following chapter all available tools and templates are described briefly.

3.2.1 Procedure guide book

A guide book is available as the most important orientation for the technology auditor to assist the execution of the technology audit. This guide book contains explanations and assistance on how to proceed. This clear guideline additionally ensures that different auditors are able to proceed in a standardized manner.

3.2.2 Checklist for preparation

Since the auditor needs a lot of information to perform the technology audit, a checklist that contains an overview of all information the RTO needs to provide in preparation for the technology audit is made available. Documents such as presentations and reports, photos and videos are also part of the checklist. This list makes it possible to have all the required information available for the audit workshop in order to carry out a detailed analysis and evaluation.

3.2.3 Questionnaire for evaluation

Based on the assessment dimensions and the assessment elements, a questionnaire is available in which all assessment dimensions and items are gathered in key questions. This questionnaire is handed to the auditor and is used during the audit as a basis for structured analysis and assessment. Serving as a guideline, the questionnaire allows the auditor to record notes and to make initial assessments of the dimensions.

3.2.4 Evaluation tool

The excel assessment tool contains all assessment elements of the assessment dimensions and enables the structured and systematic assessment of the RTO by the auditor. Logical and automatic links facilitate the

recording and evaluation. Based on the evaluation results, graphics and diagrams that clearly present the evaluation results are created automatically by the tool.

3.2.5 Technology audit report

The technology audit report comprehensively summarizes all the results of the audit. There is a template available for the technology audit report. The main statements of the report are presented as briefly as possible in a summary. Furthermore, the current state of the art of the technology area in which the RTO is active is described. This is used as a basis for the benchmark of the RTO. The analysis results and assessments are described as the status-quo of the RTO and thus represent the current state. By means of a gap analysis, it is possible to identify and describe the potential for improvement in a further part within the report. Finally, recommendations are given on how the identified gaps can be closed in the best possible way and how an improvement in technological maturity can be achieved.

3.2.6 Questionnaire for the evaluation of the auditor

After completion of the technology audit, the assessed RTO has the opportunity to provide feedback on the technology auditor. A standardized questionnaire is available for this purpose. By collecting feedback, the auditor is able to continuously improve the quality of the audit. At the same time, the RTO has the possibility to name points of criticism regarding the audit process or the auditor himself.

4. Summary & Outlook

The technology audit methodology as a procedure to analyze and assess the technological maturity, which has been described in this paper, forms the essence of a long-term research work of the authors. The technology audit builds on various conceptual elements as well as tools and templates and is in this sense practically oriented. It can be applied by experienced researchers, who act as the technology auditor to assess RTOs. In the past years this methodology has been constantly revised and updated according to the key findings that resulted from the application of this methodology since 2017. However, several updates are foreseen in the future as the technology audit will further be applied to assess RTOs in the upcoming years and further research will be conducted.

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Methodological Procedure for the Development of a Qualitative and Quantitative Evaluation Concept for Project Benefit Assessment

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Abstract : The fourth industrial revolution not only brings great opportunities for the economy, but also poses major challenges for all stakeholders. Manufacturing companies in particular are affected by challenges such as a lack of innovative strength or the risk of being overtaken by innovative start-ups. However, the dynamic environment and the resulting complexity require faster and better decisions to remain competitive in the long term. Current business practices of established companies do not meet this challenge and risk losing control of their core business. Taking a purely technological approach to this subject harbors costly risks. Only the integration of the various individual technologies into a holistic digital strategy creates efficiency and new growth areas. To exploit the full potential of Industry 4.0 (I4.0) in the manufacturing industry, companies must therefore take a strategic view of the technological options and adapt their organizational structure and culture. The main objective of this paper is therefore to describe the procedure for developing a suitable evaluation concept for assessing the economic benefits of digitization projects. The evaluation concept to be developed is designed to be able to perform a multidimensional examination and evaluation of digitization projects in order to enable a quick and well-founded decision on the implementation as well as the prioritization of a specific project or several projects from a qualitative and quantitative point of view. The paper therefore describes a seven-step approach to developing a multidimensional matrix diagram that serves as the basic structure for such an evaluation concept. To develop a suitable evaluation concept, the research focus will be carefully examined and in-depth research on two overarching themes will be conducted, resulting in the definition of appropriate evaluation criteria: From a methodological point of view, existing assessment models are considered in general and the strengths and weaknesses of these models are discussed. From a practical perspective, the special requirements of digitization and Industry 4.0 will be addressed. To this end, expert interviews will be conducted and a total of 100 practical examples will be selected from an extensive database and analyzed in a criteria-oriented manner in order to derive assessment dimensions and assessment criteria from both a quantitative and qualitative perspective.

Keywords: Industry 4.0, Digitization, Qualitative and Quantitative Assessment, Economic Benefits, Manufacturing Companies, Multidimensional Assessment, Matrix Diagram

1. Introduction

The rapidly increasing digitization of the economy and society is changing production and working methods. Progressive developments in key technologies are promoting change. Value creation processes are being digitized and implemented in dynamic and flexible value creation networks. Not only new value networks, but also new services and innovative business models are completely redefining existing industries. As a result, established market structures and world market shares are redistributed (BMWI 2019; acatech 2019; Kagermann et al. 2013).

The economic benefits of these efforts are currently difficult to predict. In Germany, for example, BCG expects significant increases in productivity (15-25%), turnover (30 billion EUR p.a.) and investment (250 billion EUR p.a.) over the next ten years (Rüßmann et al. 2015). Realistically, however, figures of this magnitude in the industrial sector seem a long way off. The main reason for this is that the concrete benefits of I4.0 are not apparent to many companies. This is confirmed in a study by the German Federal Ministry for Economic Affairs and Energy (BMWi), which highlights the lack of transparency regarding the benefits as one of the main obstacles to the introduction of digitization in companies. Combined with the supposed technological and financial uncertainties and excessively long implementation periods, this means that German companies are proving to be extremely reluctant to invest for the time being (BMWI 2015).

The fourth industrial revolution, while bringing great opportunities for the economy, is also associated with major challenges. Companies that want to grow profitably in the coming years, or at least continue their existing business, are thus forced to make radical changes (BMWI 2015; Fend and Hofmann 2018). The dynamic environment of markets and the resulting complexity mean that companies need to make faster and better

decisions to remain competitive in the long term. But decision-making processes can take weeks or even months, and decisions are often based more on intuition rather than hard data (Schuh et al. 2017).

However, the purely technological approach to the subject entails costly risks. Only the integration of the various individual technologies into a holistic digital strategy creates efficiency and new growth areas. To exploit the full potential of I4.0 in the manufacturing industry, companies must therefore take a strategic perspective on the technological options and adapt the company's organizational structure and culture. And they need to do this across the various corporate functions (Schuh et al. 2017; Deloitte 2016).

This paper aims to counteract this threat by providing a concept for the qualitative and quantitative assessment of the economic benefits of digitization and I4.0 projects in the manufacturing industry. This is intended to enable companies to make a quick, meaningful and reasonable decision on the implementation of a project based on the corporate strategy as early as the idea generation phase, thus preventing costly misinvestments.

2. Foundations of evaluation concepts

In the context of project evaluation, there is a fundamental problem of adequate method selection. For a successful project evaluation, not only quantitative but also qualitative aspects, such as strategic importance and economic benefits as well as the simultaneous consideration of multiple evaluation criteria are of great importance. Depending on the evaluation situation, different methods are applied. In this context, evaluation methods can contribute to ensure that decisions about starting, stopping or interrupting projects are not based on purely subjective, uncontrolled judgments of individual persons. To ensure this systematic and transparent evaluation of projects, a distinction can be made between one-dimensional, multidimensional and comparative evaluation methods (Kunz 2007). Within the literature, however, it is also possible to find further categorizations of project evaluation methods (Fornauf 2015; Knospe 1998; Baldegger 2007).

The figure below provides an overview of the potentially applicable evaluation methods assigned to the respective categories.

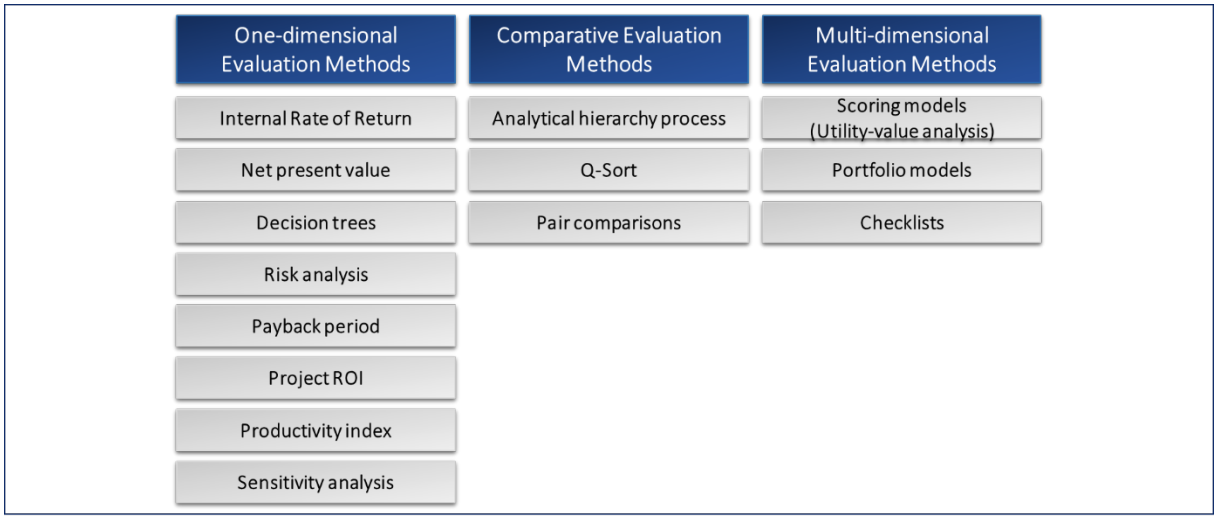

Figure 1: Types of evaluation methods

When examining the different types of evaluation methods, it was found that multidimensional methods are best suited for the purposes of this master thesis. In contrast to one-dimensional methods, which focus almost exclusively on monetary aspects, multidimensional evaluation methods allow the simultaneous consideration of qualitative and quantitative evaluation criteria. Indeed, the goal of the concept to be developed is to make decisions not only on the basis of monetary aspects, but also to consider the strategic goals of a company.

However, the existing evaluation methods were not fully convincing. Here, among other things, an insufficient consideration of qualitative characteristics, a focus on monetary aspects as well as the lack of a holistic evaluation from different perspectives are to be criticized. The term "holistic" in this case refers to the evaluation of a project from multiple perspectives simultaneously, such as technological and economic aspects, feasibility, effort, legal and personnel issues, etc. After all, there is the risk that the manifold potentials of a project are not

sufficiently considered. In addition, many evaluation concepts require special expertise from the evaluators, such as controlling, and are also time- and cost-intensive. However, the intended concept has to be easily applicable by any "average engineer" with little effort.

3. Methodological procedure for developing a multidimensional evaluation concept

This chapter deals with the methodological procedure for developing a multidimensional evaluation concept based on the matrix diagram and is divided into two sections: Since the evaluation concept to be developed will have the structure of a matrix diagram, the basics of this instrument will be explained first. Subsequently, the methodological procedure for the development of such an evaluation concept will be presented and the individual steps will be explained in detail.

3.1 Matrix Diagram

Relationships between things are often complex (many-to-many) and require thinking in more than one dimension. Especially in digitization projects, there are various factors, such as technical, economic or management factors, whose interaction contributes decisively to the success of a project. Without considering these different dimensions, it is not possible to make a reliable statement about the benefits or prospects of success. In such projects, the matrix diagram is a suitable instrument for analyzing relatively complex issues in a simple and straightforward manner (ASQ; Tague 2005).

The matrix diagram is one of the seven new management and planning tools developed in 1976 by the Union of Japanese Scientists and Engineers (JUSE). It is used to identify, analyze and illustrate the existence and strength of relationships between two or more data sets and provides a compact way of representing many-to-many relationships with different strengths (ASQ; Tague 2005). It is particularly useful for investigating the relationships between (Burge 2006):

- a set of vague and non-measurable items with a set of precise and measurable items (such as connecting customer requirements with technical requirements)
- two sets of items that are physically different (such as design solutions for a set of technical requirements)

The purpose of this diagram is to relate two or more sets of variables or lists of items to each other (Silverman and Silverman 1994) and helps to understand complex causal relationships more easily by exposing interactions and dependencies between things (ASQ).

There are five basic types of matrix diagrams that allow different numbers of lists to be examined and one additional type (roof-matrix, also QFD - Quality Function Deployment) (Burge 2006). Each matrix is named after its configuration, which indicates the number of variable sets or article lists it contains. In the body of the matrix, various information can be displayed, such as the strength of the relationships, the degree of involvement and directional dependencies, etc. This is done according to the type of symbols used to create the matrix. The designation of the relationships is entered into the cells of the respective intersection (Silverman and Silverman 1994).

The five basic types of matrix diagrams are:

Table 1: Types of matrix diagrams

Shape	Groups	Explanation
L-matrix	2 groups	A ↔ B (or A ↔ A)
T-matrix	3 groups	B ↔ A ↔ C but not B ↔ C
Y-matrix	3 groups	A ↔ B ↔ C ↔ A
C-matrix	3 groups	All three simultaneously (3D)
X-matrix	4 groups	A ↔ B ↔ C ↔ D ↔ A but not A ↔ C or B ↔ D
Roof-matrix / QFD	1 group	A ↔ A when also A ↔ B in L or T

3.2 Procedure for developing an evaluation concept according to a matrix diagram

The basic structure of the intended evaluation concept for the qualitative and quantitative assessment of digitization and I4.0 projects is based on a matrix diagram. For the development of this concept, an approach consisting of seven basic steps has been followed, which is shown schematically in Figure 1. The steps were

developed following the process of creating a matrix diagram according to (Burge 2006). The individual steps are described in detail below.

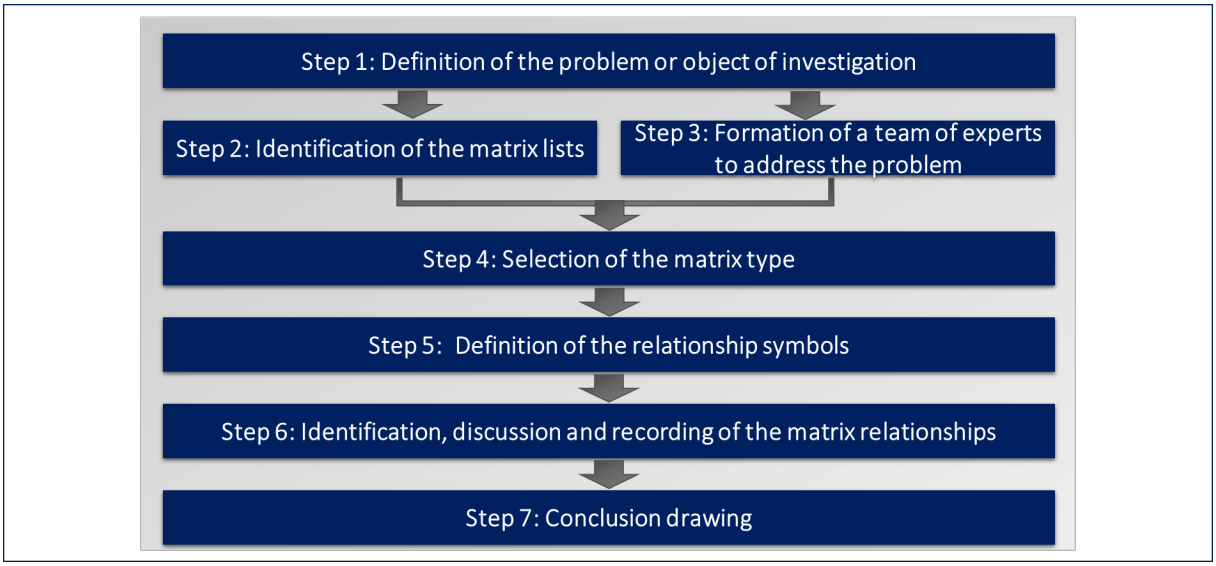

Figure 2: Methodical procedure for the development of an evaluation concept for benefit assessment according to a matrix diagram [own illustration]

Step 1: Definition of the problem and object of investigation
The application of a matrix diagram requires clarity about the problem to be investigated, the focus of the investigation and the general conditions. Furthermore, a uniform understanding of terms, especially with regard to technological aspects, is of great importance.

Step 2: Identification of the evaluation criteria and matrix lists
In an earlier work, the examination of existing evaluation concepts mainly revealed that either qualitative evaluation criteria are insufficiently considered in contrast to quantitative monetary evaluation criteria, or that the evaluation is only carried out from one perspective, e.g. the economic promise of success (Hizal 2020). An important prerequisite for the evaluation concept to be developed is therefore to address exactly these points of criticism and enable a multi-perspective evaluation on the basis of qualitative and quantitative criteria.
To develop a suitable evaluation concept, it is therefore first necessary to carefully examine the research focus and to identify the characteristic elements in relation to the required perspectives of the subject area. These may have technical, legal or economic characteristics, for example, and have to be determined individually depending on the focus of the investigation. Thus, the matrix lists result directly from the purpose of the object of investigation and contain the evaluation criteria derived from their characteristic elements.
The characteristic elements from a technological perspective are (Hizal 2020):

- Key drivers of Industry 4.0
- Enabling technologies of Industry 4.0
- Central features of Industry 4.0
- Digitization-affected innovation areas (Application areas)

Since these are only characteristics that reflect the technological perspective of the assessment, it is also important to identify characteristics that illuminate the economic perspective of the object of investigation that will also be integrated into the concept as evaluation criteria. This is necessary to ensure multidimensionality.

To identify the characteristic elements from an economic perspective, the benefits and challenges of digitization and I 4.0 have been identified using an extensive literature research and then prioritized. Prioritization was done in a group discussion with three experts who are at least Green Belt certified engineers and/or team leaders. These were then analyzed together with the characteristic elements from a technological perspective for their suitability as evaluation criteria. This validation was carried out by evaluating a total of 100 already successfully established practical examples on the basis of the defined potential evaluation criteria. The aim was to check whether it is possible to evaluate the practical examples on the basis of the identified evaluation criteria.

The results of this analysis have shown that the identified characteristic elements from an economic perspective indeed represent benefits of digitization and I4.0 projects. Based on these elements, the qualitative and quantitative benefits of digitization and I4.0 projects can be described and evaluated. Since a high number of the use cases examined originate from the manufacturing industry, they are particularly suitable as criteria for the evaluation of projects in this area. However, it is important to note that these benefits are only general examples for initiating digitization and I4.0 projects and should be revised depending on the project being evaluated.

Thus, the final list of evaluation criteria from an economic perspective is as follows:

- Automatization / Optimization of production processes
- Cost reduction
- Efficiency / Productivity
- Flexibility / Agility
- Individualization
- Quality Improvement
- Standardization
- Transparency / Strategic decision support

Step 3: Formation of a team of experts to address the problem
The expert team for carrying out the evaluation needs to be formed in parallel with the preparation of the matrix lists. This step is thus linked to step 2 and must be done before its completion. Regardless of the composition of the team, it needs to have the expertise and experience to be able to relate the lists to each other, i.e. to carry out the evaluation.

It is also important that the members of the expert team have different levels of expertise depending on the project and reflect the different hierarchical levels of a company. For example, in addition to engineers who can assess the technological aspects, managers with the appropriate decision-making authority should also be represented. The aim is to avoid concentrating only on certain aspects of the investigation, such as the technological innovation capability of a project (engineer side) or cost reduction (management side), and thus shifting the focus. Decisions need to be made under a holistic consideration of multiple aspects, such as economic advantages or the necessity of implementing a project. It is also intended to avoid time-consuming discussions and to make decisions quickly.

Step 4: Selection of the matrix type
The matrix type depends on the number of lists created in step 2 and the dimensions to be examined. The different types of matrix diagrams have already been shown in section 3.1.

Step 5: Definition of the relationship symbols
The relationship symbols fulfil two tasks:

- Indication of the existence of a relationship
- Information about the strength of the relationships

If the existence of a relationship is to be pointed out, it is possible to use any symbol for it. In most cases, however, both the existence and the strength of a relationship need to be examined. This can be done using a symbolic or numerical method. Examples for these methods are shown in the following table:

Table 2: Methods to display the existence and strength of relationships

Strength of the relationship	Symbolic Method	Numerical Method
Strong relationship	**Δ**	9
Medium relationship	□	3
Weak relationship	o	1
No relationship	-	0

When using the numerical method, other values can be chosen to show the strength of a relationship and the existence of negative relationships (e.g. -1, -3, -9). However, with this method there is the risk of using relative values or values with different ranges, which can be the trigger of constant recalibration.

Step 6: Identification, discussion and recording of the matrix relationships
The core of a matrix diagram is the identification, discussion and recording of matrix relationships in a team of experts from the subject area under investigation. A systematic approach is essential when examining possible relationships and their strength. The way of proceeding, whether row by row or column by column, depends largely on the situation and the placement of the core list. If the core list is located on the vertical axis, a line-by-line approach is often the most appropriate.

Each relationship should be considered in turn, and the presence as well as the strength debated until the team reaches a consensus. Since symbols are a measure of relative strength, it can be useful to quickly scan a row (or column) to determine the strongest relationship to which a particular symbol can be assigned. In this way, a kind of calibration is performed to match the other symbols and the consensus.

In addition to recording the presence and strength of relationships in the matrix diagram, the documentation of the resulting decisions is also of great importance. This fulfills a verification function to enable transparency and traceability of the decision made and is especially valuable in long or open debates about a relationship.

Step 7: Drawing conclusions
After completion of the matrix diagram, conclusions about the purpose of the investigation need to be drawn and communicated to the authorities concerned.

4. Conceptual design of the evaluation concept

This chapter describes the conceptual design of the planned evaluation concept. Three categories have been identified that are of great importance for evaluating the benefits of digitization and I4.0 projects. These are:

- **Enablers/Technologies/Methods:** Technologies related to digitization/Industry 4.0 or enablers of such technologies, as well as methods for implementation
- **Application Areas:** Areas strongly influenced by digitization/Industry 4.0
- **Advantages:** Potential benefits that can be generated by implementing digitization/Industry 4.0 projects

4.1 Matrix lists

The basic structure of the evaluation concept consists of a matrix diagram, presented in section 3.1. Since three categories have been identified which serve as evaluation dimensions, the matrix diagram can have the Y, T or C shape. Therefore, it is now necessary to determine which relationships are to be examined to evaluate the economic benefits of digitization and I4.0 projects in order to decide on the shape of the matrix diagram. The following options are available:

- Advantages ↔ Technologies
- Advantages ↔ Application Area
- Technologies ↔ Application Area

The main focus of the analysis is to evaluate the economic benefits of digitization and I4.0 projects. This can be done from two angles: 1. Directly from the dimension “Advantages” or 2. Indirectly from the “Application Area”. The latter covers areas of a company or organization that are experiencing structural changes in the form of innovations as a result of digitization or I4.0 and thereby generating benefits. Since two dimensions of potential benefits would be related, it is not purposeful to examine the correlation between the categories “Advantages vs. Application Area” in this respect. Therefore, only the category “Technologies” is individually related to each of the categories “Advantages” and “Application Area”. From this it can be deduced which concrete technologies contribute to the generation of a certain benefit as well as in which application areas a benefit can be generated by these technologies. This corresponds to the matrix diagram of type T.

In the following, the three categories mentioned are further detailed.

4.1.1 List 1: Enablers, Technologies and Methods

One technology alone does not generate benefits. The technological possibilities of I4.0 can be transformed into benefits most efficiently by the collaborative application of various technologies (including conventional technologies) with their enablers. This can also be supported by different methods. For this reason, the list 1 of the T-matrix was subdivided into the clusters Enablers, Technologies and Methods.

Enablers refer to the technological and human resources that enable digitization. Examples for such technological enablers are:

- Big Data Analytics
- CPS
- Real time capability
- Employee qualification

The **Methods** are rather process models or approaches for the efficient design of the entire value chain of industrial goods as well as for the efficient solution of problems and development of new ideas. Example methods are:

- Design Thinking
- Agile Working (e.g. Scrum, Kanban Flowlines)
- Lean Management

The category **Technologies** is divided into the three levers of digital transformation (Hizal 2020), namely Automatization, Digitization and Networking. This division and the assigned examples are shown in Figure 4.

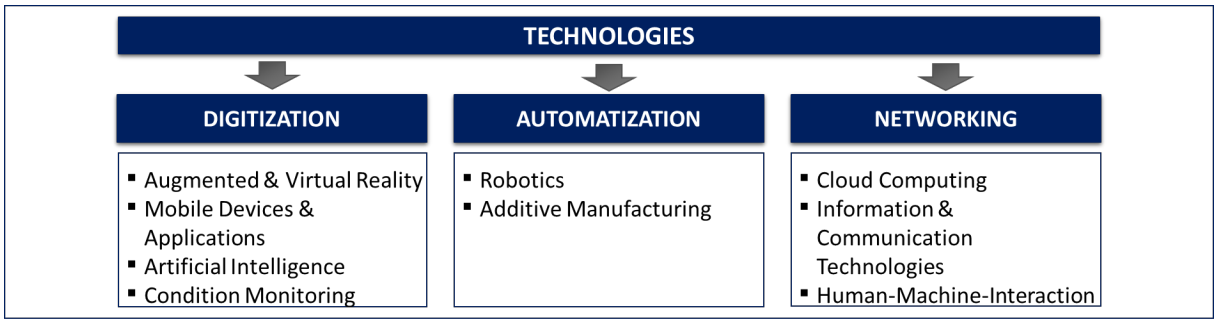

Figure 3: Evaluation Matrix: Technologies cluster [own illustration]

4.1.2 List 2: Application Areas

List 2 for the dimension "Application Area" is subdivided into three levels: Business, Product and Process (Hizal 2020). Exemplary contents for the three levels are shown in the following figure.

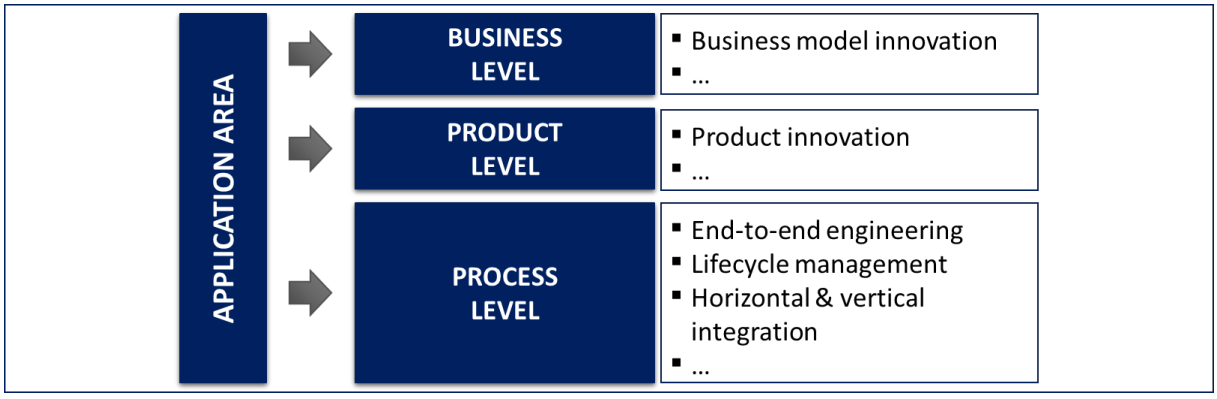

Figure 4: Evaluation Matrix: Application Area cluster [own illustration]

Projects in the field of digitization and I4.0 generate innovations with disruptive character, especially in the three areas of business, product and process. It therefore makes sense to continue this classification in the evaluation concept.

Furthermore, such a classification can be used to determine to what extent and with which effects the individual areas of a company are influenced and which (positive or negative) side effects occur on the other levels. Depending on the purpose of the evaluation, it is possible to make a finer or coarser division of the category "Application Area" to respond specifically to the needs of the investigation. For example, the "Business" level could be divided into the different parts of a company – sales, purchasing, engineering, etc. – or the "Product"

level could be divided into the different product life cycles from development to sales, as well as into the specific components.

4.1.3 Advantages

The following advantages of digitization projects, which are listed in Figure 6, were identified in an earlier work and validated by an analysis of practical application examples. The achievable advantages can be divided into product-related and process-related advantages. However, it is also possible to assign some of these advantages to both categories.

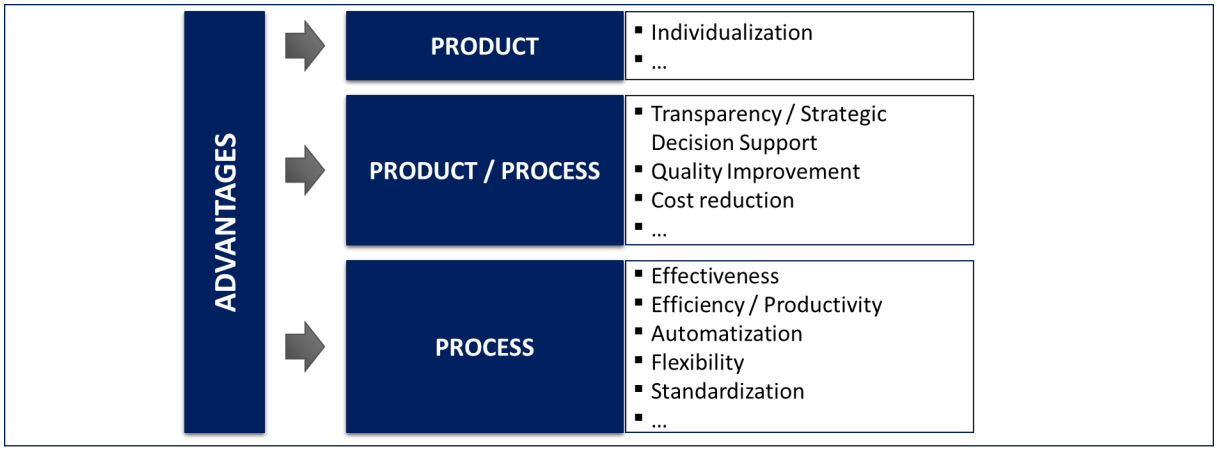

Figure 5: Evaluation Matrix: Advantages cluster [own illustration]

The advantages listed here represent merely a list of possible benefits of digitization projects, which need to be dynamically adapted (supplemented or shortened) to the purposes of the object of investigation. In a preparatory session, the evaluation team should define the benefits to be achieved by the planned project and conduct the evaluation based on these benefits.

4.2 Weighting and direction of the evaluation

For an efficient and meaningful evaluation, not only the matrix lists to be examined are of great importance, but also the determination of the relationships between these lists. Therefore, in section 3.2 various approaches to prove and display the existence and strength of the relationship between two variables were presented. When using the numerical variant, it is additionally possible to perform a weighting and then to sum up the values of the relationships.

For the evaluation concept developed in this work, two numerical weighting scales were used:

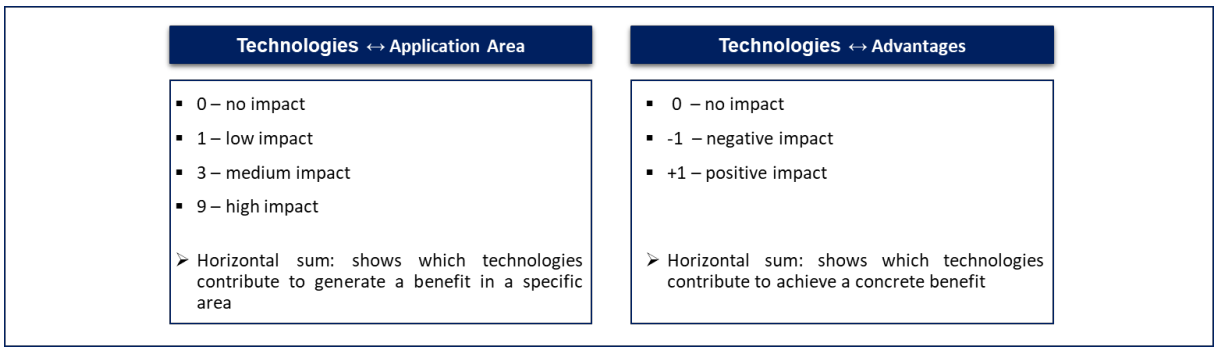

Figure 6: Weighting scales to show the relationship between the lists [own illustration]

To determine the relationships between the lists “Technologies vs. Application Area”, a scale from 0 - 9 with “no impact” to “high impact” was defined. The aim of this evaluation is to identify the potential impact and thus the potential benefit of a project on an application area. Indeed, digitization and I4.0 solutions are associated with structural and disruptive changes for the application areas. However, these structural changes can have not only positive but also negative effects, as well as side effects on other areas. Therefore, it is recommended to consider reviewing negative effects.

To evaluate the relationships between the lists “Technologies vs. Advantages”, a weighting scale with the options “-1”, “0” and “1” was created. This is used to examine whether a particular technology is suitable for achieving a certain desired benefit and whether it has a negative impact on other benefits.

When investigating possible relationships and their strength, a systematic approach is essential. In this case it is appropriate to examine the relationships between the lists line-by-line. There are two reasons for this: 1. The core list (here: Enablers/Technologies/Methods) is located on the vertical axis and 2. At the end of the evaluation, the sum of the weightings has to be formed so that the achievable benefits and the application areas for benefit generation can be determined based on an overall score. Thus, it is possible to identify at a glance whether the proposed project is suitable for achieving the targeted benefits in the planned application area. Furthermore, it is also possible to make a statement about which technologies can be used to generate these benefits.

This leads to two directions, which have to be considered in the evaluation: The analysis direction and the weighting direction. When analyzing the relationships between the lists, the core list (List1: Enablers, Technologies, Methods) is related to the two other lists “List 3: Advantages” and “List 2: Application Areas”. To derive an overall result about the areas impacted or the achievable benefits, the horizontal sum needs to be calculated. The evaluation directions are illustrated in Figure 8.

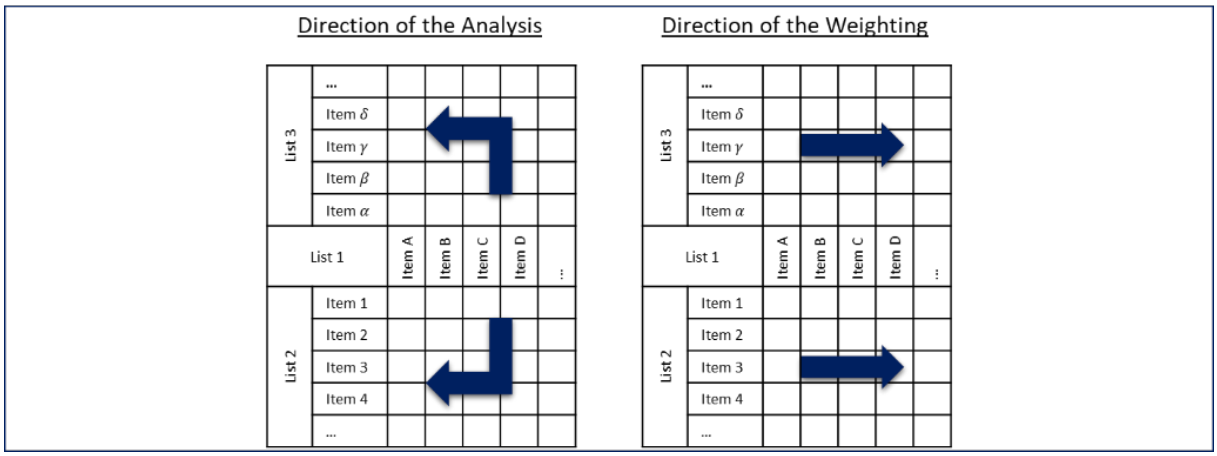

Figure 7: Evaluation directions [own illustration]

4.3 Formation of the evaluation template

If these presented components are combined, a matrix for the qualitative and quantitative assessment of the economic benefits of digitization and I4.0 projects can be compiled that is specifically tailored to the needs of the manufacturing industry. The template of the evaluation matrix is shown in Figure 9:

Advantages	Product											
	Product/ Process											
	Process											
PROJECT TITLE		Enabler		Technologies						Methods		SUM
				Digitization		Automatization		Networking				
Application Area	Business Level											
	Product Level											
	Process Level											

Figure 8: Template of the evaluation matrix

5. Summary & Outlook

This paper describes the methodological approach for developing a qualitative and quantitative evaluation concept for assessing the benefits of digitization and Industry 4.0 projects that is specifically tailored to the requirements of manufacturing companies. The evaluation concept is based on a matrix diagram and enables a multidimensional evaluation that does not require any special knowledge but can be carried out in a team of experts consisting of different disciplines to evaluate the profitability of a project or to prioritize different alternatives. The evaluation concept has already been applied and validated in various application examples. Since it is a very dynamic and flexible tool and the matrix lists have to be updated depending on the case, the tool can also be used in other fields and is therefore not limited to the manufacturing industry.

For the future, a further development of the evaluation concept is planned to the effect that the matrix lists are also correlated on the vertical axis to allow even deeper insights.

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Content Analysis or Thematic Analysis: Similarities, Differences and Applications in Qualitative Research

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Abstract: Research has a long tradition of quantitative research which still dominates many university courses on research methods. Qualitative research is a younger phenomenon that was established in research after the second world war. An emerging research field that needed new analysis methods tailored for qualitative data. Two of the most frequently used approaches in qualitative data analysis are content analysis and thematic analysis. In several aspects content analysis and thematic analysis both share a common approach to analytically examine qualitative data, and the fact that they have been used interchangeably has made it difficult for the more unexperienced researchers to distinguish and choose between them. The aim of this study is to examine doctoral students' perceptions of qualitative analysis with content analysis and thematic analysis. The study had a qualitative approach with data collected from two webinars on qualitative data analysis, where a total of 76 doctoral students participated. Data consists of participant reflections in a Padlet on content analysis and thematic analysis at the two webinars. Webinar participants have given their consent to use their reflections in the Padlet for research. Content analysis with an abductive coding approach was used to analyse the collected data and formulate categories that answer the study's aim and research question. Results show both perceived similarities and differences between content analysis and thematic analysis. Both are perceived to have a similar process in the coding of data, although content analysis has a wider selection of coding approaches and thematic analysis support deeper immersion. Content analysis is also perceived as more practical and straightforward, while thematic analysis is perceived as more intuitive and faster to learn. Both content analysis and thematic analysis are perceived to have individual opportunities and challenges that make them appropriate for different types of research. Findings presented in this study can be used by researchers at any level to explore similarities and differences between content analysis and thematic analysis, and where to apply them in research.

Keywords: Content analysis, Thematic analysis, Qualitative analysis, Qualitative research, Coding

1. Introduction

Research has a long tradition of quantitative research which still has a strong impact on university courses on research methods. Qualitative research is a younger phenomenon that began in the 1920s with the work and advocacy of the psychologist, Paul Felix Lazarsfeld (Jeřábek, 2001; Bailey, 2014). After the Second world war, qualitative methods established itself in research areas such as communication, journalism, sociology, business psychology, and anthropology. However, the development of qualitative methods has far from replaced the use of quantitative methods in these areas (O'Dwyer & Bernauer; Grossman & Cohen, 2017), and with an increased use of mixed method approaches (McCusker & Gunaydin, 2015; Bernard, 2017). In many research areas today, research methods are chosen based on the actual research design (McCusker & Gunaydin, 2015).

In the domain of qualitative research there are several approaches for analysing data (Thorne, 2000; Roller, 2019). Some examples of established methods for analysing qualitative data are content analysis, thematic analysis, open coding, narrative analysis, discourse analysis, and phenomenological analysis (Hsieh & Shannon, 2005; Nowell et al., 2017; Walia, 2015). This study had a focus on content analysis and thematic analysis, and the comparison of the two. In several aspects, content analysis and thematic analysis share a common approach to the analysis of qualitative data, and the fact that they often have been used interchangeably has made it difficult to distinguish and choose between them in research studies. What are doctoral students' perceptions of content analysis and thematic analysis after participating in a webinar where these two approaches were presented, applied and discussed? The aim of this study is to examine doctoral students' perceptions of qualitative analysis with content analysis and thematic analysis.

2. Content analysis and thematic analysis

Quantitative content analysis was used in the early 19th century by Thomas Young in the deciphering of the Rosetta Stone (Larmor, 1934). The first documented use of qualitative content analysis was in 1893 with the aim to find patterns in Shakespeare texts (Sumpter, 2001). Thematic analysis is a younger phenomenon that was more strictly defined by Boyatzis (1998). However, thematic analysis had been used earlier under other names before the term was coined in research fields such as psychology, literature, business study, and sociology (Boyatzis, 1998). In both content analysis and thematic analysis, themes or patterns or codes can be identified

and grouped in mainly two different ways, inductively or deductively (Braun & Clarke, 2006). With the inductive approach, the identified themes or patterns or codes are strongly linked to the data themselves, in what could be described as a bottom-up process (Patton, 1990; Braun & Clarke, 2006). This could be compared to the deductive approach where data is analysed in a top-down process, driven by selected theoretical or analytic interests (Boyatzis, 1998; Braun & Clarke, 2006).

2.1 Qualitative content analysis

Content analysis describes a variety of analytic approaches in a range from impressionistic and intuitive analyses to the side of very strict and systematic text analyses (Rosengren, 1981). This variety has made content analysis useful in several different research fields, where the suitable type of content analysis approach to use depends on the actual problem that is studied, and the specific research purpose (Weber, 1990). In a study by Hsieh and Shannon (2005), three types of qualitative content analysis were defined and presented: Conventional content analysis, Directed content analysis, and Summative content analysis (Table 1).

Table 1: Summary of the three approaches to content analysis (Table from Hsieh & Shannon, 2005)

Type of content analysis	*Study starts with*	*Timing of defining codes or keywords*	*Source of codes or keywords*
Conventional content analysis	Observation	Codes are defined during data analysis	Codes are derived from data
Directed content analysis	Theory	Codes are defined before and during data analysis	Codes are derived from theory or relevant research findings
Summative content analysis	Keywords	Keywords are identified before and during data analysis	Keywords are derived from interest of researchers or review of literature

2.1.1 Conventional content analysis

In some university courses this is seen as the "standard content analysis", but at others not. Conventional content analysis is often used in studies that have the aim to explore a phenomenon where theory or research literature on the studied phenomenon is limited (Hsieh and Shannon, 2005). In this analysis approach the researcher works inductively, avoids the use of pre-defined categories, and instead creates categories that emerges from the analysed data (Kondracki, Wellman & Amundson, 2002). An advantage of the conventional approach to content analysis is to directly generate information from informants without imposing preconceived theoretical perspectives. In a five-step process, the conventional content analysis could be described briefly as: 1) Immerse yourself actively into the data, read all data repeatedly to get a sense of the whole, 2) Derive codes by read word by word while highlighting key thoughts and concepts, 3) Label codes from notes of first impressions and thoughts, labels emerge that reflect multiple key thoughts that are based directly in the data, 4) Creating categories (and subcategories) by sorting and organising the codes into clusters, based on relationship between the codes, and finally 5) Developing and fine-tuning definitions for categories and codes with identified examples from the data. (Hsieh and Shannon, 2005)

2.1.2 Directed content analysis

In a research field with more prior research and existing theory, the qualitative researcher could instead choose the directed content analysis. This approach has been classified as a deductive, top-down and theory driven process (Potter & Levine-Donnerstein, 1999; Hsieh and Shannon, 2005). This approach is often used in studies that aim to extend the existing description of a phenomenon. Moreover, the chosen theory or prior research often guides the discussion on the outcomes of a directed content analysis (Hsieh and Shannon, 2005). The directed approach to content analysis is guided by a more structured process, if compared to the conventional approach (Hickey & Kipping, 1996). With the use of existing theory or earlier research, the first step is to identify important key concepts or variables as initial coding categories (Potter & Levine-Donnerstein, 1999), followed up by the second step where the operational definitions for the categories also are guided by the chosen theory. In a third step, data are coded and sorted into the predetermined categorises. All data rarely fit into the predetermined categories and as a fourth step other potentially relevant data is highlighted, followed up by a fifth step where the highlighted data are analysed and grouped into new categories, or as sub-categories to existing categories (Hsieh and Shannon, 2005).

2.1.3 Summative content analysis

A third approach is the summative content analysis which also has a quantitative touch. Selected words or content in the data are quantified to better understand the contextual use of the words or content, not to infer meaning but, rather to explore usage of them. (Hsieh and Shannon, 2005) However, an analysis that stops there

would be classified as quantitative, if only focusing on the counting or the frequency of certain content in data (Kondracki, Wellman & Amundson, 2002). A summative content analysis must continue beyond the mere frequency counts and comprise a latent content analysis as well. The term latent content analysis refers to the process of interpretation of the content (Holsti, 1969). The initial quantitative approach for deriving keywords could preferably be computer supported, while the analysing of patterns and relationships to understand contextual meanings is carried out manually by the researchers. Boiled down to a five-step process a summative content analysis could be conducted as: 1) Create the initial coding scheme based on theory, previous research or data, 2) Counting the frequency of certain words or concepts, 3) Calculate and compare found frequencies in relation to total length of data and/or to various data sources, 4) Identify and quantify alternatives by counting frequencies of the alternatives to the words or concepts used in step 2, and with the final step of 5) Update the calculation and comparison with the identified alternative words and concepts. (Hsieh and Shannon, 2005)

2.2 Thematic analysis

The use of thematic analyses has strongly increased in the 21st century after the term was more clearly defined by Boyatzis (1998). Another article that has introduced thematic analysis to a wider audience is the one by Braun and Clarke (2006). Of all research articles published that year, this article has the highest number of citations in Google scholar. Some reasons for the broad use in various research fields are probably the straightforward approach for finding themes that are relevant for the actual research question and the chosen research study design. Without any requirement of frequency counting as in a summative content analysis, to enable the idea that large data sets could be used for several constrained studies with different research questions. In the section above, the three branches of content analysis have been summarised as five-step processes. A thematic analysis was outlined by Braun and Clarke (2006) as a six-step process with the phases of 1) Familiarising yourself with your data, involving transcription, immersion and noting down initial ideas, 2) Generating initial codes from the data that identify a feature of the data, semantic content or latent, that appears interesting, 3) Searching for themes by collating codes into potential themes, 4) Reviewing themes, and checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), 5) Defining and naming themes, and refine the specifics of each theme, and the overall story the analysis tells, and 6) Writing up the presentation of the found theme and fine-tuning the overall story. (Braun and Clarke, 2006) There are also other processes for conducting thematic analysis, such as the slightly extended seven-stage process presented by Norton (2009).

3. Method

The study used a qualitative approach to produce knowledge about the participants' understandings of the studied topic and the meanings they attach to it (Polkinghorne, 2010). Data were collected and analysed from two webinars (online seminars) on content analysis and thematic analysis with a total of 76 participants. The first webinar had 60 international participants, the second webinar had 16 Swedish participants, and both webinars were targeted towards doctoral students. During the webinar, the authors presented material on content analysis (Hsieh & Shannon, 2005; Drisko, 2005; Blair, 2015) and thematic analysis (Braun & Clarke, 2006; Braun & Clarke, 2012; Braun, Clarke & Hayfield, 2019) for qualitative research which were later used for discussions and workshops. As a part of this, a Padlet was presented at the end of the webinars where the participants were asked to share their reflections on similarities and differences between content analysis and thematic analysis, and possibilities and challenges with content analysis and thematic analysis.

In the Padlet, the participants could post their reflections on the topic and comment on other participants' reflections. The Padlet was set to be anonymous, that is no names were shown or required to participate in the Padlet. The authors also informed the participants, before sharing the link for the Padlet, about the intent to use the Padlet reflections for research and that only those that wanted their reflections to be included should post and comment on the Padlet. The participants answered the Padlet either after the webinar or during a break to ensure anonymity from both the authors and the other participants.

Content analysis was used to examine the content and contextual meaning of the collected data (Hsieh & Shannon, 2005). The coding approach was inspired by *conventional content analysis* (Hsieh & Shannon, 2005) and the *abductive approach* for moving between deductive and inductive coding (Graneheim, Lindgren & Lundman, 2017). The coding could be summarised in two parts. In the first part, codes were identified in the Padlet and moved to the spreadsheet by the first author. No predetermined categories were used to identify or organise the codes, instead the categories were formulated during the coding process. With each code added to the spreadsheet either creating a new category, adding to an existing category, or re-formulating an existing category. In the second part, all codes and categories were revised for consistency by both authors.

4. Results and analysis

Through the analysis of the collected data, five main categories have been identified regarding doctoral students' perception of qualitative analysis with content analysis and thematic analysis (Table 2). The first three are considered similarities between content analysis and thematic analysis: 1) similar process of coding and analysing data, 2) similar challenge regarding subjectivity and potential bias, 3) similar challenge in defining and organising data. The last two are considered differences between content analysis and thematic analysis: 4) wide application vs. deep analysis, 5) practical approach vs. intuitive approach.

Table 2: Summary of identified categories

Similarities between content analysis and thematic analysis	*Differences between content analysis and thematic analysis*
1) Similar process of coding and analysing data	4) Wide application vs. deep analysis
2) Similar challenge regarding subjectivity and potential bias	5) Practical approach vs. intuitive approach
3) Similar challenge in defining and organising data	

4.1 Similarities between content analysis and thematic analysis

Content analysis and thematic analysis are considered to have similar processes to conduct qualitative analyses. They both require the researcher to familiarise with the data before coding and analysing. They both approach data as something "out there", content, that can be collected and analysed. Further, both content analysis and thematic analysis can be conducted inductively and deductively.

Content analysis and thematic analysis are considered to have similar challenges regarding subjectivity and potential biases. Both analyses are considered at risk for biased reading when interacting with the collected data, since subjectivity is involved when interpreting collected data. However, thematic analysis seems to be considered more at risk in this regard since it is also considered more "creative" and "open for interpretation" compared to content analysis. While content analysis is considered to have some tools for decreasing the risk of biases in its approach to deconstruct content in smaller parts.

Content analysis and thematic analysis are considered to have similar challenges to define and organise data. Defining categories is considered a challenge in both types of analyses. It is also considered a challenge to distinguish between codes and themes and how to handle potential overlap of codes and themes. It is also considered a risk that the analyses will end up coding everything and produce too many categories. Sticking to the research questions in the analyses is considered important to prevent this from happening.

4.2 Differences between content analysis and thematic analysis

A difference between content analysis and thematic analysis is that they are considered to be a choice between wide application and deep analysis. Content analysis is considered wider in its application, compared to thematic analysis, due to its connection to quantitative research. Because of this, content analysis can be used for both qualitative research and quantitative research, and anything between. It is further considered to be better suited for handling larger sets of data, compared to thematic analysis. Thematic analysis on the other hand is considered to support deeper analysis, or immersion, compared to content analysis, which allows it to bring "more in-depth understanding" of the studied phenomenon. This is connected to that thematic analysis is considered a "purely qualitative" analysis compared to content analysis. Yet within qualitative research, thematic analysis is considered a "flexible method for qualitative analysis" that can be "applied to many research designs".

A difference between content analysis and thematic analysis is that they are considered to be a choice between a practical approach and an intuitive approach. Content analysis is considered straightforward for data categorisation and therefore "faster to get started with", compared to thematic analysis. Content analysis is considered to have a "clear epistemology", providing the researcher with a route to follow on how to do research. Related to this, content analysis is considered more "positivistic", compared to thematic analysis, which could be problematic on "an ontological standpoint". Thematic analysis on the other hand is considered intuitive in its approach to data. Related to this, thematic analysis is considered more inductive in its approach by looking at data "from scratch"; and a fast way to learn how to do qualitative analysis for a "developing researcher". While content analysis is considered more time consuming in choosing between all variations and approaches.

5. Discussion

As pointed out by Hsieh and Shannon (2005), a challenge with the conventional content analysis "is that it can easily be confused with other qualitative methods such as grounded theory method (GTM) or phenomenology", and the same must be concluded if compared to inductive thematic analysis. However, a difference with thematic analysis if compared to grounded theory method, where there is a clear resemblance in the analysis process, is that thematic analysis does not have the goal of generating a theory (McLeod, 2001; Braun & Clarke, 2006).

The perception presented above that thematic analysis is considered more inductive in its approach could be compared to how thematic analysis is presented by Braun and Clarke (2012, p. 58): "TA has the ability to straddle three main continua along which qualitative research approaches can be located", with the first continuum set to "inductive versus deductive". This might depend on that the workshop activity on thematic analysis was introduced with instructions for an inductive thematic analysis. However, the main introduction of thematic analysis in the seminar presented the choice of induction or deduction in thematic analysis, and also involved a slide with:

> *"In reality, coding and analysis often uses a combination of both approaches. It is impossible to be purely inductive, as we always bring something to the data when we analyze it, and we rarely completely ignore the semantic content of the data when we code for a particular theoretical construct"* (Braun & Clarke, 2012, p 58.)

Regarding that content analysis is considered more positivistic compared to thematic analysis could probably be explained by the presentation by Braun and Clarke (2006) as a qualitative approach, while content analysis was presented with an origin in quantitative research. On the other hand, the seminar presentation also comprised Boyatzis (1998) idea that thematic analysis also could be used to transform qualitative data into a quantitative form for further statistical analyses. The reversed transformation order than the one from quantitative to qualitative described in the process of a summative content analysis.

What could be added for a richer discussion on philosophical stances in future seminars is to elaborate on the inductive vs. deductive continuum. Moreover, this should be related to the two other continua brought up by Braun and Clarke (2012), with an experiential versus critical orientation to data, and an essentialist versus constructionist theoretical perspective in a thematic analysis. According to Braun and Clarke (2012, p. 59), "Deductive TA is often critical in its orientation and constructionist in its theoretical framework, examining how the world is put together (i.e., constructed) and the ideas and assumptions that inform the data gathered.", while an inductive thematic analysis relates more to the other ends of the continua, and with the less constructivist assumption of a knowable world.

6. Conclusion

As discussed above there are both similarities and differences between content analysis and thematic analysis. The chosen division of content analysis into three different approaches can explain some of the participants' perceptions in comparisons and discussions. There is a clear similarity between the conventional content analysis and an inductive thematic analysis, while the comparison of a thematic analysis and a summative content analysis shows a fundamental difference. However, there is at the same time such a rudimentary difference between the conventional content analysis and the summative content analysis that could explain the ambiguity in the use of the term content analysis. To more thoroughly present these different approaches to qualitative analysis would facilitate for doctoral students in the inception phase of their doctoral studies. This could be considered an important early step in a qualitative research career, considering that both thematic analysis and content analysis are seen as the common foundation for the use of more complex qualitative analysis methods.

7. Limitations and future research

Some of the limitations of this study is that it only examines the doctoral student perspective, and that the data collection occurs after presentation, discussion, and workshops on the studied methods. As discussed in the paper, participant reflections are certainly affected by the presentations, discussions and workshops conducted at the webinars. With that said, it would be interesting to examine how doctoral students apply different methods for qualitative analysis in research papers. Which are the characteristics of different methods for

qualitative analysis? And do they differ from the use by more senior researchers? The authors further plan to examine the impact of different analyses approaches and theory on the results of a study, by conducting two separate analyses (deductive content analysis and inductive thematic analysis) on the same data set.

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Understanding Lived Experiences Through Inclusive lens of Interpretative Phenomenological Analysis (IPA) and Narrative Analysis (NA)

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Abstract: The paper presents the findings of a PhD study carried out and completed in 2021. The study adopted Interpretative Phenomenological Analysis (IPA) and elements of Narrative Analysis (NA) as an inclusive methodological approach to investigate and understand the experiences of educated professionals of African origin living in Finland. Through the voices of ten participants (five females and five males) in semi-structured interviews, the study provides insights into the experiences of the participants and created a basis for new hybrid epistemologies through a reconceptualisation of Western working cultures and discourses. The study makes several contributions. Within postcoloniality, it contributed to a discussion on the postcolonial interrogative space as well as postcolonial identity by proposing concepts such as 'duality of being', 'belonging ambivalence', and 'validation ambiguity'. Within social studies, the study reconceptualised the notion of positive identity validation. Regarding sensemaking, the study contested the claim that individuals change and adopt various identities according to the demands of different situations. Instead the study proposes that the sense of self, performance, and representation of identity are interrelated, and influenced by power. As the study was carried out by a culturally diverse researcher (not purely western and sharing socio-historical commonalities with the participants), it also disrupted epistemic colonisation and cultural imperialism. Methodologically, the study widened the application of Interpretive Phenomenological Analysis primarily used in psychology. By combining IPA with elements of interpretive poetics borrowed from NA, it showed how IPA can be combined with other methodological tools. This will hopefully encourage researchers from other fields, not only practitioners of psychology, to apply IPA in their studies.

Keywords: Interpretive Phenomenological Analysis, Interpretive Poetics, Narrative Analysis

1. Introduction

The focus of my PhD research was the experiences of black, educated professionals (five females and five males) from Ghana, Zambia, Zimbabwe, Kenya, and Nigeria, all living in Finland. In order to obtain rich data, a wide spectrum of insights, and as deep insights as possible, the only methodological approach that I considered appropriate was both qualitative and interpretative.

In this paper, I describe this methodological approach and my rationale for choosing it. I also shortly outline its theoretical underpinnings. I provide a justification for my choice of interpretive phenomenological analysis (IPA), and selected elements of interpretive poetics, borrowed from narrative analysis (NA). Additionally, I provide examples of the analysis and my interpretation of the narratives.

2. Rationale for adopting a qualitative/interpretative paradigm

Apart from investigating people's life experiences in a foreign host culture, I was also interested in the extent to which the values that formed their cultural identities informed their sensemaking. I considered the positivistic conception that experience can be grounded in empirical observation of the facts of the experience as valid, but I was also aware that it does not acknowledge the context as being influential in the phenomena being studied. Therefore, I considered the qualitative commitments as the only ones that rendered themselves suitable for my study.

Moreover, as my research investigated human experience through human perceptions, it also acknowledged multiple versions of reality, truth, and knowledge. A qualitative perspective allowed me to investigate and understand the world as seen through the perceptions of individuals (Smith, 2003), and it focused on the collection and analysis of stories shared by people about their lived experiences (McLeod, 2003 in Woolfe et al. 2000), and "involved alternative conceptions of social knowledge, of meaning, reality and truth" (Kvale, 1996, p. 11). I concurred with Morrow's (2007) argument that qualitative research is the most appropriate methodological approach to understand the sense and meanings that people make of their experiences. I was not interested in gathering empirical facts, proving a hypothesis, or testing an existing theory. Rather, I was interested in performative recreations of lived experiences as expressed by the participants through their personal narratives and stories. I viewed the participants as relational, subjective, and embedded in their

contexts. The empirical inquiry I was interested in was dialogic where the truths were incomplete, subjective, and relational. I wanted to hear the narratives not only with an open mind, but also with an open heart. This called for a shift towards a "concentration on horizons of human meanings" (Gadamer, 1975 in Bochner, 2018) and a more hermeneutic approach, which would provide room for subjective meanings, moral reflections, contextual embodiment, compassion, and empathy. I found Jovanovic's (2011, p. 3) description of qualitative inquiry as "a rich, heterogenous field comprising various techniques, methods, concepts, theories, interpretive patterns, values, orientations, ontological, anthropological, epistemological assumptions, ethical principles and social and political views" especially appropriate to my study. It embraces the participatory role of people as part of the research process, thus acknowledging their voices as knowledge creators. It empowers rather than controls, it includes rather than excludes.

3. Theoretical underpinnings

The critical epistemologies and theoretical perspectives of my study stemmed from Vygotsky's theory of learning (1978), which implies that personally meaningful learning and knowledge are socially constructed through the process of sharing understandings. I adopted a constructivist perspective, assuming that knowledge is co-constructed in specific social interactions (Gadamer, 1996, in Bochner, 2018; Vygotsky, 1978), and truth is constructed by social processes and that it is historically and culturally specific (Taylor, 2008). Human perception and social experience are the basis for human learning. The learning process builds on prior existing knowledge, but an individual can interpret this knowledge in new ways. Although social constructivism does not reject the existence of an objective world, it focuses on the perceptions, experiences, and the process of learning that people have developed about the world they live in. This approach creates less separation between me as a researcher and the participants.

At the other end of the spectrum, I considered critical realism, which considers an objective reality as one that exists independently of individual perception but also recognises the role that individual subjective interpretation plays in defining that reality. It occupies the middle ground between the two opposites: positivism and subjectivism. Subjective observers create a variety of interpretations and a hierarchy of meanings emerges to justify and form an objective standpoint and understanding, perceived and theorised by subjective observers. The primary function of critical realism thus lies in determining what is objectively real and what is subjectively accepted (Taylor 2018). This connection and distinction between reality and subjectivity as not mutually exclusive sits well with my understanding of the way knowledge is produced: shaped and influenced by the objective reality *out there*, but also internalised by individuals and their reality *in here.*

Figure 1 below illustrates the interrelatedness and intersections among epistemology, theory, and methods according to Hollingsworth and Dybdahl's (2000, in Clandinin, 2018) classification. I adopted it incorporating Willmott's (2016) additional parts.

The epistemological implications of the above ontological approaches meant to me that the purpose of my inquiry was NOT to create a faithful representation of the reality which is independent of the knower. On the contrary, my purpose was to investigate the phenomena and generate my interpretation and a new understanding of the phenomena based on the relation between a human being and his/her environment (life, community, and world).

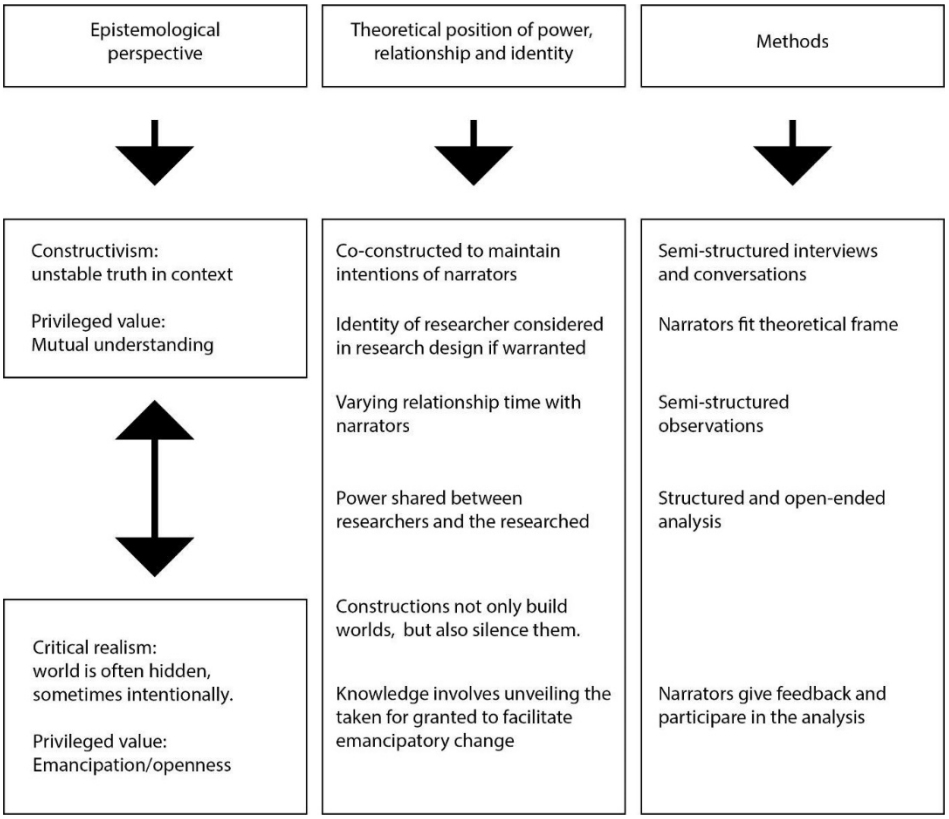

Figure 1. Intersections of Epistemology, Theory, and Methods. Based on Hollingsworth and Dybdahl (2000); Willmott (2016).

4. Epistemological Stance

Whilst investigating the experiences of the participants in a foreign host culture, I saw cultural values as motivators and driving forces behind their cognition, understanding, and sensemaking, as well as being integral elements of their cultural identity. I formulated my understanding of cultural identity as a temporal sense of self, derived from and driven by social values dominant in a given culture at a given point in time. This understanding of cultural identity, as well as its formation, guided me towards the path of my investigation. If one's cultural identity was temporal, context, and culture-bound, I considered it important to gain insights into what, over time, might have influenced it. Moreover, if it was based on the values learned in one's native culture (e.g. during childhood), I needed to investigate the early memories of the participants to find out what values they learned during that time in their home cultures. I did this by listening to their narratives. The value of narratives as a source of knowledge was advocated by Jerome Bruner (1986), who called it a "narrative approach to knowing". Inspired by Ricour's (1983) concept of narrative identity, expressed through being parts of the plot in the stories people tell about themselves, I adopted an open and semi-structured interview as my method. I designed my interview protocol and questions based on identity formation models borrowed from Erikson (1980) and McAdams and Cox (2010, in Lerner et al. 2010).

5. Rationale for adopting Interpretative Phenomenological Analysis

IPA, with its phenomenological approach, focuses on people's perceptions and experiences of the world in which they live, which also gives them meaning. It acknowledges human experience as a topic in its own right. Moreover, IPA draws its philosophical underpinnings from hermeneutics and phenomenology (Smith and Shinebourne, 2012).

IPA is a relatively young research methodology, predominantly used within 'applied' psychology (Larkin et al., 2006e), and sometimes described as an approach to qualitative data analysis. I saw it as a suitable methodology for my study for several reasons. IPA is committed to the exploration of personal lived experiences. According to Larkin, Watts and Clifton (2006, p. 116), IPA does not claim a specific epistemological position and has been described to have epistemological "openness" and "eclecticism", distinguished in its ability to encompass "the

real and the constructed". IPA also draws from a foundation of phenomenology, social constructionism, and symbolic interactionism (Smith, 2004).

Furthermore, IPA aims to explore how participants make sense of the way they experience their personal and social world, and its focus is on the study of the meanings of particular experiences or events. Essentially, IPA is interested in people-in-context and the way they make sense of their experiences. IPA pays attention to the life worlds of the participants, and it does not concern itself with the production of objective statements. On the contrary, it is concerned with an individual's personal perception or account of an event or experience (Smith and Osborne, 2008). This was the focus of my study.

IPA is characterised by its reflexive component. As IPA acknowledges both my participation as a researcher and my own conceptions, it required the application of a double hermeneutic perspective. This meant a two-stage interpretation process. On the one hand, the participants made sense and created interpretations of their experiences, and on the other, through my analysis, I attempted to interpret the participants' accounts. In this sense, IPA also has a theoretical commitment to a person as a cognitive, active, and physical being whose emotional state, talk, as well as thinking process remain in constant connection with one another.

In my analysis, my aim was to interpret the meanings of the narratives, but I also considered the wider contexts in which they were produced. Therefore, Schleiermacher's (1998, in Smith et al. 2012) approach, which provided a holistic view of the interpretative process, was well suited. For Schleiermacher, interpretation involves two levels: the grammatical and psychological. The grammatical level investigated the objective textual meaning, and the psychological level considered the role of the author of the narrative. The narrative analysis approach allowed me to investigate the grammatical level (interpretive poetics), while the phenomenological interpretative analysis provided insights into the psychological level.

In other words, I regarded the interpretative process as my understanding not only of the text of the narrative, but also the narrators. This holistic approach created possibilities of "an understanding of the utterer better than he understands himself" (Schleiermacher, 1998, p. 266). This also meant that my analysis offered a perspective on the narrative which the narrator was not aware of creating. What I also found enriching, albeit time consuming, was the iterative manner of analysis. I moved back and forth whilst looking at the data, and I interpreted the meanings within the hermeneutic circle (Smith et al., 2012). This meant that, as I approached the narratives from different levels, not necessarily in a linear fashion, I discovered new meanings and nuances.

6. Rationale for adopting elements of Narrative Analysis

Apart from complementing IPA's intellectual commitments, NA's 'pragmatic ontology of experience' was particularly suitable as it encompasses several ontological features that are also features of the methodology itself. Dewey (1934, in Connely and Clandinin, 2006), Connelly and Clandinin (2006) identified three features of NA: temporality, sociality, and place, all of which I considered crucial to the sensemaking of experiences.

As *temporality* refers to knowledge generation, following Dewey, all inquiry proceeds from experience, and knowledge is obtained from experience. Therefore, it is attached to a specific point in time.

The so*ciality* in my study meant to me that the participants in my study always and simultaneously found themselves in both personal and social conditions. The personal conditions could be feelings, hopes, desires, aesthetic reactions, as well as their moral dispositions. The *sociality* of the pragmatic ontology is the emphasis on the social dimension of inquiry and understanding. The stories being studied were products of a confluence of the social influences on a person's inner life, environment, as well as their unique social history.

The third feature of NA draws attention to the centrality of *place* and acknowledges the fact that all events happen in a concrete, physical place. The location of a place and its impact on the way people experience the world was crucial in my study. Following Basso's (1996, 107 in Clandinin, 2007) concept of the physical landscape being "wedded to the landscape of the mind", I was aware that what the participants experienced in their native countries in Africa might have an informative influence on their understanding of what they experienced in the host culture in Finland.

7. Inclusive methodology

As mentioned earlier, I saw IPA and NA as complementary and therefore I adopted relevant parts from NA in order to compose an inclusive and richer methodology that ensured both rigorous data collection and analysis, while allowing for openness. Sharing intellectual commitments and complementary qualities, both IPA and NA gave voices to individuals and acknowledged these voices as valuable data. The narratives of the participants were both subjects of scrutiny as well as media through which the participants transmitted their reality. The marriage of IPA and NA made my analysis deeper and more detailed, not to mention more interesting.

Figure 2 below shows the connections and complementary elements of both IPA and NA. IPA allows for an understanding of the meaning and interpretations of the lived embodied experiences, through the voices of the participants. NA allows for an analysis of the lived experience expressed through personal narratives embedded in and influenced by social, cultural and institutional narratives.

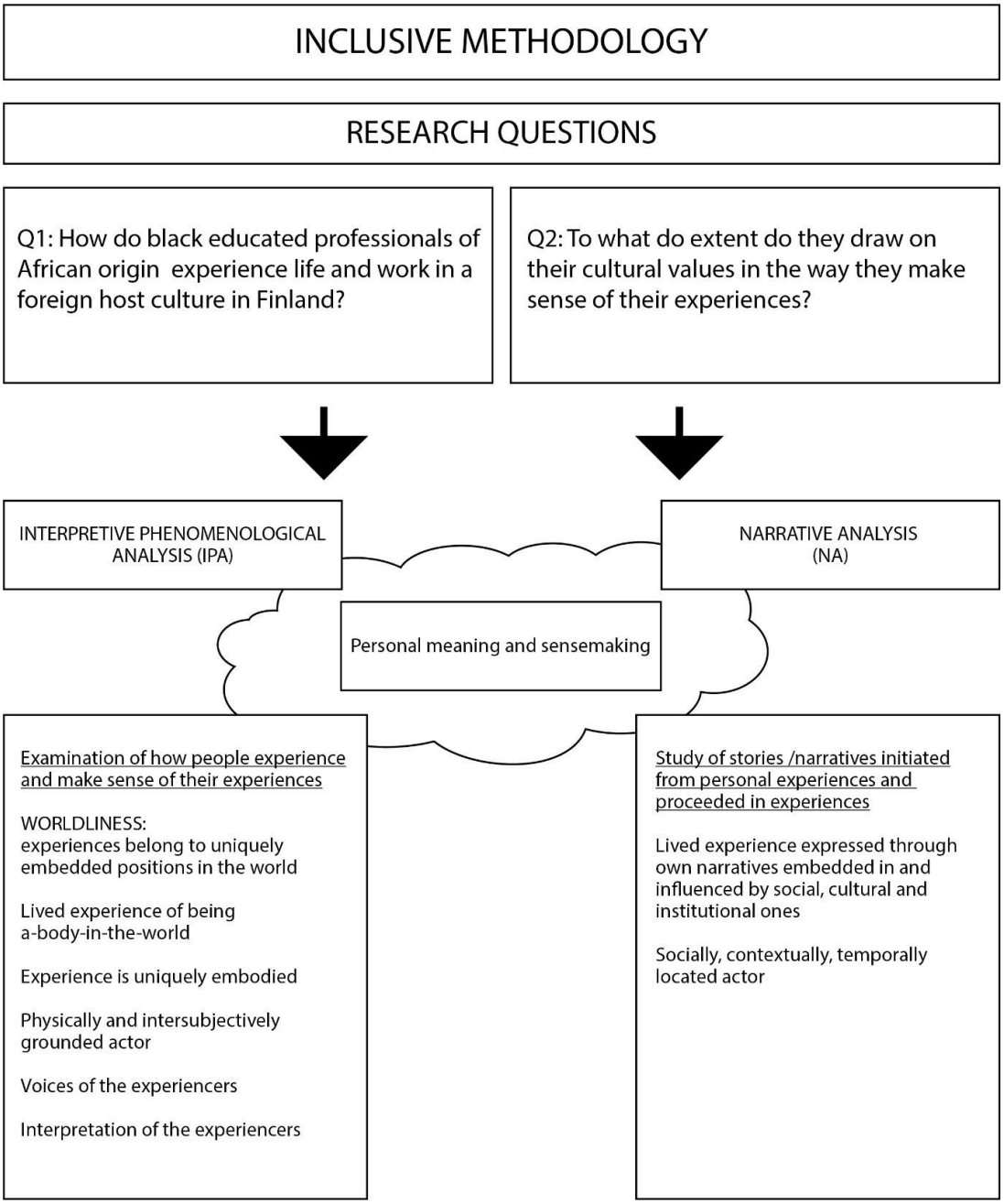

Figure 2: Inclusivity of NA and IPA

I selected an inclusive methodology because I believe that knowledge and people's understanding of lived experiences are contextual. Therefore, I adopted the "contextual constructionist" epistemological position. According to Madill et al. (2000), all knowledge is local, provisional, and situation dependent (Madill et al., 2000). I reject the realist epistemology that assumes that one reality can be revealed by using one methodology.

As the participants in my research made sense of their experiences in two very distinct cultural environments, they were and are exposed to different cultural meanings (Giorgi, 2010). This implied that their interpretations and understandings were altered as a result of encounters and observation whilst embedded in different environments, which Stiles (1993, p. 602) coins as "permeability". Stiles suggests that when adopting a constructionist epistemology, an objective way of looking at a phenomenon can be substituted by permeability. The lived experiences which the participants expressed through their own narratives were embedded in and influenced by social, cultural, and institutional narratives both in their native cultures and in the host culture. The narratives that they shared with me were expressions of the "filters of permeability" or the outcomes of the double hermeneutic within their sensemaking.

7.1 Analytical approaches

7.1.1 Interpretive poetics

Interpretive poetics (Rogers, 2007), as part of Narrative Analysis (NA), provided an additional, albeit different analytical perspective. The focus of NA is located not only in the individual's experience, but also in the social, cultural, and institutional narratives within which the individual's experiences are constituted, shaped, expressed, and enacted.

I was aware of the five interpretive layers of reading a narrative, as suggested by Rogers (1999): story threads, the divided "I", the address, languages of the unsayable, and signifiers of the unconscious. However, I decided to apply only the first three in my analysis. As I was neither equipped nor qualified to tap into the participants' unconscious minds, I decided not to include the languages of the unsayable and signifiers of the unconscious in my analysis. Notwithstanding, as I listened to the recordings and reread the transcripts, I noticed broken utterances, stops in the narratives, and seeming contradictions. This provoked my curiosity and, in turn, called for analytical tools that would render a different perspective of the analysis, yet still allow me to remain at the textual level without attempting psychoanalysis. The first three levels of interpretive poetics: story threads, the divided "I", and the address were just the tools to accomplish that.

7.1.2 Story threads

Rogers (2007, in Clandinin, 2007) claims that every utterance people make, everything they say to someone else is a product of unconscious censorship, an inherent process people employ when speaking to others. This unconscious censorship is a form of repression people employ when they form a piece of speech, to shape their speech in specific ways for the purpose of it being heard by others. Finding the threads allowed me to uncover these "censored" layers and tap into the contents of the narratives that their authors might not be aware of creating.

For example, the story thread that ran throughout the narrative of a female participant, who I named Ella, related to a sense of loss (also expressed with the most frequently used words). Ella's narrative began with a simple statement: "*I lost my father when I was very young*", and continued: "*…and that thing has remained with me for the rest of my life*". Ella went on to say, "*I have lived with that".* The sense of loss Ella expressed at the beginning of her narrative continued and permeated her story, and the event that had triggered it (the death of her father) cast a shadow over the trajectory of her entire life.

7.1.3 The divided "I"

Rogers (2007, in Clandinin, 2007) claims that when a person speaks, he/she must become divided to represent him/herself. The way people create their divided selves in their narratives points to them being at odds with who they are and who they want to be. For example, a female participant, who I named Jane, described the values she lived by in the following way: "*Family values… marriage values, that no matter …like my husband is away…it's… almost 20 years now. Others would have divorced, but… no… the distance doesn't stop you from being married. I don't care what he is doing, he knows he is married. Even me I know I am married. And this helps the children also, psychologically. Knowing the parents are still together. It's very healthy"*.

The description shows a clear division between what she described as real, on the one hand, and ideal, on the other, thereby highlighting the contradictions in these descriptions. This description evokes her ideal self, the way she projects herself: a married woman who does not divorce her husband. Later in the same utterance she falters, and by doing so she contradicts the previous statement ("*I don't care what he is doing")*. Her contradictory voice emerged and opposed the previous image of her "I". This opposing voice defines her divided "I". These contradictions revealed tensions between the way Jane saw herself and the way she became as a result of living in the host culture in Finland. Revealing these tensions further illustrated her sensemaking when reconciling her cultural African values with the reality imposed by the host culture in Finland.

7.1.4 The forms of address

The concept of address explores to whom the narrator is talking in the narrative. This is connected to the way people position themselves. Even though the narratives in my study were not works of fiction, I found Parker's claims about narrative in the works of fiction (in DelConte, 2013) helpful. Parker argued that authors employ second person narration (an extradiegetic narrator) to distance themselves from certain events in their stories, especially the events or situations that might seem embarrassing, shameful, or difficult to deal with. Using a second person narrative also becomes a catalyst for the authors' concern that they will be associated with the events that their narrators tell, a concern that erodes the distinction between author and narrator.

For example, the more a narratee is associated with the events, the less the narrator becomes responsible for them. Grammatically, this translates into because "you" have done or are currently doing something, "I" am not. Importantly, because the events are "real" and connected to another, the narrator can maintain the exclusive function of reporting, allowing the experiencing to reside in the distinct "you".

For example, the way Ella positions herself in her narrative suggests closeness or distance, belonging or disassociation with the situations and experiences she encounters. This is also influenced by the values Ella holds dear to her.

Ella addresses an imaginary Other in her narrative. At times she uses the pronoun *you* when she addresses me the narratee, but more often than that she addresses someone else. For example, when she narrates her life in Finland and talks about her neighbours, she says:

"*But Finnish people… no you cannot even knock at their door when you are sick, to say hey, help me out. No neighbour will help you, … as a foreigner, it is not easy. We come from a society which is open and outside, and we talk to neighbours. But here you have no neighbour* "(147-148).

Here, by addressing a constructed Other, she becomes an extradiegetic narrator, and in doing so she created a distance between herself the narrator and herself the character. She positioned herself on the outside of the situation which is different to what she is used to. Having come from a collectivist culture Ella is used to close relationships with people around her, and especially her neighbours.

8. Methodological contributions

Adopting an inclusive methodology (Interpretive Phenomenological Analysis, IPA) and elements of Narrative Analysis (NA), allowed me to access the meaning of the narratives of the participants from a wider perspective and at a deeper level. On the one hand, I was able to investigate how the participants made sense of the way they experienced their personal and social worlds, the context, their life worlds, and their individual personal perceptions of events and experiences. On the other hand, I was able to read deeply into the text of their narratives and analyse it from a narrative perspective.

Moreover, as IPA is predominantly utilised within 'applied' psychology (Larkin et al., 2007), adopting it for my study showed that its application in fields other than psychology can render valid findings. By including elements of interpretive poetics, my study widened the narrative possibilities of IPA, thus allowing for a more holistic approach to the interpretative process (Schleiermacher, 1998, in Smith et al., 2012) where the interpretation involved two levels: the grammatical and psychological. The narrative analysis approach allowed me to investigate the grammatical level (elements of interpretative poetics), and the phenomenological interpretative analysis provided the insights into the psychological level. This deeper two-level analysis strengthened the validity of my findings.

9. Conclusions and Limitations

Following Larkin, Shaw, and Flowers (2019), phenomenological research, especially within psychology, focuses on the personal meanings of individuals. It considers the relationship between people and the world as operationalised at the individual level. Therefore, in IPA research projects, the most common research designs involve collecting qualitative data from a small and reasonably homogenous group of participants who share a certain contextual perspective on a given phenomenon. The fact that the accounts of their personal experiences serve as a lens for illuminating the broader meaning can be considered a limitation as it might have a bearing on the applicability of the findings.

The inductive logic and cumulative approach to knowledge creation in IPA call for a detailed and context bound analysis. In my study, the accounts of the participants were local and bound to the contexts of the African home countries and Finland. Therefore, in my findings, I reported in detail the views from and within the Finnish cultural frame, but I did not claim that my findings shed light on studies carried out, for example, in the UK. In order to achieve greater validity and applicability, other subsequent studies may be added to my study. In this way, based on these additional case studies and their detailed analyses, more general claims could be made (Smith and Osborne, 2008).

Another self-limiting aspect of IPA, entailed by a small and homogenous sample of participants, could be applied in studies where the research questions or the object of study has relational aspects. For example, my study investigated how black professionals experience life in Finland. Since their experiences are bound to specific cultural contexts and these contexts influenced their experiences, it would make sense to investigate the experiences of other parties who constituted these contexts, namely their Finnish counterparts. An analysis of data revealing multiple perspectives could generate stronger accounts and thus wider perspectives of the findings.

Nevertheless, in adopting IPA as my methodological approach, I was interested in meaning, not causality. At the same time, I was aware of the possibility of triangulating my findings by inviting the participants to read my analytical accounts of their narratives in order to enhance the persuasiveness of the findings. However, I did not receive a consensus from the participants. In my future research projects, I am interested in adopting what Smith, Flowers, and Larkin (2019) describe as greater influential range in order to achieve greater persuasiveness of findings. I do not see that reaching greater persuasiveness could be achieved by designing the research process based on a model of causality, or as a shift out of phenomenological analysis and into a more empiricist frame of reference. I could still analyse the data with the focus on meaning, not causality. I could strive to obtain transparency by involving the parties who might have conflicting perspectives on the phenomenon. I could triangulate the findings by inviting the participants to partake in the analysis. This would create a wider contextual range of my analysis, where not only one specific group of people would be investigated in one specific context.

Another limiting aspect of myself as a researcher analysing and interpreting data from a phenomenological position, is the fact that I was re-interpreting the participants' individual interpretations of the meaning of their experiences. In other words, I was interpreting what the participants had already interpreted themselves, thus giving rise to a third-person interpretation. One way to overcome this somewhat compromised position could be the use of the multiplicity of evidence (the triangulation mentioned above, for example) to ensure more rigour and transparency. This approach could potentially create more "generalisability" or "abstraction" in my future phenomenological research projects, while retaining caution and context-sensitivity.

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Developing a Framework of Information Governance Addressing Online Health Information Quality

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Abstract: The adoption of the Internet has increased a large number of users that search for online health information to make healthcare decisions. The quality of these decisions heavily relies on the quality of information identified on the Internet. Prior studies focused on assessing the quality of online health information. Although a few researchers encouraged the use of information governance frameworks to manage the information, while addressing the information quality was not the focus of these frameworks. This paper presents a research protocol that outlines planned steps and procedures of a systematic review and a Delphi method, in order to develop a framework of information governance towards online health information quality. The components in the framework are proposed to be divided into micro, meso and macro levels. Research protocol for establishing the framework has been developed and we have started its implementation. The outcomes of this study will be state-of-the-art of empirical evidence supported to develop an information quality governance framework, establishing links between the components that have received limited attention in the literature. From a practical perspective, the proposed framework will help guide information governance practices from all relevant sectors of society for addressing online health information quality.

Keywords: Online health information, Information quality, Information governance, Systematic review, Delphi method

1. Introduction

Increasing number of adults are turning to online health information for decision aids and health advices (Sillence et al, 2007), while the quality of the information varies from different sources such as websites, social media and smartphone apps (Sun et al, 2019). The quality of online health information determines consumers' intention of use on the information (Bao, Hoque, & Wang, 2017), health behaviours (Bujnowska-Fedak & Węgierek, 2020), and quality of healthcare decision making (Bruce et al, 2015). High-quality information helps consumers make effective decisions. However, poor-quality information results in invalid or wrong decisions that cause the loss of property, health or even life. The quality of health information on the Internet that was low (Eysenbach et al, 2002) and remains low (Zhang, Sun, & Xie, 2015) has been a long-standing concern in society.

Previous research has paid much attention to identifying the dimensions used to assess information quality (IQ) and evaluate the quality of online health information (Eysenbach et al, 2002; Sun et al, 2019; Zhang et al, 2015). While a few studies proposed to apply information governance (IG) (Dong & Keshavjee, 2016; Liaw et al, 2014; Rabiei et al, 2019) that describes decision rights and an accountability framework to encourage expected information practices in the lifecycle of information (Gartner, 2021), addressing online health IQ was only an aspect of their study scope. To this end, this study aims to develop an IG framework to address the quality of health information on the Internet.

To achieve this aim, we will apply a systematic literature review (SLR) to identify IG components and propose an IG framework for online health IQ. Thereafter, we will conduct a Delphi study to improve the proposed framework by capturing experts' opinions. This study thus has two main contributions. Firstly, from a theoretical perspective, we identify IG components related to addressing online health IQ, organise these components in a framework and establish the links between the components that has received limited attention in the literature. Secondly, from a practical perspective, we provide guidelines and references for the participants who involve in IG activities to design and implement IG strategies for achieving high-quality online health information and call all relevant sectors of society to participate in IG for online health IQ.

The rest of this protocol is organised as follows: Section 2 gives a background about this study; Section 3 presents the methods applied to conduct the SLR; Section 4 outlines the Delphi methods utilised in the study; and Section 5 concludes this paper.

2. Background

This section provides the essential concepts applied in the study and a background of developing an IG framework for online health IQ, as presented below.

2.1 Information governance

Generally speaking, governance refers to "the way a business is directed and governed. It deals with the strategies, policies and procedures that directly impact on organisational performance, stewardship and the business's capacity accountable to its stakeholders" (Hendrikse & Hendrikse, 2003). Corporate governance cascades to subdomains such as information technology (IT) to realise business goals cascading to these subdomains (Merkus et al, 2019). Data governance (DG) and IG can be also viewed as corporate governance subdomains (Hagmann, 2013), seeking to control and secure information for achieving business goals in an organisation. Essentially, the terms 'data' and 'information' are used interchangeably, however, they are not the same. As noted in Tilly et al (2017), data is objective and it presents a phenomenon unrelated to an information system (IS), while information is subjective and it gives a context to the data using an IS that users are easy to understand. In this study, we also distinguish these two terms and focus on the IG literature addressing online health IQ to understand this phenomenon.

According to Kooper, Maes, and Lindgreen (2011), information governance is defined as "the set of activities aimed at establishing a normative foundation to facilitate and stimulate sense making interactions". Many researchers developed general IG frameworks to guide and support the management of information inside and outside an organisation. For example, Tallon, Ramirez, and Short (2013) proposed an IG framework that consists of three perspectives: antecedents (enablers and inhibitors), compositions (structural, procedural, and relational practices), and consequences (firm performance and risk mitigation), while Bennett (2017) considered that an IG framework contains four dimensions: policies, procedures, people, and technology. Meanwhile, the Association of Records Managers and Administrators (ARMA) International has developed eight principles (accountability, compliance, transparency, availability, integrity, retention, protection and disposition) for records and information management under the umbrella of IG (ARMA International, 2021). These theoretical foundations are used in various application scenarios to study and understand IG (Dong & Keshavjee, 2016; Mikalef, Boura, Lekakos, & Krogstie, 2020). They can be also employed to compare to our research findings on the components of IG in the context of this study, to figure out similarities and differences.

2.2 Information quality

In the field of information management and IS, information quality is defined as fitness for use by information consumers (Miller, 1996). Researcher have utilised multiple dimensions to describe and measure IQ such as completeness and accuracy (Arazy & Kopak, 2011; Arazy, Kopak, & Hadar, 2017). As noted in Lee et al (2002), IQ dimensions can be grouped into four categories: intrinsic IQ, contextual IQ, representational IQ, and accessibility IQ. To specify, intrinsic IQ concerns the quality of information what a system produces itself; contextual IQ emphasises IQ fulfilling the requirements for a given task; representational IQ addresses whether or not the information generated by a system is interpretable, easy to understand and manipulate, and presented concisely and consistently; and accessibility IQ focuses on whether or not the information is accessible and secure (Lee et al, 2002).

As to healthcare, IQ is an important concern for making a decision. This is especially true for online health information since a large number of consumers seek and use online health information. However, the information derived from multiple sources has the quality at an uneven level that has received extensive attention from both academics and practitioners (Sun et al., 2019). For instance, based on the Principles Governing Advertising in Publications of the American Medical Association, Winker et al (2000) proposed the principles for content, advertising and sponsorship, privacy and confidentiality, e-commerce that can be utilised to govern online health information. The concept of 'information governance' was introduced scientifically in the healthcare domain by Donaldson and Walker (2004) as a framework to support security, confidentiality, and high-quality electronic information services for the National Health Society (Kooper, Maes, & Lindgreen, 2011). While a few researchers aimed at developing an IG framework (see the next section) for dealing with health information, addressing IQ is only included as one component in their IG frameworks. To fill this gap in the literature, in this study, we intend to propose an IG framework towards online health IQ.

2.3 Related studies on health information governance

This section reviews prior IG frameworks or models for health information (see Table 1). For example, the American Health Information Management Association (AHIMA) (2014) proposed eight Information Governance Principles for Healthcare (IGPHC) (see Table 1) based on practical experience, information theory, and legal doctrine, assisting in guiding IG practices in healthcare organisations. However, Liaw et al (2014) draw on the theoretical foundation of data quality (DQ) and DQ management (DQM) incorporating IG to support data and information governance and quality management in healthcare organisations. Based on the Digital Governance Institute (DGI)'s data governance model (DGI, 2016), Dong and Keshavjee (2016) integrated the experience of Ontario healthcare system and proposed an IG framework including four components: people (e.g. IG office, data stakeholders, and stewards), processes (e.g. establish accountability, determine decision rights, manage change, stakeholder communication, evaluation and continuous improvement), and policy (e.g. information management, communication, issue resolution, decision rights, and performance management), and technology (e.g. software, hardware, and IT infrastructure). By reviewing relevant literature, Rabiei et al (2019) identified the components in health IG and divided them into eighteen groups: management of information and records, management of information life cycle, data governance, information technology governance, information technology, confidentiality and security of cyber-information, information quality, e-discovery, risk management, change management, project management, roles and responsibilities, training human resources, rules and regulations, working methods and policies, standards, compliance with rules and regulations, and program monitoring. Recently, National Health Service (NHS) updated the IG management framework and strategy that provide policies and procedures for dealing with the information of patients and employees (NHS, 2020).

The aforementioned IG frameworks or models for healthcare information have improved our understanding of the phenomena, while there are still three limitations in the literature. Firstly, prior frameworks were developed based on either theoretical underpinnings or practical experience, lacking a combination of theoretical review and empirical evidence to improve the quality of framework development. Secondly, these IG frameworks or models only looked at IQ as an aspect of IG, concerning more about patients and employees' personal information. The IG strategies for

the quality of online information (accessed by the public) concerning disease or care itself remain unclear. Thirdly, researchers identified various components in their IG frameworks or models for healthcare while they did not describe these components based on different levels (e.g. a high level or a fine-grained level). This could lead to difficulties in organising these components and comparing related studies. Furthermore, limited attention was directed towards the relationships among these components that helps better understand and carry out IG relevant initiatives.

Table 1: A summary of related studies in this review

Author(s) (Publication year)	Drawing on a prior IG model?	Research methods of developing the framework	Components in the framework	Application context	Focussing on online health IQ?
AHIMA (2014)	Not mentioned	Practical experience, information theory, and legal doctrine	Accountability, Transparency, Integrity, Protection, Compliance, Availability, Retention, and Disposition	Healthcare organisations	No
Liaw et al (2014)	Theoretical underpinnings for DQ (Phillips et al, 2010) and DQM (Thiru, Hassey, & Sullivan, 2003)	Literature review	Organisational role, Data types, Data quality Metrix, and Governance	Healthcare enterprises	No
Dong and Keshavjee (2016)	The DGI Data Governance Framework (DGI, 2016)	Practical experience	People, Processes, Policy, and Technology	Ontario health care system	No
Rabiei et al (2019)	Not mentioned	Literature review	Eighteen components in the heath IG	Healthcare organisations	No
NHS (2020)	Not mentioned	Not mentioned	Nine policies and nine procedures	Healthcare organisations	No

In this study, our IG framework development differs from existing related studies as shown in Table 2.

Table 2: Differences between related studies and our research

Aspect	Previous related studies	This study
Research methods	either only utilised theoretical underpinnings or only utilised practical experience to develop the IG frameworks	the SLR method used to identify as many relevant IG components as possible to propose a comprehensive IG framework in the study context and a Delphi method applied to assess and revise the proposed framework, assisting in the framework improvement
Scope of study	mainly concerned IG for dealing with personal information (e.g. patients and employees).	addressing the quality of online health information related to disease or care that can be accessed by users
Focus of study	did not describe IG components based on different levels	identifying IG components, providing a novel synthesis that leads to a classification of these components, and establishing the links between the components

3. Systematic literature review protocol

According to Fink (2019), systematic literature review is a methodological approach, defining well-established procedures by which it is conducted and including all relevant material within the study scope, and hence it is reproducible by others who would follow the same approach in reviewing the topic of interest. SLR is therefore utilised to select, analyse and interpret available literature related to a specific research topic, a research question (RQ) or a phenomenon of interest (Kitchenham, Budgen, & Brereton, 2016) that best fits this study to identify the components of IG for online health IQ. The process of SLR includes three main phases, i.e. planning, conducting and reporting (Kitchenham, Budgen, & Brereton, 2016). This section presents the outline of the planning phase in the SLR and an SLR protocol describing planned review steps and procedures is the outcome of this phase. A written, detailed SLR protocol document requires to be validated for its rigour and it plays an essential role in ensuring consistency in the execution of the review in the review team (Kitchenham, Budgen, & Brereton, 2016).

As starting a review with clear, concise RQs helps researchers progressively refine its scope into addressing answerable RQs for the review and serves as a reference to follow in each of the stages and steps (Wolfswinkel, Furtmueller, & Wilderom, 2013), in this study we propose three RQs to guide the SLR (see Table 3).

Having the proposed RQs, we then refer to the guideline of Wolfswinkel, Furtmueller and Wilderom (2013) to plan and organise the SLR procedures because this guideline has been widely used in the fields of information management and IS for conducting an SLR (Senyo, Liu, & Effah, 2019; Zeiss et al, 2021). Accordingly, our SLR incorporates four main steps: defining the scope of the review, searching the initial list of articles, selecting relevant articles, and analysing the included articles, as described below.

3.1 Defining the scope of the review

This step that addresses the scope of the topic and benefits in each of the stages to be organised, includes four main stages: defining the criteria for inclusion and exclusion, identifying the fields of research, determining the appropriate sources, and deciding on the specific search terms.

Table 3: Description of the RQs and rationale to propose the RQs

RQ1: What are the goals of information governance for online health information quality?
The aim of proposing this RQ is to find out the objectives or targets of IG expected to achieve that highlight the role, benefits and values of use of IG in addressing online health IQ. As noted in Liaw et al (2014), IG and organisational objectives must be aligned logically and operationalised in health organisations to ensure IQ that is good enough to support health objectives. Hence, relevant objectives in IG should be taken into account in developing an IG framework in healthcare. In the context of this study, we will look at (1) objectives of online health IQ expected to achieve by use of IG and (2) health objectives supported by quality-assured IQ using IG, thus aligning IQ goals with health goals in the IG process.
RQ2: Are there any participants engaged in information governance for online health information quality? If so, what are their responsibilities?
The motivation of proposing this RQ is to find out the types of participants involved in IG for online health IQ together with their responsibilities in the IG process. Researchers (Donaldson & Walker, 2004; Liaw et al, 2014) have described different governance archetypes for allocating decision rights or responsibilities in the areas of IG, mainly from the perspective of information providers. Due to online health information that is open and freely to access, multiple participants could engage in the IG process. In this study, we will consider roles and responsibilities of multiple participants in IG (e.g. users and police makers), calling the efforts from multiple sectors of society to address online health IQ.
RQ3: What are the factors influencing information governance for online health information quality?
This RQ aims to identify the areas that impact IG for online health IQ. According to Liu, Zowghi, and Talaei-Khoei (2020), to ensure IQ, organisations and individuals need to know what impacts IQ. If the factors influencing IQ and possible relationships between these factors are disclosed, IQ would have better chances to be potentially preserved or systematically improved. In the context of IG for online health IQ, the identification of the factors influencing IG for achieving high-quality IQ will benefit in guiding efforts from multiple perspectives and better strategising the plans and solutions to deal with IQ problems in the IG process.

3.1.1 Defining the criteria for inclusion and exclusion

Table 4 presents the inclusion and exclusion criteria used to screen relevant articles on IG for online IQ in healthcare.

Table 4: Inclusion and exclusion criteria for literature selection in the SLR protocol

Number	Inclusion criteria	Exclusion criteria
1	The articles included are published in English or Chinese.	The articles are duplicates.
2	The articles included are published up to September 2021.	The articles cannot be accessed online.
3	The articles included has a topic on use of IG to address online IQ.	The articles are not peer-reviewed research publications nor industrial/technical reports (e.g. thesis, editorial letters, and book reviews).
4	The articles included contextualise the study backdrop in healthcare.	The researchers of the articles did not provide empirical findings themselves.
5		The articles do not address any of the proposed RQs.

Empirical refers to collection of data using evidence that is collected from real world.

3.1.2 Identifying the fields of research

In this study, we focus on IG for addressing online IQ in healthcare that spans multiple research disciplines such as IS, Information Management, Information Technology Management, and Health Informatics, assisting in determining all probable corresponding databases and outlets applied in the search and generating an abundant set of relevant articles on the topic.

3.1.3 Determining the appropriate sources

Firstly, as advised by prior related studies (Liaw et al, 2014; Rabiei et al, 2019), we will utilise 8 databases as our initial sources for automatic search (see Table 5), covering multidisciplinary and health-focus types. These sources contain the potential largest set of English literature related to the topic of interest that will contribute to establishing an exhaustive view of this field.

Secondly, we will use a list of specific journals for manual search in this study. These outlets have been identified in prior review studies of online health IQ (Kim, 2016; Sbaffi & Rowley, 2017; Zhang et al, 2015) and health IG (Liaw et al, 2014; Rabiei et al, 2019) in their paper selection that will help improve the completeness of the set of articles found in the present study. They are: Journal of the American Medical Association (JAMA), Journal of the Association for Information Science and Technology (JASIST), Journal of Medical Internet Research (JMIR), International Journal of Medical Informatics (IJMI), Methods of Information in Medicine (MIM), and Journal of the American Health Information Management Association (J AHIMA).

Thirdly, we will refer to several official reports or documents on IG from ARMA, AHIMA, National Health Service (NHS), Digital Governance Institute (DGI), and International Organization for Standardization (ISO), as advised by
the researchers (Donaldson & Walker, 2004; Dong & Keshavjee, 2016; Lomas, 2010; Rabiei et al, 2019). Furthermore, we will also include the articles identified in prior literature reviews on health IG (Liaw et al., 2014; Rabiei et al, 2019), to have a comprehensive view of IG principles, standards, and regulations.

Table 5: Databases selected in the SLR protocol

Number	Type of database	Database name	Link
DB1	Multidisciplinary	Google Scholar	https://scholar.google.com
DB2	Multidisciplinary	ProQuest	https://www.proquest.com
DB3	Multidisciplinary	ScienceDirect	https://www.sciencedirect.com
DB4	Multidisciplinary	Scopus	https://www.scopus.com
DB5	Multidisciplinary	SpringerLink	https://link.springer.com
DB6	Multidisciplinary	Web of Science	https://www.webofknowledge.com
DB7	Health-focus	Medline	https://www.nlm.nih.gov/medline/index.html
DB8	Health-focus	PubMed	http://www.ncbi.nlm.nih.gov/pubmed

Lastly, snowballing methods will be employed in this study to identify the relevant articles that might have been missed in the aforementioned automatic and manual search, checking articles that are cited in the included articles in this review (backwards snowballing) and articles that cite the included articles in Google Scholar (forwards snowballing).

3.1.4 Deciding on the specific search terms

To develop the search terms, we examine the RQs and identify important terms used in the RQs to generate a set of major search terms for the review: information governance, online, health, and information quality.

To decide the synonyms and alternative terms for the major search terms, we firstly have conducted a preliminary survey to identify a few of literature reviews on (1) health IG and (2) online health IQ (Hapudeniya, Dissanayake, & Hewapathirana, 2019; Kim, 2016; Sbaffi & Rowley, 2017; Zhang et al, 2015). From these review studies, we have generated a group of synonyms and alternative terms for the major search terms (see Table 6). Accordingly, our search will begin with the keywords by using the Boolean operators as the following search strings: ('information governance' OR 'governance of information') AND ('online' OR 'internet' OR 'web*' OR 'ehealth' OR 'e-health' OR 'cyber' OR 'electronic') AND ('health*' OR 'medical' OR 'clinical') AND ('information quality' OR 'quality of information').

Table 6: Search terms developed in the SLR protocol

Major search terms	Information governance	Online	Health	Information quality
Synonyms and alternative terms	governance of information	internet web* ehealth e-health cyber electronic	medical clinical	quality of information

The symbol for truncation is usually an * at the end of a word where allows the search for a word to have multiple endings. For example, web* would find articles with the terms such as web or website in them.

3.2 Searching the initial list of articles

With the search strings, we will carry out the search in the Title, Abstract, and Keywords fields of the online databases to centralise our search. Due to different functions in databases, we will customise the search in the selected databases to identify the initial list of articles.

3.3 Selecting relevant articles

This step aims to filter relevant articles for data analysis. We will screen the articles from multiple sources (see Section 3.1.3) based on the developed inclusion and exclusion criteria (in Table 4). After that, each article of the final list of the included articles will be given a unique identifier (the letter S followed by a number) and the article can be referenced in the reporting of the findings in relation to the RQs.

3.4 Analysing the included articles

To better analyse the content of the included articles and identify the findings and insights in the text that seem relevant to the review scope, we will utilise a data extraction form to extract data that specifically addresses our RQs. The extracted data for RQs is shown in Table 7.

While Dong and Keshavjee (2016) have defined four components of the IG framework together with specific examples for each of these components (see Table 8), they focused on the context of electronic health systems and these examples of IG might not be able to accommodate all elements in IG for online health IQ in the context of this study. We therefore only take advantages of the view of people, process, policy, and technology as the analytical lens to extract relevant factors influencing IG for online health IQ.

After data extraction, we will aggregate and organise the results into three levels (i.e., micro, meso and macro level) that establish the main skeleton of the IG framework for online health IQ. Looking at IG from the micro-meso-macro perspective (Liaw et al, 2016) that enables to accommodate all findings identified in the SLR related to RQs, will benefit both researchers and practitioners to develop a tolerant and comprehensive view of IG to better participate in relevant activities. According to Junior et al. (2018), the macro-level of analysis concerns a cultural and social system surrounding and guiding the subject (i.e. IG for online health IQ in the context of this study) to fulfil a purpose or pursuit a goal, being used to accommodate the findings related to RQ1, RQ2 and the policy perspective of RQ3. At the micro-level, concrete operation (addressing online health IQ by IG in the context of this study) (i.e. the findings for people and technology perspectives of RQ3) must be subject to a series of processes occurring at the meso-level (in relation to the process perspective of RQ3), contributing to realising the purpose or the goal. In light of this, the micro-meso- macro classification scheme used in this study allows us to accommodate and structure all research findings and relationships among the categories of data will be also established (see Figure 1). Note that we do have certain

plans and strategies for the data analysis, however, we will revise and update the research findings when we have all the results available.

Table 7: Data analysis strategies of identifying IG components for addressing online health IQ

Number of RQ that needs to be addressed	The information extracted from the included articles
RQ1	• Goals, objectives, or targets of IG for addressing online health IQ (e.g. expectations on (1) IQ addressed in IG and (2) health products and services supported by quality-assured IQ within use of IG)
RQ2	• Types of the participants involved in IG for online health IQ (e.g. users of online health information, information publishers, third-party detection institutions and stakeholders) • Responsibilities of these participants in IG activities for online health IQ
RQ3	• From the people perspective (e.g., digital literacy, information literacy and IQ awareness) • From the process perspective (e.g., IG activities that are carried out at different stages of information life cycle (Yusof & Chell, 2000)(this theoretical lens of information life cycle used in the study as it is well-accepted in the field of information management that helps us better extract and analyse the data from the articles for understanding the information processes from its creation to retirement), including creation and collection, production, protection, dissemination, retrieval, access and use, and retirement) • From the policy perspective (e.g. policies for online health IQ) • From the technology perspective (e.g. dimensions of online health IQ and manifestations of IQ problems)

A thorough qualitative analysis of the findings for addressing RQs and their relationships will draw certain research patterns, existing research gaps and future research directions. Based on the IG framework for online health IQ, we can also have a better chance to develop an IG toolkit to assess the performance of online health IG towards IQ.

Table 8: The components in the IG framework of Dong and Keshavjee (2016)

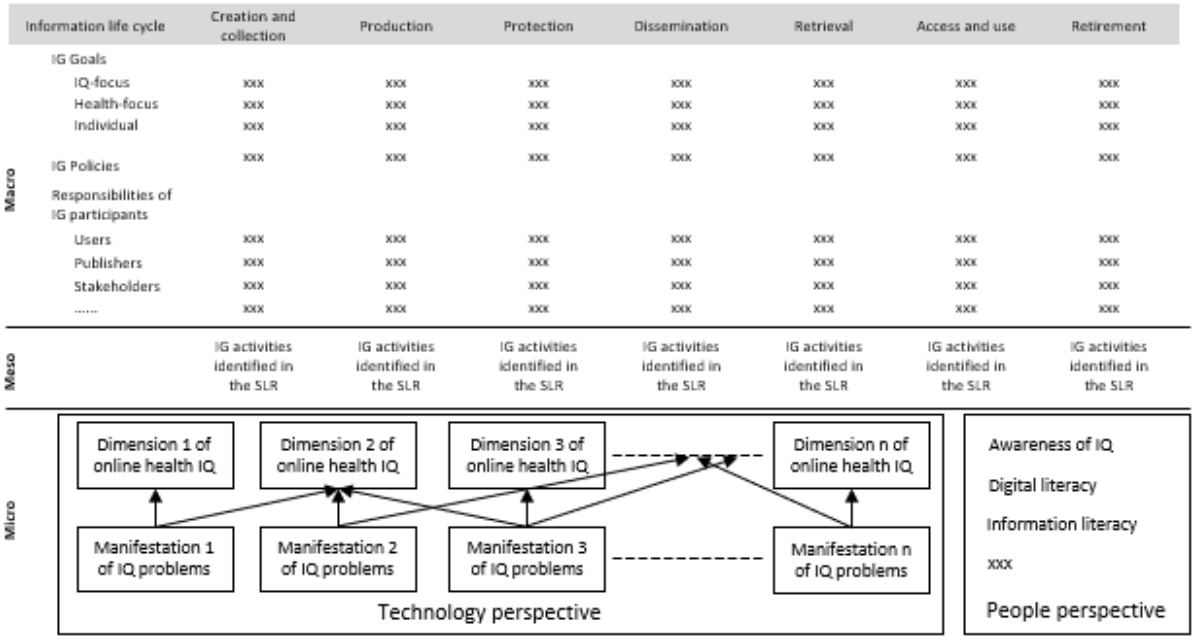
Component	Description (extracted from Dong and Keshavjee (2016))	Items under each component (these terms have been explicitly mentioned in Dong and Keshavjee (2016))
People	To identify key stakeholders involved in the IG process and their information needs	Primary clinical data providers and users
		Secondary data users
		IT service providers
		General public
Process	To reach a high-level maturity of IG through implementing a set of key processes	Data element definition
		Data integration/harmonisation
		Information sharing and accountabilities
		Building governed information into technologies
		Issues/dispute resolution
		Monitoring and change management
		Stakeholder support and communication
		Measurements and report
Policy	To legitimise the importance of IG and guide the formulation of responsibilities for key stakeholders	Mandatory data entry and data collection
		Mandatory incorporation of defined information requirements into IT systems
		Mandatory information governance committee, composition, and accountability
Technology	To provide quality healthcare supported by IT that permeates many aspects of healthcare systems	Compatibility and performance of software and hardware deployed
		Openness, capacity, and scalability of IT infrastructure

4. Delphi study protocol

Delphi method is a structured process that collects and extracts knowledge from a panel of experts, using multiple iterations of questionnaires and feedback to achieve an agreement on specific topics or RQs (Paré et al, 2013). In this study, we will use the Delphi method to investigate the IG components addressing online health IQ for three main reasons (Okoli & Pawlowski, 2004). Firstly, there is an incomplete state of knowledge about what components in IG may be desired for online health IQ. This complex phenomenon requires the knowledge from experts who understand IG principles, methods and processes. A Delphi study that offers a means of handling experts' opinions helps better understand this phenomenon. Secondly, Delphi does not require the experts to meet physically, allowing to collect data from transregional experts that leads to a more comprehensive understanding of the RQs. Thirdly, the

Delphi panel size requirements are modest and practical, soliciting opinions from 10 to 18 experts suggested in the literature (Paliwoda, 1983).

The Delphi procedure applied here is customised in the context of this study. Since the initial IG framework for online health IQ is proposed based on the SLR findings, in the Delphi study, we will (1) identify IG components for online health IQ from the experts' side, (2) incorporate the experts' opinions and revise the initial proposed framework, and (3) carry out an expert assessment of the framework, in which the procedure is similar with Holsapple and Joshi (2002). Hence, our Delphi procedure contains two main stages: preliminary stage and Delphi rounds.



xxx the content analysed from the SLR
→ one IQ dimension contain one or more than one manifestations of IQ problem
- - - multiple IQ dimensions or manifestations of IQ problems identified

Figure 1: An initial prototype of the IG framework for online health IQ

4.1 Preliminary stage

In this stage, professional panel selection criteria and boundary conditions and evaluation criteria of framework are determined before starting the Delphi process as advised by Holsapple and Joshi (2002) and Lang, Wiesche, and Krcmar (2018).

4.1.1 Professional panel selection criteria

Referring to Okoli and Pawlowski (2004), to obtain valid and robust results, we will recruit those professionals with significant work experience in the field of online health IG. We will locate our panel of professionals who are responsible for designing and implementing IG activities in relation to online health information. The initial name list of potential participants will be identified from the included studies in the SLR and workshops and forums of online health information management. Professionals practicing in this field and known to the researchers of this study are also considered. To ensure a reliable panel, we will use the below criteria to select the professionals (see Table 9). We will select as many types of professionals as possible, to cover all relevant roles of participants involved in online health IG in the study sample.

Table 9: Professional panel selection criteria

Number	Selection criteria	Description
1	Information management decision makers in a health organisation	Professionals who make decisions on information management in a health organisation
2	Online health information publishers	Professionals who create and release a piece of health information on the Internet
3	Developers of health online platforms/websites/social media	Professionals who design and develop an online platform/ website/social media involving health information
4	Information service supervision person	Professionals who guide and monitor information services related to health
5	Users of online health information	Individuals who use online health information
6	Non-novice person	Individuals who have more than one year of experience in dealing with online health information

4.1.2 Boundary conditions and evaluation criteria of the framework

We defined three boundaries for the framework development of online health IG toward IQ and four evaluation criteria for the framework as inspirited by Holsapple and Joshi (2002). As such, each Delphi iteration will address questions of assessing the framework based on these boundaries and criteria and meanwhile revise the framework incorporating professional panel's comments.

Three boundaries of the framework development include context, prescriptive, and descriptive. The context boundary confines the development to a consideration of IG towards online health IQ. The prescriptive boundary confines it to constructing the IG framework in the context of this study using three levels, i.e. macro, meso, and micro level (see Section 3.4). As the framework is developed in a top-down fashion and the IG components at each of the three levels are indefinite, a descriptive boundary confines it to describing online health IG from a micro-meso-macro perspective at the first level and their detailed components at the second level.

For the evaluation criteria of the framework, we will refer to the guiding criteria for development and evaluation of a framework that are similar with the key criteria utilised in theory evaluation (Gbededo & Liyanage, 2020; Holsapple & Joshi, 2002). They are completeness, correctness, conciseness and clarity, as shown in Table 10. These evaluation criteria contribute to developing the initial framework and assessing the framework. In light of this, we can gain an insight into strengths and limitations of the framework as well as possibilities for improvements.

Table 10: Evaluation criteria developed for the framework

Number	Evaluation criteria	Description	Reference(s)
1	Completeness	A framework addresses the broadest perspective of IG principles, methods and processes for online health IQ as well as the need of the framework and its origins.	Adapted from Gbededo and Liyanage (2020)
2	Correctness	The context and content of a framework are compatible with all elements of the philosophical claims, concepts and propositions.	Adapted from Gbededo and Liyanage (2020)
3	Conciseness	A framework is structured in a way of using fewer concepts and propositions required to explain the phenomena of interest explicitly.	Adapted from Gbededo and Liyanage (2020)
4	Clarity	The proposed framework can be used in practice for sustainability users.	Adapted from Gbededo and Liyanage (2020)

4.2 Delphi rounds

The initial framework of IG for online health IQ is derived from the analysis and synthesis of relevant literature in the SLR. A Delphi study will be conducted to obtain the opinions and comments from IG researchers and practitioners for framework revisions and improvements. This also addresses an assessment of the framework from the expert perspective. We will take suggestions from the professionals included in the study to revise the framework and stop the Delphi process when a consensus of the experts' opinion appears.

First of all, we will design a questionnaire based on the findings from the SLR to elicit comments on the framework components and its completeness, correctness, conciseness, and clarity. The instrument consists three parts: the first part gives the research objectives; the second part gives 4-point Likert scale (i.e., 'Strongly Agree', 'Agree', 'Disagree' and 'Strongly Disagree' used) for the IG components identified from the SLR, evaluation criteria, and open-ended questions for structured elicitation (allowing professionals to provide other relevant IG components that are not included in the instrument, reasons for their disagreement and suggestions to improve the framework)

(Gbededo & Liyanage, 2020); and the last part gathers the experts' personal information. It is worth mentioning that the 'Neither Agree nor Disagree' item was not used in the Likert scale in order to avoid indecisive outcomes from a Delphi study (Gbededo & Liyanage, 2020). The questionnaire will be then pilot tested by two experts in the field of health information management and their feedback will be used to refine the instrument in order to address the content validation. Finally, a web-link to the questionnaire with an invitation letter, a document describing the initial framework and a notice of post-paid participation ($50.00) will be emailed to each candidate and all are given 4 weeks to reply.

4.3 Data analysis strategy

When the responses are captured, we will organise these responses into two groups: a numeric quantitative group for individual information and IG components and an open-ended qualitative group. In the quantitative group for the IG components, we will employ the following weighting strategy to present the degree of agreement: Strongly Agree = 4, Agree = 3, Disagree = 2, and Strongly Disagree = 1. As advised by Lang et al (2018), we will utilise Kendall's coefficient of concordance that is frequently applied in Delphi studies to indicate whether a consensus in the professional panel has been achieved and the extent to which the consensus appears (Schmidt, 1997). To specify, when Kendall's coefficient of concordance is greater than 0.7, it shows a strong consensus; values between 0.5 and 0.7 refer to that a moderate consensus has been achieved, while values are less than 0.5 indicating weak consensus among experts in the panel (Schmidt, 1997).

The open-ended qualitative group will be carefully reviewed and analysed, assisting in required basic revisions, additional changes and further clarification for the components included in the framework. We will fine tune the aforementioned strategy of data analysis when we capture the responses from the experts.

5. Conclusion and future work

Addressing the quality of online health information derived from various sources remains a significant challenge in society. Identifying dimensions used to measure IQ and assessing the quality of online health information have received much attention in the literature (Eysenbach et al, 2002; Sun et al, 2019; Zhang et al, 2015). Using an IG framework that formulates activities of information management assists in guiding information practices to achieve quality-assured information, while there lacks an IG framework focussing on addressing online health IQ. Furthermore, researchers applied either theoretical underpinnings (e.g. literature review) or practical experience (e.g. personal knowledge and experience) alone to develop IG frameworks (in Table 1), lacking a combination of theoretical review and empirical evidence collected to improve the quality of framework development. This paper therefore presents the plan for conducting such a study including two stages: (1) identifying IG components using an SLR to propose an initiate framework and (2) improving the framework by seeking opinions from experts in a Delphi study.

5.1 Theoretical implications

This article includes a unique study of documenting planned steps and procedures of a systematic review and a Delphi method used to develop an IG framework towards online health IQ. The protocol thus assists in proposing and conducting similar studies in future to improve the development of IG frameworks. The analysis of related studies and categories of the components in the IG frameworks reveals that research efforts have been directed towards studying IG components from macro and meso levels, however, specific IQ issues from a micro level are missing in the IG frameworks, in the context of online health information. Investigating the IQ issues helps identify their root causes for resolution that contributes to IQ improvements and cannot be overlooked. Furthermore, related studies only discussed different roles of participants in IG practices as the IG components from a people perspective. In this study, we consider individual capabilities and awareness of achieving IQ as the people perspective for implementing IG and these IG components can determine IQ that users would obtain. Accordingly, studying and understanding human factors influencing IQ from a more a fine-grained level helps better strategise IG practices for IQ and should be taken into account when developing IG frameworks for addressing IQ.

5.2 Practical implications

Our protocol of developing the IG framework for online health IQ will attract the attention from developers and creators of online health information to this phenomenon. As IQ issues could appear from the information creation to its delivery, both developers of platforms/tools for providing health information services and information creators need to deal with IQ at each stage in the information lifecycle. As to governments and the third-party regulatory bodies, they should improve relevant policies and monitor information practices to ensure an IQ-assured online environment. Our study is also of relevance to the users who seek and use online health information. The analysis of the IG comments implies that a training for users is expected to carry out in order to

improve their capabilities and awareness of IQ. User manuals of achieving IQ by using online platforms/tools are also required to be developed and broadcasted in public.

5.3 Future work

The implementation of the SLR protocol is under progress. We have pilot tested our search strings in 8 online databases for identifying relevant English literature and applied the inclusion and exclusion criteria on a sample of the first 10 papers[1] from the results of these databases. The future work includes execution of the research plan presented in this paper to give an overview of IG components for online health IQ in order to structure an IG framework of online health IQ and outline existing research gaps and future research directions. Furthermore, the framework will benefit practitioners to assess the IG performance, for better revealing problem areas and strategise solutions to address the problems, in the context of dealing with online health IQ.

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[1] The search records for the first 10 papers from the selected databases (shot screens) are available at the following link: https://www.dropbox.com/s/9oxwjyqkjde10sn/Results%20of%20pilot%20testing%20.pdf?dl=0.

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Collecting data Online from Young Students During a Pandemic: Reflections

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Abstract: As researchers we need to be able to reflect deeply to constantly improve the research processes. Reflection can help researchers to engage critically and objectively with the worldview while acknowledging what works and what doesn't. This paper focuses on reflections emerging from online data collection during a pandemic. This paper presents what was learned from conducting online research by collecting data through an online survey administered to school children during the Covid-19 pandemic. Following a brief review of relevant literature, the research process employed is outlined. This includes the sample, measures used and ethics clearance. Secondly, we explore the advantages and limitations of conducting online research. In particular we explore the issues that were encountered and how online research made data collection from a school possible during a pandemic. The main stumbling blocks were related to: (a) parental engagement and the subsequent collection of consent forms; (b) issues that emerged during the actual data collection. These issues and others are explored through a reflection process using cycle outlined by Gibbs (1988). The aim of the study was to explore how students aged between 9 – 11 years perceived their own creative self-concept and their wellbeing at school. In this quantitative study, 530 students coming from different schools were surveyed using an online platform. Participants were recruited through their respective schools following the dissemination of information letters and consent forms. While various advantages emerged from conducting online research, a number of challenges were encountered throughout the process. This data collection exercise presented an opportunity for learning and growth through a process of reflection and evaluation.

Keywords: online research, limitations, advantages, reflection

1. Introduction:

The pandemic induced by the spread of the COVID-19 virus left a mark on empirical research on a global scale (Harper et al., 2020). The limited mobility due to various lockdowns restricted access to various sample populations. This led to the need to explore other methods to be able to access and obtain data. Online data collection has been on the increase for a while (Ward et al., 2014). This appears to be due to the fact that many more people have access to the world wide web (Granello and Wheaton, 2004).

This paper presents what was learned from conducting online research by collecting data through an online survey administered to school children during the Covid-19 pandemic. Following a brief review of relevant literature, an outline the research process employed is presented. A reflective process on the experience of collecting data online including recommendations for further consideration ensues. Jasper and Rosser (2013) refer to a reflective process as a learning experience where evaluation on the acquired knowledge takes places while fine tuning procedures for future use.

2. Doing research online.

Online research has increased considerably over the years especially since access to online media had become widespread (Hokke et al. 2018) in most developed countries. This presents an array of issues ranging from advantages and limitations of collecting data online as well as new ethical issues emerging from this method. Below is a brief outline of these factors.

2.1 Advantages when collecting data online.

In person data collection can be time consuming and expensive (Granello and Weathon, 2004; Lefever, et al. 2007). A number of advantages emerge in favour of online data collection over more traditional methods. Commutes to visit the site where data is collected from for instance could be one of the most time-consuming aspects if multiple data collection sites are used. To this end, online data collection presents researchers with the opportunity to collect data efficiently and in a timely manner (Lefever, et al. 2007, Mohanty et al, 2020). Online data collection is also perceived as being cost-effective for a variety of reasons (Mohanty et al. 2020). Firstly, paper and pencil methods are replaced by online forms thus eliminating the need for printing. Moreover,

manhours spent on the field to collect the data could be expedited through access to online portals. Mertler (2002) noted these advantages in relation to data collection from students, teachers and parents. Other points in favour of data collection appear to support the researcher directly. Using online data collection methods enhances the safe storage of data and makes loss of data less likely. Moreover, the inputting of data is efficient since it is easily downloaded into user-friendly formats. Data can then be cleaned and analysed more easily (Ileva, Baron and Healey, 2002).

2.2 Limitations when collecting data online.

Notwithstanding the various advantages of online data collection, a number of short-comings may still be observed when using this method. One of the main bones of contention here remains the issue of sampling and data integrity. (Hocevar and Flanagin, 2017) raise this issue in their work and claim that sampling and data integrity raise critical concerns in the assessment of research results no matter which online data collection method is used. Further limitations related to the sample were pointed out by Granello and Weathon (2004). They claim that when conducting online data collection, there may be issues related to the representativeness of the sample. Since the researcher will not have face to face access to respondents it may be difficult to tell who is actually completing a survey. Another relevant difficulty may arise due to technical issues (Lefever, et al. 2007). These issues may vary in nature from difficulties to establish an online connection due to faults from the part of the Internet service provider to difficulties emerging from the level of technological literacy experienced by respondents.

Response rates may still vary when collecting data online. Whereas Fricker Jr in Fielding et al (2017) claim that often the response rate for online data collection can be low, previously Ileva et al. (2002) had indicated that there may be an argument for a better response rate when using this method. Granello and Weathon (2004) suggested the use of reminders to nudge respondents into participating in online data collection methods. Other researchers have anticipated these issues and identified means to make the process of online data collection more user friendly. For instance, as early as 1999 Dillman et al. identified eleven principles that can encourage participation in online data collection. These include the following: include a welcome screen, formats that are similar to paper-and-pencil formats, limiting scrolling for respondents to view statements and clear instructions for different operating systems.

2.3 Ethical issues when conducting online research

The increase of internet and smartphone technology has made it easier for researchers to engage with family and child populations (Hokke et al., 2018). However, online research and the ease with which respondents may be approached has created new challenges for ethics committees and institutions as well as researchers (Ackland 2013 cited in Sugiura et al 2017). The need to establish ethical guidelines is evident since there is an increase in engagement with online environments by respondents. A number of researchers capitalised on this engagement leading to an increase in online data collection during the COVID-19 pandemic. These instances may have created difficulties and opportunities for new thinking for ethics committees and researchers alike (Sugiura, 2017). Some of the newly introduced research ethics procedures have been said to be to 'restrictive' (Langer and Beckman, 2005).

Shelley-Egan (2015) identified a number of issues related to ethics when conducting online research. Privacy, confidentiality and anonymity are amongst the most problematic. Another critical element is informed consent. These matters need to be given adequate consideration especially when conducting research with families and children (Hokke et al. 2018). Obtaining valid informed consent becomes critical especially since minors are considered as vulnerable and their capacity to conclude if they should participate in an online study may not be clear. It is therefore important to obtain consent from parents or legal guardians.

This section offered a brief overview of the issues surrounding online data collection. These issues were considered at research design stage. In the following section, contextual elements about the project are outlined for better appreciation of the reflection exercise.

3. Research context:

The study on which reflection is carried out involved gathering of information from students about their own perceptions of their creativity and their wellbeing at school during the time of the Covid-19 pandemic. The study took place in Malta (EU), and it adopted a quantitative approach with the aim to be able to generalise findings to the relevant age group. Statistical analysis can be used to indicate how a sample population could behave at

a macro-level. This is typically done since quantitative measures address the 'what' elements (Kelle, 2006). In this quantitative study, a sample of 530 students coming from different schools were surveyed using an online platform. Participants were recruited through their respective schools following the dissemination of information letters and consent forms.

Ethics clearance was obtained from all the stakeholders involved, namely the University, Department of Education, the Secretariat for Catholic Education and each Independent School. It was stipulated that the Head of each school would act as an intermediary between the researcher and parents or legal guardians. The latter had to provide written consent to allow the participation of their children on the project. This was done keeping in mind, the claims by Hokke et al (2018) that it is important to establish the capacity of young students to consent to participate in the study.

Information letters and consent forms were issued electronically instead of through printed formats by the school in the two official languages, Maltese and English. This was done since the handling of material was limited to the minimum to mitigate the spread of the virus. Moreover, some students experienced online schooling for the duration of the scholastic year. In Malta, approximately 90% of the population has access to the internet (NSO, 2020). This should have facilitated access to the information letters and consent forms as well as access to the online survey for students following school from home. Access to the survey was not anticipated to be an issue since all the students in the identified sample had access to a tablet provided by the Department of Education nationwide. Therefore, data for the project was to be collected using a one-time intervention on the part of each student using an anonymous self-rated survey. The researcher made arrangements with each school to access each class virtually to guide the students through the survey by giving the same instructions to all groups and by reading out each statement. This was done at different times and according to slots previously agreed on with the participating schools. This method ensured that data was collected simultaneously and that students had the same interpretation of the statements they were to use for the self-rating exercise. The survey was always administered during school hours. In keeping with total anonymity of respondents, digital identifiers of any type were not considered for harvest.

4. Guiding Framework for the reflective process.

Reflection is an essential part of learning. Although this method has gained prominence over the years, a single definition of what is understood by 'reflective practice' is not available. (Fook et al., 2006; Moon, 2013). This lack of a standardised definition causes various difficulties. Rodgers (2002) points out that there is lack of clarity about how reflection may differ from other thinking processes. For the purposes of this paper, reflective practice involved the review of an experience that was used to actively and critically think about how the activity could be improved in future. At the origins of critical reflection, we find the need for sense making to add meaning and context to develop. Gibbs (1998) provides a cycle that encourages reflective thinking that has been used in a number of studies.

The methodology used to collect reflections was of a qualitative nature. Driven by the reflective cycle identified by Gibbs (1988) reflection on the experience of doing online research was collected before, during and after the data collection process through journaling. Journals are convenient since they capture the experience as it is lived while thoughts and feelings are still fresh. This method was found useful due to the critical and reflective stance in which one needs to be in order to revisit and process events as they unfold chronologically. This practice allows the possibility to relive the experience while capitalising on opportunities for improvement thus fostering critical reflection through a growth mindset. In his reflective cycle Gibbs identifies 6 key steps to think and process experiences and learn from these practices. In itself the process leads to recalibration of how procedures are executed thus resulting in a learning experience. One may note that this cycle bears resemblance to the model of experiential learning produced by Kolb (1984).

Below and in Figure 1, are the six stages involved in the reflection process by Gibbs (1988).

- Description. In this first stage details about how the experience unfolds are shared.
- Feelings. Feelings may be associated an emotional state or a frame of mind. It is important to recall and acknowledge the feelings that emerge as a result of an experience.
- Evaluation. This stage requires an assessment of the experience itself. Details of what worked and what could be improved or what did not work at all need to be highlighted.

- Analysis. At this point we would interpret and understand the experience. This supports our sense making of a series of events that make a whole experience.
- Conclusion. This stage is particularly important if an experience is to be repeated. Using the previous stages as a scaffold, the opportunity for creative thinking emerges since deliberate effort needs to be made to generate alternatives. At this point one needs to capitalise on the learning and identify what could be done differently if there had to be a repeat of the experience.
- Action plan. The alternatives identified in the previous stage can be developed and turned into an action plan that can support future experiences.

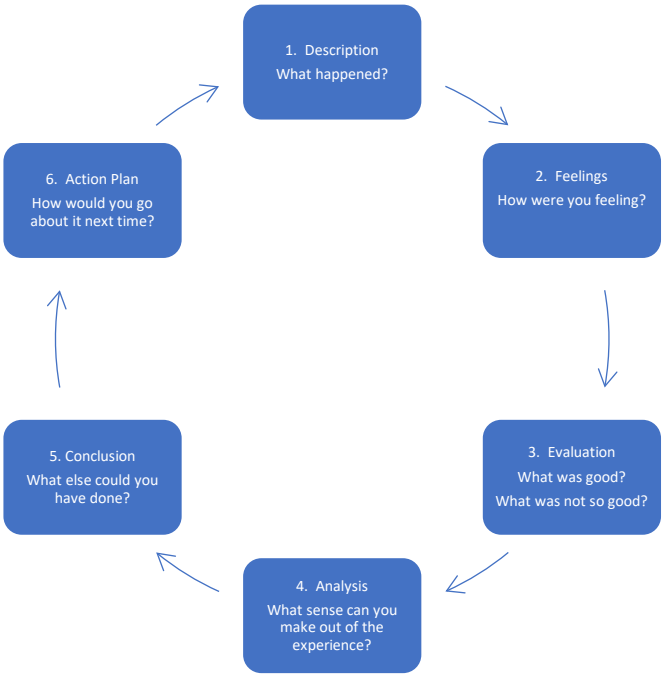

Figure 1: Reflective Cycle. Gibbs (1988)

5. Reflections:

The process of reflection started as early as during the planning of the research project itself. Assumptions about how meaning is typically made (Brookfield, 2000a) were questioned since the challenges imposed partly or completely due to the pandemic influenced how data was collected. Driven by Gibbs (1988) a critical and reflective disposition was adopted to go through the different stages of the reflective cycle model (Fig.1). A number of questions emerging from the different stages presented by the model were used as cues to guide the reflection process as found in Table 1.

Table 1: Cues guiding the reflective process.

Stage	**Cues**
Description	Where and when did the activities unfold? What happened? What was the outcome of the activities? What worked as anticipated? What were the potential difficulties? What was the role of the different stakeholders?
Feelings	How did the processes of collecting data online make me feel? How was I feeling before and after data collection? How did the stakeholders feel?
Evaluation	What went well when collecting data online? What didn't work out well? How did the respondents contribute to make the experience a positive or negative one?
Analysis	Why did the process work out? What made the process stall?

Stage	Cues
Conclusion	What did I learn from this experience? What could have been done differently? What precautions can be taken for future studies?
Action Plan	How can the process be improved for next time?

While various advantages emerged from conducting online research, a number of challenges were encountered throughout the process. In particular we explore the issues that were encountered and how online research made data collection from schools possible during a pandemic. The main stumbling blocks were related to: (a) parental engagement and the subsequent collection of consent forms; (b) issues that emerged during the actual data collection.

5.1 Description.

The planning phase and ethics clearance for the project took place between December 2020 and March 2021. Ethics clearance proved to be time consuming since submissions had to be made to different bodies including the University, the Department of Education, Secretariat for Catholic Education and each Independent schools that took part. This process ensured that the study adhered to all ethical principles both in its design and during the data collection phase. Following Recital 38 (https://gdpr-info.eu/recitals/no-38/) under the GDPR act, special attention was given since data was collected from minors. Once all approvals were in place, information letters and consent forms for parents and legal guardians and assent forms for the students were distributed by the Head of each school who acted as an intermediary. Consent forms were to reach the researcher directly from the parents or legal guardians of each participating child. This was a very long process.

As noted above, data integrity when conducting online research could pose an issue (Hocevar and Flanagin, 2017). This was overcome through the specific targeting of schools with populations of students aged between 9-11 years. Collecting data during the scholastic year also helped with the preservation of integrity. Issues pertaining to the authenticity of respondents were resolved easily since the schools confirmed the ages of the participants taking part in the project. Information letters and consent forms were sent out to the parents or legal guardians of approximately 1275 students.

Collecting data from schools during a pandemic was expected to be difficult from the outset. Different schools adopted different methods to mitigate the spread of the virus, however, one factor was common to all schools; no visitors were allowed for the duration of the scholastic year. Two options were presented. The first involved the dissemination of the surveys by class teachers who would have received training on how to present the instructions to their students prior to data collection. It was envisaged that this method could compromise the data (Hocevar and Flanagin, 2017) due to multiple interpretations. The second option, was for the researcher to reach each school online and instruct each class on the aims of the project and how to complete the survey. The latter was the preferred option. Following a pilot study with a separate school, a script was written to ensure consistency in how the instructions were given. The researcher accessed each school using the online platforms used by the different schools and read out each statement to all respondents. A number of sessions where required since each class or year group within the participating schools was approached separately to allow time for clarifications by the respondents if requested. The respondents indicated how they perceived their own creativity using the 'Short Scale for the Creative Self' by Karwowski et al. 2013 and the 'How I Feel About Myself and School Questionnaire ' by Stewart and McLellan (2015) on a Likert scale.

At the outset of the project, it was initially anticipated that obtaining consent would not be a problem. This was an assumption that was soon discounted as will be outlined below.

5.2 Feelings

This project presented a new opportunity, a novel way to engage with data collection methods. It was an exciting break to operationalise a concept that would not have otherwise been possible to do. Data collection during academic year 2020-21 could not have happened on a face-to-face basis. These feelings of excitement and anticipation were coupled with a careful stance to ensure the all ethical procedures were adhered to especially because of the vulnerability of the sample. Guided by elements highlighted in the literature privacy, confidentiality and anonymity (Shelley-Egan, 2015) were adhered to. Feelings of nervousness arose each time that data was being collected due to fears that there could be a technical breakdown. Due to the large number

of people making use of the band with locally, technical issues were not uncommon. A frozen screen or loss of connection were issues that we have learned to deal with during the pandemic. Apart from these isolated occasions that caused disruptions to the programme outlining data collection, the overall experience was appreciated by the participating schools.

The feelings related directly to the project were compounded by a degree of disappointment emerging from the expectation that parents or legal guardians could have engaged with the process more. The assumption that widespread use of internet services is made by many induced the researcher to expect a higher response rate.

5.3 Evaluation

For most of the project online data collection proved to be a pleasant experience. The advantages referred to in the literature, were experienced in their entirety. The project was run in an efficient manner both in terms of time and cost acknowledging findings by Lefever, et al. (2007), and Mohanty et al., (2020). The data collection exercise was welcomed by the participating schools since this activity provided space for students aged 9-11 years to experience personal reflection about their own creativity and wellbeing at school.

One episode in particular however, was disconcerting since a class had to postpone the data collection activity due to miscommunication within the school. The IT technician was not informed of my online visit. In this school the network was set up to allow access to approved individuals. Since I was not given rights to access, my attempts to use the provided link were futile. This led to frustration on both sides. The teachers and the students involved in this school were deeply disappointed.

5.4 Analysis

The overall satisfaction with how the online data collection project unfolded still leaves space for questions to be asked and to look back and assess the different touchpoints of the process. The carefully laid out instructions along with appropriately scheduled data collection sessions made the process run smoothly most of the time.

It was particularly pleasant to see how engaged the students were during the process. Some issues however emerged. However, parental engagement was expected to yield a higher response rate.

The research ethics committee of the university stipulated that the schools act as intermediaries between the researcher and the parents and their children. Signed consent forms had to be sent directly to the researcher via email. This process involved the assumption that parents were downloading the information sheet and the consent form that were sent by email. Initially, the response rate was low, however, a number of reminders (Granello and Weathon, 2004) encouraged more parents to give their consent on behalf of their children. After a few weeks of assessing why a number of parents were not giving their consent, potential reasons leading to a low response rate were generated as follows: (1) parents may not have had access to online devices where they could download a document, sign it and upload it again, (2) the email detailing the research project may have been interpreted as less important than other emails sent by the school and therefore it was not read, (3) parents were experiencing screen fatigue from getting all school communication sent via email, (4) parents viewing emails on a mobile phone may not have had the opportunity to download the documents. Following communication with the various schools about the response rate being lower than initially expected, one of the participating schools asked parents to simply send an email to the researching stating the name of the school, name of the child and a statement confirming their wish to participate in the project. This led to an instant increase in the number of parents or legal guardians consenting participation.

5.5 Conclusion and Action Plan

This project provided an experience for growth as a researcher. Various lessons were learned with the most salient ones being to ensure that access is granted by gatekeepers on the ground, IT technicians in this case and to potentially make the information and consenting process more accessible to respondents. In future a recorded message or a video link could replace the information sheet since this may have been too long and detailed for parents to read through especially if the medium used is a smartphone.

6. Concluding remarks

The pandemic induced by the spread of Covid-19 created new possibilities to make data collection feasible. These methods were not entirely new, however, the uptake by researchers increased dramatically since 2020. This provided a learning experience for many researchers leading to opportunities to implement reflective

practices. These methods are often desired and actively used as self-development tools. Hobbs (2007) claims that this practice ought to be pursued. This bears relevance especially in view of the experiential learning process that is undertaken through reflection leading to potential improvement of activities. This paper presented a reflective process using the reflective cycle illustrated by Gibbs (1988). The reflection process together with the increased interest in online data collection could provide fertile grounds for in-depth study of ethical procedures to enhance and encourage researchers to engage with online methods while keeping respondents safe. The level of engagement with respondents as well as the factors that could lead to enhanced participation rates need to be explored in detail to facilitate future online research.

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Measuring Political Trust: Recognising the Drivers of Trust in Public Institutions

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Abstract: Citizens' trust is fundamental to the proper functioning of public institutions. This paper explores how the construct of 'political trust' can be measured to reflect the underlying theoretical factors driving trust levels. It proposes a quantitative methodology to develop a scale that measures trust in public regulatory institutions. Some measurements of trust are dependent on a scale for questions such as 'What is your level of trust in…?' Alternatively, composite indicators are used, based on, for example, trust levels in a set of public institutions. Such measures do not recognise what influences a citizen's trust. The methodology presented here is also a composite measure but incorporates nine drivers and their extent of influence on a citizen's trust. These drivers, identified through a literature review on political trust, include consistency, transparency, outcomes, competence, integrity, openness and inclusiveness, fairness, reliability and responsiveness. The proposed methodology follows four steps: (i) It determines drivers that citizens recognise as influential on their trust in a regulatory institution; (ii) it establishes the extent to which the drivers are influential; (iii) the institution is rated on a scale for each factor; and (iv) each factor rating is weighted on the extent of its influence and a weighted average is computed to determine the level of trust. This methodology was applied to measure trust in Malta's environmental authorities following a demerger. A survey was conducted with the questionnaire's design reflecting this methodology. The empirical findings confirmed that all these factors lead to trust, but variations in the extent to which each driver influences a citizen's trust exist. Responsiveness, outcomes, integrity and openness emerged as slightly less influential on citizens' trust, whereas fairness, consistency, reliability, transparency and competence were the most influential factors. Significant differences are recorded when comparing methods of measuring trust for the two institutions. This composite measure recognises the multidimensional nature of trust, is grounded in the construct's theoretical foundations and provides reasons for variations in trust levels. Institutions can adopt this approach as a tool to regularly monitor citizens' trust and identify areas requiring attention.

Keywords: Political trust, scale development, construct measurement, public regulatory institution, drivers of trust, institutional trust

1. Introduction

Citizens' trust is fundamental to the proper functioning of public institutions and a key factor that supports an active democratic society. Political trust attracts the attention of scholars in various fields, governments and international organisations. They seek to understand what trust is, what drives it, what context brings to trust and attempt to measure this complex construct. Political trust is distinct from social trust, though some scholars present the notion that the two are related. This paper focuses on political trust. The relationship among the concepts of trust, social trust, political trust, and institutional trust is depicted in Figure 1.

Figure 1: The relationship among the concepts of trust

Political trust, i.e., citizens' trust in political institutions, is essential for a democracy's stability, for the political system's legitimacy, for citizens' political participation and adhering to the law (Turper and Aarts, 2017; Schneider, 2017). Political trust is defined by Zmerli as "citizens' assessments of the core institutions of the polity and entails a positive evaluation of the most relevant attributes that make each political institution trustworthy, such as credibility, fairness, competence, transparency in its policy-making, and openness to competing views"

(2014, p.4887). The first statement explains why political trust is important, emphasising political systems and participation. Complementary to that, Zmerli's definition adopts the perspective of citizens' evaluation of institutions and refers to attributes that influence trust. Political trust is an important construct influencing institutions' outputs and consequently the outcomes on society. Institutional trust, a component of the broader concept of political trust, refers to citizens' trust in public institutions, such as regulatory institutions.

Various attempts have been made, both by scholars and international organisations to measure political trust. However, as stated by Schneider, "researchers continue to rely on sum scores or averages of standard 'trust in government' survey questions without fully understanding what the concept means, or whether these measures tap into comparable ideas across the countries in their sample" (2017, p.964). Measures of trust have generally adopted one of two approaches. One approach is the single statement with a scale enquiring about the research participant's "trust in government". This assumes respondents' same understanding of trust and the same extent of influence by factors affecting trust. The second approach that is often applied is a composite index of respondents' trust level in a set of institutions. This approach is based on assumptions that do not allow for a clear understanding and identification of why a citizen's trust level is what it is. Scholarly literature recognises that political trust is influenced by those attributes but, at least to our knowledge, these do not seem to be reflected in measures of trust. This points to a literature gap in that existing measures do not consider or uncover the factors that influence political trust, despite the extant literature that identifies various drivers affecting citizens' trust in institutions.

The aim of this research is to design, propose and apply a quantitative methodology for construct measurement based on scale development. Specifically, it aims to measure the construct of political trust by developing a scale that incorporates the attributes that influence trust. This paper hence asks the research question: 'How can the construct of political trust be measured to reflect the underlying factors driving trust levels?' The methodology distinguishes between factors that influence a respondent's trust and the rating for each driver. This proposed methodology was used to measure trust in environmental regulators operating within a wider political system. The strength of this research, and its contribution to the political trust literature and to scale development and construct measurement literature, lies in that the proposed method is grounded in the construct's theoretical foundations, whilst allowing for the identification of reasons for variations in trust levels. A further contribution emerges as the empirical results provide evidence suggesting a significant difference between the single-statement and this proposed multidimensional measure, furthering the debate on methodologies adopted to measure political trust.

2. Literature review

Trust has been defined as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" (Mayer, Davis and Schoorman 1995, p.712). This widely cited definition encapsulates both the trust an individual has in another person (social trust) as well as a citizen's trust in an organisation or institution (political trust). Applied to political trust, this definition implies risk, interdependability and points to the willingness of a citizen to "be vulnerable" to the political agent. That willingness to be vulnerable may be influenced by the individual's background, experience, perceptions and expectations (Mischler and Rose, 2001), as explained by micro theory.

In addition, Mayer, Davis and Schoorman's (1995) definition adopts the perspective of 'expectation' to 'perform a particular action'. Bauer and Freitag (2017) concur that trust "designates an expectation" (2017, p.2), a notion particularly applicable to public institutions as they are expected to deliver. This dimension is reflected in Gamson's definition which states that political trust represents the "probability … that the political system (or some part of it) will produce preferred outcomes even if left untended" (1968, p.54). Those outcomes are determined by the conditions which the institution adopts, its policies and processes, which influence public trust (Bouckaert, 2012; Seyd, 2016), as they feed into and inform citizens' "willingness… to be vulnerable", "expectations" and evaluations of the institution. This points to Seyd's (2015) argument that trust "represents a judgement that, even in the absence of ongoing scrutiny or enforcement by citizens, a political actor or institution will act in a way that is broadly consistent with those citizens' interests" (p.74).

Accordingly, two key contemplations emerge and inform this research. First, political trust is marshalled by different attributes. Secondly, an individual's evaluation based on these drivers may provide reasons for the

varying levels of trust. This echoes Seyd's argument that a distinction must therefore be made between "the indicators held to capture the meaning of trust from those held to capture the reasons for that trust" (2016, p.13).

Measuring political trust presents challenges. Though there appears to be a consensus that trust is a multidimensional construct, measures of trust have not often reflected this. Mayer, Davis and Schoorman (1995) identify ability, benevolence and integrity as key components of trust. Zmerli's (2014) definition (cited earlier on), refers to credibility, fairness, competence, transparency in policy-making, and openness to competing views. Seyd (2016) lists competence, concern, benevolence, integrity, reliability and fairness as dimensions of trust. Additionally, cultural context plays a role in determining political trust (Marien, 2011; Kaasa and Andriani, 2021) and is particularly relevant when conducting cross-country studies. The OECD (2017) Trust Framework identifies five dimensions, namely reliability, responsiveness, integrity, openness and fairness. Figure 2 presents the construct of political trust according to its multidimensional elements, based on a literature review (refer to Frendo, 2017).

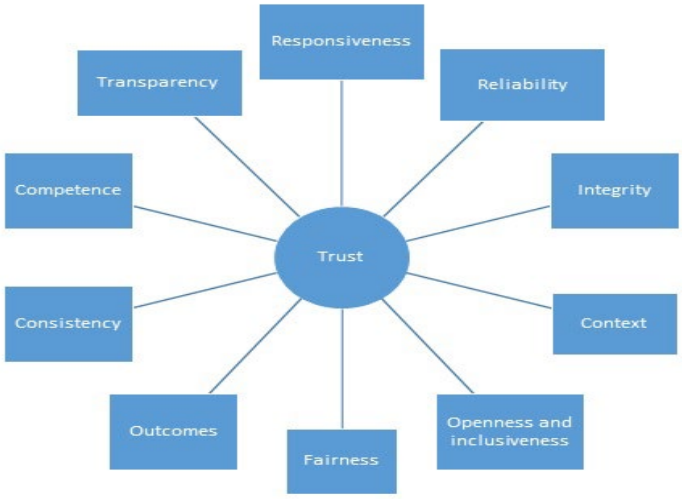

Figure 2: Drivers of political trust

Measures of trust have been carried out primarily through surveys and experiments. Yet, this distinction between the underlying drivers of the concept of trust and the causes that lead to varying trust levels in institutions are rarely incorporated in measures of political trust.

Most measures of political trust comprise a single item, asking the general question, "What is your trust in… [a political institution]?" Admittedly, a single-item question is simpler to administer and faster for research participants. However, no reference is made to the underlying drivers of the concept of trust, neither does it include a "referent against which trust is to be gauged" (Seyd, 2016, p.2), nor does it capture respondents' understanding of trust and their acknowledgement of what influences their trust. Seyd's (2016) review of how political trust is assessed identifies shortcomings in its measurement. He argues that some measures of trust are in effect evaluations of the incumbent officials' performance in the form of "honesty, competence and procedural correctness" (Seyd, 2016, p.2). No evidence indicates that single-item measures are more robust than multi-item approaches, though Ulsnaer (2015) defends the standard question for interpersonal generalised trust, which admittedly is different to political trust, but some arguments may still be applicable.

The alternatively commonly used measure for political trust enquires about research participants' trust in (or attitudes towards) a set of public institutions, presenting the measure of political trust as a composite of these measures. Marien (2011) argues that one cannot simply add these trust measures as respondents may use different criteria to determine their trust in the various institutions. Questions may be unclear as to whether they are enquiring about the political system or the people running the institution. On the other hand, multi-item measures tend to be less prone to capturing respondents' judgements about the incumbents' performance if such measures direct respondents to the determinants of trust (Seyd, 2016).

Reviews on trust measurement (Gillespie 2012, 2015; Hoe, Adnan and Fee, 2021) provide a useful and comparative assessment of existing measures. Concerns are primarily raised about construct validity, about

differences between the concept of trust and how it is measured (Saunders, Lyon and Möllering, 2015). Turper and Aarts (2017) acknowledge that empirical trust measurement relating to trust in public institutions depends on the construct of political trust and cannot be entirely free from measurement error. There still appears to be a literature gap as existing methodologies for measuring political trust do not reflect its latent nature and its drivers.

Many pitfalls identified in the measurement of trust, and referred to above, are because most measurements are not grounded in theoretical foundations. These concerns, though not all entirely addressed, informed the research design presented here.

3. Methodology

The methodology is quantitative, based on a survey using a questionnaire. Surveying through questionnaires is the most adopted method to measure trust (Saunders, Lyon and Möllering, 2015). Distinct from other surveys (as far as we are aware), this questionnaire was designed to incorporate and measure nine drivers of trust extracted from the literature, reflecting the concept's multidimensional nature. The nine drivers were selected given the frequency of mentions that emerged from an analysis of the content of literature on political trust (refer to Frendo, 2017). Though the cultural context is a driver for trust, it was not included in the empirical research since cross-country comparatives were not carried out in this study. The nine drivers are reliability, responsiveness, openness and inclusiveness, integrity, fairness, competence, transparency, consistency and outcomes. Scale measurement was used.

The designed questionnaire was used to measure trust in Malta's environmental regulators. Trust in regulatory environmental authorities has limitedly been the subject of empirical research, though "institutional trust is especially important to government activities that address market failures (e.g. public health or environmental protection) or where long-term gains require short-term sacrifices" (OECD, 2017, p.52-53).

The questionnaire's structure reflects what Seyd (2016) recommended: to distinguish between indicators for the meaning of trust and those capturing reasons for the levels of trust. Consequently, the questionnaire was divided into five sections (Appendix 1). The first section enquired about the respondent's profile, including a question as to whether the respondent or his/her family ever used these authorities' services. This was deemed relevant as experience could be a further reason for the indicated trust level. As argued by Hegtvedt, "individuals' encounters with legal authorities have a profound impact on the perceived legitimacy of those authorities, their compliance with them, and ultimately their trust in the institution of law enforcement" (2015, p.76). The questionnaire's second section (Section B) focused on influences of trust – the drivers - with the intention of capturing the meaning of trust. As argued by Saunders, Lyon and Möllering (2015), the method adopted to measure trust should follow the conceptualisation of the construct. Zmerli's definition of political trust is used to guide the empirical research together with the literature review that led to the conceptual framework for drivers of trust, (Figure 2). Participants were asked to state the extent to which these drivers influence their trust, using a 5-point scale from 'Not at all' to 'Affects me a lot'. The third section (Section C), using the single statement approach with a 5-point scale ranging from 'distrust it greatly' to 'trust it greatly', asked respondents to specify their trust in each authority. Next (Sections D and E), to capture the reasons for the levels of trust, respondents were asked to provide a rating on a 5-point scale for the 'new' authorities for each of the nine drivers of trust.

Data collection commenced in 2017, a year after the Malta Environment and Planning Authority (MEPA) was split into two authorities, namely the Planning Authority (PA) and the Environment and Resources Authority (ERA). Following pilot testing, questionnaires were distributed among tertiary level students, tapping into University of Malta undergraduate and postgraduate students. A total of 325 questionnaires were collected from students, following random face-to-face distribution on campus and an electronic mailshot, giving a 5% margin of error. The decision to involve only tertiary level students in the study was guided by logistical and practical reasons as well as by the primary purpose of the research. The student population by far outnumbers staff members at the University of Malta. Collecting data from students at the University of Malta offered the opportunity to capture research participants from a single cohort, in a single location, saving time and applying the available resources in the most efficient manner. A nationwide survey required additional time and resources which were unavailable. Given that the primary intention of the research was to test measuring trust using the methodology presented here, it was deemed gratuitous to extend the survey beyond the student

population. Data was inputted, checked for errors and analysed using Excel, SPSS and AMOS for frequency, reliability and validity. Trust was measured through the multi-item approach by multiplying each respondent's stated influence of each driver with the respective ratings on each driver and then averaging across respondents.

4. Findings

This section is structured as follows. A demographic profile of survey respondents is first provided. The results for each driver's extent of influence on respondents' political trust are then outlined. A single-statement trust measure is then presented, followed by respondents' ratings for each driver for each institution. Reliability and validity assessments are then displayed. A multidimensional measure of trust is subsequently proposed and compared to the single-question measure.

4.1 Demographic profile of respondents

The respondents' profile generally reflected the student population as 62.5% were women and 37.5% were men, whereas the gender ratio stood at 58:42. Most respondents (68.8%) were aged between 18 and 24 years, followed by the 25–34-year-olds (17.6%) and the 35-44-year-olds (7.1%). 6.5% of respondents were aged over 44 years. The student population is composed of 75% undergraduate and 25% postgraduate students. 89.6% of respondents stated that they or their family utilised MEPA's services, whilst 40.2% and 13.6% used PA's and ERA's, respectively, indicating that most respondents rated on their perception, observation, and experience.

4.2 Drivers of trust

Research participants were asked to specify the extent to which their trust in a public institution is influenced by the attributes that drive trust. The nine drivers do indeed influence institutional trust as responses are skewed towards the scale's positive end (Figure 3). Fairness, consistency, reliability, competence and transparency are recognised by more than 83% of respondents as influential on their institutional trust.

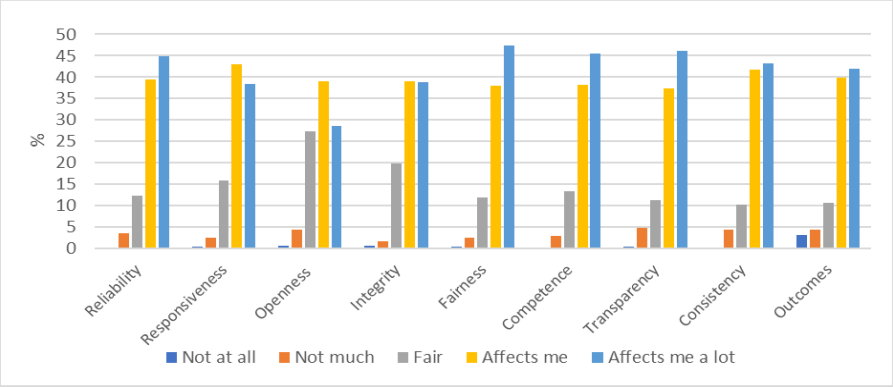

Figure 3: Extent of drivers' influence on trust

Table 1 shows the share of each driver. Fairness accounts for the highest share of influence on trust, followed by consistency, reliability, transparency and competence. This analysis proves that the assumption of equal weights in a composite score is unrealistic, as claimed by Turper and Aarts (2017).

Table 1: Influential drivers of trust

Attribute	Influence
Reliability	11.35%
Responsiveness	11.04%
Openness and inclusiveness	10.38%
Integrity	10.96%
Fairness	11.45%
Competence	11.19%
Transparency	11.28%
Consistency	11.35%
Outcomes	11.01%

4.3 Trust in regulatory authorities

4.3.1 Single-statement measure

Respondents, as shown in Figure 4, almost follow a normal distribution in their trust levels in the case of the PA. It is slightly skewed to the right indicating more trust in ERA, in contrast to trust in MEPA wherein it is slightly skewed to the left. Respondents' trust in ERA averages a score of 3.19, PA registers 2.93 and MEPA 2.64. When this survey was conducted, ERA was a year old though incorporating MEPA's Environmental Directorate and the Resources Authority. This might indicate that newer structures may be trusted more than an older organisation.

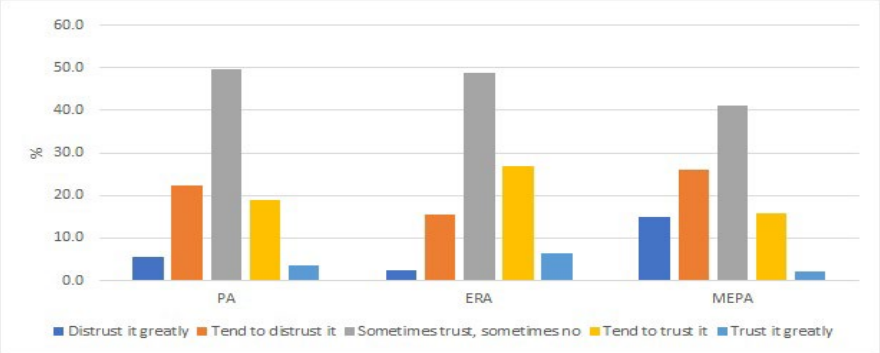

Figure 4: Respondents' trust in environmental regulatory authorities (single-statement measure)

4.3.2 Multi-item measure

A 5-point scale ranging from 'Very Poor' to 'Very Good' captured research participants' ratings of the drivers of trust for two regulatory authorities. As Figures 5 and 6 depict, 'fair' was the most common score respondents allocated for each of the nine drivers of trust. In the case of PA, fairness, transparency, consistency and outcomes register more negative scores than positive ones, averaging ratings of 2.84, 2.83, 2.86 and 2.82, respectively; whilst the other factors average around 3.1. Fairness, transparency and consistency were among the more influential trust drivers. ERA's positive ratings surpass negative ones for all drivers, except for transparency where positive and negative ratings are almost equal. ERA's average score hovers around 3.3, except for transparency and outcomes where the average is closer to 3.1. Therefore, when an institution captures a low rating for a more influential trust attribute, a lower trust value is registered for the organisation. These results provide insights into the reasons for the levels of trust.

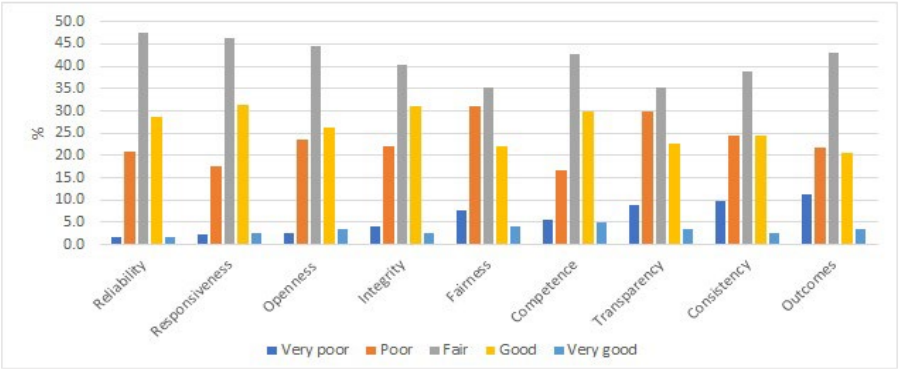

Figure 5: Attribute ratings for PA

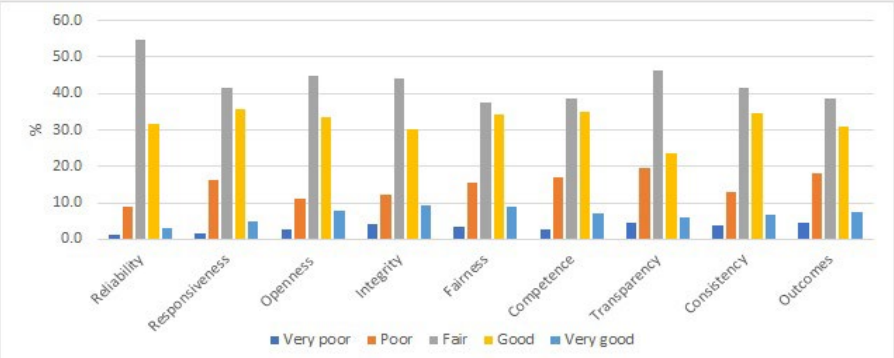

Figure 6: Attribute ratings for ERA

The question that arises here is whether the measure used to obtain a meaning of trust is in effect reflective of the latent variable of trust and whether it is distinct from the measure that seeks to capture the reasons for institutional trust levels. Reliability and validity tests were carried out.

4.3.3 Reliability and validity

The survey's internal consistency reliability was measured using Cronbach's Alpha for the three trust measurement scales, as shown in Table 2. The reliability statistics denote very good data reliability as each is higher than 0.7. The inter-item correlation matrix returned values that were all higher than 0.3 indicating that all the drivers should be retained.

Table 2: Reliability and validity assessments for trust scale measures

	Reliability	**Construct Validity**	**Construct Validity (principal component analysis)**		
Trust measure	**Cronbach's Alpha**	**Pearson correlation coefficient**	**KMO**	**Bartlett's Test**	**Number of components**
Trust drivers	0.894	<.01 and >0.113	0.902	<.001	1
PA ratings	0.925	<.01 and >0.113	0.913	<.001	1
ERA ratings	0.922	<.01 and >0.113	0.917	<.001	1

Validity was first assessed for each individual trust measure separately with the purpose of establishing whether the chosen drivers of trust were valid or were measuring additional latent variables through the chosen indicators. For purposes of this study, construct validity, as noted by Saunders, Lyon and Möllering (2015) and Seyd (2016), is of particular interest given that it evaluates the extent to which the survey measures the theoretical construct it was planned to measure. Three methods were used to test for this: Pearson Correlation Coefficient, Explanatory Factor Analysis using Principal Components Analysis and Confirmatory Factor Analysis. All three methods provided evidence that suggests that the identified drivers, incorporated in each trust measure, were valid. In the case of the Pearson Correlation Coefficient, as per Table 2, all values were significant at the 0.01 level (2-tailed) and above the critical value of 0.113. (Note: Table of results is not included due to page limitations.) In addition, one factor was extracted with the principal components analysis (Table 2), with different factor loadings higher than 0.7 for the respective constructs for each scale, supporting the conceptual framework drawn from the literature and Turper and Aarts's claim of an unrealistic assumption of equal loadings on the latent construct of trust (2017). Confirmatory factor analysis provided evidence suggesting convergent validity for each individual measure, as shown in Table 3.

Table 3: Convergent validity for each individual scale based on confirmatory factor analysis

	Confirmatory Factor Analysis			
Trust measure	**Composite reliability (CR)**	**Average variance extracted (AVE)**	**CR>AVE**	**Convergent validity**
Trust drivers	0.876	0.504	0.876>0.504	Yes
PA ratings	0.924	0.574	0924>0.574	Yes
ERA ratings	0.935	0.617	0.935>0.617	Yes

- No Maximum Shared Variance (MSV) or correlation since one latent variable was extracted for each measure.

Given that the same drivers were used to measure the respondents' meaning of trust and reasons for their level of trust in the two authorities, (though questions were different) it was deemed appropriate to assess construct validity, examining convergent validity and discriminant validity. Table 4 presents evidence suggesting convergent and discriminant validity.

Table 4: Construct validity for the three measures

Components	**Reflective of**	**CR**	**AVE**	**Correlation**	**MSV**	**ASV**
Factor 1	ERA rating	0.775	0.575	1-3: 0.601	0.361	0.067
Factor 2	Trust	0.715		1-2: 0.137		
Factor 3	PA rating	0.772		2-3: 0.038		
Convergent validity	CR>0.7 AVE>0.5 CR>AVE			Discriminant validity	AVE>MSV AVE>ASV	

The questionnaire is truly measuring three different constructs, as was the intention and as reflected in the questions' wording. The higher correlation between factors 1 and 3 indicates the similarities of the constructs of measuring respondents' ratings of the two institutions. The construct for the meaning of trust appears to be separate from the construct underlying the trust rating for each institution, providing comfort to propose measuring trust based on this measurement instrument and approach.

4.4 Proposed multidimensional measure of trust

Whilst all attributes are relevant, the empirical findings indicate that slight variations in the extent of influence of each driver exist for each respondent. Therefore, the trust measure was computed by the weighted average of each respondent's rating and his/her extent of influence of each respective driver. The PA and ERA's average scores were calculated to be 2.57 and 2.81 out of 5, respectively, both below 'fair' (Table 5). This measure can act as a comparative baseline for future trust ratings of PA and ERA.

Table 5: Multidimensional measure of trust

	Weighted average
PA	2.57
ERA	2.81

4.5 Comparing single-statement with proposed multidimensional measure of trust

The average scores for respondents' trust in the PA and ERA were 2.93 and 3.19, respectively, when the single-question was asked. These are, numerically, close to the multidimensional measure of 2.57 and 2.81, respectively. However, are they significantly different to justify adopting the multidimensional measure for measuring trust as opposed to the single statement? The Student's t-test was used to determine this. The Student's t-test result (Table 6) rejected the null hypothesis of no difference between the two measures' scores. This was the case for both the PA and ERA trust measurements, presenting evidence suggesting a significant difference between a single-statement measure and the proposed multidimensional measure. The question as to which one better reflects research participants' trust remains and necessitates discussion.

Table 6: Student's t-test for single and multidimensional measures of trust

	Paired Differences							Significance	
				95% Confidence Interval of the Difference					
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	T	df	One-Sided p	Two-Sided p
PA trust	.42623	.76404	.05005	.32761	.52485	8.515	232	<.001	<.001
ERA trust	.46218	.83739	.05428	.35525	.56912	8.515	237	<.001	<.001

5. Discussion and conclusion

The results contribute to three important aspects in the debate on the measurement of political trust. First, the empirical findings confirm the conceptual framework on the attributes that drive political trust as drawn from the literature review's analysis on political trust. Results show that the nine identified attributes are all influential with some variation in the extent of influence. Fairness, consistency, reliability, transparency, and competence emerge as the top five drivers of trust with openness being the least influential. This contributes to the political trust and regulatory policy literature as it not only confirms these attributes but also measures the extent of

what makes a public regulatory institution trustworthy. Zmerli's (2014) definition of political trust could be refined to recognise the attributes' varying influential extents - if the findings were generalisable, pointing to the need for further research.

Second, these findings strengthen the argument that in construct measurement, it is essential to understand what the concept means. As Schneider (2017) laments, it is a flaw to measure a construct without that understanding. The measure must reflect the construct's components or underlying influential factors – a consideration that is even more critical for latent constructs, such as trust. This has implications for the methodology used to measure constructs, leading on to the third point.

A key debate in the literature is whether to adopt a single or multidimensional measure for political trust and how to design the multidimensional measure. This decision should be guided by the nature of the construct and our understanding of that construct. The proposed multidimensional measure of political trust incorporated nine drivers, returning internal consistency, indicating that it truly measured the latent construct of trust. Single question measures, in the field of psychology, are generally deemed inappropriate to measure latent behavioural constructs. One may argue that the single-question measure of trust and the ratings for each institution had a positive and significant correlation (PA 0.667 (<.001); ERA 0.600 (<.001), implying that those who rated an institution highly using the single-question measure also provided a high composite rating. However, the single measure does not address what Seyd (2016) argues for: that the measure's design should distinguish between the meaning of trust and the reasons for the levels of trust. The proposed method for measuring political trust does. In addition, the measure's design is grounded in theoretical foundations of political trust; it has been tested for reliability and validity, including construct validity.

It is the multidimensional, stepwise design and method for measuring political trust, grounded in theoretical foundations, that is the main contribution this research makes to the literature. Building on the strengths and limitations of existing measures of trust, the proposed methodology followed four steps to measure the construct of political trust: (i) It determined drivers identified through the literature and that citizens recognise as influential on their trust in a regulatory institution; (ii) it established the extent to which the drivers are influential; (iii) the institution was rated on a scale for each factor; and (iv) each factor rating was weighted on the extent of its influence and a weighted average was computed to determine the level of trust. In addition, it allowed a comparison between the single-statement and the multidimensional measure of trust. The proposed method emerged as reliable and valid, having internal consistency in the collected data and construct validity, implying that the method of measurement matched the construct that had to be measured. Construct validity is not commonly presented but here it is particularly important. The construct measurement of political trust is this research's contribution.

Yet, the study has two primary limitations, namely that the drivers were identified from a literature review and that the empirical data were solely collected from tertiary-level students from a single country. Further research should be aimed at examining the possibility of generalising these findings. This would involve refining the set of drivers through a content analysis of a systematic literature review, conducting the study in different contexts, nationwide across a set of countries and public institutions. The questionnaire could then be refined and tested for robustness. A comparison between single-question and this multidimensional measure could follow.

In conclusion, trust is an abstract construct, and one may aptly argue that it cannot be measured. Yet, attempting its measurement can assist advancement in understanding trust, the attributes that drive it, and reasons for changing levels. Certainly, trust is complex. This proposed measure has sought to reflect that complexity. The composite measure, or at least its instrument, appears to be valid - though certainly not flawless - to provide us with a deeper understanding of what citizens value and expect from institutions.

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Appendix: Questionnaire

SURVEY ABOUT TRUST IN ENVIRONMENTAL REGULATORS (ERA, PA, MEPA)

Since April 4th 2016, MEPA has been split into two authorities – the Planning Authority responsible for the sustainable use of land for our planning system, and the Environment and Resources Authority set up with the aim of *"safeguarding the environment for a sustainable quality of life"*.

ERA (Environment and Resources Authority)
PA (Planning Authority)
MEPA (Malta Environment and Planning Authority)

Section A – Profile *(/) – Tick where appropriate*

Male [ ] Female [ ]	Age _____	
Course & Faculty _____	Year of study _____	
Undergraduate [ ] Postgraduate [ ]	Place of Residence _____	

Have you or your family ever used the service of the following authorities?
[ ] Environment and Resource Authority (ERA)
[ ] Planning Authority (PA)
[ ] Malta Environment and Planning Authority (MEPA)

Section B Which of the following factors affect your level of trust?	Not at all	Not much	Fair	Affects me	Affects me a lot
Reliability					
Responsiveness					
Openness and Inclusiveness					
Integrity					
Fairness					
Competence					
Transparency					
Consistency					
Outcomes (Environment Protection, Planning Policies, Enforcement)					
Other:					

Section C What is your level of trust in Environmental Authorities?	Distrust it greatly	Tend to distrust it	Sometimes Trust, Sometimes No	Tend to trust it	Trust it greatly
What is your level of trust in the Planning Authority (PA)?					
What is your level of trust in the Environment and Resources Authority (ERA)?					
What was your level of trust in the Malta Environment and Planning Authority (MEPA)?					

Section D How do you rate the Planning Authority (PA) for?	Very Poor	Poor	Fair	Good	Very Good
Reliability					
Responsiveness					
Openness and Inclusiveness					
Integrity					
Fairness					
Competence					
Transparency					
Consistency					
Outcomes (Environment Protection, Planning Policies, Enforcement)					
Other:					

Section E How do you rate the Environment and Resources Authority (ERA) for?	Very Poor	Poor	Fair	Good	Very Good
Reliability					
Responsiveness					
Openness and Inclusiveness					
Integrity					
Fairness					
Competence					
Transparency					
Consistency					
Outcomes (Environment Protection, Planning Policies, Enforcement)					
Other:					

END OF QUESTIONNAIRE

Transdisciplinary Approach in Studying Organisational Transformations: A case study in Evolution of Military Enterprises

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Abstract: Digital transformation has a notorious record of failures. Maybe the enterprise architects do not have a holistic model to study and model the organisational transformation. An enterprise consists of several structural components, which vary from culture to technology layers defined in the Enterprise Architecture. Usually, the transformation of an enterprise involves most of the interrelated layers in connection to the environment around the organisation. Seemingly, no single science provides frameworks to study the transformation of a whole system of systems (including the layers of enterprise strategy, culture, business, information, and technology). Therefore, the paper proposes a transdisciplinary approach combined with spiral research design as a framework for the business sciences and enterprise architecture. The proposed framework connects different sciences of sociology, business, strategy, history, information, and technology to understand the evolutionary particularities of each layer of enterprise in transformation. The transdisciplinary approach supports the modelling of the entire enterprise in all of its complexities and over a longer time. In contrast, the current monodisciplinary focuses only on parts of an enterprise at a particular window of time. By definition, transdisciplinary research fuses findings across the disciplines, between the disciplines and beyond the disciplines. Furthermore, the framework supports spiralling between scientific methods and non-scientific practices. The case study utilised a spiralling research process that provided a tighter feedback loop from application in practice to model development in theory. The transdisciplinary spiralling approach provided an iterative approach to verify the outcome, reduce the complexity, and address the practitioner's reality. Hopefully, the research approach used in the case study and the tool created will improve enterprise architecture practice to ensure a successful digital transformation of military organisations.

Keywords: Organisational transformation, Enterprise architecture, Transdisciplinary research, Mixed methods, Research process, Evolution of socio-technical system

1. Introduction

The paper is a part of a larger research project (Mattila, 2020) and focuses on proposing a research method that improves the understanding and orchestration of enterprise transformation. The improvement is achieved with an enterprise architecture tool that reflects the dynamics of an enterprise better than the existing body of knowledge. The tool was designed based on an improved model created by combining several discipline-specific sub-studies that focused on the dynamics of an enterprise at layers of culture, process, information, and technology. The improvement was partially due to the combination of the multidiscipline research method and the spiral of design-feedback between theory and practice.

Over the past 15 years, there is evidence that the success in the transformation of the enterprise remains an exception, not the rule (Bucy, et al., 2021). The environment outside the enterprise is changing, e.g., in ways of Industry 4.0 (Schwab, 2016), Society 5.0 (Cabinet Office, Government of Japan, 2017), Smart Governance (Bolivar & Meijer, 2015), Knowledge-Economy (The World Bank, 2013), and Platform Economy (Neittaanmäki, et al., 2016). Furthermore, the old competitors are catching up in competition, new competitors are popping up while customer expectations rise beyond imagination, and the supply chain evolves (Porter, 1985). Therefore, companies need to transform or perish when longstanding competitive advantages diminish. (Becker, et al., 2018)

The emerging technologies (e.g., 5G, Edge computing, Artificial Intelligence, Big Data, Quantum and Biotechnology) (Michlelotti, 2020) are driving enterprises towards a digital transformation that may be perceived as anything from IT modernisation to implementing new business models. (Gartner, 2004) The drive has been there for over 20 years, and organisations are challenged to keep up with competition as the average company lifespan of the Standard & Poor 500 list is down to 18 years. (Garelli, 2016) At the same time, Enterprise Architecture (EA) has been helping companies to understand their structure and its transformation. (The Business Architecture Group, 2019) Is it possible that EA frameworks do not support the understanding of the dynamic nature of an enterprise (Ulrich & McWhorter, 2011), or maybe the existing models and reality differ too much for the practitioners' benefit?

The complex socio-technical, adaptive system called an enterprise comprises various layers and components modelled according to enterprise architecture (EA). The layers of enterprise vary from culture down to technology. (Open Group, 2019) The transformation involves all the interrelated layers in connection to the environment around the enterprise. Hence, no one science possesses all the tools to study the whole system of systems (unless we consider systems science). Hence, a multidisciplinary approach is required to connect the different sciences of sociology, business, strategy, history, information, and technology needed to understand the particularities of each organisational layer in transition. Furthermore, the forces of interrelationships between the layers need to be understood since they either enable or prohibit the transformation of the entire enterprise in Figure 1.

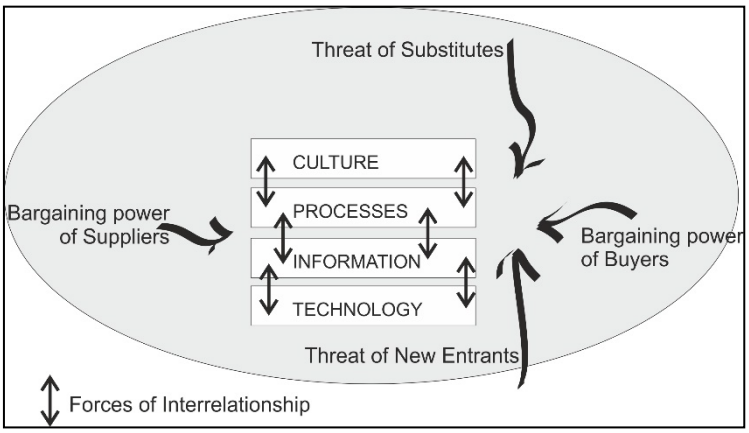

Figure 1: Challenge in understanding the powers and forces impacting enterprise transformations

The research focuses on improving the modelling of the evolution of enterprise dynamics during a transformation seeking a practical approach for multidiscipline study and making the enterprise architecture tooling more feasible for practitioners. The questions related to the research approach are:

1. How to orchestrate multidisciplinary research covering the complex evolution of culture, processes, information, and technology in a way that would create a model for the transformation of the system of systems?
2. How to design an artefact that is perceived beneficial among enterprise architecture practitioners?

The following sections provide an overview of finding answers to the questions above. Section 2 will review the existing knowledge on both the challenges in multidisciplinary research and making practical EA tools. Section 3 explains the transdisciplinary method with spiralling feedback between practice and theory. Section 4 summarises the results both from the practical tool and research method viewpoints. Finally, section 5 concludes the paper.

2. Literature review

Since the research questions are divided into two separate viewpoints: the challenge of multidisciplinarity and practicality of EA, the current theoretical status is illustrated according to these lines of approach.

2.1 Multidisciplinary challenge

Enterprises are often characterised as complex adaptive socio-technical systems (Buckley, 1968) where an organisation is defined as a network of components that interact with each other, typically in a nonlinear fashion (Sayama, 2015). When observing and modelling an enterprise, the researchers need to comprehend micro-level interactions and macro-level emergent behaviour. (Chiva, et al., 2013) Therefore, researchers need to understand how organisational science affects knowledge science and technical science as a team. Unfortunately, each scientist prefers their own mental models or definitions of their branch of research, which hinders gaining a system of systems understanding within the team. For example, engineers like to think and talk about algorithms and ontology, whereas sociologists prefer the jargon of behavioural or cognitive features. Sometimes, the power relationships within the research team may define the understanding of the overall system and create bias to analyses of the data. (Bell & Kozlowski, 2012)

Consequently, the research seeks to minimise bias in the multidisciplinary research process. Multidisciplinarity is “a sequential process whereby researchers in different disciplines work independently, each from their

discipline-specific perspective, to eventually combine efforts to address a common research problem." (Stokols, et al., 2008) The key in researching the dynamics between the stack of enterprise layers is the ability to transfer the impact of powers and forces from one layer or component to another. (Sanders & Wagner, 2011) Therefore, the research seeks the foundational transfer methods from a transdisciplinary approach.

Transdisciplinarity is "an integrative process in which researchers work jointly to develop and use a shared conceptual framework that synthesises and extends discipline-specific theories, concepts, methods, or all three to create new models and language to address a common research problem." (Stokols, et al., 2008) It has been long used to solve 'wicked problems' (Rittel & Webber, 1973) but may present challenges in managing and fusing data within the research team. (Palmer, et al., 2018) The key is the integrative process, which uses a shared conceptual framework that helps synthesise and extend the discipline-specific research. (Bergmann, et al., 2013) The method provides several ways to integrate different disciplines and understandings, such as theoretical framing, research questions, assessment process, modelling and simulation, or boundary objects. (Fiore & Wiltshire, 2016) Of the integration options, the framing seems to fit well to support collaboration over an enterprise architecture problem. (Brown, et al., 2010)

2.2 Enterprise Architecture Challenge

First, the contemporary approach of linear evolution constraints EA practitioners with a predetermined roadmap for enterprise change (United States government Accountability Office, 2011). One of the current challenges from the enterprise affairs viewpoint is the existing frameworks' lack of value stream and evolutionary transformation understanding (Bankauskaite, 2019) or as David Bohm (Ulrich & McWhorter, 2011, p. 61) says:

> *"What is needed is a relativistic theory, to give up altogether the notion that the world is constituted of basic objects or building blocks. Rather one has to view the world in terms of the universal flux of events and processes."*

Furthermore, there has been criticism that the current body of EA knowledge is too narrowly focused (Vargas, et al., 2014), technologically oriented or static (Akhigbe, et al., 2014) (Bryl, 2009) (Korhonen, et al., 2016). Therefore, the practitioners of EA need a more dynamic set of tools to understand the complexity of enterprise transformation.

Second, the realisation of the EA benefits is not straightforward. Besides the apparent technical issues, the concern is also in socio-political-cultural matters. (Wan, et al., 2013) Therefore, the scope of multidisciplinary research needs to be more inclusive. Hence, the layers describing an enterprise include cultural aspects concerning the environment. Fortunately, enterprise architecture has been previously used to help in unifying transdisciplinary research processes. (Yamamoto, 2019)

In conclusion, a benefit perceivable from the EA viewpoint requires a model that simplifies a complex socio-technical organisation's flux of events and processes. Next, the paper proposes an approach to improve the transdisciplinary research orchestration to further reach the complexity of an organisation and create a practical set of tools to realise the benefits of a clearer understanding of dynamics in transformation.

3. Research method

The research process follows the sequence of Design Science Research Framework (Hevner & Chatterjee, 2010) that introduces the problem, designs the artefact, demonstrates its applicability, and evaluates its feasibility. However, despite the engineered artefact outcome, complex adaptive systems research requires a transdisciplinary approach and multidimensional research design. Furthermore, the research chooses to view the challenge from a pragmatic position (Creswell, 2014, p. 11) because of the emergent nature of the challenge and the aim of the research:

1. Firstly, the challenge has emerged to the author and his colleagues over the years practising enterprise architecture. The long experience gathered over the years has led to seeking a broader context for the possible causes of failures in transformation. Therefore, the research is reaching out along the social, historical, political, and technical dimensions in an attempt to understand the broader phenomena.
2. Secondly, the aim is to provide a feasible tool for enterprise architects to understand and predict better the digital transformation of armed forces. Therefore, the overall research method follows design science focusing on problem-solving and designing an artificial tool (Dresch & Anatunes, 2015, pp. 11-13). Each partial research tries to use the applicable methods of the chosen scientific approach.

Therefore, the research uses mixed methods to understand the socio-technical evolution (Trist & Bamforth, 1951) from an interpretive viewpoint (Blumberg, et al., 2014, pp. 16-18).

Consequently, the flow of the research was divided into two slopes: The deductive approach to capture the bigger picture of the phenomena and the inductive approach to see if the details support the bigger picture. The research storyline is illustrated in Figure 2.

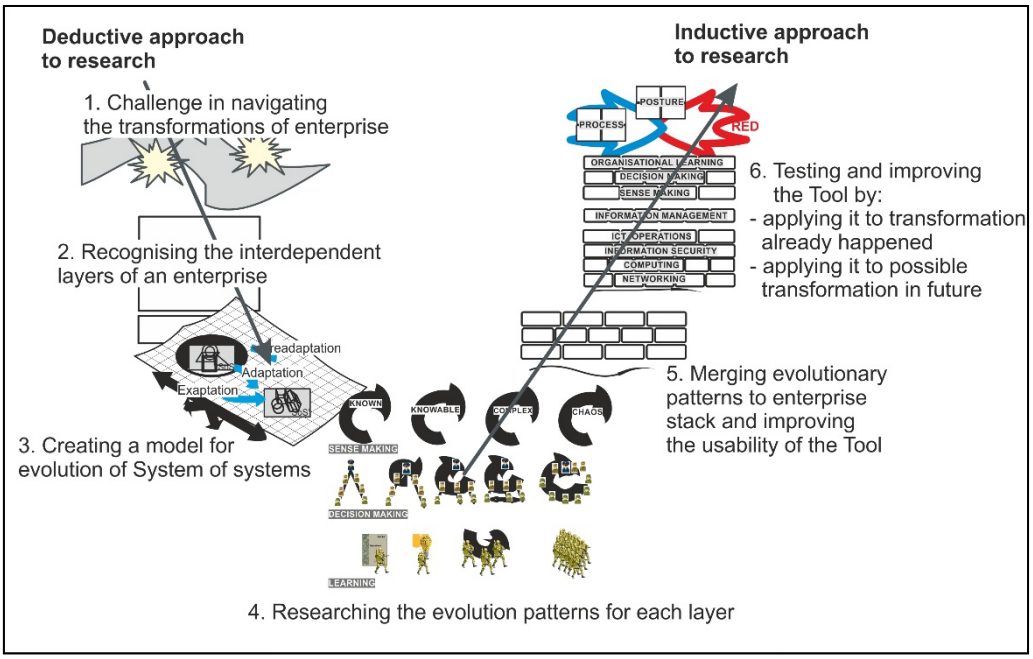

Figure 2: The two slope storyline of the research design

Because of the transdisciplinary nature, the research design created the necessary theoretical frames (Bergmann, et al., 2013) to integrate all the science-specific parts of research. These frameworks included:

- A generic business model (1, see Figure 2) and its evolution from a historical perspective for an organisation in the given context,
- An enterprise model describing the independent but relational layers of enterprise structure (2), and
- A model of dynamics in an open socio-technical system (3) to study the evolution of an organisation.

Further on, armed with these frameworks, the research was divided into five pieces of research (in lines of strategy and culture, processes, information, information security, and technology) to study the evolution of each layer separately (4). The layers were chosen based on the ontologies of the TOGAF architecture framework (Harrison, 2013) to understand how the different components at each layer interact in transformation. Each layer of lifeline was constructed separately from a post-positivistic view (Creswell, 2014, p. 7) but used a common ontology for the organisational evolution based mainly on Mokyr's knowledge economy model (Mokyr, 2002).

Table 1 illustrates the approaches and methods used in sub-studies. Each study used the appropriate scientific approach without forgetting the complexity of the bigger picture. For example, most evolutionary studies used the model deducted and tested in Report 1. Nevertheless, Report 2 used historical reasoning (McCullagh, 1984), and Report 3 used the path-creation model (Garud & Karnoe, 2013) to triangulate the primary evolutionary approach defined in Report 1. Since the foremost challenge was to manage the evolution of enterprise architecture, the time dimension is primarily longitudinal. However, the demonstration and evaluation of the holistic architecture model used a cross-sectional approach because of the practical scope of architecture work in assessing an existing situation and analysing optional paths for the development ahead.

Table 1: List of mono-disciplinary reports and their main research design

Report vs Research Approach	***Appropriate scientific approach***	***Data***	***Research Methodology***	***Time dimension***
1. Evolution of the socio-technical system	Systems	Extreme case sampling of historical data	Experiment	Longitudinal
2. Affairs & Culture	History	Heterogeneous sampling of historical data	Case study, experiment	Longitudinal
3. Knowledge management & Culture	Knowledge	Typical case sampling of historical data	Experiment	Longitudinal
4. Information management & Culture	Engineering	Typical case sampling of historical data	Design, Demonstration, Evaluation	Longitudinal
5. Information security & Security culture	Engineering	Typical case sampling of historical data	Survey	Longitudinal
6. ICT architecture	Engineering	Heterogeneous sampling of observations and historical data	Case study	Longitudinal
7. Enterprise architecture in change management	Design	Heterogeneous sampling of case study data	Demonstration = Experimentation with case study data	Cross-sectional
8. EA tool helping to apply artificial intelligence in an enterprise	Design	Heterogeneous sampling	Demonstration = Experimentation with case study data	Cross-sectional

After the deductive slope, the inductive design research took over since the artefact's purpose was to predict the journey of transformation better. First, it started designing and developing a comprehensive schematic framework for each layer of enterprise structure with a lifeline of the featured evolution for each layer (5). The ontological paradigm assumed enterprise as a combination of interacting systems made of interdependent components that are affected when engaging the environment in a manner that is not evident by direct observation (Sayama, 2015, pp. 3-9). Therefore, the two-dimensional dynamic enterprise architecture tool went through cycles of testing in practice (Gummersson, 2017) and adjusting the theoretical model (Blumberg, et al., 2014, pp. 20-24), as illustrated in Figure 3. The spiralling approach was inspired by the ways of agile development (McMahon, 2011) and spiral acquisition (Boehm, 1988) and driven by the requirements for the Enterprise Architecture body of knowledge (Whittle & Myrick, 2005) and the reality of practitioners' work.

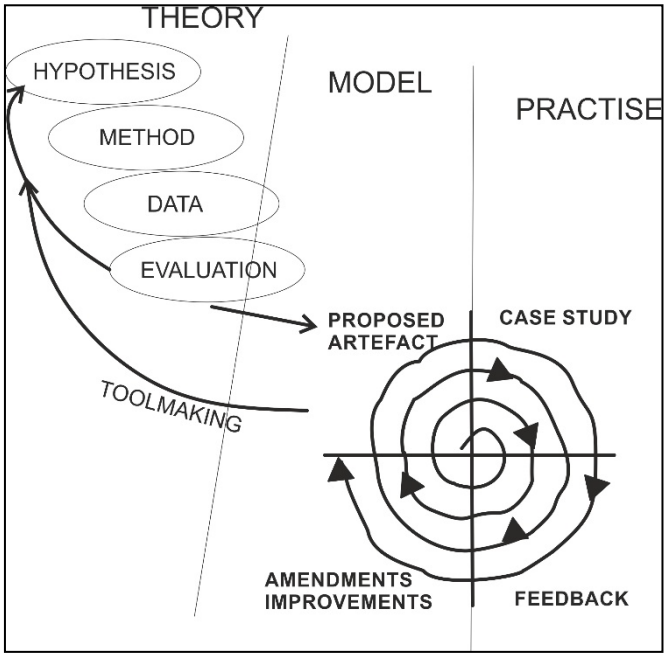

Figure 3: Iterative method in improving the feasibility of an academic artefact

Eventually, the researchers created a holistic system model (EA tool) and demonstrated it to confirm the parts' feasibility and the whole model (Weerakkody, 2015, p. 23). The demonstration included two scenarios (6): post-analysis of transformation and pre-analysis of possible futures. First, the post-change demonstration included experimentation where a group of seasoned enterprise architects analysed three different military transformations after their implementation. The aim was to evaluate the designed EA tool in two measurable dimensions:

1. Ability to define stages on the EA and foresee the transformation challenges of evolution (Akhigbe, et al., 2014) and forces of change from within and outside of the enterprise (Geels, 2002),
2. Ability to focus efforts over the three phases of organisational change (Unfreeze, move, and refreeze) (Cameron & Green, 2012, pp. 120-123).

Second, the pre-analysis of the EA tool included experimentation where a group of enterprise architects analysed how an organisation could gain benefits by utilising features of Artificial Intelligence (AI). The demonstration aimed to apply the tool in three measurable missions of an Enterprise Architecture:

1. Enterprise journey to its current posture, capabilities, and structure (Morecroft, 2015),
2. Forces that may help or hinder the enterprise in their further developments (Maisel & Cokins, 2014), and
3. Ability to address the AI-specific (Bostrom, 2014, pp. 95-109) opportunities or challenges and how they may be exploited or mitigated (Mokyr, 1998).

4. Results and discussion

The results of this research project can be approached from two points of view: 1. the feasibility of the engineered artefact (EA Tool) for the Enterprise Architecture practitioners, and 2. the novel way of solving research problems in the evolution of a complex socio-technical, adaptive system for academia.

4.1 The EA Tool

The research designed an EA tool for EA practitioners (Mattila, 2020). When demonstrating and evaluating the EA tool, it appeared to fulfil the standard requirements for an EA model satisfactorily, addressed the particular challenges in modelling the dynamics of enterprise evolution, and did well in advising how to implement artificial intelligence features in an enterprise. Therefore, the engineering tool met the expectations for quality and usefulness in (Mattila, 2020, pp. 48-49):

- Illustrating the dynamism within the layers of enterprise structure, and
- Assessing the impact of interrelationships between the layers, inside and outside of the enterprise as shown in Figure 4.

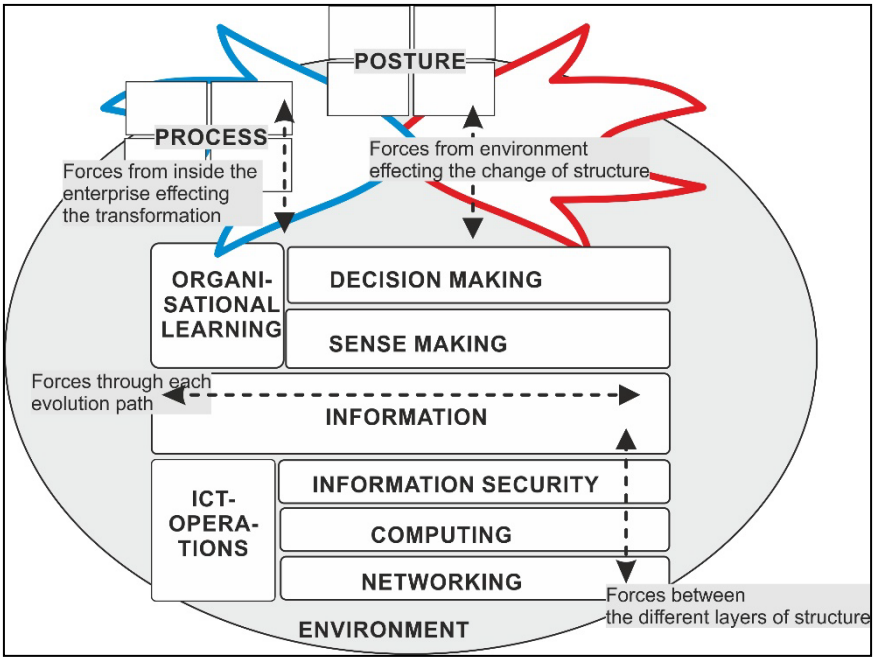

Figure 4: Recognising the interrelation forces between the layers and components of an enterprise

From theoretical and practical viewpoints, the EA Tool provides potential advantages in ways to (Mattila, 2020, pp. 50-51):

1. Analyse the strategic transformation ability of both competitors and their organisations.
2. Plan and implement a successful, holistic transformation of an enterprise.
3. Require and build more integrated business capabilities based on a layered system of systems architectures.
4. Manage small changes in the continuous development of business capabilities.
5. Improve the integration of existing systems and components of an enterprise.

Following the nature of design science, the EA tool was demonstrated in two separate case studies using different measurement approaches for quality: 1. explaining an enterprise transformation after it has happened, and 2. helping to foresee opportunities and challenges in adopting emerging technology. Therefore, the feasibility evaluation was triangulated with two independent groups and viewpoints. The practitioners contributing to these case studies were fully supported through the process, so there may be challenges to utilising the EA tool independently. Through additional training and educational material, the skill required will be achieved. Furthermore, the small number of researchers and contributing practitioners (two crews of five people) leave the research open to the bias of constrained focus and competency. Further practice of the EA tool will mitigate this bias. Since the data used for the research was from armed forces only and the goal was to understand transformations of western military enterprises, the applicability of the EA tool may prove specific to similar organisations only.

4.2 The Research Method

The research project faced the following research methodological challenges, as illustrated in Figure 5, in seeking a better understanding of enterprise transformations:

A. How to keep multidisciplinary research projects on course and transfer findings from one science to other fields of science?
B. How to create a feasible artefact that meets the expectations of the body of EA knowledge and practitioners' reality?

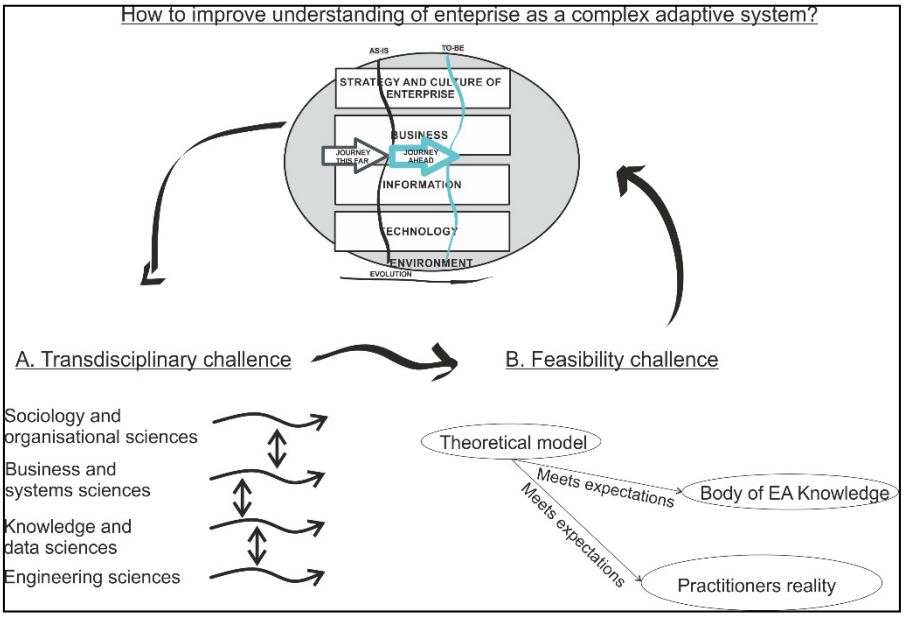

Figure 5: Challenges for research methodology

First, the framing method of transdisciplinary research kept the partial studies aligned within the holistic model of enterprise evolution, business model and interacting forces. Hence, the results of each partial study were fluently interpreted with other results when the layered dynamic model of the enterprise was composed. Furthermore, the small number of researchers made it easier to orchestrate the research process, so challenges may emerge with a larger group of researchers. Wider research teams should apply normal project management practices to mitigate the challenge of size.

Second, the spiralling method between theory and practice assisted in adjusting the theoretical model to meet the expectations of both the body of EA knowledge and practitioners' reality. The spiral included case studies engaging small groups of EA practitioners, and lessons were collected back to model and hypothesis formulation. However, the research was focused on the defence sector where the architecture taxonomy may be more established than in other sectors. Established terms and definitions may help to scale the EA tool in other sectors.

5. Conclusions

The complex socio-technical, adaptive system called enterprise is composed of various layers and components according to the practice of enterprise architecture (EA). The EA has been supporting the enterprise in its organisational transformations since the 1990s. Nevertheless, there is evidence of several partial or complete failures in the recent history of digital transformations. Hence, the main research question is "How to model the enterprise evolution more clearly to anticipate the challenges of its transformation"?

Modelling the enterprise requires reaching out along the social, historical, political, and technical dimensions trying to understand the transformation. Furthermore, the theory needs to be feasible for practitioners to create a more detailed account of the dynamics of the case. From the research design viewpoint, the main question required answers to two sub-questions:

1. How to orchestrate multidisciplinary research covering the complex evolution of culture, processes, information, and technology in a way that would create a model for the transformation of system of systems?
2. How to design an artefact that is perceived beneficial among enterprise architecture practitioners?

The multidisciplinary challenge was mitigated by a transdisciplinary approach that allowed the transfer of force vectors from one particular research to another. The framing appeared as an essential tool to align each monodisciplinary study and focus on engineering needs. In this research, it was imperative to approach the problem first from a deductive view and define the three dimensions of enterprise evolution (business model, interdependency model and model of dynamics) for the frames of specialised studies.

Spiralling between scientific methods and enterprise architecture practices improved the feasibility of the EA tool in daily architecture work. Furthermore, the intensive feedback loop from practise to theory provided additional empirical data for conforming to the results and adjusting further the model. The significance of the artefact produced as a result of the research was proven both in retrospect analysis and forward-looking evaluation, especially in the chosen area of business. Furthermore, the research method provided a novel way to combine multidiscipline studies with the engineered design of an artefact within one project. Naturally, the detailed research design may not appear as a scalable practice to other fields of business, but the generic approach may help other business researchers to create an improved understanding in their specific fields.

The main limitations of this research emerge from the small size of the original research group, tight focus on the defence sector, and from the variety of understanding and philosophy between disciplines. Therefore, there is room to improve the current model with a wider number of cases studied by broader groups of researchers and practitioners. Established taxonomy and project management practices may support the scaling of the research method. The profound challenge of knowledge transfer between separate disciplines was mitigated in an effort to improve the understanding of the evolution of the complex dynamic military enterprise. A transdisciplinary approach with established architecture taxonomy and motivated EA practitioners were the key enablers in this accomplishment.

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Brand Awareness and Promotion in Social Networks Based on the Example of a Lithuanian Supermarket Chain

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Abstract: With the rapid spread of technology, consumers spend most of their free time on computers, smartphones, and social networks. It is becoming increasingly difficult for businesses to reach the consumer directly, and more and more businesses are reorganizing all or part of the electronic space. This process was particularly evident during the COVID-19 pandemic. Merchants are discovering ever new ways to present their goods and services. Thus, the changing needs of the user also change the means of promotion. However, the question constantly arises, what factors influence one or another consumer's choice, what increases the brand awareness, how to promote it most effectively on social networks? We carried out a systematic and comparative analysis of the concepts published in the scientific literature, a study of the brand, brand awareness, brand promotion concepts, and factors increasing the brand awareness. The article aims to identify the factors that increase brand awareness and, based on the results of the Eye-tracking system research, to make suggestions for increasing brand awareness on social networks. Research methods: a systematic and comparative analysis of concepts and methods published in the scientific literature, statistical processing, expert survey, research of the Eye-tracking system, multicriteria evaluation.

Keywords: brand, brand awareness, Eye-tracking system, multicriteria evaluation, expert survey

1. Introduction

Branding is one of the most important marketing tools used to increase visibility. However, with the current abundance of brands and advances in technology, this is becoming increasingly difficult. The internet is becoming more and more pervasive in every consumer's life, with consumers spending most of their free time on computers, smartphones and social networks. Currently, the most popular advertising is on social networks, forums and similar communication sites. In 2019, 79% of businesses used online social media, and this figure is rising. Among the fastest growing tools are social networks. Almost everyone who has internet access also uses different social networks. So, in today's world, it is compelling for a company to take advantage of them.

According to a NordVPN study conducted in June 2021 (Higgins 2021), Lithuanians spend 25 years, 3 months and 5 days online in their lifetime. That's almost a third of their lives. People who use the internet for personal purposes do so mostly for networking; reading news and magazines; and looking for information about goods and services. As many as 74.3% of people use the internet on a daily basis. In terms of occupation, the most intensive daily use of the internet is by schoolchildren and students (97.6%), while the most moderate use is by people of retirement age (31.2%).

Therefore, in order to increase the brand awareness, it is necessary analysing and understanding what consumers want and seek when they go online. According to (Adcock, D.; Halborg, A.; Ross, 2001), the main feature that differentiates consumers is that online consumers have a computer and the internet. The aim will be to determine what factors increase the brand awareness, how the consumer searches for information on the Internet and what should be done to increase brand awareness.

2. Brand

A brand is any distinctive set of words, phrases, letters, numerals, drawings, designs, shapes, colours, logos, labels or combinations of these components intended to distinguish goods or services. In many countries, remarks, advertising slogans, film and book titles are also considered trademarks. The following table shows different authors' conceptions of trademarks (Table 1).

Table 1: Concept of brand

Author, year	Concept
National Patent Office (2010)	A trademark (or simply mark) is a sign that identifies and distinguishes one company's products from another company's products in the market. In many countries, remarks, advertising slogans, film and book titles are also considered trademarks.
Davidavičienė, Jezukevičiūtė (2013)	A brand is a company's visual identity, consisting of tangible and intangible factors, which represents the company to consumers, and differentiates it from competitors and increases its value to creditors (shareholders, etc.).
Kotler and Armstrong (2015)	A brand is created when a product is given a special meaning - a name, logo or other form of identification - that distinguishes one seller's goods or services from those of competitors.
Schroeder (2017)	The brand implies an understanding of the management context, cultural processes, which include historical context, ethical issues, consumer reaction and regulation.
The Republic of Lithuania Law on Trade Marks (2000)	A trademark may consist of words, names of persons, names, artistic pseudonyms, company names, slogans, letters, numerals, drawings, emblems, three-dimensional forms (the exterior of the products, their packaging or container), a colour or combination of colours, a composition of colours, and any combination of the signs referred to in this Article.
Grubor, A., Milovanov, O. (2017)	Brand is a unique blend of functional and emotional characteristic perceived by consumers as an additional value, unique experience and fulfilled promise. It has a symbolic value different from everything that is available in reality, and ability to represent interests that go beyond the brand itself.
American Marketing Association, 2020	A brand is a name, term, design, symbol or any other feature that identifies one seller's good or service as distinct from those of other sellers.
Kotler and Keller, 2007	Brand image is defined as perceptions about a brand as reflected by the brand associations held in consumer memory and consists of four categories: Types of Brand Association, Favourability of Brand Associations, Strength of Brand Associations, Uniqueness of Brand Associations.

An analysis of the definitions by different scholars shows that they have changed little over time. In all cases, the brand is referred to as a symbol or visual device that helps to distinguish the product or service of a particular company from other companies.

Brand awareness is about reputation, distinctiveness and market position (Kautish, Khare and Sharma, 2021). Various studies (Kotler, 2011) show that buyers are willing to pay more for a product with a well-known brand than for the exact same product without a brand. (Kapferer, 2012) argues that brand awareness is identified with aspects such as trust, reliability, availability, high quality, uniqueness.

Often, a brand has an emotional connection with the consumer. It's nice to get personal attention, or wearing a certain brand builds self-esteem, and many other things that can be associated with a brand. How a company promotes, and what strategy it chooses in positioning a brand, determines how it is perceived and attached to by consumers. If a brand provides high value to the consumer, it will certainly have no competitors, and the consumer will choose a brand that they know and trust (Murphy, 1998). According to (Urbanskienė, R.; Vaitkienė, 2006), brand awareness is the ability of a potential buyer to recognise or recall that a brand is part of a certain product category. Išoraitė (Išoraitė, 2018) divides brand awareness into two parts: brand recognition and well-known brands. Meanwhile, Koniewski (Koniewski, 2012) identified five levels of brand awareness: negative associations caused by the company or the brand; company reputation; brand recognition; preference; and consumer loyalty.

To sum up, brands are influential in shaping consumer opinion. If a brand meets consumers' expectations, they are likely to become loyal to the brand.

2.1 Branding using social networks

Social networks are a fast-growing online marketing tool. Lithuanian researchers (Vilkaitė-Vaitonė, 2015; Trakimavičiūtė, 2017) in their scientific works investigated both social networks themselves and their application in business. Pei, Chakraborty and Sycara (Pei, Chakraborty and Sycara, 2015) presented the advantages and

threats of social networks. According to Bakanauskas and Vanagienė (Bakanauskas, A.; Vanagienė, 2012), social networks have become so popular because 'people can anonymously meet others with the same fears, problems, or interests, check their beliefs, or find like-minded people by discussing various topics'. As a result, social networks have become very popular for promoting goods or services and for communicating with consumers or potential customers in a faster and more useful way. If used properly, social networking can be the best way to promote your brand.

Social networks are very popular because of their convenience and simplicity. According to Bakanauskas and Vanagienė (Bakanauskas, A.; Vanagienė, 2012), 'social networks are zones of comfortable, unrestricted communication that can be accessed from anywhere, anytime. These are usually bulletin boards, forums, event calendars, newsletters and anything else that allows users with similar interests to communicate publicly or anonymously'.

In 2021, there will be just over 2.8 billion people in the world using at least one social network. According to be1st.agency, the top three social networks are FACEBOOK; INSTAGRAM; TWITTER. Do I need social networks to promote my brand? It is undoubtedly one of the most important benefits for an organisation today. As Bakanauskas (2012) says, 'it is essential for an organisation and a brand to promote itself on social networks, i.e., to set up forums, bulletin boards, etc. on the website. This builds a strong community of consumers and loyalty to the organisation, brand, products and services. Recommendations from loyal customers attract new customers, which leads to sales growth'. (Bakanauskas, A.; Vanagienė, 2012).

Modern technology offers every opportunity to promote your brand in cyberspace. As Davidavičienė and Jezukevičiūtė (2013) state, 'branding in social networks is inseparable from emotional branding'. According to the authors, it includes three emotional elements of branding in social networks: personalisation; communication; brand experience.

Sometimes a brand can face difficulties on social networks. Consumers are very considerate of the opinions of other online consumers. The point is that bad reviews spread much faster than good ones. Even one negative review can spread quickly on social networks and have a significant impact on sales. But one good review is no longer enough to rebuild trust. Consumers will look for different opinions from as many consumers as possible. Therefore, brand advertising on social networks must be controlled much more responsibly than it seems at first sight.

3. Methodology

The study was carried out in several stages:
Stage 1. A questionnaire survey was carried out to find out the brand awareness and promotion of a Lithuanian supermarket chain on social networks. 144 respondents took part in the survey. The survey was carried out between August and October 2021.

Stage 2. An expert survey was carried out to assess the consistency of the experts' views. The aim of this survey was to determine the experts' attitudes towards the viral advertising of the Lithuanian supermarket chain. The agreement between the opinions of the ten experts participating in the survey is assessed by Kendall's concordance coefficient W (1)

$$W=\frac{12\tilde{S}}{k^2(n^3-n)} \quad (1)$$

$$\tilde{S}=\sum_{j=1}^{n}(\tilde{R}_j-\frac{\tilde{R}_1+\tilde{R}_2+....+\tilde{R}_n}{n})^2=\sum_{j=1}^{n}(\tilde{R}_j-\frac{k(n+1)}{2})^2, \quad (2)$$

where:
x_{ij}- is the value of the j-th expert's estimate of the i-th variable.
$\tilde{R}_j$ - the sum of the ranks of the j-th, i.e. $=R_1+R_2+....+R_k$
n – sample size;

Stage 3. The weights of the factors and their individual groups were determined by the statistical average method according to formula (4):

$$w=\frac{\bar{s}_i}{\sum_{i=1}^{m}\bar{s}} \quad (3)$$

where, $\bar{s}_i$ is the statistical average

The weighting factor shall take values between 0 and 1. The sum of the weighting factors for each group of factors should be 1.

Stage 4. SAW (Simple Additive Weighting) method (Ginevičius, Podvezko and Mikelis, 2004; Ginevičius and Podvezko, 2008; Zavadskas and Turskis, 2011; Lazauskas, Zavadskas and Šaparauskas, 2015) (5):

$$S_j = \sum_{i=1}^{m} w_i \tilde{r}_{ij}, \quad (5)$$

where:
S_j – is the multi-criteria evaluation value of alternative j;
ω_i – is the weight of the i-th indicator;
r_{ij} – is the normalised value of the i-th indicator for the j-th alternative

The normalisation of the original data is carried out according to formula 6 (Ginevičius and Podvezko, 2008)

$$\tilde{r}_{ij} = \frac{r_{ij}}{\sum_{j=1}^{n} r_{ij}}, \quad (6)$$

where:
r_{ij} – is the value of the i-th indicator for the j-th object.

Stage 5. Biometric testing of respondents to find out the brand awareness of the supermarket chain. Biometrics include fingerprints, iris scanning and voice recognition (Kaklauskas, Krutinis and Seniut, 2009; Kazlauskas, A.; Zavadskas, 2010).

Business also can benefit from biotechnology. When setting up an e-business, it is possible to analyse how users search for information, and where they look first. This is particularly important in the design and layout of the website. 'Eye-Tracking is a technology that tracks eye movement or the point at which your eyes focus on an object'. This process is filmed and stored in a database. During testing, the following features are recorded: the coordinates of the direction of gaze, the duration, the sequence of glances, etc. On this basis, special maps are created using mathematical methods.

Biometric devices can therefore be used to learn many things about a person's behaviour. Eye-Tracking allows us to determine user's behaviour in e-shops, i.e., where they look for information first and where they focus their attention. This analysis enables companies to design websites that are user-friendly. The correct presentation of information in the virtual space will attract more potential customers, which will enable companies to succeed.

4. Results of the study

The Lithuanian retail chain in question is engaged in the wholesale and retail trade of construction and finishing products. It has been operating successfully since 2000. It currently operates twenty-four stores. The chain employs around 800 people. The market survey revealed that spontaneous awareness of the chain is only 8.4 %, while the awareness of the named competitors is 70.1 %. In contrast, the awareness of the described chain is 55.6 %, while the awareness of the named competitors is 95.9 %. Respondents usually find out about promotional campaigns on the internet. 144 respondents took part in the survey. The majority of respondents were young people aged 19-25 (84.7%), with older young people aged 26-35 (10.4%) also taking part. The survey was mainly targeted at young people, and the selected segment was young people aged 19-25. The majority of participants were women (76.4%). The income distribution of the respondents varied. This implies that both employed and unemployed people participated in the survey. This allowed us to assess whether people with different incomes have the same perception of the Lithuanian supermarket brand, social networks and advertising for them. Social networks are used by 96.5% of respondents. Only a very small proportion of consumers appear to not use social networks. It can be concluded that it is beneficial to place advertisements on social networks, as almost all consumers use them and the likelihood of the advertisement being noticed is very high. The social network with the highest popularity is Facebook (51.5% of the respondents giving such an answer). This suggests that the most useful place to place an advertisement would be on Facebook. However, some users have a negative view of advertising on social networks. 28.5% of users never open ads and 14.6% use ad-blocking apps. 51.4% of respondents only open ads if it is a product they are interested in and only a very small proportion (2.1%) always open any ads. This suggests that the advertising must be interesting. Because

the majority will open an advertisement if it catches their attention. Therefore, it has to be interesting and unique.

Consumers use social networks not only to communicate, but also to search for different information about certain products. The majority of respondents said they look for discounts on social networks (34%). A slightly smaller proportion said they were looking for a more detailed description of the product or service (21.3%). Similarly, there was a similar distribution of opinions when it comes to purchasing a product or service and getting to know new products (almost 16%). It can be concluded that consumers are most attracted by discounts. It can be argued that in order to interest and attract consumers to a product or service, it is necessary to offer certain discounts or promotions. An interested consumer will definitely look at the advertisement and will then be interested in the product or service itself. The statements made in the survey about social networks were rated by respondents on a five-point scale (Table 2).

Table 2: Influence of social networks on respondents

Please rate the following statements (circle the number that applies to you) (1 - strongly disagree, 2 - disagree, 3 - neither agree nor disagree, 4 - agree, 5 - strongly agree).					
	1	2	3	4	5
I always read product reviews on social networks.	22.3%	21.6%	28.8%	18.0%	9.4%
If I'm interested in a brand, I search for it on social networks.	22.1%	12.1%	21.4%	30.0%	14.3%
I buy goods that are advertised on social networks.	34.3%	30.7%	27.9%	5.0%	2.1%
I always watch viral ads on social networks (viral ads are different videos about a product).	45.0%	24.3%	20.7%	5.7%	4.3%

When asked whether consumers read product reviews, the majority of respondents gave a moderate answer (28.8%), while 27.4% agreed with this statement. This suggests that the majority of consumers do read product reviews on social networks, which is an important factor for them. The majority of respondents (30.0%) agreed that they will search for products of interest on social networks. 14.3% strongly agreed and 21.4% moderately agreed with this statement. It can be said that the majority of consumers search for products on social networks. The majority of respondents search for information but do not intend to buy the goods, as 65.1% of respondents stated. A large proportion of consumers also mentioned that they do not watch viral advertisements on social networks (69.3%). Reviews on social networks have a significant impact on the product. Consumers tend to read and be interested in reviews, but do not trust all of them. The majority (37.5%) trust reviews written by people they know. Similarly, some consumers only trust reviews when they find a lot of good things to say about a product or service (24.3%). It can be argued that it is equally important to have a lot of good feedback on a product or service as it is to have good advertising. The brand also has an influence on the purchase of a product. 66.7% of respondents say that the brand influences the purchase of a product. Therefore, most consumers will buy a product that they have already seen, heard or tried. In this case, advertising is also useful, because if a consumer sees a product on social networks, they will remember it and are likely to choose it.

When shopping in a Lithuanian supermarket chain, respondents mentioned that they pay most attention to price (34.0%) and quality (42.2%). These are the main factors taken into account by consumers. Brand is important for only 11.7% of respondents. Almost all consumers mention that they have seen an advertisement for a Lithuanian supermarket chain (95.8%).

It can be said that the Lithuanian supermarket chain brand is popular and well-known. A large proportion of consumers have also seen advertisements related to the brand. When asked where they saw advertising most often, consumers mentioned different sources. Most consumers saw advertisements on television (30.4%), while a slightly smaller proportion saw advertisements on video portals such as Youtube (28.3%). Only 23.6% of respondents saw advertising on social networks. It can be concluded that there is a low visibility of this product on social networks. Therefore, in order to broaden and increase the popularity of the product among young people, more attention should be paid to advertising on social networks. The concordance between the experts is statistically significant and close to 1 (0.78), indicating that the experts have been chosen appropriately.

4.1 Multi-criteria research on branding in social networks

The last study to be carried out is a multi-criteria evaluation method. This research method was used to investigate consumers' attitudes towards viral advertising of a Lithuanian supermarket chain. This will allow an

assessment of whether the advertising is appropriate, what could be improved and whether the advertising will be suitable for use on social networks.

In the multi-criteria analysis, the factors used to evaluate viral advertising were selected. All the factors were grouped into specific categories: the image of the ad, social network factors, Lithuanian shopping network factors, other factors such as the type of ad, the position of the ad on social networks, etc. Each factor is scored from 1 to 3 (the factors and the scored values are shown in Table 3). Respondents were asked to select the value they considered most relevant for the advertisement. A total of ten respondents took part in the evaluation.

Table 3: Factors and their values for viral advertising, social networks and the Lithuanian shopping network

Advertising image	*Value*	*Scores*
Eye-catching colours	Appropriate	3
	Partially appropriate	2
	Inappropriate	1
Informativeness of advertising	Sufficient	3
	Moderate	2
	Insufficient	1
Video material used in advertising	Appropriate for advertising	3
	Partially appropriate	2
	Inappropriate for advertising	1
Duration of the advertisement	Appropriate	3
	Average	2
	Inappropriate	1
Social networking factors	*Value*	*Score*
Using social networks for advertising Facebook, Youtube	Appropriate	3
	Partially appropriate	2
	Inappropriate	1
Reliability of information on socialnetworks	Reliable	3
	Sometimes	2
	Unreliable	1

Lithuanian retail network factors	*Value*	*Score*
Brand awareness of a Lithuanian supermarket chain	Relevant	3
	Moderate	2
	Irrelevant	1
Price	Appropriate	3
	Less appropriate	2
	Inappropriate	1
Name	Appropriate	3
	Less appropriate	2
	Inappropriate	1
Other factors	*Value*	*Score*
Appropriateness of the type of image for viral advertising	Appropriate	3
	Average	2
	Inappropriate	1
Advertising exposure on socialnetworks	Relevant	3
	Moderately relevant	2
	Irrelevant	1
Updating the Lithuanian Trade Network's information on socialnetworks	Relevant	3
	Moderately relevant	2
	Irrelevant	1

In particular, the presentation of advertising was assessed. The final score for the advertising image was 0.81 out of a possible 0.9. This indicated a fairly high expert assessment. It can be concluded that the respondents liked the colour scheme of the video material the most. 90% of the respondents mentioned that the colours of the advertisement were well chosen. The next group to be assessed was social networking factors. The final score for social networking factors was 0.79 out of a possible 0.9. Although this is slightly lower than the previous group, it is also high. 80% of respondents mentioned that the use of social networks for advertising purposes was appropriate and effective. 20% of respondents mentioned that it was a partially appropriate method. Both the advertisement itself and the type of product are important. Respondents gave different ratings to the information provided about the brand on social networks. The third group evaluated was Lithuanian retail network factors. The final factor score was 0.58 out of a possible 0.6. This is almost the maximum. Brand awareness was important for 90% of respondents and only moderately important for 10%. Price was relevant

for 90% of the respondents and less relevant for 10%. 80% of the respondents mentioned that the name of the Lithuanian supermarket chain was relevant because it was Lithuanian, well-known and many people were used to the name and could easily recognise it. 20% of the respondents mentioned that the name was moderately appropriate for a Lithuanian supermarket chain.

The last group to be assessed was other factors. The final score for other factors was 0.48 out of a possible 0.6. This was the lowest score of all the groups. However, it was also quite high. Several factors contributed to the lower score. The type of the promotional video itself (pictures with commentary) was found to be appropriate by 50% of the respondents, but 40% mentioned that the type was moderately appropriate and 10% mentioned that the type was completely inappropriate. Respondents mentioned that it would be more interesting to watch a video made up of filmed clips rather than photos. A new service such as ordering products from a Lithuanian supermarket chain via social networks was not important for 70% of the respondents and 30% of the respondents said it was moderately important. Respondents considered this service to be unnecessary. Information, discounts, news and so on were more important. The position of advertising itself was important for 40% of respondents, i.e. the positioning of the advertisement itself on social networks is important. 60% of respondents mentioned that it was moderately important, because they will use search to find a product and will not pay much attention to advertisements. 70% of the respondents mentioned that regular updates about the product were important. 30% of the respondents considered it moderately important. However, product information needs to be kept up-to-date so that consumers do not forget it.

All results were added together to give a final score. Out of the three possible scores, the final score of 2.65 was obtained from the experts' opinions on the factors of social networks and the Lithuanian shopping network. This confirm that the viral advertising itself was successful and that the Lithuanian supermarket chain is popular and well-known.Some major weaknesses were observed in the technical parameters, such as the choice of the type of advertising and also in social networks, where there is less trust in the information and a lack of certain desirable elements, such as promotions, discounts and so on.

4.2 Biometric brand research in social networks.

The next test was a biometric test. This test method is used in different ways. With the help of this test, human physiology can be investigated, i.e. hearing, vision, voice, etc. Since this study is used to find out how to promote the brand of a Lithuanian supermarket chain on social networks, the iris of the eye is examined. Ten experts took part in the biometric study. They were given two identical tasks each. During the tasks, the equipment recorded how the iris moved. The iris movement trajectory was then saved on a computer in video format. On the computer, the iris movement is represented by a red stripe and the stopping of the gaze by a red circle. The larger the circle, the longer the user has held the gaze in this position. This method is useful for the study in that it will provide insight into where a users' gaze lingers longest, where on the screen their gaze is most often fixed, and where the user looks least often etc. This will allow us to assess where best to place advertisements or other desired information on social networks to maximise visibility.

Ten experts took part in the study and were tasked with finding a Lithuanian retail chain's Facebook profile and a promotional video for the September stationery sale. For the first task, all respondents used search. The gaze is focused in the search box. It was observed that 40% of the experts briefly glanced at the banner ads on the right side of Facebook. The Analysis results shows that the eye is initially drawn briefly to the advertising section. However, the gaze does not stay there and moves on to the search box. All 40% of respondents did the same. The glance at the advertisements was quick and abrupt. Probably, if there was an advertisement for a Lithuanian supermarket chain, they might not even notice it. This can also be explained by the fact that all respondents had a precise task and had already decided that the product was most likely to be found through search.

The second task was a bit more challenging. Respondents were asked to create a promotional video for the September stationery sale. The respondents used the same approach to searching for information as in the first task, and all experts used the search box. In this case, no user's gaze moved sideways. All respondents used the search immediately. The name of the Lithuanian supermarket chain was immediately found on the Facebook profile, but the search for the promotional clip took a while. All respondents focused their gaze on the middle of the page. For all respondents, the gaze wandered in different directions, but was kept fairly centred. 70% of users immediately searched for the video clip on the 'wall' of the profile. The other 30% glanced briefly on the 'wall' and, seeing no video, decided to search in other sections even though the video clip was already visible on the screen. Although the image they were looking for appeared on the screen, it was at the very end of the page

and did not attract attention, since, as mentioned earlier, the respondents' attention was focused on the middle of the page. These users, not finding the video on the 'wall', searched for it in the 'videos' section, where it should logically be. Unfortunately, when they did not find the video, they returned to the homepage and tried again to find the video on the 'wall'. The second time the image was found, as the page was lowered, the image was in the middle and the respondents noticed it. The first task took on average twenty-three seconds to complete. A few respondents completed the task in nineteen seconds and a few took thirty seconds. However, all respondents completed the first task relatively quickly. The second task was slightly more difficult, and therefore respondents performed it quite differently. The second task was completed most quickly in twenty-three seconds. The respondent focused his/her gaze on the centre of the page and found the clip he/she was looking for on the 'wall'. 50% of the other respondents did the same. Their average time to complete the task was thirty-five seconds.

5. Conclusions

Changing attitudes towards online marketing have made it crucial to running a successful business. It has become possible to target certain marketing tools to each individual consumer, according to their interests and activities. Neither place of residence, nor gender, nor age matters. This saves not only time but also money, as it is much easier and cheaper to collect all the necessary data about the consumer and to reach them.

a brand is influential in shaping consumer opinion. If a brand meets consumers' expectations, they are likely to become loyal to that brand. Social networks are one of the most important tools to promote a brand and, not only that, modern technology offers all the possibilities to promote your brand in cyberspace.

The survey shows that a very high proportion of consumers use social networks. The most used social network is Facebook. However, base on the research results , a small proportion of respondents have seen advertisements for the Lithuanian supermarket chain on social networks. Therefore, in order to increase brand awareness among young customers, it is necessary to use Facebook as a brand promotion tool.

The biometric study showed that consumers concentrate their gaze mostly in the middle. If the user has a specific goal, i.e. to find a product that is already known and of interest to them, they will use the search engine without paying much attention to the information on the sides.

The multi-criteria evaluation method resulted in a fairly high score of 2.65 out of 3. This indicates that the viral advertising of the Lithuanian supermarket chain was successful and that the supermarket chain in question is well known. A few major weaknesses were noted in technical parameters such as the choice of the type of advertising. Also in social networks, where there is less trust in the information and a lack of certain desirable elements, such as promotions, discounts and so on. Consumers on social networks often search for discounts and promotions on their favourite goods or services.

The supermarket chain's Facebook profile is difficult to find in the Lithuanian. Users appeared to be distracted by the inappropriate profile picture. A suggestion is that this profile be moved to the first place in the search engine. The type of advertising image that was most acceptable to consumers surveyed was filmed video footage. This may be a more appropriate way for a Lithuanian retailer to advertise a product on social networks. However, the video itself should be as short as possible, preferably under two minutes.

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The Challenges of Writing an Effective Literature Review for Students and new Researchers of Business

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Abstract: The literature review is a key part of a dissertation or journal paper, yet it is also one of the areas that is often the most challenging. The multidisciplinary nature of business and management studies adds to the demands of writing a critical review by deciding which theories, subject areas and texts to interrogate. There are a number of approaches that students and academics might take in writing a literature review that require a differing approach, resources and timeframe. The purpose of this conference paper is to review the literature and develop an understanding of the complexities and challenges faced both by students and new researchers in preparing journal papers. We share our experience as faculty with teaching and writing at undergraduate and postgraduate level, and identify a number of the problems typically faced. Recent trends with regard to the proliferation of open access journals are outlined, and a journal Editor addresses common mistakes that lead to poor submissions and reviews. A popular business school text is amongst those views considered. Specialist types of software for analysis associated with the complexities of Systematic literature reviews are also outlined. We close with guidelines for success and conclusions. More research is encouraged as students now have fewer opportunities to develop the skills required for critical writing.

Keywords: type of literature review, critical review, systematic reviews, narrative reviews

1. Introduction

1.1 Why do students find it a challenge?

Over the past two years we have experienced a continuum of student responses to the requirement to develop an effective literature review (LR). New researchers continue to face challenges in publishing their work, often receiving criticism of the LR. In this paper we aim to identify choices in approach and lessons within the business and management studies field of study. Similarly, our experience of teaching research methods and supervising students in preparing dissertations has revealed a wide range of ability and interest. More recently a growing level of disinterest in undertaking a project and learning research skills has become apparent (Brown and Rich, 2020; Mitchell and Rich, 2020, Mitchell and Rich, 2021). The popularity and recent growth in eBusiness may mean that assumptions underpinning a traditional Business School curriculum cease to exist, or at least are challenged. We are concerned in this paper that the manner in which students and novice researchers, prepare LRs has changed; and we wish to explore how open access publication and student expectations have made an impact see Bennis and O'Toole (2005) and other critiques of Business Schools.

1.1.1 Objectives

We appreciate that a broad range of people embark on Business and Management studies, some have commercial or industrial experience but typically lack research training and skills. PhD students and new researchers continue to be under pressure to publish. These assumptions inform the following objectives:

- Review literature to better understand the issues some have with writing LRs.
- Consider our experience as academics and that of journal editors in identifying the criteria for an effective LR.
- Identify several of the different approaches to writing a LR.
- Appreciate the differing timescales and resource requirements that are necessary.
- Develop guidelines for success.

1.1.2 Structure of this paper

The paper explores the experience of academics in teaching students to write LRs (2.1) as well as an editor in reviewing journal papers (2.3) Different approaches to writing a LR are considered (3.0) along with software and technology support (4.0). Finally, some guidelines (5.0) are developed along with interim conclusions. In this way

we address the experiences of both students writing a literature review, often for the first time; and the frustrations that researchers sometimes experience with submitting journal papers, particularly given the various stylistic approaches to a literature review that are available.

1.2 Multidisciplinary nature of business and management studies

The multidisciplinary nature of business and management studies adds to the demands of writing a critical review and deciding which theories, subject areas and texts to interrogate. This is particularly true of strategic, operational and organisational issues where material would be drawn from a range of traditional functional subjects that require integration and careful interpretation. Business and management students and writers therefore need to cast their net wider than those of a 'pure' science, politics, language etc. However, this is contested as other subject areas will make similar claims. For example, with medicine knowledge of developments in molecular biology, genetics and pharmacology (Collins and Fauser, 2005). In economics a knowledge of politics, sociology, geography may be required to research supply chain, outsourcing and offshoring decisions (Mitchell, 2016).

2. Experience with teaching students and submitting journal papers

2.1 Faculty experience

The authors have many years of experience at a number of schools of teaching research methods, project supervision and as directors of MBA, MSc and BSc programmes. With 'Executive' MBA programmes (typically 5 years work experience), a number of students may already have a PhD, and then experience little difficulty with writing a LR and managing the project process (see Table 1 below for a summary). However, some do lack enthusiasm for this area of study and may neither enjoy the experience nor see the relevance. In recent years a number of taught master degree courses have revised the syllabus to include more group work, live case studies and simulations. As a result, there may be fewer individual assignments with less academic focus, and hence fewer opportunities for students to practice writing a LR, drafting research questions, designing a methodology, collecting and analysing data. Writing a LR is a daunting task for some. An online module (or taught alternative) on academic skills should be taught prior to a research methods module. There are also a range of affordable 'pocket books' available on study skills that are most instructive. Bayes Business School stress in their guidance to undergraduates that writing a LR and dissertation is different from an essay in that it needs to have a distinctive, critical and analytical component. Table 1 is a summary of some of our experiences and the differences at Masters and Bachelor level.

Table 1: Comparison of postgraduate and undergraduate business and management students (authors)

	Postgraduate	**Undergraduate**
Experience/ qualifications	Those with research degrees and previous experience struggle less with writing a LR.	Some recognise the importance for future employment e.g. consultancy, research agencies.
Timing	Early clarity on the topic and research question(s) helps with writing the LR, keeping on track and following the logical sequence of the dissertation.	Use of an option for a shorter 5000 words project (instead of 10000). Other options also becoming popular.
Significance of LR	Often 20% of the dissertation and regarded as a key chapter.	The LR may be 30% of the marks in a full dissertation. Some students prefer something more 'practical' and less abstract. Many doubt the need for a LR if the project is to develop a business plan and struggle to identify contingent areas of literature.
Practice	May not be a chance to practice with assignments as more group work and live cases dominate the curriculum.	One week teaching usually as part of a research methods module, examples and case studies.
Style	Not linear and descriptive, but thematic, comparative and critical.	Some writing workshops available as an option. The choice of supervisor is significant with regard to personal approach and level of commitment.
References	Select by theme and key word, check abstract before selecting.	Less experienced with search techniques using key words and theme headings.

For secondary research the purpose of the LR is to summarise, synthesise and analyse the arguments of others also to critically assess the knowledge that exists and what gaps occur in research related to the field of interest. This should clarify the relationship with the student's research and reveal consistencies, inconsistencies and

controversies with previous research. The LR should guide the subsequent development of an appropriate methodology design and subsequent data collection. The order for action learning and grounded theory approaches are often different but less usual for business and management students. Once relevant papers have been identified (ideally grouped by theme) they should be '*superficially scanned'* and the abstract reviewed to check the paper's suitability in answering the research questions before reading the paper more closely (Table 1 above). Those papers that do not 'fit' the research questions ought to be discarded rather than used to extend the list of references. Developing a draft list of references alongside the LR helps to keep track of sources especially as increasing use is made of online media. Comparing, contrasting and critiquing different authors on a particular topic helps to make the LR more interesting to read as well as avoiding the trappings of plagiarism. A synthesis at the end of a LR helps to highlight the key messages, cross reference the relevant sources and develop a link to the methodology section.

Each year at Bayes Business School, a small number of undergraduate students interested in CSR write their projects in collaboration with the CSR function of an employer. It is hoped to develop this option and offer it to students interested in other areas. While this is a different format, it is very clearly offered as a research activity and students are expected to carry out a LR. The employer is the source of primary data for the project.

2.2 Academic Texts.

A seminal text at Business Schools for research methods offers helpful insight on critical writing (Saunders, 2019 based on Mingers, 2000). Four aspects are identified encouraging students to be sceptical towards rhetoric, tradition, authority, and objectivity (Mingers, 2000). Being critical in reviewing the literature is a combination of skills and the manner with which the text is read and interpreted (Saunders, 2019). This means that students should constantly consider and justify their own critical stance. This takes practice and considerable effort, especially if the student has little experience of writing LRs. Business students will find that subject areas, themes, strands, theories, overlap with one another (Danson and Arshad, 2014). For example, in marketing studies, opportunity and creativity are themes to be understood to develop marketing plans. However, opportunity and creativity themes are also discussed in entrepreneurship when seeking gaps in the market and developing a business plan to address the gap. It is imperative that the LR is clear and consistent over such issues.

2.3 Journal editor

A student wishing to develop a good quality dissertation may also submit to a journal paper. Sometimes this is done in conjunction with a supervisor. PhD students have always been encouraged to publish, and an awareness of the challenges set by the peer review process and journal editors is part of the preparation for a career in academia. It is becoming harder, and arguably taking longer to get papers reviewed and published in 'traditional leading' journals. The views of an editor are helpful in this regard (Jennex, 2015) as it has been suggested that the quality of many LRs is declining (Table 2 below). There has also been a huge rise in open access journals to support global access to research. Some open access journals are labelled as 'predatory' and frowned upon (https://www.nature.com/articles/d41586-019-03759-y), although the distinction is often unclear. This creates confusion amongst researchers (especially those relatively new) and is unfair to those open access journals that do add value and meet a genuine market need. Technology has also impacted the manner in which researchers search for relevant papers and the way they reference and check scripts for plagiarism. Reviewers are encouraged to provide feedback in a positive and constructive manner to address complaints by authors for many years.

Other common mistakes (Jennex, 2015) include authors not having access to relevant papers, weak search criteria, not using original source material, failure to synthesize material and translation issues for non-native speakers. Early career academics suffer the same problem as undergraduates and other specialist students, that more structured guidance would be beneficial.

Table 2: Reasons why reviewers to decline papers (adapted from Jennex, 2015)

Content	The review must be limited to studies that have bearing on its specific research question.
Journals	The scope of the review might limit itself to high-quality journals, or journals in a particularly field of study.
Authors	The study might be restricted to works by certain prominent authors.
Setting	Only studies conducted with specific industries or regions are considered.
Participants or subjects	Studies may be restricted to subjects of a certain gender, work situation, age, or other criteria.
Program or intervention	There might be a distinction made between data that is self-reported versus researcher-measured, or if subjects are self-selected into various groups.
Research design or sampling methodology	Studies might be excluded based on not using a particular research design. Date of publication or of data collection, or duration of data collection
Date of publication	Studies will often be restricted to certain date ranges for data collection, or duration of data collection.
Source of financial support	Studies might be restricted to those receiving non-private funds unless there is a concern that this might be a source of bias in the results.

3. Different approaches to writing a literature review

The traditional or critical narrative style is generally a starting point for students and academics. Different professions favour various styles of LR, as with medical research where in-depth structured evidence is the most common example of systematic LR approaches. There are other styles, and we use the key ones summarised below in Table 3 and in more detail in 3.1 to 3.3. Other approaches tend to be variants, although agreement on the types of approach and descriptions is contested, Danson and Arshad (2014) suggest that over the years, numerous types of LRs have emerged and consider the four main types to be traditional or narrative, systematic, meta-analysis and meta-synthesis. An important distinction is the time typically required and the resources available. A narrative LR 1- 4 weeks, usually by one person whereas a systematic review is more likely to be in excess of 6 months with a small team of researchers that require extensive library facilities. Specialist technical support for data search, storage and analysis may also be required (4.0) below.

Table 3: Types of Literature Review. Adapted from: Grant and Booth (2009)

Approach	Description
Narrative	Generic term: published materials that provide examination of recent or current literature. Can cover wide range of subjects at various levels of completeness and comprehensiveness. May include research findings. Also referred to as 'narrative' style.
Scoping review	Preliminary assessment of potential size and scope of available research literature. Aims to identify nature and extent of research evidence (usually including ongoing research).
Systematic review	Seeks to systematically search for, appraise and synthesize research evidence, often adhering to guidelines on the conduct of a review.

The clarity, validity and auditability with which a LR is developed are key tests of how systematic a process the LR is irrespective of whether it is a simple scoping, a traditional narrative or more comprehensive systematic review (Booth et al, 2021). It is too easy for bias to arise whereby papers are rejected that propose an alternative argument. Resources and time are likely to be constraints, so it is important to fully outline any limitations in the chosen approach.

3.1 Narrative

Saunders (2019) suggests that it is necessary to have clearly defined research question(s) and parameters for the literature search, as well as key words or themes. The literature search may include tertiary sources and the Internet, following up references in articles previously read; scanning and browsing secondary literature. The literature should be synthesised for relevance to the research question(s) and key messages that subsequently inform the methodology. Narrative reviews may be comprehensive and cover a wide range of issues within a given topic, but do not necessarily follow prescribed rules regarding the search for evidence or decisions about relevance and validity. The majority of LRs are narrative rather than systematic (Collins and Fauser, 2005).

3.2 Scoping

Scoping reviews help to determine the coverage of a body of literature on a given topic and give clear indication of the volume of literature and studies available (Mann and Peters et al 2018). Scoping reviews are useful for

examining emerging evidence when it is still unclear what other, more specific questions can be posed and valuably addressed by a more precise systematic review. They can report the types of evidence that address and inform practice in the field and the way the research has been conducted. Scoping reviews are an increasingly a popular methodology to synthesise evidence that can be influential for policy and practice (Colquhoun et al, 2014). However, variability in the labelling, definition, methodology, and reporting currently exists, which limits their potential. The purpose may include identifying the types of available evidence, the key concepts/ definitions; an examination of how research is conducted on a certain topic, the key characteristics or factors related to a concept or knowledge gaps (Mann and Peters et al 2018) . May be used in preparation for a more detailed systematic review.

3.3 Systematic

Systematic reviews use explicit methods to methodically search, critically appraise and synthesize literature on a specific issue (Collins and Fauser, 2005). The systematic review attempts to reduce reviewer bias through objective, reproducible criteria to select relevant individual publications and assess their validity. A systematic review may include a meta-analysis or statistical summary of individual study results. The aggregate of effects from several studies yields an average that is more precise than individual study results. Thus, the systematic review involves explicit, transparent methods which are clearly stated, and reproducible by others. For some review topics, however, the strengths of the systematic review may turn into weaknesses. The primary problem is that the narrow focus and prescribed methods of the systematic review do not allow for comprehensive coverage. Unlikely to be suitable for students or new academics with limited time and resources where a traditional narrative review, in which less explicit methods are the trade-off for broader coverage. Every step of the review, including the search, must be documented for reproducibility. Systematic reviews are most commonly associated with medicine and clinical trials (Georgetown University Dahlgren Memorial Library) Publication bias can cause positive results to become exaggerated as medical researchers are less likely / reluctant to submit bad results. Other fields include IT and more recently HR, operations and supply chain management.

4. Use of Software / Technology

Students usually have access to Google Scholar and university library databases and should be encouraged to use them. MAXQDA may be helpful for developing a comprehensive LR. It works with a wide range of data types and offers powerful tools for LRs, such as reference management, qualitative, vocabulary, and text analysis tools, and more. Highly structured approaches e.g. Systematic LRs, require the use of specialist software and Technology (Carcary, 2018) particularly where a large volume of studies is involved. The use of Computer-assisted (or aided) qualitative data analysis software (CAQDAS) offer tools that assist with qualitative research such as transcription analysis, coding and text interpretation, recursive abstraction, content analysis, discourse analysis, grounded theory methodology. Optimal searches in systematic reviews could search Embase, MEDLINE and Web of Science as a minimum requirement to guarantee adequate and efficient coverage. Most universities have access to this software which is necessary for the highly detailed data analytics associated with the large number of papers.

Table 4: Comparison of Traditional v Systematic Literature Review approaches (adapted from Ferrari (2015); Collins and Fauser (2005) and University of Alabama

	Traditional	Systematic
Authors	One or more authors usually experts in the topic.	Two or more authors are involved in good quality systematic reviews, may comprise experts in the different stages.
Protocol	No study protocols.	Written protocol that includes details of the methods to be used.
Research Question	Range from broad to specific, hypothesis not stated.	Specific question that may have all or some of PICO components e.g. medical research (Population, Intervention, Comparator, and Outcome). Hypothesis is stated.
Search Strategy	No detailed search strategy, search is probably conducted using keywords.	Detailed and comprehensive search strategy is developed.
Sources of Literature	Not usually stated and non-exhaustive, usually well-known articles. Prone to publication bias.	List of databases, websites and other sources of included studies are listed. Published and unpublished literature are considered.
Selection Criteria	No specific selection criteria, usually subjective. Prone to selection bias.	**Specific inclusion and exclusion criteria.**
Critical appraisal	Variable evaluation of study quality or method.	**Rigorous appraisal of study quality.**
Synthesis	**Often qualitative synthesis of evidence.**	Narrative, quantitative or qualitative synthesis.
Conclusions	Sometimes evidence based but can be influenced by author's personal belief.	Conclusions drawn are evidence based.
Reproducibility	Findings cannot be reproduced. Conclusions may be subjective.	**Accurate documentation of method means results can be reproduced**
Update	**Cannot be continuously updated.**	Systematic reviews can be periodically updated to include new evidence

5. Guidelines for success

Having reviewed some of the challenges, issues and alternatives we are left with the question of 'how to decide on what approach to use?' (Snyder, 2019) for a specific type of review. The project research question(s) and purpose of the review should determine the right strategy to use.

Table 5: Defining characteristics of traditional literature reviews, scoping reviews and systematic reviews adapted from Adapted from:

https://bmcmedresmethodol.biomedcentral.com/articles/10.1186/s12874-018-0611-x/tables/1

	Traditional Literature Reviews	Scoping reviews	Systematic reviews
A priori review protocol	No	Yes (some)	Yes
PROSPERO registration of the review protocol	No	No	Yes
Explicit, transparent, peer reviewed search strategy	No (journal dependent)	Yes	Yes
Standardized data extraction forms	No	Yes	Yes
Mandatory Critical Appraisal (Risk of Bias Assessment)	Maybe (should be)	Maybe (should be)	Yes
Synthesis of findings from individual studies and the generation of 'summary' findings	Yes	Yes	Yes

While the systematic review is perhaps the most accurate and rigorous approach to collect articles with certainty that all relevant data have been covered, this approach requires a narrow research question, and might not be feasible or even suitable for all types of projects. This is where a scoping review can be useful, but this approach is also problematic. While the methodology for systematic reviews is straightforward the scoping review process requires tailoring to the specific project. Researchers need to develop their own standards and a detailed plan to ensure the appropriate literature is covered to both answer the research question and be transparent about the process. However, if done properly, this can be a highly effective way of covering more areas and broader

topics than a systematic review can handle. In addition, when it comes to the narrative review, it becomes even more demanding, which puts more responsibility on and requires more skills of the researchers, as there are fewer standards and guidelines for developing a strategy. There is a contradiction here in that for students this is usually seen as the most straightforward and common choice. However, successfully conducting a critical, thematic review and contributing with a new conceptual model or theory, can be significant reward and suit most purposes.

6. Conclusion

Objective 1.1.2a:-Undergraduates find the process of writing a LR demanding if they have received little training in research methods, and have had few opportunities to practice critical writing of a LR with assignments and course work. Exploring what has gone before, finding gaps in literature, identifying relevant theory are important aspects of research. Critical writing, thematic literature search, comparisons of literature is an important skill. Postgraduates often have an advantage especially if they have previously experienced a research degree (2.1).

Objective 1.1.2b: As students, an ability to summarise, synthesise, interpret and justify arguments is key to producing a good LR. As academics, submitting papers to journals can be a demanding process where common mistakes include not having access to relevant papers, weak search criteria, not the using original source material, failure to synthesize the material and translation issues for non-native speakers (2.1-2.3).

Objective 1.1.2c: A key message is the need for an appreciation of critical skills writing, and the possibility that students today may have less chance to write a LR in advance of a dissertation (1.1). There are a number of distinct approaches plus variants that have become popular over the years. Choice of the most popular types is contested and here we have chosen narrative, scoping and systematic. In fields such as medicine, the rigour and ability to repeat and check experimental data makes systematic approaches a clear leader. There are examples of a systematic approach bring taken within business and management e.g. IT and Operations, but this choice is for those who are experienced academics with time, library, budget and software resources. For students with broader research questions and scope a traditional narrative style is in some respects simpler and is commended (3.0).

Objective 1.1.2d: An important distinction is the time and resources that are available. A narrative LR 1- 4 weeks, usually by one person whereas a systematic review is more likely to be in excess of 6 months and with a small team of researchers requiring extensive library facilities. Specialist technical support for data search, storage and analysis may also be required. Software includes MAXQDA, and CAQDAS, see 4.0 (Carcary, 2018).

Objective 1.1.2e: The choice of approach is dependent upon the aim, scope, research questions and experience of the writer. A systematic style is the most rigorous and designed so that reported experiments can be repeated and results checked. However, it is highly structured, time and resource intensive, and requires experience. For students a narrative or traditional style is still demanding but more suitable for business projects (5.0).

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Trait Emotional Intelligence & Leadership: A Study of Managers and Employees

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Abstract: Over the past 30 years, Emotional Intelligence has been gaining ground in the field of business and management. Much has been written about the importance of Emotional Intelligence (EI) in leadership, which overlaps with the concept of management (Young & Dulewicz, 2008). Although, there are many researches into the connection between leadership and emotional intelligence, there seems to be a research gap between Trait Emotional Intelligence and Transformational Leadership (TL). This study examines the effects of the factors of Trait EI (emotionality, self–control, sociability, well–being, adaptability and motivation) (TraitEI, 2021; Petrides, 2009) on the dimensions of Transformational Leadership (vision, inspirational communication, supportive leadership, intellectual stimulation, personal recognition) (Rafferty and Griffin, 2004). Two groups were surveyed for this study. One (with 74 participants) consisted of managers who work in public or private sector' organizations. The other sample (with 120 participants) consisted of employees who work in public or private sector' organizations. The aim of the study was to investigate the connection between Trait EI and Transformational Leadership from the manager's point of view, and from the employees' point of view. Are there any differences between those two points of view? Are there any differences between Trait EI and Transformational Leadership due to the sectors (private – public) of the organizations? The tools used in this research include the following: a) Trait Emotional Intelligence Questionnaire (TEI-QUE SF) by Petrides (2009) and b) Rafferty's and Griffin's (2004) Five Dimensions of Transformational Leadership Test. The current paper hopes to contribute to the comprehension of the linkage among Trait EI and TL on Greek organizations managers', and trigger future empirical research in the area.

Keywords: Trait Emotional Intelligence, Transformational Leadership, connection, managers, employees, organizations

1. Introduction

Over the past few decades, the concept of Emotional Intelligence (EI) has been a major topic in the Human Resources Field and it has been broadly considered as crucial for a leader to be effective. According to Ashkanasy and Tse (2000) transformational leaders are attentive to their own emotions. As a result, they reflect on their emotional behaviors, perceive others' emotions and effectively react to their needs. Moreover, Suciu, Petcu & Cherhes (2010) argue that leaders who underestimate EI are likely to fail due to their lack of ability to inspire followers.

Transformational Leadership (TL) is described as leadership which creates valuable and positive change amongst followers with the goal of developing followers into leaders. TL enhances the motivation, morale and performance of followers through a variety of mechanisms, such as the following: a) connecting the follower sense of identity and self to the mission of the organization, b) being a role model for followers that inspires them and c) understanding the strengths and weaknesses of the followers (Bass & Bass, 2008).

Transformational leadership is associated with many aspects of an organization (Rossidis et al., 2020), such as: job satisfaction (Belias & Koustelios, 2014a; Belias & Koustelios, 2014b; Belias & Koustelios, 2015; Boamah et al., 2018; Belias et al., 2020), change management (Belias & Koustelios, 2014c), performance (Wang et al., 2011), organizational culture (Belias et al, 2017; Ntalakos et al., 2022; Belias et al., 2018) and motivation (Conchie, 2013). Hence, it is very important to examine the parameters which can influence the transformational leadership.

Although there are several researches which suggest that there is a strong positive connection between EI and TL (Leban & Zulauf, 2004; Rubiz, Munz & Bommer, 2005), there are some researchers who argue that there is a mediocre or, at some cases, no connection between EI and TL. For instance, Follesdal et al. (2013) discovered that EI levels did not predict TL; especially when control factors as leaders' ages are used.

The main purpose of the current research is to discover if there is a connection between the factors of Trait EI and the dimensions of TL as far as managers and employees are concerned. In the first part of the paper, there is a literature review of the linkage between Trait Emotional Intelligence and Transformational Leadership. The material used for this paper has been retrieved from scientific pages such as Scopus, Google Scholar and Science Direct. In the second part of the paper there is the methodology and the results of a research which conducted on managers and employees of Greek public/private organizations. The current research hopes to be useful to scholars and practitioners for future reference.

2. Trait Emotional Intelligence

Petrides and Furnham (2000) were the first researchers who introduced the model of Trait Emotional Intelligence (Trait EI) (Petrides, Pita & Kokkinaki, 2007). Trait EI is defined as "a constellation of emotional self-perceptions located at the lower levels of personality hierarchies and it should be investigated primarily with reference to established personality taxonomies; trait EI can be measured via trait emotional intelligence questionnaire" (Petrides, 2010; Petrides, Pita & Kokkinaki, 2007).

In addition, trait EI is the only operational definition in the area that recognizes the inherent subjectivity of emotional experience (Petrides, 2010). Hence, the trait EI facets are personality traits, and not competencies or mental abilities or facilitators as other researchers have suggested (Petrides, 2010). In fact, according to researches, the same genes that are implicated in the development of individual differences in the Big Five personality traits are also responsible for th
e development of individual differences in trait EI (Vernon, Villani, Schermer & Petrides, 2008).
According to London Psychometric Laboratory (Psychometriclab, 2021), which is developed by Petrides and colleagues, there are 15 specific facets which can comprise global trait EI. These facets are grouped into four main factors:

1. Well – Being: describes the facets happiness, optimism and self – esteem
2. Self – Control: describes the facets emotion regulation, impulse control and stress management
3. Emotionality: describes the facets empathy, emotion perception, emotion expression and relationships
4. Sociability: describes the facets emotion management, assertiveness and social awareness

Apart from these 4 main factors, there are two independent factors used to describe the facets adaptability and motivation respectively.

High scores on the above facets are associated with extraversion, mental health, job satisfaction, seniority, popularity, organizational commitment, affective reactions in decision making, sensitivity, overconfidence and social desirability. On the contrary, low scores are correlated with neuroticism, introversion, anxiety, job stress, humility, psychopathology, truancy and rumination (TraitEI, 2021).

3. Transformational Leadership

One of the first researchers who introduced the concept of Transformational Leadership (TL) was James MacGregor Burns (1978). According to Burns (1978), transformational leadership can be recognised on an organization when "leaders and followers help each other to advance to a higher level of moral and motivation" (Allen et al., 2016).

Burn's original ideas were expanded by Bass (1985) to the development of the theory that is best known as Bass's Transformational Leadership Theory. According to Bass (1985), transformational leader can be defined based on the impact that he has on his followers (Choi et al., 2016). In other words, transformational leaders gain trust, respect and admiration from their followers (Choi et al., 2016). Similarly, Allen et al. (2016) present a series of characteristics that transformational leaders should have. These are the following: focus on the goals of the organization, influence by modelling, use persuasion, promote individualized influence, motivate with charisma to attain a common goal.

The most common empirical model, which is used to measure transformational leadership, is the Multifactor Leadership Questionnaire (MLQ) (Rafferty and Griffin, 2004). During the past 20 years, several alternative versions of MLQ were developed. More thoroughly, Bycio et al. (1995) (by using MLQ-1 model) discovered that a five – factor model including charisma, intellectual stimulation, individualized consideration, contingent reward and management by exception, was a good fit to data. In addition, Avolio et al. (1999) suggested their

model based on the MLQ – 5X. This is a six – factor model using a reduced set of items produced the best fit to the data (Rafferty and Griffin, 2004).

Finally, inspired by the leadership measures of House (1998) and Podsakoff et al. (1990), Rafferty & Griffin (2004) suggest the 5 Dimensions' Transformational Leadership model. This is used to measure the 5 factors (dimensions) of the transformational leadership skills which a leader should possess. Thus, Rafferty & Griffin (2004) re-examined the theoretical model developed by Bass (1985), and they suggested the below five sub-dimensions of transformational leadership:

1. Vision is defined as: the expression of an idealized picture of the future based organizational values.
2. Inspirational Communication is defined as: the expression of positive and encouraging messages about the organization, and statements that build motivation and confidence.
3. Supportive Leadership is defined as: expressing concern for followers and taking account of their individual needs.
4. Intellectual Stimulation is defined as: enhancing employees' interest in, and awareness of problems, and increasing their ability to think about problems in new ways.
5. Personal Recognition is defined as: the provision of rewards such as praise and acknowledgement of effort for achievement of specified goals.

4. The linkage between Trait Emotional Intelligence and Transformational Leadership

Over the past 20 years there have been several different researches indicating the relationship between Emotional Intelligence and Transformational Leadership. More thoroughly, Barling et al. (2000) discovered that EI is significantly related to three dimensions of TL: inspirational motivation, idealized influence and individualized consideration. Gardner's and Stough's (2002) research was based on the analysis of the data of high level managers. They argue that EI is positively related with TL. More specifically, intellectual stimulation has the strongest correlation with total EI scores. In addition, Hackett and Hortman (2008) (based on their research on assistants principles of secondary education) suggest that EI levels were positively correlated with TL behaviours; social awareness and relationship management are the most significantly correlated. Similarly, San Lam and O' Higgins (2013) examined the connection between EI and TL using data from managers and employees of two Chinese companies. The authors found out that there is a positive correlation between EI and TL.

Although there are several researches indicating the relation between EI and TL (such as the above), there are some researches indicate that there is a mediocre relationship between EI and TL. After the collection of data from public employees who worked in organization on the United States, Barbuto and Burbach (2006) found that there is a moderate correlation between EI and TL, as well as there is a difference between the leaders' self-reported and the employees' rated-reported results. On the same point of view, Brown, Bryant & Reilly (2006) found no correlation between EI and TL. They also discovered that neither the total EI nor its subscales predicted variance in TL scales.

The main purpose of the current study is to examine the connection between Trait EI and TL not only from the managers' point of view, but also from the employees' point of view. In addition, this study investigates if there is a difference between the scores of Trait EI and TL of the managers in comparison with those which are collected by the employee's group. Last but not least, the current research examines if the variable sector (public or private) has a moderating role in the connection between trait EI and TL both for managers and employees. Hence, the hypotheses of the research are the following:

- Hypothesis 1 (H1): There is a positive connection between Trait EI and TL both for managers and employees.
- Hypothesis 2 (H2): There is a difference between the scores of Trait EI and TL of the managers in contrast to the ones collected by the employees' group.
- Hypothesis 3 (H3): The variable Sector moderates the connection between Trait EI and TL.

5. Method

5.1 Participants and procedure

The participants of this study were collected by two different samples. The first sample consisted of managers who work in public or private organizations (74 participants in total). More thoroughly, 50 men and 24 women participated. 30 managers (40.5%) work in public organizations and 44 managers (59.5%) work in private

organizations. The mean age of the sample was 48.1 years (SD=10.94) and the age range was from 18 to 65 years. The majority of participants had attained an undergraduate (48.6%) or a Master's degree (29.7%) and as far as their annual income is concerned, the majority of the sample (32.4%) gained from 20.001 up to 30.000 euros per year. The managers worked in several organizations such as education institutes, health departments, ministries and public services, banks, retail stores.

The second sample consisted of employees who work in public or private organizations (120 participants in total). More thoroughly, 58 men and 62 women participated: 51 employees (42.5%) work in public organizations and 69 employees (57.5%) work in private organizations. The mean age of the sample was 33.7 years (SD=10.45) and the age range was from 18 to 65 years. The majority of employees had attained an undergraduate (49.2%) or a Master's degree (30.0%) and as far as their annual income is concerned, the majority of the participants (45.0%) gained from 10.001 up to 20.000 euros per year. The participants worked in several organizations such as education institutes, health departments, ministries and public services, banks, retail stores, food industry and real estates.

A questionnaire was given to the participants of the first sample. This questionnaire consisted of three parts: a) Demographics of the sample, b) Measurement of the Trait EI of the sample, and c) Measurement of the transformational leadership skills of the sample.

Similarly, a second questionnaire was given to the participants of the second sample, which consisted of the same three parts.

Both questionnaires were hosted in an online platform for approximately two months. All the questionnaires were completed anonymously either by managers or employees who work in Greek organizations of public or private interest. Both groups were invited through email and social media applications.

5.2 Measures

5.2.1 Trait EI

In order to measure the Trait EI factors of the participants of the two groups, Trait Emotional Intelligence Questionnaire Short Version (TEI-QUE SF) was used (Petrides, 2009). TEI – Que SF is a 30 item scale designed to self – measure global Trait EI. These 30 items are categorised under the six key factors of global Trait EI: a) Well – Being, b) Self – Control, c) Emotionality, d) Sociability, e) Motivation and g) Adaptability. All the questions (30 items) were measured through a 7 – point Likert scale (1 – "Strongly Disagree" to 7 – "Strongly Agree") (TEIQue – SF, 2021).

5.2.2 Transformational Leadership

To measure the transformational leadership skills of the managers of the organizations of the sample, Rafferty's and Griffin's Five (5) Dimensions Transformational Leadership Test was applied (Rafferty & Griffin, 2004). Rafferty's and Griffin model consisted of 15 items (questions) which are used to measure the five dimensions of transformational leadership skills: vision, inspirational communication, intellectual stimulation, supportive leadership and personal recognition. Managers were asked to complete the 15 items on a 5 – point Likert scale (1 – "Strongly Disagree" to 5 – "Strongly Agree") measuring transformational leadership skills from the managers' point of view. Likewise, employees were asked to complete these 15 items from their point of view; to put it in another way, employees were asked to measure their leader's transformational skills from their personal experience in the workplace.

6. Results

Table 1 displays the descriptive statistics both for managers and employees. As shown in Table 1, managers had higher Trait EI scores than employees as mean value in managers (mean=5.095, SD=.667) is greater than the one in employees (mean=4.806, SD=.657). Similarly, managers had higher transformational leadership skills scores (mean=4.079, SD=.439) than the ones that the employees scored (mean=3.308, SD=.899). In other words, managers believe that they have higher scores of transformational leadership skills than the employees believe about their managers. Moreover, on the first group the internal consistency for global Trait EI is .887 (Cronbach's alpha value) and the internal consistency for transformational leadership is .821. On the second group, the internal consistency for global Trait EI and for transformational leadership is .860 and .956 respectively. Thus, the 30 items of Trait EI are closely related. Similarly, the 15 items of TL are closely related. In addition, the last

column of Table 1 presents the values of the Pearson coefficient. According to the fourth column, there is a strong linear relationship between global Trait EI and Transformational leadership (Pearson coefficient = .657) on the participants of the first group. On the contrary, the value of the Pearson coefficient (.213) is very low on the second group which implies that there is a weak linear connection between employees' global Trait EI and their managers' transformational leadership skills.

Table 1: Descriptive statistics for Group 1 and Group 2.

Table 1a: Means, Standard Deviations, Cronbach's Alpha, Correlations of Managers (Group 1)

Variable	Mean	SD	Alpha	Pearson
Trait Emotional Intelligence (EI)	5.095	.667	.887	.657
Transformational Leadership (TL)	4.079	.439	.821	
N = 74. SD = Standard deviation. Alpha > .600 reliability is significant. Pearson > .500 correlations are strong				

Table 1b: Means, Standard Deviations, Cronbach's Alpha, Correlations of Employees (Group 2)

Variable	Mean	SD	Alpha	Pearson
Trait Emotional Intelligence (EI)	4.806	.657	.860	.213
Transformational Leadership (TL)	3.308	.899	.956	
N = 120. SD = Standard deviation. Alpha > .600 reliability is significant. Pearson > .500 correlations are strong				

Table 2 shows if there are any differences between the global Trait EI of the participants of the group 1 compared to the participants of the group 2. According to Table 2, there is a significant difference between global Trait EI of the managers compared to the Trait EI of the employees (t=2.948 and p=.004<0.05). More specifically, there is difference between manager's Trait EI skills and employee's Trait EI skills, as managers scored more in comparison with the Trait EI scores of the employees. Moreover, Table 2 indicates that there is difference on the values of Transformational leadership between the group of managers and the group of employees (t=6.846 and p=.000<0.05). Managers scored higher values on their leadership skills than the employees' ones. In other words, managers think that they have very good leadership skills, whereas the employees believe that their managers have mediocre leadership skills.

Table 2: Compare means of Trait EI and TL for Group 1 and Group 2.

Table 2. Independent Sample T test (compare means of Trait EI and TL for Group 1 and 2)				
Variable	t	sig. (p-value	Mean Difference	Std. Error Difference
Trait Emotional Intelligence (EI)	2.948	.004	.289	.098
Transformational Leadership (TL)	6.876	.000	.770	.112
p value < 0.05 is significant (confidence interval percentage 95%)				

Table 3 displays the moderating role of the sector (public or private) in the relationship between Trait EI and Transformational leadership. According to Table 1 there is strong linear connection between Trait EI and TL as far as the managers of Group 1 are concerned (Pearson coefficient = .657). Table 3 shows the results of correlation analysis after the use of variable Sector, as a Control variable. As a result, Pearson coefficient value has become .673 which implies that the connection between Trait EI has become stronger due to the moderating role of variable sector. Likewise, Table 3 displays the moderating role of the sector in the linkage between Trait EI and TL for the employees of Group 2. As it is already said, there is a weak linear relationship between Trait EI and TL as far as the employees of Group 2 are concerned (Pearson coefficient = .213). On Table 3, Pearson coefficient value (after the use of Sector as control variable) has become .211. This indicates that sector has no significant influence on the linkage between Trait EI and TL for the employees' sample.

Table 3: Correlation (Pearson coefficient) after the use of Sector as Control Variable (Group 1 & 2).

Table 3a. Pearson Coefficient (Correlation with the use of Sector as Control Variable) (Group 1)		
Variable	Pearson	sig. (p-value)
Trait Emotional Intelligence (EI)	.673	.000
Transformational Leadership (TL)		
p value < 0.05 is significant (confidence interval percentage 95%), Pearson > .500 correlations are strong Control Variable = Sector (public or private)		
Table 3b. Pearson Coefficient (Correlation with the use of Sector as Control Variable) (Group 2)		
Variable	Pearson	sig. (p-value)
Trait Emotional Intelligence (EI)	.211	.000
Transformational Leadership (TL)		
p value < 0.05 is significant (confidence interval percentage 95%), Pearson > .500 correlations are strong Control Variable = Sector (public or private)		

7. Discussion and Conclusion

The purpose of the current study was to examine the connection between Trait Emotional Intelligence and Transformational Leadership. Hence, data collected from two different groups: one group was structured by managers of Greek public/private organizations and the other one was structured by the employees of Greek public/private organizations. Based on Trait EI theory (Petrides, 2009) and Rafferty's & Griffin's sub-dimensions model of TL (2004), hypotheses were formulated in order to examine the above relationship.

According to first hypothesis (H1), the findings of the current research show that there is strong positive correlation between Trait EI and TL on the sample of managers. On the contrary, there is mediocre positive correlation between the factors of Trait EI of employees and the opinion the employees have about the transformational leadership skills of their managers. In other words, the relationship of Trait EI and TL is much less significant in the sample of employees than the one on the managers in which the connection is very strong.

Consequently, as far as the second hypothesis (H2) is concerned, the findings of the research show that there is difference between the Trait EI of managers and the Trait EI of employees. More thoroughly, managers seem to have higher scores of Trait EI skills than the employees. Similarly, there is difference between the opinion managers have about their own TL skills and the opinion employees have about their managers TL skills. Managers seem to believe that they have high leadership skills, while their employees believe that their managers do not possess high TL skills.

Last but least, the third hypothesis (H3) referred to the moderating role of Sector (public or private) in the connection between Trait EI and TL. Although in the group of managers, sector seems to moderate in the connection between Trait EI and TL, in the second group (employees) sector seems to have no influence on the connection between Trait EI and TL.

To sum up, the current study contributes to the theoretical as well as the practical research of the linkage between Trait EI and TL. Although there are several reviews about Emotional Intelligence and Leadership there seems to be a research gap between Trait EI and TL. Especially when it comes to the Greek market, there is no significant information about this linkage as far as public or private organizations are concerned. This research hopes to trigger future researchers and practitioners into decode all the key factors that influence Trait EI and TL.

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The External Factors Leading to Product Innovation Outcomes in the Visegrad Group-Structural Equation Model Approach

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Abstract: This paper empirically investigates the role of external factors which drives small and medium enterprises product innovation in the Visegrad Group. An empirical analysis is based on the Business Environment and Enterprise Performance Survey conducted by the World bank with a combined sample of 2002 small and medium enterprises (SMEs) in the Czech Republic, Slovakia, Poland, and Hungary. The results of the Structural Equation Model indicate that product innovation performance is slightly higher among SMEs that are proactive in strengthening their relationships with innovative suppliers, users, and consumers. Furthermore, the findings of this paper support the view that SMEs will have better new product development results if they improve their relationships with foreign-owned firms and collaborate with external research firms. Again, the empirical study will give insights into the SME's product innovation outcomes in the Visegrad Group and a wake-up call to SME's practitioners and stakeholders on the need to collaborate externally across the European regions.

Keywords*:* Product Innovation, innovation outcomes, SMEs, Visegrad countries, structural equation model

1. Introduction

Product innovation refers to a new breed of products that evolves from an existing product with existing technologies and provide substantial consumer satisfaction (Kim et al., 2018). With the potential to ensure keen competition among competitors, product innovation drives firms' growth and ensures a greater market share (Medda, 2020). Product innovation development across the Visegrad is therefore enticing numerous research efforts. Several studies have drivers to product innovation, among which extent R&D has received prominent attention in recent literature (Zajac et al., 2000: Albert 2016). For example, some studies emphasize that external R&D contributed to product innovation (Kim et al., 2018: De Marchi et al., 2018).

Despite the great interest in this literature, few studies have paid less attention to the role of external markets, technology licensed from foreign-based firms and external knowledge with other firms. Prior studies tend to conceptualize internal factors rather than those that stabilize small and medium enterprises within the Visegrad countries. However, the content of firms' external factors is essential since innovation can never be materialized without external collaborations with other firms (López-Cabarcos et al., 2019). Based on different classifications of knowledge, we classify external knowledge into two: external knowledge from other firms and external knowledge on R&D with foreign-owned firms and assess how they contribute to product innovation within the Visegrad countries.

Secondly, most extant literature has asserted that external learning is beneficial to innovation (Wu, 2021: Odei & Stejskal, 2018: Odei et al., 2021): yet fewer studies have assessed how adequate knowledge from external firms has been helpful to small and medium enterprises (Odei et al., 2020). According to Zajac et al. (2000), the contingency theory asserts the effectiveness of SME strategy depends on the strategic plans and the business environment. Thus, the impact of external learning, technology license acquisition with foreign-owned firms and how the external markets contribute to product innovation across the Visegrad countries.

The study aims to address these two research gaps. It assesses the effects of the two types of external learning (i.e., R& D with other firms and sharing of knowledge with foreign firms) on product innovation and the role played by the external market and technology acquisition from foreign-owned firms.

2. Literature review

2.1 External learning perspective

Small and medium enterprises' organizational learning happens either within or beyond the boundary of firms (Odei et al., 2021). Within the firms, employees are compelled to learn from the experience. Externally, firms collaborate with research and development (R&D) and share knowledge with foreign-owned firms. External

collaborations open up avenues that promote product development and ensure higher turnover (Albert, 2016). Again, external knowledge increases small and medium enterprises' chances of being involved in radical innovation, while internal knowledge enables employees to have sufficient knowledge and novel ideas.

Consistent with the literature on organizational learning (De Marchi et al., 2018), we define external knowledge as sharing R&D with other firms and ideas with external or foreign-owned firms. Knowledge can be grouped into two types: administrative and technical (Bao et al.,2012). Technical knowledge entails employing the technical knowledge systems in operating the firm. In contrast, administrative knowledge refers to firms' management system using employees to develop products through reward systems and internal competition (Bao et al.,2012). This knowledge classification scheme forms the basis of different focuses of external learning. In particular, technical learning refers to external R&D activities with other firms. For example, Visegrad firms are famous their innovation capability based on collaboration with other foreign-owned companies, which enables them to learn new technologies from stronger innovator countries such as Germany and the United (Ivanová & Masárová, 2018; Odei et al., 2021). Organizational learning refers to learning management systems and improving services within the firm. For instance, some firms conduct weekly and monthly training for employees to be well equipped about their business operations (Anderson & Odei, 2018).

We therefore propose the following;
H1: External Knowledge with other firms contributes to Product innovation among SMEs in the Visegrad countries,
H2: Research and development(R&D) with other firms contributes to Product innovation among SMEs within the Visegrad countries

2.2 Technology license acquisition and product innovation

Prior studies identify small and medium enterprises merging with foreign-owned firms as a critical factor for the successful development of product innovation. According to (López-Cabarcos et al., 2019), acquiring technology licenses with other firms strongly impacts product innovation because this protects firms' innovation activities from being directly copied by competitors. Thus, there is a need to diversify their technology license with other firms. Product innovation would be fully developed and can achieve its potential in the business environment when small and medium enterprises form a strong partnership (Odei et al., 2020). Again, acquiring a technology license externally leads to a high level of technological munificence and expands the scope of technical knowledge available for learning, contributing to the product innovation firm. To insulate core competence from the threat of external technological changes, small and medium enterprises may have to switch resource allocation from internal knowledge and acquire technology licenses from foreign-owned firms. Firms need to collaborate with external and trusted firms to avoid fearing the potential threat from competitors as teaming up ensures explosive growth of the product. We, therefore, propose that,
H3: Technology licensed with foreign firms with other firms contribute significantly to SMEs product innovation

2.3 External Markets and Product innovation

External markets refer to the rate at which small and medium enterprises engage their consumers on the domestic and international front to develop their products. In the presence of competitive pressures, firms tend to narrow their focus on established markets and pay attention to the needs of existing consumers (Odei et al., 2020: Amponsah et al.,2020). According to Zajac et al. (2000), developing effective corporate strategies depends on financial stability and market dynamics. Firms conduct market research to develop existing products and meet the international product standards to ensure more significant profit margins. Again, firms involved in market research would enable them to discover new markets and plan adequately on products based on living standards to meet consumer demands (Odei et al., 2021). Thus, there is a need to protect the firm's territory and its environments to ensure idea findings and products' technical and commercial development processes. We therefore propose that
H4: Markets in which products are sold ensures product innovation among SMEs within the Visegrad countries.

3. Data and methodology

Data for the empirical study was from the Business Environment and Enterprise Performance Survey (BEEPS V), conducted by the World Bank and the European Bank for Reconstruction and Development (EBRD), from 2017 to 2019 with 2002 sample SME firms combined from Poland, Czech Republic, Slovakia and Hungary. The dataset provides variables for comparative innovation measurement scores and analysis for all member countries of the world bank. This dataset comprises an annual analysis of the SMEs sector across the Visegrad Countries. It

reveals some external factors that drive product innovation performance and inform policymakers on the need for rapid changes in product branding across the Visegrad groups.

The study subsequently adopted the Structural Equation Model (SEM) to develop a model to analyze and test the hypothesis. SEM was chosen due to its distribution-free assumption, predictive focus, and explanatory model development approach for understanding how external factors drive product innovation (Kock, 2015). Path analysis in SEM allows researchers to assess all the coefficients and establish a causal relationship as seen in multiple regression models (Kock & Lynn, 2012: Kock, 2010).

4. Results

This study carried out various measurements to determine the reliability of the constructs and the internal consistency of the model. These include convergent validity, composite reliability, and discriminant validity. According to Hair et al. (2017), construct reliability uses Cronbach's alpha coefficient to determine the actual composite weights and estimate error terms. Hair et al. (2017) emphasized that a Cronbach alpha equal to or greater than 0.7 is acceptable. Table 1 and Table 2 below show that all the constructs used have demonstrated this result. The model has shown that all the constructs were above 0.7 thresholds. The convergent validity measures the extent to which items are placed together in the structural model, which can be assessed by the Average Variance Extracted (AVEs) with at least minimum loading 0.50 and composite reliability (CR) with an acceptable minimum of 0.70 (Kock, 2015). All our constructs in this model have loadings higher than the 0.50 threshold.

4.1 Construct Reliability Tests

The construct reliability test which comprises of composite reliability, cronbach's alpha, average variance extracted, full collinearity variance inflation factor was 1.000.

Table 1: Combined loadings and cross-loadings

	MKT	TEC	INO	EXT	R&D
MKT	1	0.1416	0.0905	0.1084	0.1837
TEC	0.1416	1	0.0832	0.2637	0.1843
INO	0.0905	0.0832	1	0.1788	0.1346
EXT	0.1084	0.2637	0.1788	1	0.2443
R&D	0.1837	0.1843	0.1346	0.2443	1

Source: Own processing

4.2 Structural model results

Figure 1 below shows the results of the hypothesis testing. It can be seen that the strongest external factor that drives product innovation activities was firms' external knowledge with other firms (0.146). This result was followed by firms' external R&D activities with foreign-owned firms (β=0.09), which was closely followed by external markets (β= 0.06) and technology license from foreign firms (0.021) being the least. According to Cohen 1988 has posited that path coefficients can be very indicative depending on the effect sizes employed by researchers (i.e., whether the effects are minimal, moderate, or large). A value of 0.35 indicates a larger effect size,0.15 indicates moderate, while 0.02 indicates a weaker effect size, which can be considered significant from a practical research point of view (Cohen, 1988). This means that this model has almost moderate predictive values except for 0.021.

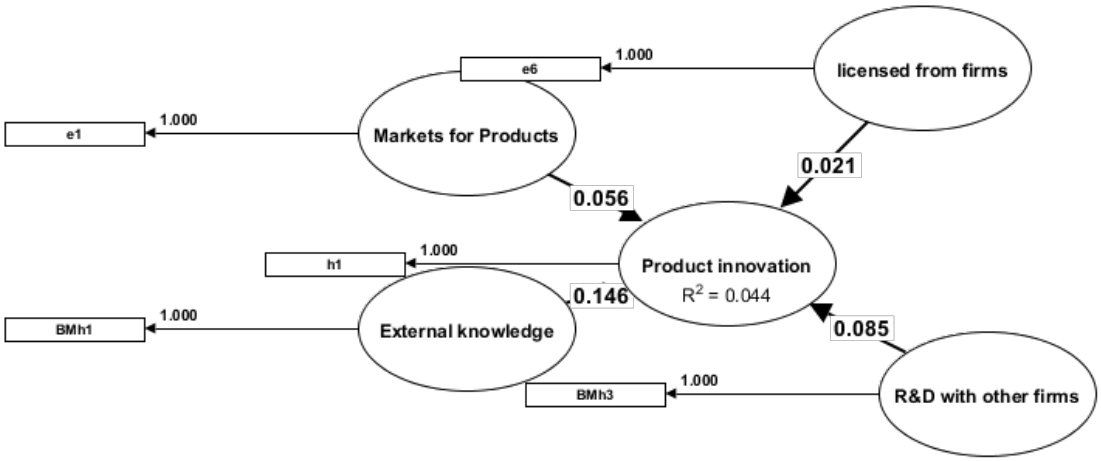

Figure 1: Results of hypothesis testing

Note: Dependent variable=Product innovation, H1(BMh1) =EXT (External Knowledge with other firms), H2(BMh3) =R&D (Research and development with other firms), H3(e6) =TEC (Technology licensed with foreign firms), H4(e1) =MKT (Markets for Products)

Source: Authors own processing based on Adanco 2.1 software

Table 2: Path Estimates and Hypotheses Testing

Hypothesis	Regression weights	P values	Remarks
H1(BMh1)>R&D	1.000	0.085***	Supported
H2(BMh3)>EXT	1.000	0.146*	Rejected
H3(e6)>TEC	1.000	0.021***	Supported
H4(e1)>MKT	1.000	0.056***	Supported

The path estimates indicate a positive and significant relationship between external research and development (with a p-value of 0.085), external technology licensed with foreign firms (with a p-value of 0.021) and external market for products (with a p-value of 0.056). However, external knowledge with other firms was insignificant, with a p-value of 0.146.
Source: Own processing

5. Conclusion

In conclusion, this paper established a link between external factors that drive product innovation within the Visegrad countries. The strongest positive influence on product innovation is external knowledge technology licenses from other firms and markets in which products are sold. The least determinant factor which was insignificant was the external research and development. Authors identified that external knowledge *(H1)* significantly contributed to product innovation. Firms hiring the services of consultants enables the firm to come up with new ideas as to how to contribute to product innovation. External consultants have always been helpful as they have sufficient knowledge about the field. They have always conducted research and contributed to SME's expansion the best. Firms utilize this new idea from consultants to maximize turnover. A study conducted by Be & Vavra (2020) affirms that external knowledge increases product innovation.

Again, the study discovered that external research and development with other firms *(H2)* does not contribute significantly to product innovation. This means that when SMEs collaborated with external research organizations, it was not beneficial for their product innovation. Our result contradicts similar research conducted by Odei et al. (2021), whose findings affirm that firms collaborating with research organizations contributed successfully to firms' product innovation.

Again, $H3$ support the study showing that technology licensed acquisition from other firms contributes to product innovation. This result is not surprising because all inventions need to be protected and prevented from emulating. The license acquisition also helps SMEs register their innovations to have a credible trademark record and instils trust in customers. However, our results are similar to findings by Knell (2017), who discovered that

licensed acquisition from the technology transfer offices contributed significantly to business innovation within the Visegrad countries.

Furthermore, the results of the empirical analysis have demonstrated that markets in which products are sold within the Visegrad countries contribute significantly to product innovation. SMEs should not overlook the market *(H4)* is an external factor that SMEs should not ignore. Whether products would be sold locally or on the international front, firms need to have their research team conduct a survey to know consumer preferences and adapt quickly to the market. Our results have shown that SMEs within the Visegrad countries conducts a market survey which has enabled them to satisfy their customers with business innovation (i.e., they factor standard of living and consumers demands to create product innovation). This supports *H4* and other research conducted by Odei et al. (2021), whose work concluded that the products' markets determine the level of product innovation within the Visegrad countries.

From the preceding discussion, this study strongly asserts that external factors that drive product innovation within the Visegrad countries are external knowledge technology licenses from other firms and markets in which products are sold. Given these factors, the necessary attention will help transform the SME sector for quality products which would help strengthen the rate at which customers patronize products. These factors buttress and form the basis of SMEs in the adoption of product innovation. The Visegrad countries are transition economies; therefore, forming an exclusive innovation policy will help facilitate innovation culture to promote a firm's competitiveness. We recommend future research should explore some governmental policies that drive product innovations. Again, other studies can also explore funding policies and limitations in adopting product innovation. Knowledge of this will broaden why most firms are unwilling to shift from their traditional production method and adopt new products.

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The "Conceptual Framework" as a Threshold Concept for Investigating Processes in Leadership Research

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Abstract: A process perspective in research has been largely neglected, including in studies of leadership. This neglect is partly because of the dominant quantitative variance approaches to research that have been adopted in many disciplines. However, it is also because of the difficulties that researchers encounter in conceptualising and investigating their research from a process perspective. This process of conceptualisation is particularly challenging for post-graduate students. Threshold concepts are critical to student learning, providing gateways to understanding particular fields or disciplines. This paper adopts this idea of threshold concepts and relevant teaching practices to illustrate its use in post-graduate students' teaching and learning activities to develop a conceptual framework that can investigate a process. Several key topics are addressed: How conceptual frameworks are introduced and taught; Differentiating quantitative variance conceptual frameworks from qualitative process conceptual frameworks; and Explaining and illustrating how to conduct process theory in qualitative research using the case study method, grounded theory method, and critical incident technique.

Keywords: threshold concepts, conceptual framework, leadership process, teaching research design

1. Introduction

In the teaching and learning literature, threshold concepts are considered to be critical to student learning (Wright & Hibbert 2015). They serve as gateways to understanding, can be transformative, providing critical insights into the field or discipline, and shape how students "'think' in a particular discipline, or how they perceive, apprehend, or experience particular phenomena …" (Meyer & Land 2003, p. 424). Furthermore, according to Meyer and Land (2003), threshold concepts have the following characteristics: They are transformative, irreversible (i.e. unlikely to be forgotten), integrative, bounded (i.e. demarcate disciplinary areas and are therefore not holistic), and troublesome (i.e. counterintuitive, alien or incoherent). As a result of these characteristics, threshold concepts are critical for educators to address through their teaching and learning activities, but simultaneously, they are hard for students to grasp.

When teaching students how to design a research study, a "conceptual framework" is one of the threshold concepts encountered (e.g. Alpi & Hoggan 2016). Researchers may portray the relationship between several concepts related to their phenomenon of interest as a conceptual framework (Grant & Osanloo 2014; Jabareen 2009), and these can be investigated quantitatively or qualitatively (Miles, Huberman, & Saldaña 2014; Pearse 2019). The conceptual framework scopes and shapes the research by explicitly displaying the central concepts of a research study and their relationships, and so becomes an important reference point for supervision and an instrument to scaffold learning (Berman & Smyth 2015).

"Process" is a second threshold concept that is focused upon in this paper. Process theories represent a distinct category or type of theory concerned with "process" and are differentiated from "variance" and "systems" as two alternative categories of theories (Burton-Jones, McLean, & Monod 2015).

There are relatively few publications that illustrate the teaching and learning practices associated with threshold concepts in general, let alone "conceptual frameworks" and "process", in particular. Educators that have addressed the challenges of teaching threshold concepts, have adopted a variety of techniques. These include providing readings and holding discussions or workshops (Kiley 2009), adopting active learning techniques such as role plays and presentations (Nicola-Richmond, Pépin, Larkin, & Taylor 2018), conducting tutorials and creating communities of practice (Leshem 2007), contrasting the everyday frameworks of students with scientific frameworks (Davies 2019), and enabling peer to peer collaboration (Bhola & Parchoma 2016) to facilitate learning. The aim of this paper is to illustrate how post-graduate students are taught to conceive and apply a conceptual framework to process theories. Several key topics are addressed in lectures and provide a structure for this paper, namely:

- Explaining and illustrating conceptual frameworks.
- Differentiating quantitative *variance* conceptual frameworks from qualitative *process* conceptual frameworks.

- Explaining and illustrating how to conduct process theory in qualitative research.

The paper specifically illustrates the research design of leadership studies, thereby complementing the work of other authors such as Fischer, Dietz, and Antonakis (2017), whose focus is on the leadership phenomenon itself. Given the focus on research design, researchers should transfer the ideas presented here to phenomena other than leadership.

To simplify this illustration of teaching and learning, like Niederman and March (2018), a pragmatic approach is adopted in examining process, and is agnostic on matters related to ontology and epistemology. As Niederman and March (2018) point out, this stands in contrast to the philosophical approaches to process as advocated by Whitehead and Demir and Lychnell (2015).

2. Teaching conceptual frameworks

According to Burton-Jones, McLean and Monod (2015), building a theory consists of two main components, namely concepts and relationships. These are also the basic building blocks for designing conceptual frameworks. Tom Wujec has developed a "Draw Toast" workshop (see https://www.drawtoast.com/) to apply systems thinking and address wicked problems. Here, the basic building blocks of a systems design are nodes and connectors, which closely resemble the concepts and relationships of Burton-Jones, et al. (2015). This activity is adapted to a classroom exercise of "Draw how to make a cup of coffee". Students each draw their process diagrams and then compare them with the drawings of others. This comparison leads to further classroom discussion, emphasising the process of design.

Thereafter, examples are provided of conceptual frameworks used in management research, with a distinction made between untested conceptual frameworks and tested conceptual models. Finally, students are asked to draw a diagram illustrating their own conceptual framework, showing the main concepts of their research and the relationships between them. In degree programs such as the MBA, the research is of limited scope. Therefore, students are encouraged to identify a conceptual framework from the literature and adapt it to derive a simplified conceptual framework representing their research, with have far fewer concepts and relationships. Cooperative learning (Slavin 1995) then takes place with students presenting the conceptual frameworks to their peers, explaining what they have drawn, and making modifications in the light of feedback received and their further reviewing of the literature.

3. Quantitative conceptual frameworks versus qualitative process frameworks

In quantitative leadership studies, an input-output model is dominant, with a questionnaire typically being the preferred data collection method (Bryman 2004). While quantitative researchers may frequently refer to leadership processes, according to the categories of Burton-Jones, et al. (2015), this research is classified as variance research and not process research. Explaining this distinction to students is an important step in explaining process theories and how their conceptual frameworks differ.

From a quantitative perspective, leadership theories explain the causal relationship between inputs and outputs (Fischer, Dietz, & Antonakis 2017). Therefore, the most basic quantitative relationship is illustrated by an independent and a dependent variable. It is assumed that a change in the independent variable level is responsible for a change in the level of the dependent variable. More complex quantitative conceptual frameworks build on this fundamental relationship, creating a configuration of various types of variables. A summary of the main types of variables is included in Table 1. These types of variables are illustrated in class through a lecture and supplemented with reading material.

Table 1: Illustrating the configuration of quantitative variables

Variable or Model Type	Explanation	Statistical tests	Examples
Situational variables	Situational variables incorporate physical and social surroundings, temporal and task dimensions, and various antecedent states that affect a variable of interest (Belk 1975).	Correlation analysis or ANOVA (James, Demaree, & Hater 1980).	Contingency theories of leadership in the 1970s and 1980s (House & Aditya 1997). Context in psychological leadership research (Liden & Antonakis 2009).

Variable or Model Type	Explanation	Statistical tests	Examples
Moderating variables	Moderation occurs when another variable is introduced that modifies the relationship between an independent or dependent variable by either strengthening, weakening, negating, or otherwise altering the relationship (Allen 2017).	Moderated multiple regression (Jose 2013).	A meta-analysis of the Multifactor Leadership Questionnaire noted that significant moderators of the relationship between leadership style and effectiveness included the level of the leader (high or low) and organizational setting (public or private (Lowe, Kroeck, & Sivasubramaniam 1996).
Mediating variables	A mediating variable is understood as part of a causal chain that is built, whereby the mediator explains to a greater or lesser extent the relationship between the independent and dependent variable (Baron & Kenny 1986). A mediator is, therefore, a causal mechanism in the chain of variables.	Stepwise (Baron & Kenny 1986) or by an analysis of the coefficients of estimated regression equations (MacKinnon & Dwyer 1993).	Gottfredson and Aguinis (2017) established that leader-member exchange was a mediating mechanism between leadership behaviour and its effect on follower performance. Lu, Lau and Yiu (2012) investigated multiple mediators in their study of transformational leadership.
Nomological networks	"A lawful pattern of interrelationships that exists between hypothetical constructs and observable attributes …" (Colman 2009).	Structural equation modelling.	Numerous nomological network models for leadership exist, including ethical leadership (Brown, Treviño, & Harrison 2005), servant leadership (Eva et al. 2019), authentic leadership (Gardner, Cogliser, Davis, & Dickens 2011) and the implicit followership theories of leaders (Sy 2010).
Multilevel models	Provide a more integrated explanation of leadership phenomena across various levels (e.g. at a micro and macro level; or individual-, team- and organisational-levels).	Multilevel structure equation modelling.	Maynard, Gilson and Mathieu (2012) provide a multilevel review of psychological empowerment at the individual, team, and organisational levels. Zhang, Lee and Wong (2016) investigated servant leadership measures at both the individual and organization levels.

Source: Author's construction

As explained and illustrated above, according to Burton-Jones, McLean and Monod (2015), the quantitative processes referred to above would be classified under a variance perspective. That is, a variance perspective assumes that the nature or properties of concepts (or entities) do not change, but only their value. On the other hand, a process perspective assumes that the concepts of interest are changed by a series of events or over time, so the sequencing of these events in time is critical (Burton-Jones, McLean, & Monod 2015). That is, a series of conditions need to occur in a particular sequence for them to have the potential to cause a change (Markus & Robey 1988). Since the nature of the concepts themselves change over time and not only their value, with the unfolding of a series of events, it is not feasible to construct valid and reliable measures of these unstable concepts. Therefore, they can only be investigated using qualitative research approaches.

4. Explaining and illustrating process theory as a qualitative process

To illustrate to students the distinction between quantitative variance models and qualitative processes, several process models that show qualitatively different stages are explained in a lecture, including:

- The experience of change as a loss (Bridges, Bridges, & Lencioni 2016; Prochaska, Prochaska, & Levesque 2001). This process has been built upon the grieving process of Kübler-Ross (1973), which is characterised by distinct phases of denial, anger, bargaining, depression and acceptance. Not surprisingly, therefore, what is viewed as appropriate leadership behaviour in each phase of change differs (see, for example, Kotter 1996).

- The classic forming, storming, norming and performing stages in the development of a team (Tuckman 1965) also require different types of behaviour from the leader at the different stages to facilitate team development (Rickards & Moger 2000).

As a further example of the distinctly dynamic nature of concepts from a process perspective, the Horila and Siitonen (2020) paper is given as a reading. It shows that relational leadership was not stable, nor did it develop linearly. Once students grasp the distinctive nature of process theories versus quantitative variance theories, they can develop conceptual frameworks that illustrate these processes. After that, their attention turns to designing the qualitative research strategy.

5. Approaches to developing qualitative leadership theories

In class, students are introduced to various qualitative research methods and techniques, with examples being provided of their use in leadership research. While several research methods can be used, this paper only discusses three possibilities, namely the use of the case study method, grounded theory method, and critical incident technique in theory building.

5.1 The case study method

Case study research is predominantly concerned about finding explanations to questions of "How?" and "Why?" (Yin 2014). These process-based explanations typically illustrate a series of unfolding steps or stages over time, with some also explaining the process or identifying its underlying causal mechanisms. The primary function of these mechanisms is not to predict but to explain "how?" (Davis & Marquis 2005). As Davis and Marquis (2005, p. 336) elaborate, "If a regression tells us about a relation between two variables - for instance, if you wind a watch it will keep running - mechanisms pry the back off the watch and *show how*." A range of mechanisms can be identified, including situational, action formation, transformational, environmental, cognitive, and relational mechanisms (Davis & Marquis 2005). For example, Beyer and Browning (1999) explained how charisma was routinised through administrative structural arrangements, succession planning and strategic and cultural initiatives. These various types of mechanisms can be analysed using, among other methods, a case study approach.

Five analytic techniques of case studies have been proposed by Yin (2014), which can all be used in process-based research:

- Pattern matching may be employed to match the process observed in the data to a theoretical process derived from the literature or presented as a conceptual framework.
- Explanation building attempts to identify the causal links that explain "how" or "why" something occurred as it did.
- Time-series analysis seeks to map out changes over time by compiling a chronology of events and their causes.
- The logic model explains why a sequence of events unfolded as it did by referring to an existing theory that provides a causal explanation and determining if it applies to the case at hand. This causal explanation can be analysed at an individual, organisational or programme level. As such, it is a type of pattern matching.
- Cross-case synthesis is used to analyse multiple cases, such as investigating leaders' learning processes in international organisational settings (Bingham, Eisenhardt, & Davis 2007). It can also be helpful in analysing processes across levels, if the cases are nested, such as O'Kane's (2006) study on leading a turnaround.

5.2 The grounded theory method

Mechanisms explain the occurrence of a process. Therefore, in contrast to events based stepwise processes which answer the question "how?", mechanisms are distinct in addressing "why?" questions. One popular qualitative research method that aims to explicate mechanisms is grounded theory. That is, grounded theory intends to generate a theory or explanation for a basic social process (Goulding 2002). For example, in the grounded theory study of Kan and Parry (2004), "identifying paradox" emerged as a basic social process in their investigation of leadership overcoming resistance to change in a New Zealand hospital.

Processes can consist of a series of events and/or activities, where events refer to something that happens to leaders, while activities are initiated by leaders who demonstrate agency (Niederman & March 2018). In

grounded theory studies, which seek to explicate basic social processes, this agency is reflected in the paradigm model as action/interaction strategies (Strauss & Corbin 1990). In their grounded theory study, Haque, Liu, and Titi Amayah (2017) showed how leaders who were patient during decision-making were better able to cultivate a collaborative culture, encourage growth, and attain organisational goals and objectives.

5.3 The critical incident technique

Originally designed as a quantitative observation-based technique by Flanagan (1954), the critical incident technique was subsequently adapted as a qualitative technique for gathering and analysing interview data (Chell 2004). The critical incident technique has also been used to provide structure to the collection of data, with an alternative method of data analysis being applied, such as content analysis (Ellinger & Cseh 2007), grounded theory (Hamlin & Whitford 2020), or thematic analysis (Ruiz, Hamlin, & Esparza Martinez 2014). The qualitative version of the critical incident technique provides one approach to exploring the unfolding of events and behaviours related to the occurrence of the critical incident.

For example, Bott and Tourish (2016) investigated the leadership dynamics in 18 diverse non-profit organisations. While the technique has tended to focus on significant events (Bott & Tourish 2016), a growing number of studies have used it to investigate the effects of routine activities in shaping behaviour (Ellinger & Cseh 2007; Ruiz, Hamlin, & Esparza Martinez 2014). For example, Parzefall and Coyle-Shapiro (2011) studied how employees made sense of a breach in the psychological contract and reported how employees went about attributing responsibility for the breach (typically to their immediate manager) and finding an explanation for its occurrence.

6. Implications for process-oriented research

Several implications emerge from this brief overview of teaching and learning activities to introduce students to the threshold concepts of conceptual frameworks and processes. A distinction is evident between quantitative and qualitative understandings of, and approaches to, the idea of process in theory building and testing. This distinction needs to be made explicit to students to successfully navigate the reviewing of the literature. For example, the research methods utilised in the literature need to be identified and included in reviews, and the nature and (in)stability of the concepts being investigated, clearly understood.

By extension, when identifying the gaps in the literature, researchers may find it necessary to view quantitative and qualitative studies as two separate bodies of literature. This may aid in problematisation or gap-spotting (Sandberg & Alvesson 2011), as a smaller body of literature is directly relevant. Alternatively, adopting a different research approach to that prevalent in the literature can also create an opportunity to make an original contribution to the existing body of knowledge.

7. Conclusion

This paper has aimed to illustrate how post-graduate students are taught to conceive and apply a conceptual framework to process theories, using various examples of leadership research studies. In describing these teaching and learning practices, given the space limitations of this paper, a pragmatic approach was adopted. As a result, this paper did not to explore the philosophical underpinnings of process research. For a more detailed discussion of the ontology and epistemology of the topic of process, readers are referred to the work of Demir and Lychnell (2015). Furthermore, it has not been possible to include mixed-method research designs that focus on the leadership process, even though there are examples of such studies (see Karsten & Hendriks 2017; Lyndon, Pandey, & Navare 2020; Serban & Roberts 2016).

Hopefully, in teaching how quantitative and qualitative research has approached the investigation of leadership behaviour, this paper has achieved a greater appreciation of conceptual frameworks as a gateway, or “portal” (Meyer & Land 2003) to understanding process in leadership behaviour research and will lead to more research in this neglected area.

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Caught in a net: Opportunities and Challenges of a Netnographic Study

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Abstract: This paper reports on the opportunities and challenges associated with the use of the qualitative methodology of netnography, an interpretative method which represents a written description of fieldwork emerging from on-line or computer mediated data. Specifically, a humanist netnography which focussed on answering research questions connected with deep social values with the aim to influence social change within the context of business and management research was applied. Over the course of 26 months, a total of 2033 comments from a bespoke, in-house social media monitoring tool were analysed and ratified through triangulation with 107 posts from an engagement survey. The data was captured within an automation and engineering organisation in the private sector in England. The context of the study was to use netnographic research to explore the impact on employees subjected to the implementation of multiple, consecutive redundancy programmes. The aim was to understand areas of concern for employee wellbeing and identify opportunities to improve the redundancy implementation strategy. Humanist netnography was applied to allow a specific focus on the culture of the community within the organisational setting, and the emotions experienced amongst employees within this community. The findings highlight that netnograhic research can offer rich and meaningful data when used in a controlled, digital environment for organisations as well as for academic research. This study discusses the opportunities associated with netnography and how the use of in-house bespoke social media monitoring tools can help drive and improve organisational effectiveness. In addition, this paper identifies challenges associated with the use of netnography such as the little perceived value of emoticons defined as symbolic netnography, as real meaning were found in the expressed words. Concerns with respect to ethical considerations and protecting individual participants when using netnographic data are discussed.

Keywords: Netnographic study, digital research, online communities

1. Introduction

This paper presents new evidence with respect to analysing large data sets using triangulation and builds on the work of Baron and Russell-Bennett (2016) who illuminated that one of the fundamental challenges, and potential opportunities, faced for both academic researchers and practitioners is how to approach, collect and analyse the vast array of data (including images, videos, texts, audio and their integration) available from digital platforms and social media monitoring tools. Findings are based on a longitudinal study set within an automation engineering organisation in the private sector in England.

Anonymous employee comments were sought to help the organisation understand the feelings and emotions of employees whilst undergoing four consecutive redundancy programmes. Data captured was reviewed and analysed throughout the redundancy programmes with the aim to identify areas of concerns for employee wellbeing, and to improve the organisation's strategy for redundancy implementation. Further data analysis took place after the completion of the redundancy programmes to identify the success of initiatives implemented throughout each redundancy programme. The data was collected through an in-house bespoke social media monitoring tool, named the 'mood indicator' which invited random feedback from all employees during the successive redundancy programmes. Triangulation (Cohen, Manion and Morrison, 2011) supported thematic data analysis by ratifying employee participant comments through the use of qualitative data captured by the organisation's in-house digital engagement survey, which was deployed once, after the completion of the last redundancy programme. The use of triangulation of social media with other sources has been argued to allow for more rounded data that offers detailed perspective (Reid and Duffy, 2018).

This paper is structured as follows. We commence with a brief overview of netnography and the study of online communities. This is followed by positioning the relationship of netnography in the context of the specific organisational setting and the particular approach of how our data was collected. We then present the main contribution and critically discuss the potential opportunities and fundamental challenges of netnography as observed in this study. We conclude with the main argument that netnographic studies present tremendous opportunities for academic researchers as well as practitioners despite the challenges faced.

2. Review of netnography as a study of online communities

Internet research is defined as a "tool and also a field site for research" (Markham and Buchanan, pg. 3, 2012). Netnography (Kozinets, 2002) presents a relatively new approach to digital, qualitative data collection which is evolving at pace as access to online data and technologies develop continuously (Reid and Duffy, 2018). Escobar (1994) challenged the integration of using new technologies and community and fieldwork research at a time when the digital domain was regarded as a subculture and an isolated place. More recently, digital ethnography is used for studying everyday digital practices as well as studying unfamiliar occurrences, whilst approaches to netnography are seen as arguably a digital domain that is more familiar (Zaród, 2021).

Netnography originated from a merger of the words 'internet' or 'network', with 'ethnography' (Kozinets, 2010). Also popular in netnography lexicon is the use of 'cyberethnography' (Ward, 1999), 'online ethnography' (Wiles, Bengry-Howell, Crow and Nind, 2013) and 'virtual ethnography' (Hine, 2000). The basic premise remains that research is collected through online communities and user interaction (Kozinets, 2010, 2019; Jong, 2019). The concept relies on a virtual platform where researchers can gain valuable insights on contemporary issues and global phenomena (Jeacle, 2020). Netnography studies are popular in the search of consumer behaviour (Ewing, Owens and Cassidy, 2016; Healy and McDonagh, 2013; Hofacker, Malthouse and Sultan, 2016), but are now being used in diverse online communities, such as accounting research (Jeacle, 2020), older communities in China (Zhao, Zhang and Ma, 2019), e-sport research (Zaród, 2021), sport (Gilchrist and Ravenscroft, 2011), marketing (Hardey, 2014), education (Janta, Lugosi and Brown, 2014) to name a few.

3. Organisational context

The research setting consisted of a private sector organisation, based close to London, UK specialising in automation and engineering within the construction industry. The economic crises that began in 2008 impacted numerous companies that faced tough trading circumstances, posing a direct threat to their survival (Schoenberg, Collier and Bowman, 2013). The market crash impacted the organisation within this study in 2012, which led to the exploration of business turnaround and recovery strategies. The UK market in 2012 reflected high levels of unemployment and low investment. Subsequently, due to external factors and influences beyond the control of the organisation, several redundancy programmes were implemented to mainly drive cost savings. Figure 1 demonstrates the timelines of the four redundancy programmes and the respective reasons for the redundancies. Redundancies were implemented on a smaller scale with the intention to not overreact and unnecessarily remove surplus headcount. Unfortunately, strategies to gain new business did not come to fruition and subsequently more redundancies were mandated.

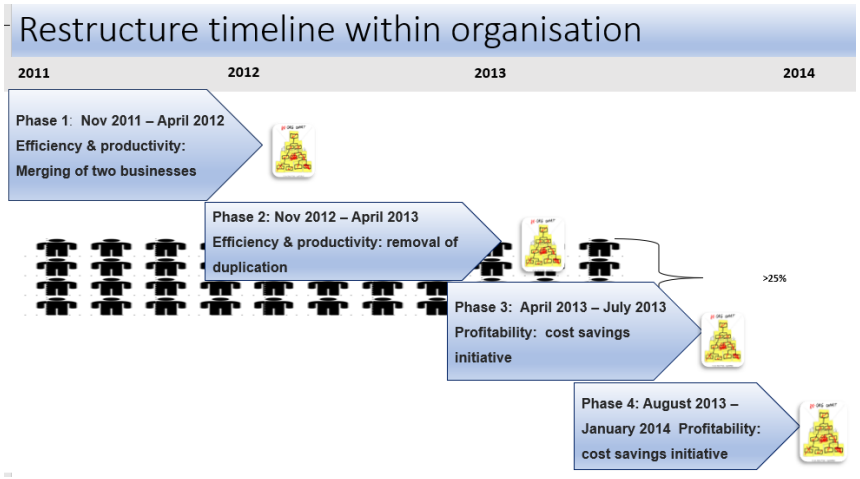

Figure 1: Redundancy timeline with reasons for redundancy

4. Data collection

Data was captured through two inhouse community tools; the 'mood indicator' and an engagement survey, with the aim to monitor and understand the impact on employee morale, levels of redundancy fatigue, and overall wellbeing. The comments were also used to identify themes to improve redundancy implementation strategy and to minimise the negative impact on employees.

Research was captured and analysed through the lead researcher, who was embedded within the organisation, fulfilling a dual role of netnographer and Human Resource Business Partner.

Netnography presented itself as an appropriate method to focus on the symbiosis of the two specific community-tools, and how these individual digital messages shaped the different relations between the individuals and communities within the organisation (Zaród, 2021).

4.1 Mood indicator

The mood indicator platform was used to capture employee perceptions during the redundancy programmes, and over the two-year period post redundancy implementation. By using a digital platform, employees had the opportunity to provide anonymous, qualitative feedback on how the redundancy programmes impacted their mood and morale. To validate reliability, the data was ratified through the comments obtained from an engagement survey, which was released approximately a year after the completion of the redundancy programmes.

Over the course of the study, a total of 2033 comments were captured and subsequently analysed. Sixty-six employees out of approximately four hundred employees were invited on a weekly basis to post feedback. During each iteration, a different sixty-six employees were invited to post feedback, essentially inviting all employees at different intervals and naturally, over the duration of twenty-six months all employees were invited to post feedback several times. As redundancies were finalised and the headcount reduced, the sample size of employees invited to participate reduced accordingly. The average response rate was around 50%, indicating that nominally there was a response from approximately thirty-three employees per week. Employees mostly chose to post comments as a stand-alone post instead of forming a discussion board.

We gained a significant amount of knowledge from comments posted on the company's mood indicator**,** especially on the area of improving organisational effectiveness that can be seen below:

> *'Still much to be done to consolidate IT and processes and finally remove all the barriers which are complicating the merger into one business.'*

> *'Things need to be improved from a process point of view. As an example, expenses! Engineers in the field don't have access to printers, scanners and in most cases the internet.'*

> *'Processes are hard to find with being new.'*

> *'Processes remain disjointed…'*

> *'Not enough discussion on projects between departments pre the delivery phase, get it right before you take it to site, Sales Projects Engineering and Service need to be around the same table discussing new projects…'*

Employees had the opportunity to respond with an emoticon and/or leave a specific comment in an open text box. Members of the senior team provided a management response to the views expressed or issued raised. Figure 2 demonstrates an example of top-level results, and the emoticons used in the tool to represent the following options: 'excellent', 'good', 'ok', 'not good' or 'don't ask'. This is the method that Kozinets describes as Symbolic Netnography (2011:248).

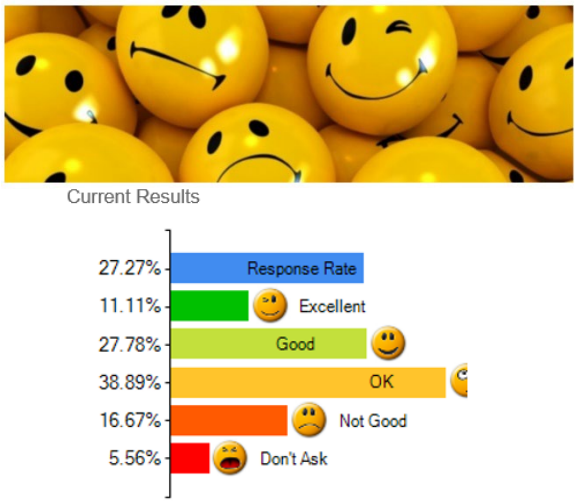

Figure 2: High level example of mood indicator tool results.

Any employee could respond to an individual's post with a thumbs-up or thumbs-down response to indicate whether they agree or disagree with the post. After management's feedback was posted, any employee in the company could also rate management's response with a thumbs-up or thumbs-down response, as can be seen in figure 3 which shows an example post.

Feedback	Date	Response from Management	Agree With
It's a good feeling to witness some progress in business improvement. By which I mean orders - not huge wins but orders all the same, and good ones (target customers, in defined markets) … Dare I say it, I think maybe a few less decision makers will see fewer instances of de-railing which I know has hampered progress for far too long, leaving us in the situation we are now in.	01 October 2013	You're right, we really are seeing some improvements in business wins, small but targeted business wins. Our new structure needs time to bed in but it has been carefully thought out to best support our business and performance plans moving forward. As we work through things, we will be able to see where we may need to tweak and makes changes. The important thing is we are moving in a more positive direction.	Feedback 1 0 Response 1 0

Figure 3: Example mood indicator post from 11 June 2015

4.2 Engagement survey

To support making sense of data, triangulation was used by utilizing qualitative comments from the company's inhouse engagement survey. Employees had the opportunity to participate anonymously by completing feedback on a rating scale, as well as free text boxes. The engagement survey provided valuable, insightful data on how employees perceived the organisation, the changes being made, and the challenges and successes of the redundancy programmes. The survey data was helpful in complementing the data collected from the mood indicator.

5. Data analysis

Data was analysed through thematic analysis (Braun and Clarke, 2006) which consisted of various stages such as data familiarisation, code generation, and identification and formation of themes (Östlund et al., 2011, Baran, 2016). The use of thematic, or content, analysis is supported by Reid and Duffy (2018) as a sensible approach to the categorising of netnographic data. While other popular methods of analysing online conversations often take data-centric approaches (Gandomi and Haider, 2015), where the number of likes and followers are used to analyse the data, this approach offered little benefit to data interpretation in the current study and no real meaning was gained by reviewing the number of 'likes' or 'dislikes' – partially in this case due to the low response rate and interaction elicited from this method. Due to the lead researcher being active and participative to understand the context of the research communities, the thematic analyses was undertaken by identifying key

words and searching for specific phrases. Our approach is aligned with the thinking of Reid and Duffy (2018) who posit that having an overview of the data collectively with an understanding of the community and context that is being studied, allows data to be analysed with more confidence. Employee posts were reviewed every two weeks as they were received, which allowed the process of identifying themes to be continuous.

In this study, the lead netnographer adopted the role of a participant observer, instead of a passive observer as having clear knowledge of the organisational context e.g., reason for redundancies, redundancy programmes, and the related communities were critical to understand the comments. Belk and Kozinets (2017) argue that passive observers do not have the same opportunities as participative observers, as participative observers have the prospects to experience a deeper understanding of the embedded culture.

6. Opportunities and challenges of netnography

As in most cases, opportunities can equally offer challenges, just as challenges can lead to opportunities. The following section considers both factors in the discussion.

6.1 Opportunities

6.1.1 Rich meaning of data

The effectiveness of netnography as a qualitative methodology is dependent on the requirement for "human presence and personal connections online" (Costello, McDermott and Wallace, 2017:1) which is supported by Kozinets (2015) and Reid and Duffy (2018) who posit that effective narratives can only be formed when data is read, compared, and understood within the community, culture, and context of the conversations. Based on this human factor of participative research, our study fully supports the notions of Costello, McDermott and Wallace (2017), Reid and Duffy (2018) and Zaród (2021) that applied humanist netnography provides an opportunity to make sense of the real meaning of the data. The profound knowledge and experience of the cultural context supports better interpretation of the data set (Kozinets, 2010).

Online discussion forums (ODF) are forums where individuals can post messages which become threads, as defined by Veyreda and Antaki (2009). Goodlad (2013) found in her study that ODF led to a more accurate account of the chosen research topic, and subsequently a richer dataset in comparison with interviews.

6.1.2 Unobtrusive

One of the key benefits we found, and supported by Kozinets (2002) and Pollok, Luttgens and Piller (2014), is the unobtrusive and non influencing approach to collecting data. In agreement with Costello, McDermott and Wallace (2017), netnography worked well to capture personal or sensitive topics, allowing participants to share emotions anonymously without fear of retribution from management. Marcell and Falls (2001) support our views that potentially, the reason for valuable and rich data is due to participants not being influenced by external factors such as fear of being judged.

6.1.3 Speediness

Data collection can be speedy as argued by De Valck, van Bruggen and Wierenga (2009), which we found in our study. The data was readily available for immediate interpretation and themes could be deduced every two weeks when data were collected via the online tool. The business requirement was to respond proactively and in a timely manner to employee concerns and as such, the speed of the process was imperative to meet its intended objectives, i.e. identify concerns with employee morale and wellbeing for example.

On the contrary, when it came to analysing the overall combined impact on employees over the consecutive redundancies – data interpretation was time consuming. This was however, not due to the methodology of netnography, but rather the specific nature of the narrative research design adopted. The pace of interpretating and analysing data using netnographic methods therefore depends on how it is used and analysed. The speed of downloading reports with typed content in contrast with the more traditional qualitative research methods such as interviews or focus groups where transcripts are required, was also a notable advantage.

6.1.4 Quality of data

Social media monitoring tools, defined as 'the continuous systematic observation and analysis of social media networks and social communities' (Fensel, Leiter, and Stavrakantonakis, 2012, p. 16) can have a significant influence on the effectiveness and quality of data collected. In our case, by using an in-house bespoke tool, the

organisation had the opportunity to stipulate privacy settings and limit data analysis complications such as, having to incorporate the analysis of hashtags or focussing on interactive exchanges or debates (Arvidsson and Caliandro, 2016). Specifically, in this study, where the digital tool used was bespoke and used within a controlled environment, data collection allowed for rich and informative data.

6.1.5 Organisational effectiveness

A significant benefit of our netnographic research was the ability to elicit new ideas and recommendations for improvement from the data, which was immediately identified and acted on by the lead researcher as an active, participative netnographer. This allowed for innovation and collaboration to emerge (Cherif and Miled, 2013) which stimulated further comments for areas of improvement. To promote employee participant engagement and encourage feedback, management acknowledgement is key, and as such, in a similar approach than Gurrieri and Cherrier (2013) who employed a lead blogger to help ensure community views were incorporated in their understanding of data, we had the benefit of a dedicated management respondent. The role helped to understand comments, respond to employee voice and interpret data correctly which in turn, led to improved organisational effectiveness when it came to management interventions. Correspondingly, sharing results, feedback, and acknowledgements with the community promoted valuable feedback as previously found by Cherif and Miled (2013).

6.2 Challenges

6.2.1 Protracted data analysis

Data analysis and triangulation was completed using Braun and Clarke's (2006) 6-step framework for thematic analysis. Due to the lead researcher adopting the role of an active, real-time, participatory netnographer with the aim to contribute value and a continuity to the narrative journey (Costello, McDermott and Wallace, 2017), analysis took place through manual methods using Excel to identify themes. The main challenge identified here was associated with the costly time consuming process required to analyse the data collectively after the redundancy programmes were complete, and to ensure validity and reliability through triangulation. Triangulation clearly has it's benefit in improving data quality (Cohen, Manion and Morrison, 2011) and is endorsed by views that the use of social media data alone is not encouraged (Ewing, Owens and Cassidy, 2016). The combined process of data analysis with triangulation was however, timely and took the lead author 64 hours of analysis. This process could be a challenge however, it is recommended that large volumes of data can be analysed more effectively through computer-supported software (Pollok, Luttgens, and Piller, 2014). Reid and Duffy (2018) support the notion that while the use of automation to categorise data is useful, and may help overcome such challenges, there is still a requirement for human insight to make sense of the distinctions in hidden behaviours.

6.2.2 Requirement for active, participative netnographer

As discussed in the section on opportunities, the requirement for an active, participative researcher is really important to allow for the interpretation and understanding of the data within the organisational setting. This in itself can present a challenge, as realistically this opportunity may not be afforded to researchers or vice versa; as it may not be realistic to expect practitioners to be academic researchers. In our study, we were fortunate to be able to provide context and meaning when analysing our large data set as we had the benefit of an active, participative researcher.

6.2.3 Limitations of symbolic netnography

We recognised early on that the use of emoticons alone, or symbolic netnography (Kozinets, 2011), and the absence of text to provide context, provided little insight as the 'why' was missing from the analysis and thus the meaning often lost. Our findings were supported by Zaltman and Leichliter (2011) who argue that symbolic netnography without text can cause significant challenges from a data analysis perspective, as it is subject to much interpretation.

6.2.4 Ethics

Ethics in the use of social media is contentious, with contradictory views on what is regarded as private and public information. The basic principles of ethics whilst conducting internet research, 'include the fundamental rights of human dignity, autonomy, protection, safety, maximization of benefits and minimization of harms, or, in the most recent accepted phrasing, respect for persons, justice, and beneficence' (Markham and Buchanan, 2012, pg. 4,). Concerns around ethics and privacy guidelines pertaining to digital tools have been highlighted,

maintaining that social media platforms are often used as a research methodology with a key focus on the technical possibilities of data collection, but less concern for ethical appropriateness (Evans, Ginnis and Bartlett, 2015). Ethical principles posit that the greater the vulnerability of the participants, the greater the obligation of the researcher to protect the participants (Markham and Buchanan, 2012).

A challenge could thus be getting the ethical considerations right, with Reid and Duffy (2018) contending that it is the researcher's responsibility to raise ethical concerns. On the contrary, the use of an in-house social media monitoring tool, could prevent ethical dilemmas when being set up. Anonymous posts helps to address some of the challenges associated with ethics, although anonymity cannot always be guaranteed and depends on the individual circumstances.

6.2.5 Supporting vulnerable participants

One of the challenges to consider when participants leave feedback anonymously, is identifying and supporting employees that appear fragile, or that could be considered harmful to themselves. This can present a real and present challenge for the organisation as well as the researcher. Posts that were deemed to cause alert of the employee's own wellbeing were responded to by offering various steps or support, including a contact name, number and email address of a specific individual in HR for support, instead of generic contact details. Management feedback also encouraged the employee to speak to their line manager in the first instance or to contact a member of management as a priority. Ironically, we found that in most such cases, where organisational support was of immediate need, and where employees started to suffer very low levels of morale, they willingly left their name and contact details in the posts. Thus, despite the posts being anonymous, the organisation could not prevent an individual from willingly disclosing their identity.

7. Conclusion

In summary, our own experience of conducting a humanistic netnographic study highlighted new perspectives on the opportunities and challenges associated with netnography as a qualitative research method. We discussed 5 opportunities and 5 challenges that we experienced and positioned this within the context of available literature. Despite the challenges faced, we believe that with the necessary awareness, the challenges identified can be overcome and proactively addressed when conducting netnography. We posit that the use of in-house social media monitoring tools give researchers and organisations the opportunity to address many of these challenges, and also afford the benefit of harnessing the opportunities. Our research indicates that the biggest challenge is to ensure and allow for human presence (Kozinets, 2015), and an active and participative netnographer is necessary to understand and interpret personal connections online (Costello, McDermott and Wallace, 2017; Reid and Duffy, 2018). We conclude with the main argument that netnographic studies present tremendous opportunities for academic researchers as well as practitioners despite the challenges faced.

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Wrapping up a Business and Public Administration Research Report

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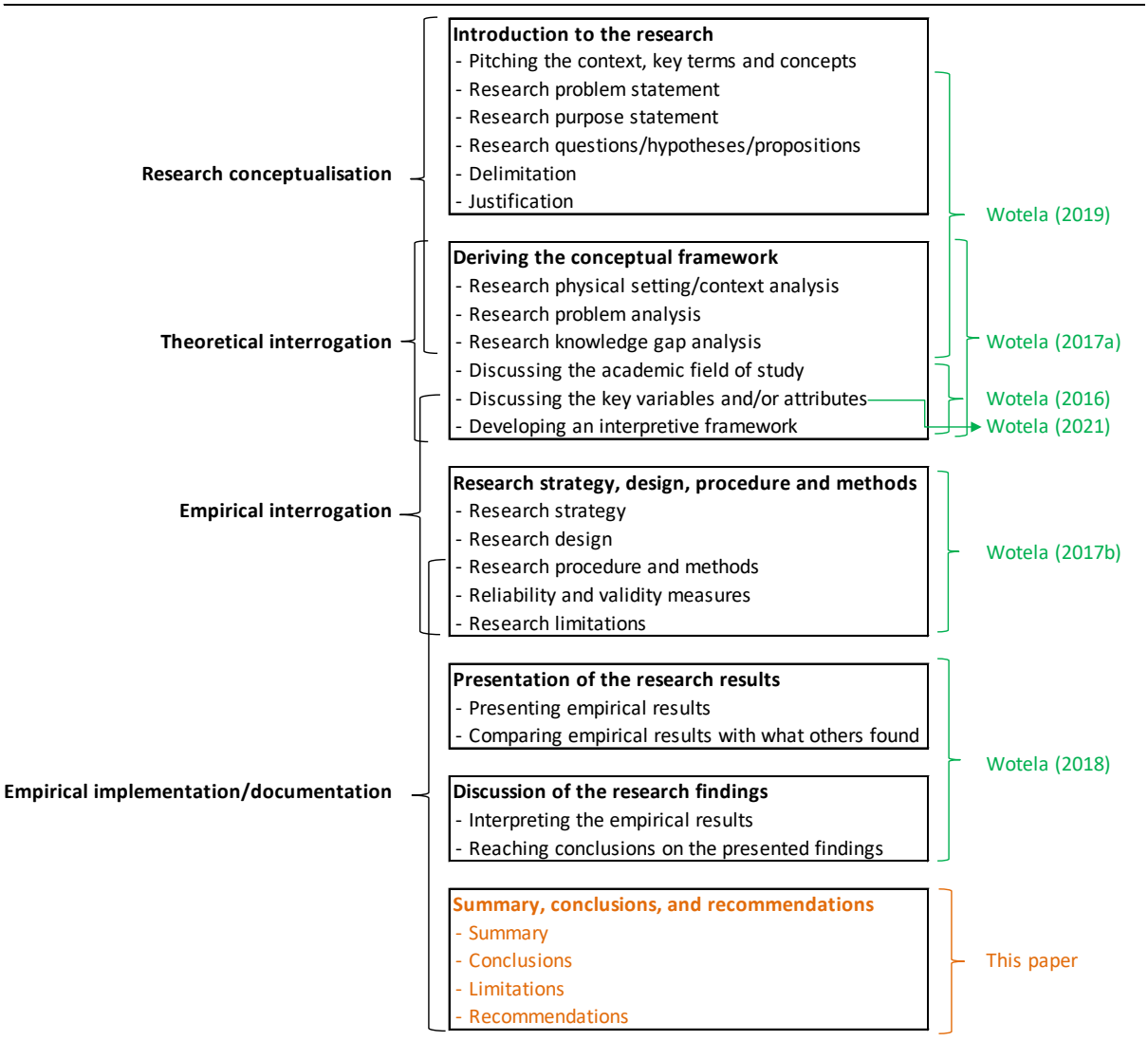
Abstract: Like the first component of a research report (introduction to the research), the last component (research summary, conclusions, limitations, and recommendations) is an important component in business and public administration research as is the case in any humanities and social science research. In sum, the 'introduction to the research' component focuses on conceptualising the research, that is, 'what' research we are pursuing and 'why'. The 'research summary, conclusions, limitations, and recommendations' focuses on four related aspects of a research report. First, it provides for the outputs of research by summarising its process and content. Second, it provides for the outcomes of research by pointing out its conclusions. Third, it documents aspects that took away (limitations) from the research process and its resulting content. Lastly, based on the foregoing, it proposes some policy, operational, practical, and future research recommendations. However, when undertaking this ultimate component, we often fail to explicitly tie in all that happened (research process) and how this led to the content. Therefore, this paper pursues the question, 'how can we effectively summarise a business and public administration research report and critically point out its conclusions as well as limitations and recommendations'. In doing so, we propose some approaches and considerations when wrapping up our business and public administration research. Generally, we should realise that this component feeds off and links in with the other five components of a research report, implying that its quality is only as good as the quality of the other components. Further, since this component also feeds into the other components of a research report, we can use it to improve our research report especially the first component (research conceptualisation) and the second (the conceptual framework). Specifically, the four subcomponents namely, research summary, conclusions, limitations, and recommendations, are interlinked and, therefore, we should have this in mind when dealing with this component. Like any other component, it should be well structured, well written, and its content comprehensive and critical. We should remember that it is a platform for us to stand out from anyone else doing similar research. We believe that the approach proposed in this paper provides a firm starting point for wrapping up our business and public administration research.

Keywords: research processes, research components, research content, summarising a research, concluding a research, research limitations, research recommendations

1. Background

Remenyi and others (1998) have proposed an eight-stage process for business and management research—that is, reviewing the literature; formalising a research question; establishing the methodology; collecting evidence; analysing evidence; developing conclusions; understanding the limitations of the research, and producing management guidelines or recommendations. As shown in Figure 1, Wotela (2021) has grouped these eight stages into four processes and six components. The four processes include, *research conceptualisation* (Wotela, 2021), *theoretical interrogation* (Wotela, 2016, 2017a, 2021), *empirical interrogation* (Wotela, 2017b) as well as *empirical implementation as well as its documentation interrogation* (Wotela, 2017b, 2018). This paper focuses on this last process in general but more specially the last three (of eight) stages in Remenyi and others (1998), that is, (i.) developing conclusions, (ii.) understanding the limitations of the research, and (iii.) producing management guidelines or recommendations. Here we pursue the question; how can we effectively summarise business and public administration research and in doing so point out the conclusions and limitations as well as make practical and future research recommendations? Like the first component of a research report (introduction to the research) where we conceptualise our research, the last component (research summary, conclusions, limitations, and recommendation) is an important component in any humanities and social research (Trafford and Leshem, 2008) including business and public administration. However, we most often fail to explicitly tie in the research process to its key content. This is probably because whilst there are several articles on summarising and concluding a research undertaking, for example Bryman (2016), most of them merely outline and describe the requirements. This is the gap that this paper intends to contribute to and, therefore, it is a concerted effort to demonstrate how we should explicitly summarise our research process and key content before moving on to pointing out the key conclusions, limitations, and finally, practical or policy recommendations as well as future research.

Our suggestions in this paper reverse engineer comments that we have compiled from examiners' reports of our students[1] and subsequent discussions with colleagues and research students through devising seminars. Fundamentally, the paper follows basic systems thinking principles described in Gharajedaghi (2006) which for our purposes are detailed in Wotela (2016) and builds on the work of Wotela (2016, 2017a, 2017b, 2018, 2019, 2022). The approach proposed in this paper provides a guide that research students, especially novices can use when wrapping up a research undertaking. If successfully implemented, the approach is likely to yield an integrated, comprehensive, and critical 'research summary, conclusions, limitations, and recommendations' component. As always, we focus on business and public administration research but our approach could apply to any other research especially in social sciences and humanities.



Source: Modified from Wotela (2019)

Figure 1: Showing the four processes of research and their accompanying six components of a research report as well as their subcomponents

2. The 'summary, conclusions, limitations, and recommendations' component—what, why, and how

Social research textbooks—such as Bak (2004); Hofstee (2006), Wagner, Kawulich, and Garner (2012); Brynard, Hanekom, and Brynard (2014); Neuman (2013); Gilbert (2015); Bryman (2016); Kumar (2018); and Parija and Kate (2018)—have a chapter or section on research writing. Some books, such Henning, Gravett, and van Rensburg (2005) as well as Remenyi and Bannister (2012), are devoted to academic writing or how to write a research report. However, most emphasis is on writing up the literature review (Neuman, 2013; Wagner,

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Kawulich, and Garner, 2012; Parija and Kate, 2018) and the research proposal (Kumar, 2018; Parija and Kate, 2018) but hardly on the other five components of a research report. A few authors, for example Remenyi and colleagues (1998) as well as more notably Hofstee (2006) and Trafford and Leshem (2008), include a detailed discussion on *how* to write the 'summary, conclusions, limitations, and recommendations' component. Even then, apart from Hofstee (2006), the emphasis is, and reasonably so, on the research conclusions rather than the other subcomponents of this last component of a research report. We can, therefore, certainly argue that there are few holistic guides on how to approach the ultimate component of a research report. This paper seeks to address this deficiency.

In all, as Henning, Gravett, and van Rensburg (2005) point out, it should be evident that our 'research summary, conclusions, limitations, and recommendations' component results from a coherent research process. We should also demonstrate that we now fully understand the research we have been pursuing and our resulting content is based on this understanding. Therefore, rather than speculation, this component should be based on the theoretical and empirical evidence that we have generated (Henning, Gravett, and van Rensburg, 2005; Trafford and Leshem, 2008; Brynard, Hanekom, and Brynard, 2014; Bryman, 2016). However, Gilbert (2015, 549), has also argued that we should actually "… speculate a little, going beyond the … [theoretical and empirical evidence that we have generated to] … point out further issues that the research has raised".

The material in this Section provides for the 'what' and 'why' of the 'research summary, conclusions, limitations, and recommendations' component but very little of the 'how'. This is probably because, as Gilbert (2015) has argued, this component is the most difficult to write. It is not easy to summarise the process and content of a research "… in a succinct and interesting way" (p549). Trafford and Leshem (2008, 127) share this view when they point out that "the prospect of distilling all the chapters into a single highly focused chapter may … [be] quite daunting".

3. The research process and components preceding the 'summary, conclusions, limitations, and recommendations' component

As shown in Figure 1, by the time we start thinking about summarising and concluding our research, we would have conceptualised our research and then undertaken our theoretical interrogation before moving onto empirical interrogation as well as way into our empirical implementation and its documentation. This implies that we would have completed five of the six components of our research report, be it a dissertation or a thesis. To prepare for the discussions in the sections that follow, this Section details what we would have achieved and produced in our business and public administration research before we start tackling our 'research summary, conclusions, limitations, and recommendations' component. As discussed in Wotela (2019), research conceptualisation allows us to reflect on our (i.) research title, (ii.) research problem statement, (iii.) research purpose statement, and (iv.) research questions as well as, where applicable, the accompanying research hypotheses or research propositions. We should then use these four pillars to develop the outline of the entire research write-up. However, we should also continuously update these pillars of research conceptualisation as our research progresses.

'Theoretical interrogation' entails interrogating six sets of literature (see Figure 1) and culminates in a conceptual framework (Wotela, 2017a). The first three sets of literature—that is, the research physical setting/context analysis, the research problem analysis, and the research knowledge gap analysis—provides for understanding the research problem (within the research context) that we are pursuing and then identifying the research knowledge gap. This interrogation assists us to strengthen our research conceptualisation and helps us start thinking about the research strategy, design, procedure and methods that we should use for our research (Wotela, 2019). The last three sets of literature—that is, establishing and discussing the academic field of study, establishing and discussing the key variables and/or attributes, and establishing and discussing an interpretive framework—provides for interrogating the attributes and variables that are key to the research that we are pursuing (Wotela, 2021) as well as the frameworks that we should use to interpret the anticipated empirical research results (Wotela, 2016). Ideally, this should be situated within appropriate academic context. We then derive the conceptual framework by summarising the key aspects emanating from these six sets of literature on our research and then using this summary to propose how we should undertake the empirical part of our research. Ideally, the conceptual framework affirms our research conceptualisation and paves the way to empirical interrogation.

Empirical interrogation entails interrogating research methodology literature to detail the research strategy, design, procedure and methods used (Wotela, 2017b). This paves the way to empirical implementation (and its documentation) that provides for describing how we actually collected, collated, processed and analysed either the quantitative research data or qualitative research information. Thereafter, we present our empirical research results before moving on to discuss our research findings by using our framework, theoretical or otherwise, to interpret what our empirical research results entail (Wotela, 2018). We need to emphasise that the discussion of research findings is an important ingredient into the 'summary, conclusions, limitations, and recommendations' component. Trafford and Leshem (2008) emphasise that it is the discussion of research findings that provides a foundation for wrapping up the research. With the preceding discussion in mind, we should then move onto reflecting on how we should summarise and conclude a business and public administration research report.

4. Towards wrapping up a business and public administration research

Figure 2 shows how the 'research summary, conclusions, limitations, and recommendations' component links in with other components of a research report. Intuitively, this component both feeds off and into the other components of a report. This means our first consideration when wrapping up a business and public administration research is its relationship with the preceding components (Trafford and Leshem, 2008). Therefore, following on the discussion in Section 3, we should explicitly[2] reflect on the material in the first five components of our research report to articulate the material for the sixth and last component. Table 1 shows the Microsoft Excel template that we can guide our reflection and articulation. More generally, we should begin with pointing out the summary points and then reflecting on the conclusions resulting from the summary. We should then move onto pointing out the limitations and then reflecting on the recommendations arising from the summary, conclusions, and limitations. Figure 3 is the possible content, proposed by Trafford and Leshem (2008), that we should articulate and reflect on to derive content for the 'research summary, conclusions, limitations, and recommendations' component.

Specifically, and without exception, our reflection during research conceptualisation focuses on (i.) the research title, (ii.) the research problem statement, (iii.) the research purpose statement, and (iv.) the research questions as well as where applicable the accompanying research hypotheses or research prepositions. The other materials and subsections such as background, justification, and delimitations in the first component are meant to support these four pillars of research conceptualisation. The second component focuses on the theoretical interrogation to derive the conceptual framework and should include (i.) the knowledge gap on the topic of our research, (ii.) the attributes or variables that are key to the research that we are pursuing, (iii.) the frameworks, theoretical or otherwise, that we have used to interpret the empirical research results. The third component focuses on empirical interrogation and empirical implementation (and its documentation). The former is a reflection on the key aspects of the research strategy, design, procedure and methods as well as how appropriate they are to the research that we are pursuing. The latter entails capturing key experiences during data or information collection, collation, processing, and analysis. The four and fifth components are an extension of empirical implementation (and its documentation) and provide for presenting empirical research results and discussing research findings.

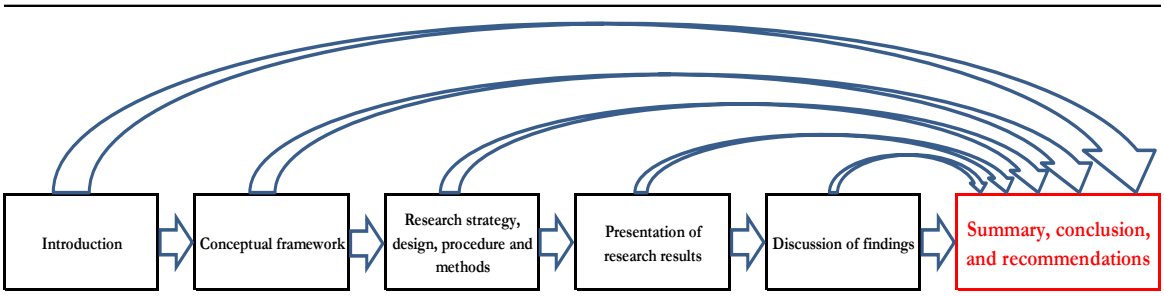

Figure 2: Showing the linkages between 'the summary, conclusions, limitations, and recommendations' component and other components of a research report

[2] This implies that we should think through what we need to do before we actually do it, that is, we should not just do it because we have to.

We should be very economical so that we only pick key aspects in each of the preceding five components especially that we have already summed up the other aspects in each of the components. Further, for each key aspect, we should articulate the conclusions and point out the limitations and recommendations. Similarly, feeding off our articulated summary and conclusions, we should then reflect and point out the limitations and the recommendations. Furthermore, based on the limitations of the research, we should recommend future research. We should note that these limitations apply to the entire research process and content beyond those we have articulated in the 'research strategy, design, procedure and methods' component. Therefore, they should bring out what else we could have done as well as what we could have done better as well as what else we should have rather realised.

Another consideration, as shown in Figure 4, is that the subcomponents of 'the summary, conclusions, limitations, and recommendations' component link in with one another. Therefore, it is equally important that we reflect on this linkage explicitly. Basically, it entails linking (i.) the summary to the conclusions, limitations, and recommendations, (ii.) the conclusions to the limitations and recommendations, and (iii.) the limitations to recommendations. Therefore, once we have populated our Table 1 with our summary points, conclusions, limitations, and recommendations and considering that the subcomponents of the 'the summary, conclusions, limitations, and recommendations' component and linked together, we should then reflect on our points collectively. This helps us to collate our key summary points, conclusions, limitations, and recommendations.

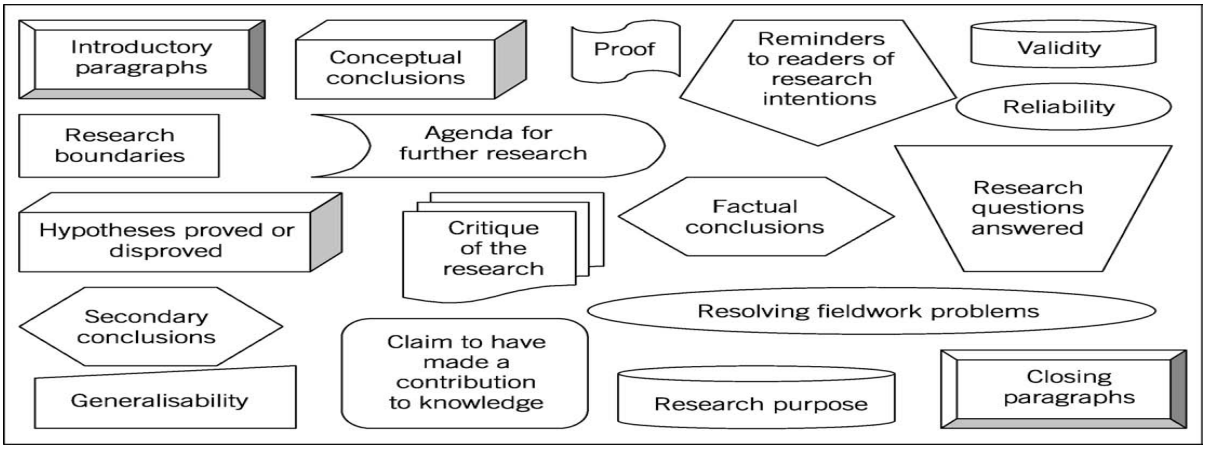

Figure 3: Showing how the possible content of 'the summary, conclusions, limitations, and recommendations' component suggested by Trafford and Leshem (2008)

Table 1: Showing the Microsoft Excel template that we can use to reflect and articulate the final component of a business and public administration research report

	Key summary points	Arising key conclusions	Possible limitations	Recommendations
Research conceptualisation				
Research title				
Research problem statement				
Research purpose statement				
Research questions and if applicable the accompanying hypotheses or prepositions				
Research justification				
Research delimitations				
Conceptual framework				
Research problem analysis				
Research knowledge gap analysis				
Interpretive framework				
Conceptual framework write-up				
Research strategy, design, procedure and methods				
The employed research strategy and design				
The emplyed research procedure and methods				
Data/information collection and collation				
Data/information processing and analysis				
Presentation of empirical research results				
To question 1 …				
To question 2 …				
To question 3 …				
Discussion of research findings				
Point 1 …				
Point 2 …				
Point 3 …				

5. Writing up 'the summary, conclusions, limitations, and recommendations' component

Like any other component, the write up of this component should be well structured (ideally around Figure 4) and well written, comprehensive, and critical. It should also be sufficiently attributed and correctly referenced. Second, based on its intended aim and objectives, we should write up the introduction to this component of between half-a-page and one page. The introduction should state the aim and objectives (what) of the component and why we need it as well as how we have put it together. If possible, we should also point the reader to layout (where) of the content in this component. Third, using the material in our populated Figure 4, we should *summarise* the (i.) introduction to research component, (ii.) conceptual framework component, (iii.) research strategy, design, procedure and methods component, (iv.) empirical research results component, and (v.) the research findings component.

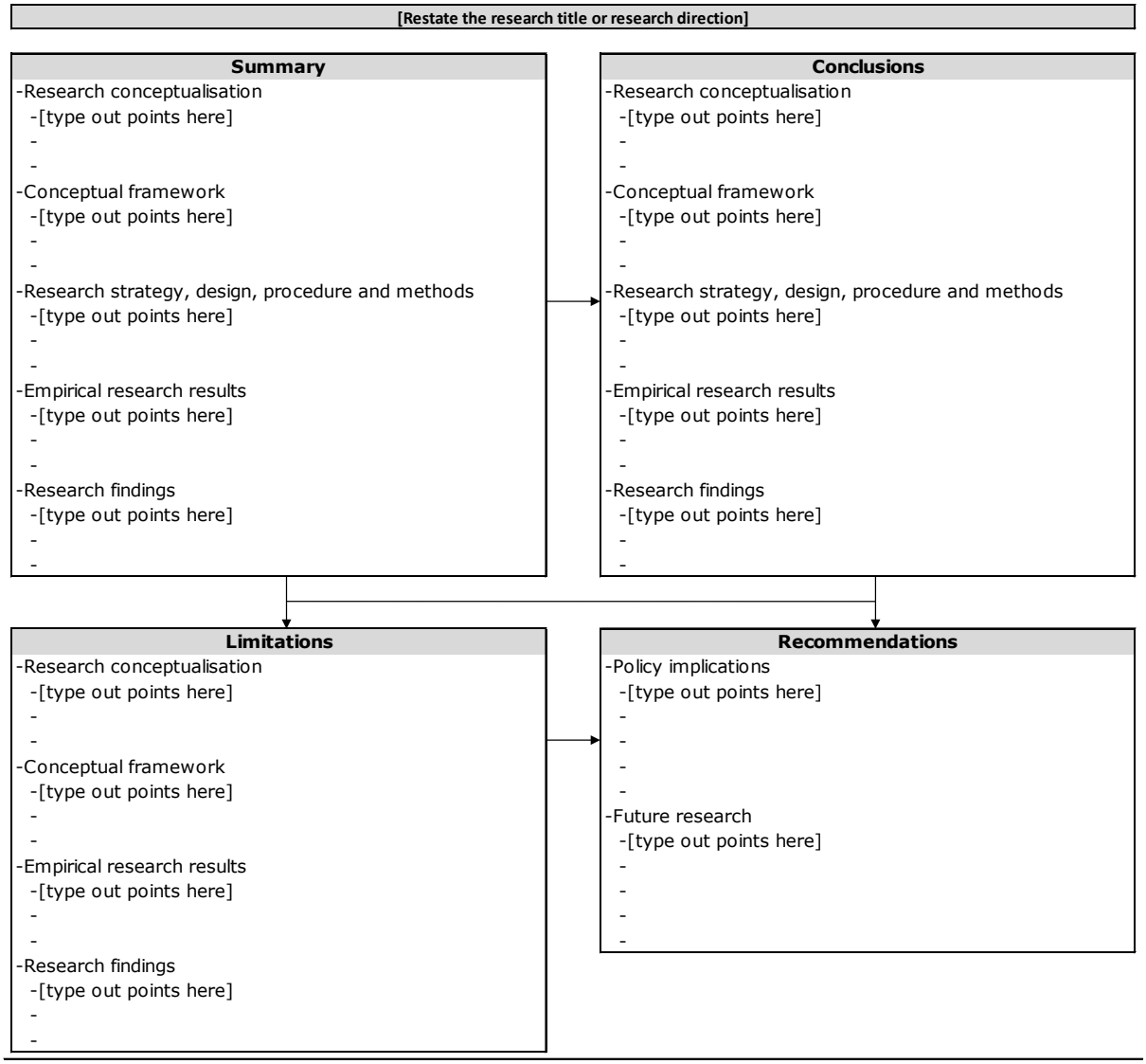

Figure 4: A Microsoft Excel template showing how the four subcomponents of the 'the summary, conclusions, limitations, and recommendations' component link in

Fourth, linking in the summary, as explicitly as possible, we should discuss the *conclusions* pertaining to the preceding five components. As implied in Henning, Gravett, and van Rensburg (2005), while the summary should provide us and the reader with sufficient gist about our research, the conclusion should tie the research components together (Trafford and Leshem, 2008). Therefore, we should be creative and our argument should be well pitched as well as convincing that the research process and emerging content is an addition to the body of knowledge (Remenyi, Williams, Money, *et al*, 1998). Another crucial inclusion should be the implications of our conclusions on existing frameworks, theoretical or otherwise—that is, do our conclusions confirm, substantiate, or contradict existing frameworks (Hofstee, 2006). Whatever the case, we are contributing to the body of knowledge (Remenyi, Williams, Money, *et al*, 1998). For a doctoral research, we may need to reformulate the existing framework or formulate a new one if our research shows that the existing ones are insufficient or absent. In sum, as emphasised in Hofstee (2006), we should point out the key contribution of our research, that is, (i.) the 'new' knowledge that we have generated and (ii.) the implications of our contribution, theoretical or otherwise, to knowledge on the topic of our research. This should preferably be in reference to the 'theoretical' research knowledge gap discussion in the second component of our research as well as the 'empirical' research knowledge gap that we unintentionally pick up in our research results and findings.

Fifth, linking in, as explicitly as possible with the summary and the conclusions we should point out and discuss the *limitations* of the research process and content pertaining to our (i.) research conceptualisation, (ii.) conceptual framework, (iii.) empirical research results, and (iv.) research findings. Here we are referring to the

overall limitations and not those specific to the 'research strategy, design, procedure and methods' component because we have already discussed these. As Remenyi and colleagues (1998) point out, since we have done the research, we understand what went in and what we could have done differently. The limitations help us to reflect on what we can do better if we are to redo the research. In essence, it is an element of self-discovery as we reflect on our work. Sixth, as explicitly as possible, linking in the summary, the conclusions, and the limitations; we should point out and discuss the *recommendations*, that is, (i.) policy or practical (re)considerations and (ii.) future research. Without exception, business and public administration research should offer tangibles that can make practitioners enhance their work or dealings effective and efficient (Remenyi, Williams, Money, et al, 1998). With regards future research, Hofstee (2006, 162) makes a case that "… one good answer leads to several new good questions …" that we or others should answer as well. We should, however, restrict our further research recommendations to those that will advance knowledge. Both the limitations and recommendations should be described in full and not bullet points or numbered items.

Lastly, even though this component feeds off the other five components, we should not merely repeat the earlier text (Trafford and Leshem, 2008). Rather, we should use the 'the summary, conclusions, limitations, and recommendations' component to show our intense reflection on our research so that we can stand out from anyone else doing the same research (Hofstee, 2006; Gilbert, 2015). This component is "… a means of selling to [our] readers the impressions that [we] would like them to have …" about our research (Trafford and Leshem, 2008, 135). Therefore, we should critically read and edit the discussions and figures of this component. We should remember that good writing implies saying what we want to say first then backing it up with literature. We should attribute our discussions (both ideas and words) and reference them correctly (using an appropriate referencing system). Chikodzi, Dube, and Nhamo (2021) have provided an example of what we should aim for when wrapping up a business and public administration research. We should keep in mind the intended objective of this component—that is, to ensure that we have a reflective, comprehensive, and critical summary and conclusion to our research. Obviously, this should include the overall limitations of the research process and content as well as proposing arising key recommendations. Further, Component 6 should read like a standalone piece looping and linking in the other five components of our research as well as integrating (i.) the summary, (ii.) the conclusions, (iii.) the limitations, and (iv.) the recommendations.

Using the draft 'Research summary, conclusions, limitations, and recommendations' to refine our research conceptualisation and the conceptual framework

Figure 5 shows how 'the introduction to the research' and 'the summary, conclusions, limitations, and recommendations' components link in with each other as well as the other components of a research report. Therefore, we articulate our 6th Component (research summary, conclusions, limitations, and recommendations) from the material in our 1st Component (Introduction to the research) through the 5th Component (Discussion of research findings). Normally, we should even stop6 here since we now have all the six components. However, we should not do so because now we should use the material in the 6th Component to improve on our entire write-up especially its research conceptualisation and conceptual framework. Actually, one of the four 'golden threads' in researching and research reporting (Wotela, 2021) emphasises that 'the introduction to the research' component should align with 'the summary, conclusions, limitations, and recommendations' component. Put differently, the first component of the research should echo or mirror the last component (Henning, Gravett, and van Rensburg, 2005). The former provides for what research we are pursuing and the latter documents what we have realised from the research. Therefore, the alignment is crucial because we should pursue what we have promised, and we should realise what we promised. Henning, Gravett, and van Rensburg (2005, 94-96) have provided some examples that illustrates this point.

In general, our 'summary, conclusions, limitations, and recommendations' component means that we should capture our theoretical and empirical interrogation in all the components of our research now that we actually have all the material. Specifically, we should ensure that key information with regards (i.) the introduction to the research, (ii.) the conceptual framework, (iii.) the research strategy, design, procedure and methods, (iv.) the presentation of empirical research results, (v.) the discussion of research findings (vi.) the research summary, conclusions, limitations, and recommendations is now present and explicit in the research title, research problem statement, research purpose statement, and the research questions as well as, where applicable, the research hypotheses or the research propositions. We should then proceed to update all the six components based on our refined pillars of research conceptualisation. This is a circular exercise that can continue

indefinitely, and we should repeat it as much as we can. Trafford and Leshem (2008) refer to this circular exercise as 'the magic cycle: putting it all together'.

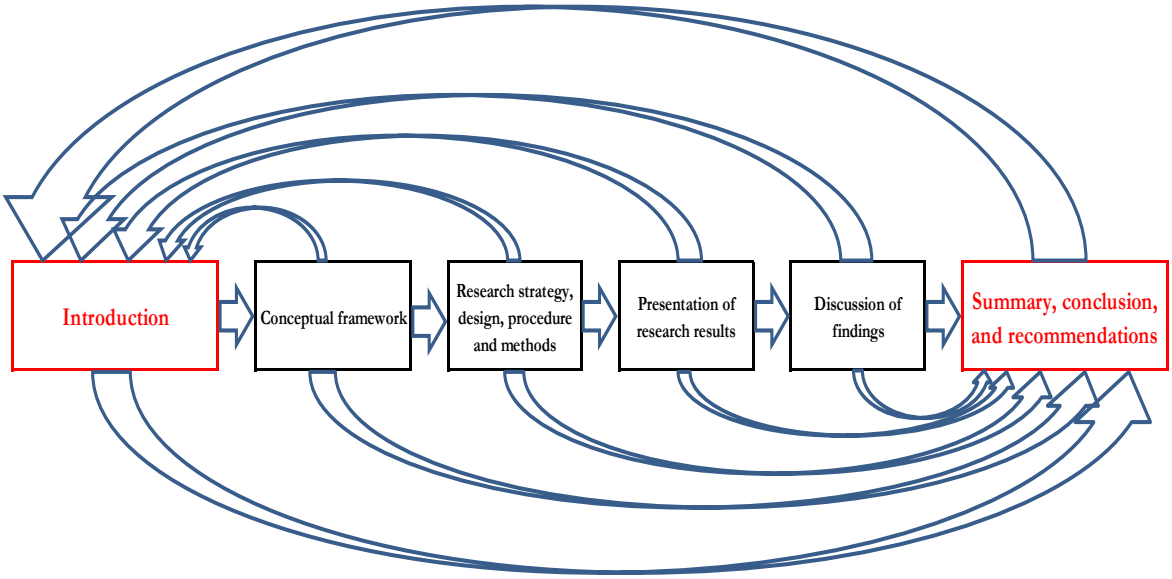

Figure 5: Showing how 'the introduction to the research' and 'the summary, conclusions, limitations, and recommendations' components link in with each other as well as other components of a research report

In addition, we should look at the preface to the research report in Component 1 (Introduction to the research) as a summary of Component 6 (Research summary, conclusions, limitations, and recommendations). We should, therefore, beef up the preface to a research report using the material in the 6th Component to provide adequate information on the contents of Components 2 through 6. Putting it differently, the preface is a reflective summary of the 'research summary, conclusions, limitations, and recommendations' component. Again, we should not merely outline the names of the research report components. Instead, the preface should provide notable content of each component of the research report. It should be a full description and not bullet points or numbered items. Therefore, like any other section of the research report, the preface to the research report should be comprehensive and critical, that is, it captures the key arguments and content of the last component. Ultimately, Component 1 should now squarely and explicitly speak to or mirror Component 6.

Furthermore, the 'conceptual framework' component summarises the literature that we have reviewed to spell out our (i.) research problem, (ii.) knowledge gap, (iii.) attributes or variables that are key to the research that we are pursuing, and (iv.) frameworks that are important to interpreting our empirical research results. The summary of this literature is the basis for our proposed research strategy, design, procedure and methods—that is, the empirical interrogation and empirical implementation as well as its documentation. Therefore, now that we have actually done all this as captured in the ultimate component, it is important that it is reflected in the conceptual framework. In sum, we should ensure that the key information pertaining to (i.) the introduction to the research, (ii.) the conceptual framework, (iii.) the research strategy, design, procedure and methods, (iv.) the presentation of empirical research results, (v.) the discussion of research findings (vi.) the research summary, conclusions, limitations, and recommendations is now present and explicit in the key sets of literature that makes up our conceptual framework. Again, we should then proceed to update all the other components of our research report based on our refined conceptual framework. We should repeat this circular exercise as much as we can. Badenhorst (2007) points out that this is articulation helps us with critically revising our research report.

6. Summary and conclusions

Remenyi and others (1998) have proposed an eight-stage research process for business and management students—that is, reviewing the literature; formalising a research question; establishing the methodology; collecting evidence; analysing evidence; developing conclusions; understanding the limitations of the research; producing management guidelines or recommendations. Wotela (2022) suggests that we can also group these into four processes, that is, (i.) research conceptualisation, (ii.) theoretical interrogation, (iii.) empirical interrogation, and (iv.) empirical implementation as well as its documentation. In all, these four processes result

in six products or components (Figure 1) regardless of the number of chapters we have in a research report. This paper focuses on the last three stages of Remenyi *et al* (1998) list, that is, developing conclusions, understanding the limitations of the research, and producing management guidelines or recommendations. These are captured in the last process (empirical implementation as well as its documentation) and the last component (research summary, conclusions, limitations, and recommendations) of a research report.

As the name suggests, the last component involves summarising the research, pointing out the key conclusions and limitations as well as making practical recommendations. However, it is easier said than done. Therefore, we highlight four considerations we should have in mind to produce a comprehensive and critical 'research summary, conclusions, limitations, and recommendations' component. The first two considerations are to explicitly reflect on the linkage of this component to other components as well as the linkage of its subcomponents. This component results from our prior processes and components. After conceptualising our research, we move onto the theoretical interrogation to derive the conceptual framework. The conceptual framework summarises the key literature that we have interrogated and then using this summary we propose how we should undertake the empirical part of our research. Our empirical interrogation summarises research procedure and methods that we should use to collect, collate, process, and analyse our research data or information. Research conceptualisation, theoretical interrogation, and empirical interrogation paves the way to *empirical implementation and its documentation*. The products of data or information analysis are presented as empirical research results before moving onto interpreting the meaning of the results that we should package as a 'discussion of research findings'. At this point, we are ready to wrap up our research in the last component that summarises the research process and content, points out the key conclusions as well as limitations before we make recommendations. Moreover, the subcomponents of 'the summary, conclusions, limitations, and recommendations' component link in with one another and, therefore, should be presented as such.

The third consideration is ensuring that we use our last component to improve on the other components of the research report especially our research conceptualisation (what research? and why?) which is the nerve centre of our research as well as the conceptual framework. Lastly, this component like any other component should be well written and its content should be comprehensive and critical. Apart from the discussion of research findings, readers and examiners use this component to judge the merit of our research.

Acknowledgements

I am grateful to our research students that took part in a series of *devising seminars* where we have discussed the various components of research reports focusing on what they are, why we need them, and how we can undertake them. I am, however, most grateful to the students that applied these proposed approaches for providing feedback on what worked and worked really well as well as what did not work. Further, I would like to thank colleagues, notably Prof Pundy Pillay, for the helpful comments and encouraging remarks. Lastly, as always, the reviewers including my daughter, Chibula Wotela, for helping me fine-tune this article and reconcile my argument as well as perfect my write-up.

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PhD Research Paper

Deriving a Theoretical Framework for Interpreting Management Research Results in South Africa

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Abstract: Drawing from a study investigating performance management in South African public institutions, this article highlights the significance of literature review as a technique for deriving a theoretical framework for interpreting public management research results. Specifically, the article argues that the process of developing an interpretive framework begins with understanding the difference between a conceptual frameworks and a theoretical framework. Understanding this distinction is important because students and seasoned researchers often treat these concepts as synonyms, of which they are not. As a result, most postgraduate management students in South Africa struggle to effectively use literature review as a technique for constructing a framework for interpreting their research findings. Exacerbating this struggle is that most universities do not offer structured teaching on how to do literature review and specifically use it to construct a theoretical framework. Therefore, this article provides guidance on how postgraduate management students in South Africa should effectively use literature review to develop a framework for interpreting research findings. In developing this guidance, the article drew from an ongoing research and existing literature on research conceptualisation to demonstrate the significance of literature review as a technique for interpreting research results. In other words, the article applies a combination of research theory and practice to contribute knowledge on how to construct a theoretical framework for interpreting research results.

Keywords: Literature review, Conceptual Framework, Management Research, South Africa

1. Introduction

Based on a study on performance management in South African public institutions, this article highlights the role of literature review in constructing a theoretical framework, which is the most difficult undertaking for most postgraduate students. For example, it is common for postgraduate students to refer to a description of concepts used in research as a conceptual framework (Naidoo 2011; Nelson 2016; Leburu 2018). Indeed, a conceptual framework describes concepts used in the study but Maxwell (2013) cautions that this description should be systematic. However, as Wotela (2016) points out, most postgraduate students in South Africa, and probably elsewhere, provide an incoherent discussion of concept after concept leading to an ineffective approach to research conceptualisation. This problem is a consequence of the unavailability of taught modules on literature review in most universities (Atkins & Wallace 2012; Bloomberg & Volpe 2008). As a result, literature review is the most overlooked aspect of the research process (Tight 2019). For this reason, most students struggle to effectively review literature for constructing theoretical frameworks for interpreting research findings. To address this problem, the article outlines a process towards deriving a framework for interpreting public management research results. First, it distinguishes between theoretical and conceptual frameworks to dispel the notion that these concepts are synonyms. Second, it draws from Wotela (2016) to provide guidance on how postgraduate students may effectively use literature review as a technique for constructing a theoretical framework. Last, it applies Grant and Onsaloo's (2014) approach and draws from ongoing research to demonstrate how students may link theory to key components of the research such as the research problem and the research questions.

2. Approach

This article is founded on the premise that a conceptual framework, which Camp (2001) describes as an outline showing research progression, is an outcome of a systematic literature review (Wotela 2017; Bless 2021). Therefore, the first step towards deriving a theoretical framework – an important component of a conceptual framework – involves undertaking a systematic literature review. To this end, the criteria for searching literature from a variety of academic databases such as Scopus and Google Scholar were developed. The search yielded a significant number of sources some of which were eliminated after screening abstracts. After screening, 15 peer-reviewed journal articles from the field of public administration and management were selected and subjected to thematic analysis using a grid matrix consisting of five questions. The first question interrogated the purpose of the literature review while the second focused on key products of literature review. The third addressed similarities and differences between a conceptual framework and a theoretical framework while the last interrogated key functions of these frameworks. These questions were deposited in the first column of the

matrix resulting in five rows with each row representing a specific question. Specifically, each of the selected articles was analysed on how it responded to each question in the matrix. For example, each article was examined on how it had defined the purpose of literature review, and information extracted in this regard was recorded in a cell corresponding to this theme. After analysing all the selected articles against the five questions, the author expanded the matrix by three columns. In the first additional column, the author recorded similarities across articles on how they have addressed a specific question. The second column was reserved for differences while in the last column the author recorded his own reflections across a broad range of issues emerging from how all the articles had responded to the five questions mentioned earlier. As noted in Wotela (2016), understanding similarities and differences allows the researcher to establish a general pattern on how literature responds to a particular question. With this pattern established, it was easy for the author to add his own voice in the discussion of each identified theme, resulting in a comprehensive and critical understanding of a wide range of issues pertaining to the role of literature review in the research process. After undertaking this exercise, the author made the following observations.

The first is that South African public administration and management research does not offer adequate tools for using literature to derive a theoretical framework. Second, Grant and Onsaloo (2014) as well as Wotela (2016), offer useful guidance to close this gap. Last, some postgraduate management students in South Africa have applied the Wotela approach to interrogate literature for conceptualising their studies. However, no one has released a publication on the effectiveness of this approach in facilitating the development of theoretical frameworks. Therefore, in closing this gap, this article draws from ongoing research to demonstrate how postgraduate students in a South African context, can effectively use literature as a technique for deriving a framework for interpreting public management research results. In this regard, the article argues that the successful construction of interpretive framework requires students to first understand related but distinct functions of a theoretical framework and a conceptual framework.

3. Distinguishing between theoretical and conceptual frameworks

The importance of literature review as a technique for constructing theoretical and conceptual frameworks is hardly contested. However, as Evans (2007) points out, there is a debate on whether these concepts serve the same purpose. Out of a desire to contribute to this debate, this article highlights common errors that researchers commit in describing these important products of literature review. For example, Maxwell (2003) describes a conceptual framework as a presentation of a theory of the phenomenon under investigation. Similarly, Imenda (2014) defines it as a product of bringing together several related concepts to explain or predict a given event. According to Gabriel (2008), prediction is the main function of theory. Therefore, positioning a conceptual framework as a predictive concept confirms Grant and Onsaloo's (2014) observation that some scholars treat these concepts as synonyms. This obscures the distinctive features of these concepts and makes it difficult for South African postgraduate management students to appreciate their functions in the research process. Another mistake is that these concepts are described as structures that guide the research process (Liehr & Smith 1999) without explaining the type of structure they are and how each guides the research process. To provide clarity in this regard, the article treats conceptual and theoretical frameworks as complementary but distinct products of the literature review.

In terms of complementarity, both enhance research conceptualisation but theoretical frameworks specifically provide for interpretation of research findings while a conceptual framework guides the entire research process. Highlighting the complementarity between these concepts, Ravitch and Riggan (2017) define a theoretical framework as a set of theories supporting the relationship embedded in the conceptual framework. Drawing from the author's experience as a postgraduate student, this article argues that a theoretical framework infuses theory into critical components of a conceptual framework such as the research problem and the research questions. Most importantly, a theoretical framework allows researchers to justify methodological options presented in the conceptual framework. Perhaps this complementarity is the source of a misconception that the two concepts serve a similar purpose. Fuelling this misconception is limited literature offering a distinct description of the two important aspects of literature review (Maxwell 2013; Merriam 1997; Miles & Huberman 1994). Considering this, this article highlights different functions of a conceptual framework and a theoretical framework.

The main difference between a conceptual framework and a theoretical framework is that the former describes a pathway along which the research process unfolds from the beginning to the end. On the other hand, the latter

constitutes theories and concepts that guide researchers in collecting, analysing, and eventually interpreting research findings. For example, a theoretical framework provides a structure for what to look for in the data (Kivunja 2018) and allows researchers to analyse variables and attributes extracted from the data in a way that links theory to research questions. Therefore, its value lies in its ability to infuse theory into key aspects of a conceptual framework, especially the research problem statement, research justification, research questions, research strategy, design, procedures, and methods. According to Miles and Huberman (1994), decisions on how to explore these research elements are dependent on the researcher's orientation and personal understanding of concepts. Therefore, as Adom and Hussein (2018) point out, a significant difference between a conceptual framework and a theoretical framework is that the former is derived from personal orientations and experiences. On the other hand, the latter relies on literature to identify existing and relevant theories, frameworks, and concepts to inform the researcher's approach to answering the research questions.

Having noted similarities and differences between a conceptual framework and a theoretical framework, the article moves on to answer the most pertinent question of how to construct a theoretical framework. To answer this question, the article concurs with Wotela (2016) that deriving a theoretical framework begins with interrogating literature to understand the field of study in which research is embedded. Based on this explanation, management was interrogated as an academic home for this article and this interrogation enabled the author to identify theoretical views of leaders in the field of management. According to Grant and Osanloo (2014), these theoretical views should be tightly aligned to the research problem, the research justification, and the research questions. To facilitate this process, Wotela (2016) suggests five questions with the first question aimed at understanding events leading to the development of a theory of interest. The second question examines how the theory of interest was developed and for what purpose while the third examines what the theory explains. The fourth question provides information on the advantages of identified theory while the fifth addresses its disadvantages. These questions, together with Grant and Onsaloo's (2014) approach to integrating theory into key components of the research process, inform the process towards deriving a framework for interpreting public management research results as outlined in the next section.

4. Dering a theoretical framework: Lessons from performance management research in South Africa

As mentioned earlier, this article is a product of an ongoing study on performance management in South African public institutions. Therefore, in line with Wotela's (2016) suggestion that deriving an interpretive framework begins with understanding the field of study, the author interrogated management as a field of study in which the main research that informs this paper is located. To this end, management is defined as a branch of public administration divided into two components of business management and public management. Given its title, this paper is located within the realm of public management. This means that public management provides potential theories, concepts, and frameworks for interpreting public management research results. In this regard, new public management stands out for its ability to explain a transition from public administration to public management. Therefore, constructing a theoretical framework for interpreting public management research findings requires a detailed analysis of key dimensions of public management. In this regard, the author began by tracing the origins of new public management back to institutional economics and managerialism (Hood 1991). With this in mind, the article argues that an effective interpretive framework for public management studies should draw from the two fields. For example, theories such as public choice, property rights, and transactional costs are commonly used for interpreting different aspects of institutional economics. However, these are not appropriate for this study which is rooted in the field of public administration. For example, Sidzumo and Wotela (2016) applied the theory of bureaucracy which originates from public administration, to explain constraints towards the use of performance monitoring and evaluation in South African public institutions. Adding to this, this article identifies management by objectives, implementation theory, and organisational culture as potential theories for explaining challenges facing South African public institutions. Identification of several theories in this regard confirms Ravitch and Riggan's (2017) notion that understanding the field of study, in this case, public management provides a cluster of potential theories for interpreting research results. For this article, there are three clusters of potential theories for interpreting public management research results. The first cluster consists of theories drawn from the field of public administration while the second and third are drawn from the field of management and the field of organisational behaviour respectively.

Now that clusters of potential theories for interpreting public management research results have been identified, the next step is to use these theories to interpret research findings. To facilitate this process, the article draws from Crawford (2014) and Wotela (2016) who suggest that before applying potential theories, researchers should first understand their origin, as well as assumptions, propositions, and explanations associated with them. Therefore, the article traces the origin of bureaucracy within the South African public service to apartheid, which according to Gumede (2015), was fragmented along ethnic, regional, and political lines and characterised by centralised control, top-down management, lack of transparency, and accountability. Given the oppressive policy of apartheid, bureaucracy was mainly used as a tool for compliance and control. Notwithstanding inefficiencies of bureaucracy, as noted in several proponents of new public management, Cameron (2009) states that principles of bureaucracy are entrenched within the South African public service. For example, the current bureaucracy, established on democratic principles of accountability, is also characterised by nepotism, lack of accountability, and professionalism when it comes to the appointment of senior public servants (Ndevu, 2019). As Kgatle (2017) points out, political interference, lack of accountability, and nepotism are root causes of poor performance in South African public entities. For this reason, Weber's (1947) theory of bureaucracy is suitable for interpreting factors that hinder performance across South African public institutions. In addition, Wilson's (1887) theory of politics-administration dichotomy, which originates from the failure of the spoils system, is relevant for interpreting the same issue. Specifically, Weber's rational bureaucracy allowed the author to understand that bureaucratic institutions are slow to adapt and innovate leading to poor performance. Most importantly, Wilson's ideas allowed the author to understand how failure to adhere to the principle of politics-administration dichotomy has eroded accountability and professionalism leading to the collapse of key institutions in South Africa.

Moving on to theories clustered under management, the article argues that the principle of task monitoring espoused in the original work of Taylor's (1911) scientific management, is the basis for the introduction of performance standards in public institutions. Subsequently, this principle became a cornerstone of Drucker's (1954) idea of management by objectives that appeared in the wake of the new public management movement. Specifically, key principles of management by objectives permeate all facets of new public management making this theory appropriate for interpreting performance issues in South African public institutions. Therefore, the successful development of a theoretical framework for interpreting management research results requires theories drawn from multiple fields of study. For example, Taylorism, which is a management theory, provides the basis for use of performance standards in public institutions. In other words, Taylorism provides a theoretical foundation for new public management, which in turn, draws inspiration from Drucker's management by objectives. In sum, new public management draws its theoretical foundations from several fields including public administration. This means that the popularity of new public management does not mean that it is a new phenomenon. What is new is that old ideas expressed by classical public administration and management scholars were repackaged and widely promoted by international organisations as a panacea for administrative problems facing public institutions in general. Riding over the bandwagon of this international movement, a democratic South Africa adopted different aspects of performance management especially monitoring and evaluation, as a solution to service delivery challenges it inherited from apartheid administration.

Adoption of performance monitoring and evaluation assumes that the effectiveness of public institutions rests on the use of private sector management techniques and values. However, as Meek (1988) points out, this assumption is not accurate because private and public institutions do not share a homogeneous culture. For this reason, Gumede (2015) concludes that new public management reforms have not yielded convincing results in South Africa. To address this problem, this article points to the third cluster of theories drawn from a domain of organisational behaviour. Specifically, it draws from theories of culture to demonstrate the significance of organisational culture as a performance-enhancing attribute. To this end, the author applies Wotela's (2016) thematic analysis to interrogate literature for understanding different aspects of organisational culture. As noted in table 1, this interrogation is guided by key issues reflected in the first column. Based on personal experience, effective analysis of potential theories for interpreting research findings requires students to source a minimum of three articles on each theory to be considered for inclusion in the theoretical framework. One article should be written by the pioneer of the theory, the other by its supporter while the last should be written by its antagonist.

Table 1: A framework for interrogating literature to derive a theoretical framework for interpreting public management research results (Adapted from Wotela 2016)

	Pioneer	Supporter	Antagonist
Author and year	**Durkheim (1960)**	**Radcliffe Brown (1965)**	**Van der Berghe (1963)**
Events leading to development of organisational culture	Comte gave the subject its name and an ambitious prospectus; Durkheim gave it academic credibility and influence.		
Purpose of organisational culture	ritual and ceremony serve to build cohesion and facilitate collective cognition	Social institutions are necessary for inculcating the values and strengthening solidarity among the masses.	
What does organisational culture explain	To make sense of culture, then, one must first attend to the social structural configurations that beget and sustain it	The social structure of society consists of various components such as social institutions, social norms, and values, that are interconnected and dependent	Culture is the product of negotiated and shared symbols and meanings; it emerges from social interaction.
Advantages	The two Frenchmen who did most to create the discipline were Auguste Comte (1798–1857) in the aftermath of the Revolution, and Émile Durkheim (1858–1917) after the Franco-Prussian War.	Each component of the structure has a specified role and altogether these social patterns contribute to the balanced and stable functioning of society.	
Disadvantages			"criticised structural functional theory for its assumption that the parts of a society exist in a natural state of equilibrium, functioning efficiently so as to maintain the effectiveness of the total social structure"

After sourcing three articles (see table 1), the analysis should begin by interrogating culture as a concept. In this regard, culture is understood as a configuration of social structure and how it functions (Durkheim 1960). In support of this view, Brown (1965) identifies different components of culture which include social institutions, social norms, and social values. Based on Durkheim's understanding of culture, norms and values give meaning and identity to a social structure. Even Van der Berghe (1963), who criticises Durkheim's idea, recognises this fundamental aspect. For this reason, in the original study that informs this paper, the author collected empirical data on norms and values that shape individual and institutional behaviour that determine the administrative culture of public institutions in South Africa. To understand how these values and norms are translated into strategic objectives, the author reviewed organisational reports and strategic documents. Therefore, this article underscores the relevance of structural functionalism for interpreting the administrative culture of social institutions. Building on key elements of structural functionalism, Schein (1985) developed a framework for analysing organisational culture. This framework consists of three dimensions of organisational culture which are, artefacts, beliefs, and values as well as assumptions underlying these beliefs and values. Artefacts describe physical spaces and objects important to the organisation while beliefs and values shape individual identity and are driven by underlying assumptions. These dimensions are consistent with components of culture outlined in Durkheim's (1960) notion of structural functionalism. This means that Schein's (1985) understanding of organisational culture is informed by social norms and values that make institutions, as part of social structures, functional. Therefore, the original study on which this article is based applied Schein's framework to understand social norms and values that shape individual attitudes and perceptions that determine the administrative culture of the South African public service.

In recent years, scholars have shifted from an anthropological perspective and adopted a management approach to understanding the culture of institutions. For example, Harrison and Stokes (1992) provide a framework outlining four dimensions of organisational culture (power-oriented culture, role-oriented culture, achievement-oriented culture, support-oriented culture). According to Hampden-Turner (1990), the power dimension thrives on respect for authority, rationality in processes, and division of work. This means that power-oriented culture

is associated with bureaucracy thereby confirming the author's argument that bureaucracy remains relevant for interpreting performance in South African public institutions. Harrison and Stokes (1992) describe role-oriented culture as substituting the power of the leader with a mechanistic system of rules and processes. These types of organisations are governed by position and contract procedures (Hampden-Turner 1990) meaning that they are as bureaucratic as power-oriented organisations. The achievement-oriented culture is described as a culture that lines people up behind a shared vision or purpose (Harrison & Stokes 1992). This culture is consistent with key principles of new public management espoused in Hood (1991) and organisations that embrace this culture are more likely to perform better than those that are power-oriented and role-oriented. Last, support-oriented culture promotes strong interpersonal relationships (Harrison & Stokes 1992). For this reason, it is consistent with Schein's (1985) description of norms and values as determinants of interpersonal relations.

In sum, the article has outlined a cluster of potential theories for interpreting public management research results. Specifically, it underscores the relevance of traditional public administration theories and contemporary public management theories for interpreting performance issues in South African public institutions. However, new public management is inadequate because it does not recognise organisational culture as a performance-enhancing attribute. To this end, the article argues that Harrison and Stokes (1992), as well as Schein (1985), offer ideas that enhance limitations of new public management as an interpretive framework. So far, the article has described how specific theories drawn from different fields of study can be used to establish a theoretical framework for interpreting public management research results in a South African context. Therefore, the next step is to explain how theory can be infused into specific aspects of research.

Once a theoretical framework has been constructed, it should be linked to all components of the research. However, due to limitations of time and space, this article focuses on how to link theory to the research problem statement and the research questions. Drawing from the original study that informed this article, the author structured the problem statement around an argument that traces the failure of new public management reforms in South Africa to inadequate recognition of organisational culture as a performance-enhancing attribute. For this reason, organisational culture and new public management emerged early on as potential theories for interpreting performance issues. After conceptualising the research problem statement, the author derived the research questions, one of which was to determine constraints to effective implementation of monitoring and evaluation. Therefore, implementation theory was used to collect and interpret data on how monitoring and evaluation were implemented in South African institutions. Last, another question focused on the role of organisational culture as a performance-enhancing attribute. In this regard, Schein's (2010) framework of analysing culture was found useful for collecting and analysing data to understand norms and values that shape the administrative culture of public entities in South Africa. In a nutshell, this is how theory is linked to the research problem statement and the research questions and the same approach should be applied to other components of research.

5. Conclusion

This article has outlined a process towards deriving a theoretical framework for interpreting public management research results in South Africa. Specifically, this article distinguished between a conceptual framework and a theoretical framework before demonstrating how postgraduate management students should interrogate literature to establish an academic home for research. In this regard, the article has argued that distinguishing between these important aspects of research allows students to appreciate related but distinct functions of theoretical frameworks and conceptual frameworks. Most importantly, understanding the field of study, especially public management, allows students to identify clusters of potential theories for interpreting public management research results. Therefore, this article has demonstrated how specific theories drawn from public administration, management, and organisational behaviour, can be used to construct a framework for interpreting public management research in a South African context. By so doing, the article contributes much-needed knowledge on how postgraduate students across a variety of disciplines may effectively use literature review as a technique for interpreting research findings.

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Using Mixed-Method Technique to Investigate Role of Local Governments in City Branding

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Abstract: Local governments provide a range of local services, preserve the life and liberty of residents, creating space for democratic participation and civic dialogue, supporting market-led and environmentally sustainable development. City branding supplies the principles for the city developing policy to sustain the local development. In other words, city branding means being powerful to face the increasing wild competition for resources, investment, and tourism facilities, both for addressing crucial social issues and cultural variation. The purpose of this study is (i) to investigate the role of local governments in city branding, (ii) to determine city branding contribution to local economic development (LED). Although there are plenty place branding techniques in the world, the success of the city branding strategy cannot be performed without the participation of a local government. In addition, the current study selects the city of Durban in the Province of KwaZulu-Natal, South Africa as the context of the study and a local government to focus on. The problem is that the city of Durban has not been successful at making the city competitive enough to attract the needed investments. The city officials have also not been effectively marketing the city to the world to make known of its inherent potentials. This study seeks to overcome this issue by developing city branding strategies. The city management need to take proactive action in implementing them to effectively market the city to the world. To achieve objectives, the study adopts the form of a mixed-methods approach, using quantitative (survey questionnaire) and qualitative (in-depth interview) as methods and instruments for data collection. The study follows a sequential design starting with quantitative and followed by qualitative data collection. Since the study employs both quantitative and qualitative methods, both purposive sampling (for qualitative phase) and simple random sampling (for quantitative phase) techniques will be selected. The researcher selected participants from Durban municipality. The study's sample size constitutes 350 participants (N=320 was surveyed) and (30 were interviewed). The researcher analysed the data collected with questionnaires through descriptive and inferential statistics and data collected using in-depth interviews through content analysis.

Keywords: mixed-methods, sequential design, local government, city branding.

1. Introduction

Research based on studies deploying a mixed-method approach is scant and limited. Hence, the current study uses the mixed-method approach to extend the knowledge on mixed-methods approach. Creswell (2014) and Denscombe (2016) argued that methodological integration results in improved understanding of research issues and strengthen the position of the study.

The current study aims to examine the role of local governments in city branding to gain city competitive value. The following are subordinate objectives of the study: (i) To examine the role of local governments in city branding, (ii) To explore the branding strategies of the eThekwini Metropolitan Municipality, (iii) To determine city branding contribution to local economic development (LED).

Academic discourse about mixed-methods approach has not been receiving increasing interest on scholars and practitioners. Researchers either employ qualitative method or quantitative method as a research strategy. Therefore, the current study fills this gap by examining the role of local governments in city branding by applying the mixed-method approach. Although there is a great abundance of research on local governments and city branding, however, the specific academic literature seems to be fuzzy when it comes to understanding the role of local governments, exploring the branding strategies, and determining the contribution of city branding on LED using mixed-method approach.

The current paper has developed from the PhD thesis which is an in-progress thesis on the research methodology chapter (Zulu and Phiri, 2021). The PhD thesis has employed the mixed-method technique to approach the study. Studies by Phiri and Madondo (2018:10) has found that "research on business management studies predict that in South Africa researchers generally prefer the quantitative and qualitative methodological adoption and implementation." This suggest that authors neglect the adoption of a mixed method and select either qualitative or quantitative method (Phiri and Madondo, 2018). This is where the current study wishes to close the gap in knowledge and employ the mixed-method technique to investigate the current issue. The study begins by

presenting the review of literature which includes the main studies related to the theme under the current study. The explanation of the methodology section in the current study the follows, with the subsequent analysis of results. This section will be followed by the presentation of discussion of the findings, followed by the conclusion and refence list.

2. Literature review

2.1 Local government

The two-fold essentialities (purposes) that local government serves are (a) supplying goods and services come under administrative purpose, (b) the representation and the involvement of masses in locating particular public need and objectivity to understand how these needs can be met (Adnan, 2012). The administration and representation at local levels inside the structure of local government is connected and formulated by the process of representatives at local government (Adnan, 2012). For the enhancement of creating a better understanding about the local government's structure and functions, it is essential to elaborate and define local government. As an element of decentralization, local government is a result of devolution. Adnan (2012:4) posited that "in the context of literature, there are two advances to define the local government. In aspect of comparative studies, under the central government, all those national structures are regarded as central government. In the second approach, the specifics and particular characteristics that determines local government in more circumspect manner." Therefore, these distinguished features mainly focus on the five following aspects: (1) legal personality, (2) localness, (3) effective participation by citizens, (4) extensive budgetary and employing self-sufficiency in regard to bounded control from central authority, and (5) particular powers to execute a variety of functions (Adnan, 2012). These attributes are significant in separating it from the different forms of institutions at local level and furthermore, it makes certain that organizational effectiveness is maintained at a speedy rate.

Robson (1937:574) studies found that local government from the perspective of legality as: "In broad categorization, local government may engage the formation of a protective, community that is non sovereign and contains the legal rights and essential institution to articulate its internal associations. The prevalence of authorities at local level with authority to perform without external involvement and control along with the local community's participation in the administration of its own affairs are assumed in turn of those regulations". In addition, Gomme (1987:1-2) studies of local government found that local government "is a sub part of the entire government of a nation or states is regarded as local government that is managed and administered by the system subordinate to authority of state but independently elected of the state's authority control, by competent persons local, or containing properties in specific localities, which regions have been structured through common interests and common histories by the communities."

The views of both Robson (1937) and Gomme (1987) have strongly argued that local government are not entirely free from the control of the central government. This indicates that the power and authority enjoyed by the local government is to relative extent and it is because of the responsibilities are split among national and local government for the provision of services. Furthermore, it is vital to note that these divisions of responsibilities are done according to the political interests and policy related agenda. In the designing of sound democratic political system local government should be viewed as the cornerstone as it serves as a cardiac vehicle on specific level to ensure able and conscientious citizenship.

2.2 Local government efficiency

Narbon-Perpinaa and de Witte (2016:2) studies found that "the efficient management of the available resources in local governments has been a topic of high interest in the field of management studies." Therefore, according to de Borgerand Kerstens (1996a) there is possibility of two strands of the empirical study. First studies by Worthington and Dollery, 2001; Benito-Lopez et. al., 2011; Benito et. al., 2015 focused on evaluation of a particular local service, such as refuse collection and street cleaning, water services (Garcıa-Sanchez, 2006a), street lighting (Lorenzo and Sanchez, 2007), fire services (Garcia-Sanchez, 2006b), library services (Stevens, 2005) or road maintenance (Kalb, 2012). Other studies by Narbon-Perpinaa and de Witte (2016) evaluate local performance from a "global point of view" considering that local governments supply a wide variety of services and facilities. The efficient provision of these services impacts the image of the city hence attracts inward investment.

From the global point of view, numerous studies have attempted to investigate and determine external factors affect local governments' performance. In their study de Witte and Kortelainen (2013:2) found that "municipalities face different environmental conditions in terms of social, demographic, economic, political, financial, geographical, and institutional, among others. These environmental variables can have a huge impact on the efficiency scores because they are beyond the control of local managers." For example, municipalities located in tourist attraction areas may have higher costs when providing some public services and facilities during some periods of the year. These municipalities could be unable to achieve the "best practice" due to their relative harsh environment and, as a consequence, leading to biased efficiency results and wrong-headed policy implications (de Witte and Kortelainen, 2013).

In addition, there are many contextual variables that face municipalities and affect their performance. According to Narbon-Perpinaa and de Witte (2016:2) the most prevalent method they employed in their research include Tobit censored regression model and ordinary least squares (OLS) or single and double bootstrap methods (Simar and Wilson, 2007). These methods were selected to understand environmental variables in local government efficiency. Their studies found that "the multistage approaches assume (implicitly) a separability condition where the operational environment would not influence the input or output levels, but only efficiency." Da Cruz and Marques (2014) proposed a classification for the different type of determinants, and they are observed variables in six main categories: social and demographic determinants, economic determinants, financial determinants, and geographical or natural determinants. According to studies by Narbon-Perpinaa and de Witte (2016) these are determinants that that affect the city. However, the current study focused on discussing the economic determinant as it relates to the theme of the research. Narbon-Perpinaa and de Witte (2016:2) found that "this group of environmental variables is composed by variables related to the economic situation of each local government. It is explained by seven indicators: unemployment, citizen's disposable income, economic status, tourist index, commercial activity, industrial activity." On tourism particularly, Gimenez and Prior (2007) and Perez-Lopez et. al., (2015) found a positive relation between this variable and efficiency, concluding that the more tourism activity, the lower the cost excess. Finally, some studies (Nakazawa, 2014) found that tourism is not statistically significant.

2.3 City branding

In our days, the branding of places and more specifically of cities, has gained an extraordinary momentum among city officials (Anholt, 2010). As such, "place marketers are striving to settle the city as a brand, with the purpose of promoting to existing and potential target groups; and differentiate themselves from each other, to assert their individuality in pursuit of various economic, political, or socio-psychological objectives" (Kavaratzis and Ashworth, 2005:183). Living in a world where competition is fierce, it is about time to start thinking about finding new ways to improve the image of the city with the purpose of attracting visitors and investors. In this respect, Kotler et al., (2003:3-4) advocate that "many cities and towns are "dying or chronically depressed", others can experience "boom and bust characteristics", while "favoured few" enjoy continuous and strong growth.

Because city officials are becoming aware of the strategic importance of branding a destination, the average per capita of city marketing budget allocated has reached promising numbers (Kotler, 2011). The need to establish a successful brand for the city has been further applauded by other scholars, who rationalize upon the consequences of not having a city brand. Therefore, Trueman et. al., (2004) cited in Kasapi and Cela (2017) highlights:

> *"Poor perceptions of a city can devaluate its image and have far reaching consequences for its future prosperity. These negative associations may reduce the likelihood of inward investment, undermine business community activities, and have a detrimental effect on the number of visitors, thereby exacerbating urban decline"*

3. Methodology

The methodological procedure used in the current study is tied in the mixed-method paradigm. With qualitative analysis it was possible to contextualize and collect information about the object of the study, the data collection, its analysis, and respective results (Bogdan and Biklen, 2013); these data were subsequently coded and analysed quantitatively. Leedy and Ormrod (2001); Williams (2011) describes the research methodology as the holistic steps a researcher employ in embarking on a research work. Research methods in social sciences are often divided into two main types: quantitative and qualitative methods. The current study employed both

qualitative and quantitative research method. According to de Vos, Strydom, Fouche and Delport (2011:6), each method has its "own purposes, methods for conducting an inquiry, strategies for collecting and analysing data, and criteria for judging quality".

3.1 Research Strategy: Mixed-Methods

Bryman (2008:22) refers to a "research strategy as a general orientation that determines how the research is to be conducted." The research approach is usually informed by the nature of the research problem. Three classification of research strategies as identified by Schiffman and Kanuk (2004) and Bryman (2008) are quantitative, qualitative and mixed-methods. According to Schiffman and Kanuk (2004:27), "a mixed-methods approach is a combination of quantitative and qualitative research approaches." According to Creswell (2015), a mixed-method strategy of inquiry includes the sequential strategy, concurrent strategy, and transformative strategy. The current study adopted the sequential mixed methods strategy, which involves the researcher expanding the findings of one method with another method (Creswell, 2015). Bryman (2008: 607) stated that this is a "form of mixed methods approach arises when one strategy is employed in order to aid research using the other strategy." Therefore, the quantitative approach will be adopted as the main strategy being facilitated by the qualitative approach. The researcher will begin with a quantitative approach, followed by a qualitative method involving explanation through semi-structured interviews with a few individuals. The elements described and analysed will be people, governance, tourism, exports, culture and heritage, and investment and immigration.

The current study subscribes to the research strategy recommendations on similar studies by Lewis and Soureli (2006) and Mostert (2002) who adopted a mixed-methods approach. To a greater extent, there will be a need to measure the relationship between variables and to test hypotheses in this study. This will be done through statistical (quantitative) analysis. To a lesser extent, there will also be a need to examine the role of local governments in city branding to gain competitive value. This will be done through a qualitative approach. The qualitative dimension will also be inevitable as it will allow for speculative discussion in the discussion chapter. In support of this, Schiffman and Kanuk (2004:27) maintain that "quantitative and qualitative approaches are complementary in nature." Quantitative research makes prediction possible while qualitative research provides a better understanding of the phenomena. Therefore, a combination of quantitative and qualitative research results a richer and more robust profile of consumer behaviour than either research approach used alone (Makanyeza, 2014). "Combined findings make it possible for marketers to design more meaningful and effective marketing strategies" (Schiffman and Kanuk, 2004:28).

3.2 Research Design

Zikmund and Babin (2007:75) described a research design as "a general plan that guides how the research is to be conducted." According to Malhotra and Peterson (2006: 71) a "research design provides a framework that directs the procedures to be followed when collecting data relevant for particular research." In other words, a research design is the overall plan or framework in which the study is conducted. It is a logical structure of enquiry (De Vaus, 2001). Bryman (2008) noted that the choice of research design is largely influenced by the research problem. Research designs are plans and the procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis. The overall decision involves which design should be used to study a topic (Leedy and Ormrod, 2013).

Creswell (2009: 59) stated that "researchers benefit from being familiar with the numerous classifications of mixed methods designs found in the literature. These classifications represent different disciplines, and they use different terminology." Creswell (2009) posited that researchers should be aware of the range of mixed methods design types, as well as the discipline-based discussions of mixed methods designs. According to Creswell (2009: 59) "there are four major types of mixed methods designs and these are the Triangulation Design, the Embedded Design, the Explanatory Design, and the Exploratory Design. The following table 5.2 provide an overview of the mixed method design classifications.

Amongst the four major types of mixed methods designs identified by Creswell (2009), the current study has adopted the explanatory design. The explanatory design is a two-phase mixed methods design. The overall purpose of this design is that qualitative data helps explain or build upon initial quantitative results (Creswell, Plano Clark, et. al., 2003). This design is well suited for the current study as the researcher needed qualitative data to explain significant (or nonsignificant) results, outlier results, or surprising results (Morse, 1991). This design can also be used when a researcher wants to form groups based on quantitative results and follow up

with the groups through subsequent qualitative research (Morgan, 1998; Tashakkori and Teddlie, 1998) or to use quantitative participant characteristics to guide purposeful sampling for a qualitative phase (Creswell, Plano Clark, et. al., 2003).

3.3 Procedure of the explanatory design

The explanatory design (also known as the explanatory sequential design) is a two-phase mixed methods design (see fig. 5.1) (Creswell, 2006). This design starts with the collection and analysis of quantitative data. This first phase is followed by the subsequent collection and analysis of qualitative data. The second, qualitative phase of the study is designed so that it follows from (or connects to) the results of the first quantitative phase. Because this design begins quantitatively, researchers typically place greater emphasis on the quantitative methods than the qualitative methods (Creswell, 2006).

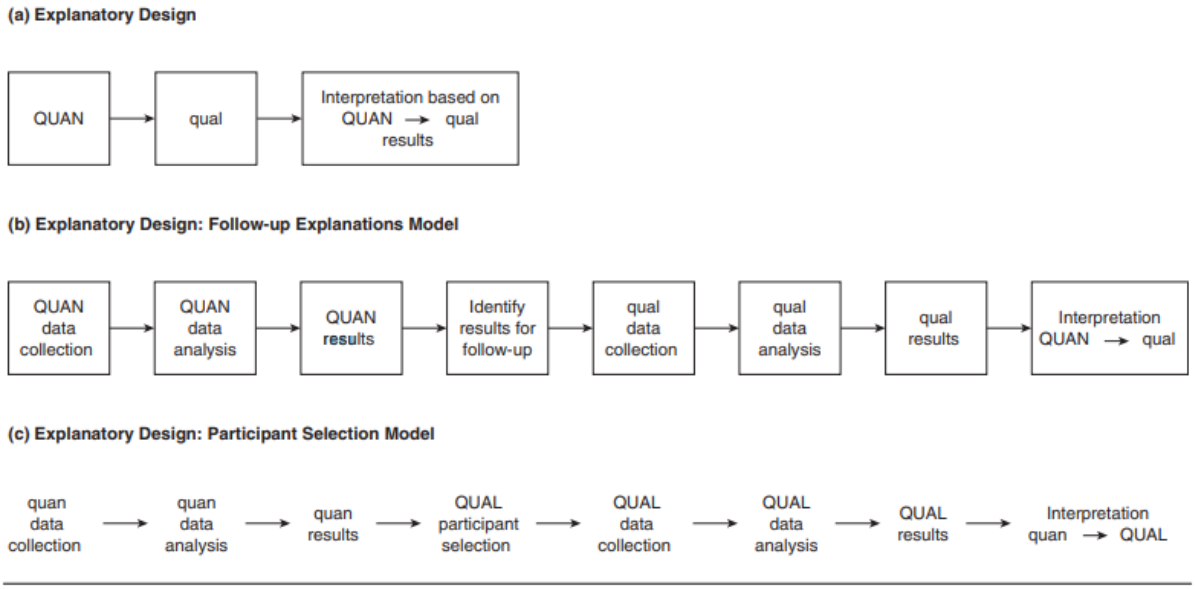

Figure 1: Explanatory design

Source: Creswell, 2006

4. Strengths and challenges of explanatory design

4.1 Strengths of the explanatory design

The Explanatory Design is considered the most straightforward of the mixed methods designs. The advantages of this design that made the researcher to adopt it incorporate the following:

- Its two-phase structure makes it straightforward to implement, because the researcher conducts the two methods in separate phases and collects only one type of data at a time. This means that single researchers can conduct this design; a research team is not required to carry out the design (Creswell, 2006: 74).
- The final report can be written in two phases, making it straightforward to write and providing a clear delineation for readers (Creswell, 2006: 74).
- This design lends itself to multiphase investigations, as well as single mixed methods studies (Creswell, 2006: 74).
- This design appeals to quantitative researchers because it often begins with a strong quantitative orientation (Creswell, 2006: 74).

4.2 Challenges in Using the Explanatory Design

Although the Explanatory Design is straightforward, researchers choosing this approach still face challenges specific to this design (Creswell, 2006). For all variants:

- This design requires a lengthy amount of time for implementing the two phases. Researchers should recognize that the qualitative phase (depending on the emphasis) will take more time than the quantitative phase, but that the qualitative phase can be limited to a few participants. Still, adequate time must be budgeted for the qualitative phase (Creswell, 2006: 74).

- The researcher must decide whether to use the same individuals for both phases, to use individuals from the same sample for both phases, and to draw participants from the same population for the two phases (Creswell, 2006: 74).

5. Results

The current study collected data from 350 participants. Data was collected from the city central government of Durban municipality and staff members within this municipality. Data was explored and presented in the form of tables. The researcher addressed critical objectives of the study by collecting data using a survey questionnaire (quantitative technique) and semi-structured interview (qualitative technique). A stratified random sample of 320 respondents was selected, and the questionnaire was administered. This was followed by the collection of qualitative data using the semi-structured interview of 30 participants. This section presents quantitative data followed by the qualitative data.

5.1 Response rate

The response rate is defined as the ratio of the number of usable questionnaires to the legible respondents in the sample (Fincham, 2008). The researcher distributed 320 questionnaires to the respondents. The researcher anticipated a high response rate hence the respondents returned 299 completed questionnaires yielding a response rate of 92%. This high response rate was attributed to the simplicity and the length of the questionnaire (questions were structured very well and were simple to complete), and the way in which the questionnaire was administered (respondents will be given the questionnaires and will be told that once they had completed it, they could return them to the researcher). On the other hand, qualitatively the researcher received an 69% response rate from the executives of the city. The reason for this percentage was that the city government is considered busy officials however the researcher made efforts to receive the highest response rate possible.

5.2 Reliability of research instrument

Cronbach's alpha test was conducted to assess the reliability of the questionnaire and internal consistency adopted for the study (Taber, 2017). In the business arena and social sciences research, the acceptable Cronbach's coefficient alpha score ranges from 0.70 to 0.80 (Taber, 2017).

Table 1.1: Cronbach's alpha test

Section	Valid Cases (N)	No of items	Cronbach's alpha coefficient	Comment
A	320	35	0.785	Internally reliable

N=questionnaires the researcher distributed

The statistic in Table 1.1 above revealed 35 items that will have Cronbach alpha index of 0.785 which is above 0.7. This result indicates good internal consistency of the research instrument used. The questionnaire was reliable. The researcher concluded that the number of questions in the questionnaire document might have contributed to this high figure. This implied that the questionnaire results could be subjected to further analysis.

5.3 Qualitative results

The properties of cities are the basic elements which allow them to have a brand as a value in terms of the branding axis. A city's historical, geographical, cultural, and economic characteristics are the main criteria to be taken into consideration to evaluate a city in terms of making it a brand. The cities with a long history, the cities with geographical location which is suitable for presentation and the cities which are open to economic and financial development are one step ahead. However, as expressed in the definition of brand, the city must also have distinctive and characteristic features (such as logo, symbol, image, etc.) and this also must be supported by social values as well as individual lifestyles and behaviour patterns (Anholt, 2010:6-7; Cevher, 2012: 107-108).

6. Discussion

The aim of this paper aimed at inspiring and extending knowledge on the power of a mixed-method approach as developed by ongoing research and methodology studies scholars like Collins et. al., (2006) and Creswell (2014). In addition, mixed method research approach values multiple disciplines, and allows interpretive and integrative which is the heart of continuum (Dumay, 2009). It addresses a wide spectrum of exploratory, explanatory, and confirmatory questions at the same time, whereas studies that use one methodological component usually addresses single-minded results and findings and that keeps theory away from practice (Tashakkori and Teddlie, 2006; Dumay, 2009). This paper therefore proposes more consideration in adopting mixed methods reducing the methodological bias and scepticism in business management academics and

experts (Phiri and Madondo, 2018). This means proposing for research results that are less biased – but close the gap between theory and practice (Dumay, 2009).

Is city branding policies effective at attracting business? Respondents were broadly positive about place branding's potential utility in attracting businesses. Place branding policy can be used to guide identification, enhancement and leveraging of the place-based advantages a city or region has to offer, tailoring the image of the area to align with the needs of the business (Cleave, Arku, Sadler and Gilliland 2016). It is through this well-measured and substantive approach to coordination, organization and promotion of local resources that provides the best opportunity for effective policy development (Cleave et al., 2016). The current study found that effectiveness in the city is purely the alignment of city elements. This demonstrates how place branding can be maximized to increase its utility in business attraction (Cleave et al., 2016). Lever and Turok (1999:792) noted that 'cities and other places compete with one another. This takes many different forms – some direct head-to-head competition for particular projects or events; others more indirect, subtle and incremental in nature'.

Place branding is a competitive tool, as the policy aims to differentiate one area from its competitors with the goal of creating inward investment (Cleave et al., 2016). If properly designed and executed, it has the potential to benefit to the local economy. An important caveat, however, is that simply undertaking place branding will not guarantee local growth or prosperity (Cleave et al., 2016). The uneven distribution of a finite set of resources will result in some area becoming winners and some becoming losers (Ashworth, 2010; Leigh and Blakely, 2013; Malecki, 2004).

The responses from the city central government possibly indicate that despite the success of city, place-branding policy in Durban often takes a 'low-road' approach. Typically, these failures are associated with superficial branding attempts. These failures are associated with socio-economic issues. The poorly executed place branding resulted in negative national media attention and may be held as an example of government wastefulness.

7. Conclusion

In conclusion, this study provides a means of examining how local governments want people to think about their city. As city branding is becoming an increasingly present part of local economic development, local and regional governments must be careful to undertake it in a way that is both effective and an efficient use of public resources. As such, the elements meaningful to a target audience i.e., a business considering relocation must be considered, rather than appealing to a sub-group unlikely to invest in the community. Without this alignment, the brand will fail and the potential for attracting investment will be hampered, as it will be difficult to align or enhance assets to present any form of competitive advantage.

A good relationship between municipal government and the residents of the city should also exist for the city to be successful in their place branding strategies. Since each city resident is a walking-talking advertisement, support from residents and belief in the city brand are important attributes successful cities possess. Successful cities brand themselves in ways their residents found the city believable, and in doing so, the brand is reinforced as truthful. This reinforcement come in many forms such as word-of-mouth, political climate perception, advertising, early public relations, and graphic design. As their positive attributes are exposed, this reinforces the positive city brand.

Ultimately, this study provides a means of examining how local governments want people to think about their city. The purpose of the city executives involved in marketing the city is to transmit information about a municipality to existing and prospective residents, businesses, and visitors. However, as the typology of marketing themes illustrates, most local governments do not passively provide information but instead actively attempt to shape how the viewer interprets it. The use of the Internet in this way signifies an expansion of the city marketing apparatus, yet unlike the physical environment or even promotional material, a homepage can be easily and frequently altered to fabricate a narrative around a city even when it is lacking iconic structures, unique histories, or other identifiable features. As such, the strong marketing role has implications for the ways in which municipalities market their cities deliver information. Although not directly explored in this study, the preponderance of marketing images and the lack of focus on public services and civic engagement imply that the imaging role overshadows other potential uses of the city homepage, such as providing information about new tourist attraction areas in the city or improving access to municipal services and departments. Future

research could tackle this issue by examining how city websites for instance are actually used using the mixed-method approach.

As the aesthetic dimensions of places and quality of life amenities are increasingly on the agendas of municipal governments, marketing and branding will likely remain a critical strategy to distinguish a city and to boost its economic development potential. Thus, an understanding of the various ways that local governments brand cities is a significant concern for urban planners and designers.

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Work in Progress Papers

The Evidence of case study Research in Business Management: Definitions and Guidelines for Empirical Analyses

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Abstract: The case study is one of the preferred research methods in Business Management field due two main reasons, i) it is recommended for exploring new themes, subjects, relations, or contexts, and ii) it helps the researcher to build theory from analyzed case(s). Despite the extensive contributions from different authors in management research for addressing the case study method, the definition, constitution, and operationalization of evidence analyses are still not fully clear. This research has as goal to fulfil this gap in the research methods literature by defining, constituting, and guiding researchers in operationalizing the evidence analyses for case study research. In this research, the evidence concept was triangulated from Forensic Sciences in order to achieve a more specific and detailed definition. The notions of quality and types of evidence are revisited. Thus, evidence from empirical case studies is analyzed aiming to provide its constitution. The manuscript offers a guideline for researchers in the case study method for better identifying, gathering, analyzing, and presenting evidence found from empirical research.

Keywords: Case study research, Empirical evidence, Research methods, Business Management.

1. Introduction

The case study is one of the preferred research methods in Business Management field (O'Gorman & MacIntosh, 2015). The reason is that case study allows scholars exploring new themes, subjects, relations, or contexts, or helps the researcher to build theory from analyzed case(s) (Eisenhardt, 1989). The most common approaches are the quantitative (Yin, 2014; Eisenhardt, 1989) and qualitative (Stake, 1995). This research focused on the quantitative approach in the Business Management field of study.

Although evidence is associated with data collection, there is no consensus on what evidence is. In Yin (2014) it is noticeable the six 'sources of evidence' for gathering data. The first is the 'multiple sources of evidence', not clear but giving the general idea that evidence is 'facts or findings'. Yin (2014) underlines the third source as 'chain of evidence' representing the relations among the asked questions, collected data, and conclusions (Tellis, 1997). In Gerring (2004), the empirical evidence is considered as covariational, a causal relationship.

Most scholars are considering evidence as related to data. Yin (1981, p.58) stated that "… the case study does not imply the use of a particular type of evidence. Case studies can be done by using either qualitative or quantitative evidence. The evidence may come from fieldwork, archival records, verbal reports, observations, or any combination of these". Eisenhardt (1989) stated that "The evidence may be qualitative (e.g., words), quantitative (e.g., numbers), or both." Despite these precise contributions, it is clear that evidence is considered as a synonymous of qualitative or quantitative data. Even though both qualitative and quantitative data are needed in case study research, we argue that evidence is not related solely to the data. We believe that a clearer and operational definition of evidence in case studies is still missing.

The relevance of addressing a more precise definition of evidence is due to the possibility that researchers deal with any kind of data that is gathered from field research that could be considered sufficient evidence of what was being collected. Moreover, the lack of clarity and rigor of collecting and analyzing evidence prejudices researchers in many ways. First, the idea of collecting one type of data is enough for responding the research questions. Second, considering the quality of data, a researcher can consider as sufficient enough to use multiple sources of evidence. Third, researchers may not consider relevant data to properly prove evidence. Fourth, the quality of case study in general may be jeopardized. Five, the lack of definition may lead the researcher to collect redundant data causing an overload of data to be analyzed.

This research has as goal to fulfil this gap in the research methods literature by defining, constituting, and guiding researchers in operationalizing the evidence analyses for case study research. Main contributions of this research to the existing literature are presented as follows. It states a clear definition, constitution, and operationalization of evidence analyses, extending the definitions of Yin (2014) and Eisenhardt (1989). This research presents types and quality of evidence for case study. In doing so, the evidence concept was triangulated from Forensic Sciences (Houck & Siegel, 2015) in order to achieve a more specific and detailed definition. The adopted procedures allowed proposing a guideline for researchers when defining, dealing, and analyzing empirical evidence for case studies.

2. Towards a definition of evidence

Evidence and data are not synonymous, and evidence goes beyond the data definition. We argue that evidence cannot be considered only data due a given evidence needs to be compared between/among other evidence *to confirm or disconfirm a statement*. After identification, comparison is fundamental process of evidence analysis (Houck & Siegel, 2015). Usually, the existing case studies do not compare one evidence with another but compare the results with literature (the discussion). In this way, evidence is needed to establish the idea/information validity concerning an object or phenomenon under study.

Thus, evidence is the result of identifying different data that could be confirmatory or contradictory, and then, after analyzing data, evidence can dis/confirm a statement. Evidence is not considered as a meta-inference or a set of data, but the *meaning* that is apprehended after analyzing sets of data aiming to respond a research question.

In Forensic Science (FS) (Houck & Siegel, 2015, p.44), evidence is considered:

> *"… as information – whether in the form of personal testimony, the language of documents, or the production of material objects – that is given in legal investigation to make a fact or proposition more or less likely. … Having the association of the bullets to the gun makes the proposition that the accused is the perpetrator more probable than it would be if the evidence didn't exist."*

Evidence depends on the association among other evidence and *how they prove or not a given statement*. The way of proving this statement is through analyzing different kinds of evidence and two or more evidence are needed to confirm a statement. This is a relevant finding from FS due there are case studies being conducted without this notion of *evidence comparisons to prove or not a statement.* This limitation is addressed when Yin (2014) stated the need for triangulating the 'sources of evidence'. However, most researchers are using triangulation more as a requirement for conducting case studies than benefiting from such kind of procedure.

After defining evidence, the next step is to define the types of evidence. Houck and Siegel (2015, p.45) provided fourteen types of evidence commonly considered in FS. From these types of evidence, four are adherent to the case study research as stated below and were previously tested by the case studies conducted by Ferasso (2018).

1. Circumstantial evidence (CIR): evidence that is based on inference, not representing the individual knowledge or perceptions (individual bias). This type of evidence includes a process of inference or reasoning where the conclusion is understood as justified considering the available information (principles of logic - Mortari, 2001).
2. Conclusive evidence (CON): evidence that is strong enough to overbear any other contrary evidence.
3. Corroborating evidence (COR): evidence that differs from the main evidence under study, but that reinforces or confirms main evidence.
4. Presumptive evidence (PRE): evidence considered to be true and sufficient unless it is discredited by other contradictory evidence.

These types of evidence also provide the fundamentals for understanding the quality of evidence, or the *probative value of data* (Houck & Siegel, 2015; Robertson, Vignaux & Berger, 2016). The quality of an evidence depends on how it is sufficient enough to prove or refute a statement. This quality is based on evidence's own content. By content of the evidence, it is understood the data that provide clear conclusions after inference processes. The different types of evidence are compared in order to provide greater assertiveness of the results of inference process.

3. Proposal of guidelines

Aiming to offer guidelines for better identifying, gathering, analyzing, and presenting evidence found from empirical research, a hypothetical case study is analyzed. As example, the theme of absenteeism in a company is framed as research topic of case study. Table 1 operationalizes the way of identifying, analyzing, and presenting the evidence in a case study.

Table 1: Guideline for evidence analyses

Theme of a case study	Identifying	Gathering	Analyzing	Probative value
Absenteeism in company 'A'.	Interviews with employees and employer. Employee's attendance sheets. Satisfaction and motivation reports. Site visits (observation).	Company has one CEO, one Human Resources Department (HRD), five employees (observation). "Employee 1 is always absent on Fridays" (Employee 4). Employees 1 and 4 did not participate in the Satisfaction and Motivation in the last three surveys (HRD reports). Employee attendance sheets showed 3 absences per month of employees 1 and 3 on Fridays, and all employees start late and leave earlier (HRD reports). The company has a noisy production room. During the visit, the CEO said: "We are solving this problem in next week" (observation). "The CEO was alerted about the noise in the factory in the last six months and nothing changed" (Employee 2).	Employees are showing two different degrees of absenteeism: the lower level is the late entrance/earlier leaving, the highest is the absence of two employees (COR). Empirical evidence of absenteeism could be associated with the bad working conditions caused by the noise in the factory (PRE).	CIR: The noise (CON) proved to be the cause of absenteeism in two different degrees among employees (COR).
	Second round: Interviews with employees.	Second round of interviews with employees regarding the noise in the factory room: "I hate noisy environments and I am already looking for another position" (Employee 1). "I am sensitive to noise, and I am avoiding staying too much in that room" (Employee 3). "I try to balance my permanence in the production room by circulating in the other places of the company. But I am unsatisfied with these working conditions" (Employee 2). "Too noisy!" (Employee 5).	Second round of interviews with employees revealed the association between the absenteeism and the noise in the factory (CON).	

4. Concluding remarks

This research aimed to provide a definition, constitution, and operationalization of evidence analyses in case study research in Business Management field of study. The definition and constitution of evidence were provided. The quality of evidence, types and probative value of data were discussed.

Aiming to help researchers in conducting future case studies using the discussed precepts of evidence, this research proposes guidelines for identifying, gathering, analyzing, and presenting evidence from empirical research. As limitations, this research was based on the ideas of the authors.

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Antecedents of Crowdsourcing in Science: Scale Development and Initial Testing

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Abstract: Crowdsourcing in science has become a growing field of research interest. Although the importance of crowdsourcing in science along with its barriers and requirements have been well recognized in the literature, many questions remain open. One of them refers to factors that determine the intention of academics to use crowdsourcing in science. Besides, previous research is held back by the lack of a rigorous measuring instrument. The aim of the article is to identify the antecedents of crowdsourcing in science, as well as the construction and initial testing of the measuring scale. Identifying the antecedents of crowdsourcing in science followed a combined approach, i.e., systematic literature review and nine focus group discussions were used. The process of developing the scale and its initial testing includes a pilot study conducted among 66 researchers. The final scale consists of 38 items covering the five antecedents of crowdsourcing in science.

Keywords: crowdsourcing in science, antecedents, measurement scale

1. Introduction

Crowdsourcing in science is seen as an alternative to research projects (Lukyanenko et al. 2019), a strategy for organizing the work of researchers (Lukyanenko et al. 2019), a research tool (Law et al. 2017), a new way of modern research activity that enables creation of knowledge. Previous research on the antecedents of crowdsourcing in science was conducted from the perspective of biology, medicine, physics, geography, anthropology, scientific information, and engineering (Lukyanenko et al. 2019), and was limited only to scientific crowdfunding (Tucker et al., 2018) or public involvement in scientific activities (Poliakoff & Webb 2007). At the same time, the literature points out that the specificity of crowdsourcing in science depends on the type of discipline (Beck et al. 2020). For this reason, the antecedents of crowdsourcing in science in the context of management sciences may differ from others. For example, Beck et al. (2020 p. 19) believe that "studies of university-industry collaboration consistently reveal that fields including the applied sciences and parts of the social sciences, such as economics and management studies, are more prone to collaborations with the private sector, patenting, and spinout formation". In turn, the motivation to use crowdsourcing in science differs among researchers and depends on the discipline and field (Beck et al., 2020). Therefore, the research problem was formulated in the form of two research questions:
RQ1. What factors influence academic teachers to reach for crowdsourcing in science?
RQ2. How can antecedents of crowdsourcing in science be measured?

In answer to the first question (RQ1), a combined approach was adopted, i.e., deductive and inductive. This approach results from the fact that "considering that item generation may be the most important part of the scale development process, future measures should be developed using the appropriate definition of the conceptual domain based on the combination of both deductive and inductive approaches" (Morgado et al. 2017, p. 10). First, as a part of the deductive approach, a list of antecedents of crowdsourcing in science was generated based on a systematic literature review. Then, in order to detail, develop and supplement them, nine focus group interviews (induction) were conducted. In this way, we were able to provide a theoretically and empirically grounded set of antecedents in crowdsourcing in science.

Then, to answer the second research question (RQ2), it was concluded that "in order to ensure the content validity, the researcher seeks other opinions about the operationalized items. The opinions can be those of expert judges (experts in the development scales or experts in the target construct) or target population judges (potential users of the scale), enabling the researcher to ensure that the hypothesis elaborated in the research appropriately represents the construct of interest" (Morgado et al. 2017, p. 2). Therefore, a pilot study was conducted among 66 researchers. This allowed to identify and rigorous initial testing of a scale to measure the antecedents of crowdsourcing in science.

2. Scale development methodology

Given that the purpose of this article is to construct a measurement tool, the widely used scale development paradigm by Churchill (1979) was adopted, which was then extended by many researchers (Bagozzi et al. 1991). The procedure consists of five steps divided into two phases: (1) item generation (literature review and focus research group), (2) content validation. In the second phase, scale development was started, in particular: (3) sampling procedure and data collection, and (5) item purification.

3. Results

The estimation of the reliability of the scale was based on the analysis of the correlation between the questions in relation to the variance of the question (Tavakol &Dennick 2011). The entire research tool has a value of 0.939, which proves a very high reliability of the tool. The reliability of the tool can also be said to be very high. Neither of the items needed to be eliminated as they all loaded high between 0.924 and 0.979. Additionally, the raw data was tested for the risk of common method bias (Podsakoff et al. 2003) using the main Harman factors test (Podsakoff et al. 2003). The results showed that the variance of the one-way solution did not exceed 70% (Fuller et al. 2016) and was 61.80% – so there was no error of common variance of the methods.

The design validity was assessed using EFA. To verify the basic requirements of the EFA, the adequacy and sphericality of the sample were verified prior to the analysis. KMO measures indicate that it is possible to use EFA to analyse and isolate the main components (Tabachnick & Fidell 2014). The KMO result was 0.915 and the Bartlett sphericity test was 657,846, with a significance level of <0.001, indicating the validity of the use of factor analysis.

The EFA method of principal components was used to determine the internal structure of the scale. As a result, eight factors with the eigenvalue above 1 were obtained, explaining in total 82.980% of the variance. Taking into account the recent concerns about the reliability of the Fornell and Larcker criteria (1981), an additional analysis of the correlation with Pearson's coefficients was performed. The results show that the strongest relationship with behavioural intention is shown by normative pressure ($r = 0.536$; $p < 0.01$), then subjective norms ($r = 0.468$; $p < 0.01$), perceived organizational support ($r = 0.425$; $p < 0, 01$) and attitudes (0.440; $p < 0.01$). There is a weaker relationship between behavioural intentions and motivation ($r = 0.397$; $p < 0.01$), perceived usefulness ($r = 0.377$; $p < 0.05$), descriptive norms ($r = 0.374$; $p < 0.05$), perceived behavioural control ($r = 0.335$; $p = 0.006$), perceived risk ($r = 0.329$; $p = 0.007$) and perceived utility ($r = 0.309$; $p < 0.012$). Additionally, on the basis of significant correlation results at the level of $0.000 < 0.05$, it can be concluded that there is no relationship between the perceived effort and institutional pressure.

Taking into account the results of the analysis of the correlation between antecedents and behavioural intention, as well as the results of EFA, CR and AVE, as well as recommendations of other researchers regarding the reasons for the participation of researchers in initiatives based on public involvement (Poliakoff & Webb 2007), the following antecedents that showed the strongest relationship with behavioural intention, i.e. normative pressure, subjective norms, perceived organizational support, perceived usefulness, and attitudes. The final version of the crowdsourcing in science antecedents tool consists of 38 items including 5 antecedents of crowdsourcing in science.

4. Discussion and conclusion

This publication responds to the calls and extends the findings of other researchers regarding the explanation of why academics use crowdsourcing in science. Therefore, the publication, based on the results of a systematic literature review and focus group interviews, provides a list of 12 antecedents of crowdsourcing in science. Moreover, due to the fact that there is currently no reliable and up-to-date tool for measuring antecedents of crowdsourcing in science in the literature (Beck et al. 2020; Franzoni et al. 2021), a pilot study was conducted. Their results suggest that the 5 antecedents have a moderate impact on the intention of scientists to use crowdsourcing in science (normative pressure, subjective norms, perceived organizational support perceived usefulness, and attitudes). In contrast, a weaker relationship of behavioural intentions is observed in relation to motivation, descriptive norms, perceived behavioural control, perceived risk, and perceived utility. Additionally, there is no relationship between behavioural intention and perceived effort and institutional pressure. The obtained results are consistent with the findings of other researchers to date. They also fit into planned theory of planned behaviour (TPB) (Ajzen 1991) and institutional theory (DiMaggio & Powell 1983). Therefore, this article proposes a tool for measuring crowdsourcing in science antecedence consisting of 38 items (using the 7-

point Likert scale) taking into account 5 antecedents of crowdsourcing in science. These tools were provided and tested using the approach proposed by Churchill (1979).

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Prisma Guidelines for Systematic and Scoping Reviews: Cultural Mapping of Creative Industries

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Abstract: While policymakers have had a great interest in debating Cultural and Creative Industries (CCIs), there is a lack of literature presenting a systematic overview of existing relevant research regarding CCIs mapping. This paper discusses and compares PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines for Systematic Review (SR) and PRISMA for Scoping Review (ScR) for synthesizing research on CCIs mapping. 'A systematic review attempts to collate all empirical evidence that fits pre-specified eligibility criteria to answer a specific research question. It uses explicit, systematic methods that are selected to minimize bias, thus providing reliable findings from which conclusions can be drawn and decisions made' (Liberati et al. 2009: 65). ScR '(…) follow a systematic approach to map evidence on a topic and identify main concepts, theories, sources, and knowledge gaps' (Tricco et al. 2018: 467). After analyzing and applying the guidelines and further documentation on both protocols, the ScR revealed to be more suitable in a complex field with distinct terminologies, production contexts, methodologies and objectives. Since certain topics in SR become optional, ScR is easier to apply in fields in which methods are difficult to compare and quantify, such as the Arts and Humanities.

Keywords: PRISMA, scoping review, systematic review, cultural mapping, Cultural and Creative Industries (CCIs)

1. Background

The original application of cultural mapping exercises is related to the study of indigenous communities. Its exact temporal origin is not precise: Crawhall (Ribeiro et al. 2020: 59) identifies the 1960s and Currie and Correa (2021: 90) the 1970s as the first attempts at the practice. Over the years, and following the growing complexity of society, the focus of this type of study broadens, being applied to the urban contexts (Currie and Correa 2021: 91).

The growing recognition of creativity as key for economic development in the last two decades, sparked evidence-based policies (Ponzini, Gugu and Oppio 2014: 75) and the regeneration of cities and regions (Evans and Foord 2008). This aroused interest on the behalf of policymakers who started promoting cultural mapping exercises focusing on Cultural and Creative Industries (CCIs) as an initial phase within cultural planning. Cultural mapping is a vital phase in policymaking of communities, being villages, cities or regions, as it allows effective territorial planning, resource management, tourism management, amongst others, built on the awareness of cultural assets in the area. Moreover, cultural mapping can be developed in direct articulation with the community, both to map their resources and for their empowerment (Duxbury et al., in Currie and Correa 2021: 91). Cultural management is about achieving an equilibrium between developing the tourism industry, generating revenue whilst still preserving the physical integrity of sites, promoting as well as celebrating their historic, cultural values and artistic practices. Amongst the outcomes resulting from this practice Porrello, Talone and Collovini (2010: 4-5) indicate: documentation about cultural resources, community empowerment, effective management of cultural resources, economic development of the community, transmission of local knowledge systems, and promotion of intercultural dialogue.

2. Objective

This paper is part of an ongoing investigation on cultural mapping CCIs. Since systematic scientific methods are not usually applied to research in the Arts and Humanities, it is relevant to understand how they can contribute to its rigor and replicability. Thus, the paper aims to compare and reflect on the suitability of systematic and scoping reviews for the investigation. Although both can guide state of the art investigations, identify knowledge gaps and future research needs, they comprehend some variations: SR 'can identify problems in primary research that should be rectified in future studies' and 'can generate or evaluate theories about how or why phenomena occur' (Page et al. 2021: 1) and ScR can be used to 'determine the value of undertaking a systematic review' and 'summarize findings from a body of knowledge that is heterogeneous in methods or discipline' (Tricco et al.; Canadian Institutes of Health Research, in Tricco et al. 2018: 467).

3. Methodology

To fulfill the objective, PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) for systematic reviews (SR) and PRISMA for scoping reviews (ScR) will be compared based on its guidelines and related documentation.

4. Results

Table 1: places PRISMA SR and PRISMA-ScR checklists side by side, enabling an explicit identification of the required topics:

SECTION	TOPIC	
	Systematic review (SR)	Scoping Review (ScR)
Title	Title	Title
Abstract	Abstract	Structured summary
Introduction	Rationale Objectives	Rationale Objectives
Methods	 Eligibility Criteria Information Sources Search Strategy Selection process Data collection process Data items Study risk of bias assessment Effect measures Synthesis methods Reporting bias assessment Certainty assessment	Protocol and registration Eligibility Criteria Information Sources Search Selection of sources of evidence Data charting process Data items Critical appraisal of individual sources of evidence* Synthesis of results
Results	Study selection Study characteristics Risk of bias in studies Results of individual studies Results of syntheses Reporting biases Certainty of evidence	Selection of sources of evidence Characteristics of sources of evidence Critical appraisal within sources of evidence* Results of individual sources of evidence Synthesis of results
Discussion	Discussion	Summary of evidence Limitations Conclusions
Other information/ Funding	 Registration and protocol Support Competing interests Availability of data, code and other materials	Funding

Table 1. Comparison of PRISMA checklists for SR (Page et al. 2021: 4-5) and ScR (Tricco et al. 2018: 471).
* Optional items.

The two protocols have a similar structure in terms of key sections, slightly differing in the terminologies and required information for each topic.

- *Title* - both begin by requesting a title that specifies the type of review. That is, whether it consists of a SR or a ScR.
- *Abstract* - results from the succinct identification of the checklist elements that are explored in greater detail in the remaining stages. This element aims to present an overview of the article's content, allowing readers to identify its relevance to their knowledge or investigation (Beller et al.; Hopewell et al.; Haynes et al., in Tricco et al. 2018). In the case of SR, it is detailed in a specific extension - *PRISMA 2020 extension for Abstracts*. It should address *title*, *background* (main objectives or research questions the review is trying to answer), *methods* (eligibility criteria, information sources, risk of bias, synthesis of results),

results (included studies and synthesis of results), *discussion* (limitations of evidence, interpretation), and *other* (funding, registration). The abstract for ScR has a similar structure, differing in the fact that it does not include biases, nor the *other* (that is funding and registration).

- *Methods* - PRISMA SR solicits information that is not requested for PRISMA-ScR, namely:
- *Study risk of bias assessment*- specification of the bias inherent to each of the eligible studies by referring to possible methodological tools for this assessment. The number of researchers involved and their work methodology can also be mentioned.
- *Effect measures* - specification of the measures for evaluation used in the process of synthesis and presentation of the results (e.g. risk ratio, mean difference) (Page et al., 2020: 4).
- *Synthesis methods* - detailed description of the methodological steps used for the synthesis of information and results, as well as methods to manage the lack of summary statistics or data conversions.
- *Reporting bias assessment* - report the bias associated with the research selection, analysis and discussion process.
- *Certainty assessment* - methods used to evaluate certainty or confidence in the body of evidence after a critical assessment of the types of associated biases.

PRISMA-ScR includes, in this section, the *protocol and registration* (if it exists, is applied and and how it can be accessed (Tricco et al. 2018: 471)), *critical appraisal of individual sources of evidence* (optional item to critically describe the process of selecting information sources, resembling the *effect measures* and *certainty assessment* of SR), and *synthesis of results* (description of methods for managing and summarizing the results, allowing for an overview of the evidence collected) (Peters et al. [a]; Peters et al. [b]; in Tricco et al. 2018).

- *Results* - the inclusion of the following items is expected for SR:
- *Risk of bias in studies* - application of the methods defined in the topic *study risk of bias assessment* (of the *methods* section) to present the bias of studies included in the review.
- *Reporting biases* - implementation of methods for *reporting bias assessment* (*methods* section).
- *Certainty of evidence* - application of the *certainty assessment* (*methods* section).

It is optional to present a *critical appraisal within individual sources of evidence* in ScR, a step done in accordance with the methods stipulated in *critical appraisal of individual sources of evidence* (*methods* section). The last topic of ScR for this section is *synthesis of results*, entitled *results of syntheses* in PRISMA SR. Although in both cases the results are organized in a summarized and comparable form to answer the objectives or research questions, ScR does not presuppose the registration of the sensitivity or robustness of the studies. It favors a more distant analysis from statistical references.

- *Discussion* - In PRISMA-ScR this topic is broken down into *summary of evidence*, *limitations* and *conclusions*. Regarding the content of the *discussion*, both SR and ScR aggregate and ask for the same requirements: results obtained, critical assessment of the study's difficulties and limitations, potential contribution to the research area and possible future work directions.
- *Other information* in SR suggests a reference to:
- *Registration and protocol*: details information about the registration and protocol used in the review process. It aims to ensure that the investigation process is not arbitrary and that the decisions involved at each stage are legitimate. This safeguards the transparency of the study and confidence in the SR findings.
- *Support*
- *Competing interests*
- *Availability of data, code and other materials*

The last section of the ScR is *funding*, with no other element required.

5. Discussion

The first attempt at synthesizing evidence about cultural mapping was to follow the SR protocol. However, it was not thought to be suitable to study the encountered information as the area of expertise is broad (since cultural mapping is a matter of interest to various subject areas like Social Sciences, Arts and Humanities, Economics or Computer Science), the literature is published in wide range of sources, and has porous conceptual boundaries (compromising the comparison between papers' methods and results).

PRISMA SR guidelines are primarily focused on reporting effects of interventions (Moher et al. 2009: 334) or on 'evaluating aetiology, prevalence, diagnosis or prognosis' (Page et al. 2021: 2), hence usually applied in clinical or laboratorial practices where population, context and study design must be detailed. By requesting a clear identification of the methods used, SR guidelines foster the collection of a sample with comparable characteristics. Humanities and Arts, among other fields, are not exact mathematical sciences and do not usually have this kind of precision when reporting their research procedures. Thus, in most of the papers analyzed regarding the topic, the methodologies were unclear or non-explicit, making it difficult to compare the results and provide accurate findings.

Assessing the bias of the papers' methodologies and results, as well as the *effect measures* and *certainty assessment* topics for SR was unattainable. These are not required in the case of conducting a ScR.

In addition, the major difference between the two approaches is related to the synthesis of data. Whereas SR privileges the synthesis of information gathered from sources eligible in accordance with narrow research questions, explicit methodologies, and samples; ScR departs from broader questions (Tricco et al. 2018: 467) and therefore can encompass a larger selection of papers. SR presupposes a more accurate description of the process for data collection, selection and results presentation, while ScR synthesizes information but also contemplates a description and interpretation of the results according to the studies' objectives or research questions. Having all things considered, it proved to be more effective to apply PRISMA-ScR to our investigation.

6. Conclusions

Both SR and ScR follow a systematic approach to summarize and analyze evidence eligible in accordance with defined research questions. By implying the description of all the steps, following those guidelines enhances the transparency of the processes undertaken (Altman and Simera; Moher et al., in Tricco et al. 2018: 467), ensures that the value of the investigation and its subsequent findings are preserved and can be further applied in decision and policymaking (Liberati et al. 2009).

Doubts were raised on whether to implement a SR or a ScR within the reach of cultural mapping CCIs. After comparing the requirements of each protocol and its subsequent practical application, SCR proved to be the most suitable protocol for the intended research. It allowed the treatment of the heterogeneous body of knowledge, in methods and disciplines, that we have encountered. (Tricco et al. 2018: 467)

Other information

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Late Submission

Q-sort Methodology: The Systematic Study of Participant Viewpoints in Social Research

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Abstract: In social sciences research there are instruments made up of questions and that aim to ascertain opinions, behaviors and attitudes, aim to find out how the person would act in a given situation, instead of putting the person to the test. Although there are no right or wrong answers, there is a tendency to respond in a socially acceptable way, even if the answer does not correspond to reality. This problem can be circumvented through the Q-sort methodology that combines quantitative and qualitative data and analytical techniques that are not present in other methods. In this way, it consists of presenting participants with a set of statements on a given topic and asking them to classify them according to their opinion, according to a predefined distribution, which, in general, is approximately normal. This methodology forces participants to distribute the score among the items on the scale, thus avoiding the constraints associated with social desirability and the tendency to respond in the same way or always through the midpoint to different questions. Another advantage is that it provides linearity and near-normality to the scale, which makes it possible to compare subjects more easily with each other. Notwithstanding its advantages, Q-sort methodology also has negative points because forced-choice measures produce ipsative data that lead to distorted scales and problematic psychometric properties. As the data are obtained by ordering a set of items or by forcefully choosing one item over another, it is impossible to reach very high or very low values on all scales, which gives rise to a large number of negative values that, in turn, they result in an average correlation between the scales, which is also negative. In view of the above, it was considered pertinent to review the research carried out on the q-sort methodology, presenting its main advantages and disadvantages.

Keywords: Q-sort methodology, Data analysis methodology, Data collection procedures, Human perspectives, Social research

1. Introduction

The Q methodology was presented by Stephenson (1935) and later refined in Brown (1996) for the areas of social sciences and humanities to study subjectivity through a combination of qualitative and quantitative techniques (Zabala et al., 2018). It is a methodology that aims to investigate subjective perspectives, beliefs and concepts that characterize human mental states and behavioral manifestations (Akhtar-Danesh, 2018).

According to Lundberg (2019) it is appropriate to study social phenomena around which there is much debate, conflict and contestation, since the study of values and attitudes is often carried out with self-report instruments. Therefore, most of the time, the answers are given according to social norms and the representations that people build of reality and not according to reality itself (Escobar Cabello and Sánchez Soto, 2019). To avoid this situation, subjects are required to classify the scale items according to a previously established distribution, which approximates normality (Stenner and Capdevila, 2020).

Following this idea, Kamperman et al. (2022) add that it is desirable that the data follow a normal distribution, as it means that the values of the variable are grouped around the mean, in a symmetrical pattern, which reveals that the responses of the participants are diversified, a fundamental aspect for the making statistical inferences.

The purpose of this article is to review the research carried out on the q-sort methodology, presenting its main advantages and disadvantages.

2. Literature review

2.1 Q-sort Methodology

Q-sort is a mixed research method that uses quantitative results to confirm qualitative results in order to better understand the phenomenon under study (Santos et al., 2019). One of the strengths of this methodology is its exploratory approach and its potential to generate theories, since, generally, no hypothesis is formulated before the execution of the study (Lundberg, 2019). In addition, several authors (*e.g*., Eyvindson et al., 2015; Moree, 2017; Thompson et al., 2013) describe the Q-sort methodology as a reliable approach to fill the gaps inherent in the R method that only allows relate differences between individuals, while Q-sort makes it possible to relate intra-individual differences.

Following this idea, Eyvindson et al. (2015) adds that the R Method emphasizes the analysis of the relationships between the variables, while the Q Method focuses on comparing the perception of each of the individuals within the sample in which they belong. This method consists of a group of statements or objects about a topic predetermined by the researcher (*e.g*., The sustainability practices adopted by the organization comply with current legislation) and from which participants classify these statements into categories (Santos et al. al., 2019).

The Q-sort table includes a rating scale that can range from -3 and +3 to –6 to +6, depending on the degree to which participants agree with each of the statements presented. There is no ideal range, because it depends on the number of statements. A greater number of statements generally requires a wider reach (Akhtar-Danesh et al., 2018).

When organizing the statements according to their personal opinions, each one occupies a place in the table according to the importance attributed to each one, which varies from negative to positive (Figure 1). After completing each individual Q-sort, the statements receive the rating assigned to their place in the table and in the general Q-sort, made up of the responses of all participants. The values assigned to each statement are added together and generate the final score assigned to each category (Lutfallah & Buchanan, 2019).

The number of columns and rows that make up the table depends on the number of statements developed/selected by the researcher, each of which must have a place in the table so that it can be sorted by the participant. If the number of statements to be evaluated is 25, the table must consist of 25 spaces (Santos et al., 2019).

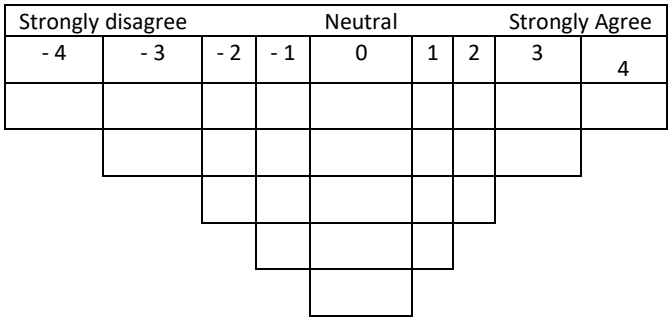

Figure 1: Q-sort table with extremes that oscillate between – 4 and 4

(Adapted from Santos et al. 2019)

The table presented in Figure 1 is composed of nine columns, where the value minus four (-4) corresponds to total disagreement with the statement and four represents total agreement with it. The number of responses corresponding to each statement was limited in advance, which forces a forced distribution and encourages participants to carefully reflect on the ranking of statements according to their point of view on the topic (Lucinski, 2016). The Q-sort matrix facilitates the analysis and interpretation of results and increases the accuracy of the analysis performed (Martínez et al., 2021).

The Q-sort methodology makes it possible to establish correlations between people and not between measurement instruments, so that participants who order items in a similar way share the same point of view on the subject under analysis. Based on individual correlations, factors are extracted that identify people who

reveal similar or different opinions regarding a given factor (Escobar Cabello and Sánchez Soto, 2019). The linearity and approximation of the normality of the data distribution, allows the subjects to be compared with each other more easily (Stenner and Capdevila, 2020).

It is important to mention that like any methodology, this one also has advantages and disadvantages that we will now describe.

2.2 Advantages of the Q-sort methodology

One of the main advantages of this methodology is related to the decrease in the number of answers attributed to the midpoint of the scale, because when participants answer different types of questions in the same way, validity is compromised due to the bias of the results (Karim, 2001).

According to Stenner and Capdevila (2020), the person always marks the same answer because he is afraid to take a position on the subject under analysis and decides to respond according to his perception that it is socially desirable. With Q-sort, participants are forced to distribute their answers across the various spaces of the table, which implies decision making and as such the effort to distort the answers is considerably less (Ramlo, 2021).

Unlike questionnaires, whose items can be answered using a Likert-type scale, which requires a single reading for a generally direct and quick answer, Q-sort may require several decisions to assign an answer, because it requires a comparison of each affirmation with the others, which increases the validity of the evaluation process (Eyvindson et al., 2015).

Another advantage concerns the a priori criterion used by the researcher to develop the measurement instrument, since, as he is responsible for choosing theories and/or variables, he selects the response scales that may allow him to validate his hypotheses (Lundberg , 2019).

In the Q-sort, the answers are classified, by the participants, according to their references on the topic under analysis, that is, it is the respondent who decides the importance he attaches to each statement in relation to the others and its ordering in the table. Subsequently, this ranking is compared with that of the other participants to assess the similarities and differences in relation to their points of view. Thus, it is not the researcher who prepares the Q-Sort who decides, a priori, the classifications, but the respondent, from his point of view (Stenner and Capdevila, 2020).

2.3 Disadvantages of the Q-sort methodology

Despite its advantages, the Q-sort methodology also has negative points, because forced-choice measures produce ipsative data that lead to distorted scales and problematic psychometric properties (Salgado et al., 2015).

In this context, Martinez et al. (2021) report that as the results are relative, it is impossible to obtain very high or very low values on all scales, which leads to a large number of negative values which, in turn, result in an average correlation between the scales, which is also negative. And despite these averages approaching zero, when there are few scales involved, it becomes difficult to assess the construct validity through the Classical Test Theory (Kleka and Soroko, 2018), which leads Walton et al. (2020) stating that with less than 30 scales it is practically impossible to obtain psychometric parameters that can be interpreted.

Martínez et al. (2021) also states that often a normal distribution may not be appropriate for ipsative data, because as all scales are correlated, it is more likely that profiles with predominantly positive or negative values will emerge, which have asymmetry coefficients and kurtosis that deviate from the range -1.96 to 1.96 recommended in the literature.

The interdependence that exists in the forced choice scales and in the observed results can change the psychometric properties of the instrument, because the selected item does not depend only on the level of latency that it is measuring, but also on the set of items to which it belongs, which makes that each observed result is influenced by the results of the set of items (Welter and Capitão, 2007).

Santos et al. (2019), in turn, report that, due to the low intercorrelation of the items, the subscales tend to have low internal consistency, with average values around 0.20, which is why it is not uncommon for it to be rejected to the detriment of the Likert scales.

3. Q-sort methodology Phases

The effectiveness of the Q-sort methodology depends on the fulfillment of the steps recommended by Ferreira et al. (2022), namely: (i) identification of the topic to be analyzed; (ii) gathering information from a literature review or through interviews with experts in the study area; (iii) selection/development of a representative set of statements; (iv) election of participants who meet all the inclusion criteria; (v) construction and application of the Q-sort with the statements considered most relevant to answer the research problem; (vi) statistically analyze individual and global results through factor analysis of Q-sorts, with the aim of revealing which individuals are part of each point of view and the "strength" of this connection; (vii) and qualitative interpretation of ratings to explore claims that differentiate one factor from others.

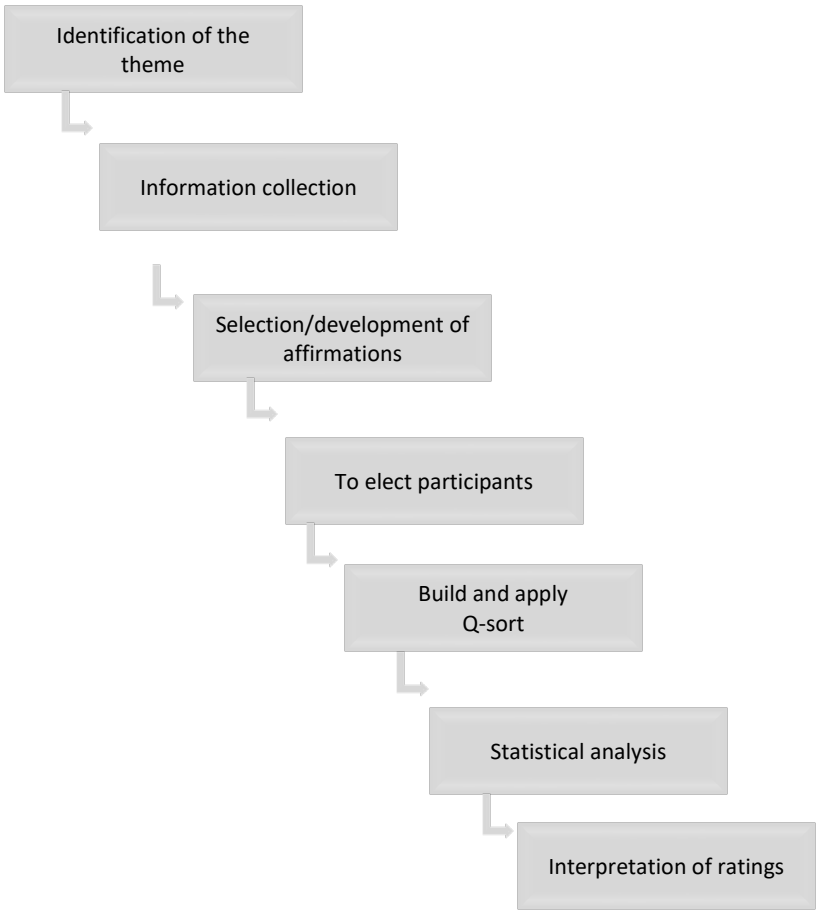

Figure 2: Q-sort methodology Phases

(Adapted from Ferreira et al., 2022)

It should be noted that the Q-sort methodology does not require large samples, because after a certain number of statements, theoretical saturation is reached and no new information is introduced (Maia et al., 2018). In addition, statistical validity is not the main concern of this type of methodology, since the importance falls on the different opinions (subjectivity) about the topic being studied and not on the percentage of the population that adheres to each of these opinions (Ferreira et al., 2022).

This methodology allows analyzing whether there is agreement between the opinions of the participants, how and why it occurs. The comparison of convergent, complementary and/or contradictory opinions can be extremely useful in all areas of knowledge, in particular those dedicated to the study of subjective social phenomena that largely depend on the values and beliefs of those who evaluate them (Escobar Cabello &

Sánchez Soto, 2019). The use of the Q-sort methodology makes it possible to expose similar profiles of individuals who share ideas (Stenner and Capdevila, 2020) regardless of sociodemographic variables (*e.g*., sex, age, education level).

4. Conclusion

The Q-sort methodology is suitable for social phenomena where there is a lot of debate, conflict and contestation (*e.g*., sustainability, politics and religion), so the objective is not to obtain the absolute truth, but rather to collect and explore as many opinions as possible /points of view of different people (Wulff, 2019).

According to Santos et al. (2019) the distribution used in the Q-sort methodology has several advantages over traditional Likert-type scales, among which the impossibility of the respondent to agree with all the questions or choose only the central answers stands out. All answers have to be allocated to the space of the table corresponding to the degree of agreement attributed to each statement (Ramlo, 2021).

The elaboration of a Q-sort instrument implies the presentation of a set of statements to the participants who must distribute them according to the degree of agreement with them (Rampold et al., 2020). The classification is based on the respondents' references on the subject under study and according to a previously established nomenclature (Stenner and Capdevila, 2020).

This methodology was created to give participants the opportunity to express their opinions on a given topic, without the researcher being responsible for choosing the variables that allow the validation of their research hypotheses (Ferreira et al., 2022).

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