

An International Comparison of the Sustainability of Knowledge

Andrea Bencsik

University of Pannonia, Hungary

bencsik.andrea@gtk.uni-pannon.hu

Abstract: Sustainability and organisational knowledge have been of interest to academics for decades, but the long-term sustainability of knowledge within organisations is a less researched area. This study aims to fill gaps in the literature on knowledge sustainability through the views of knowledge management practitioners. It will also provide a generally useful definition of knowledge sustainability. The research was carried out using the Delphi method. A two-round questionnaire survey was carried out involving professionals from 7 continents. The expert groups surveyed were TM experts, Business experts, and Academic staff. In the first round of the survey, 106 respondents expressed their views and ideas on the sustainability of knowledge in a free-text format, which was evaluated using Atlas.ti. In the second round, the statements of the questionnaire, based on a content analysis of the first round of responses, were ranked by experts on a 6-point Likert scale. In this case, 126 responses were received. The ranked statements were evaluated using IBM SPSS 25 statistical program and the validity of our hypotheses was tested. The results confirmed that a trust-based organisational culture, based on the values of sustainability leadership, is a prerequisite for knowledge sustainability. Alignment of the elements of the knowledge management process with organisational objectives is essential for the long-term sustainability of knowledge and the IT tools of the organisation play a dominant role. The comparison of the 3 groups of experts isolated in the study and the opinions by continent did not show any significant differences. As a final summary of the results of the research, a definition of knowledge sustainability was formulated, which provides a new basis for further research into the theory and practice of building sustainable knowledge management systems.

Keywords: Knowledge Management, Sustainable Knowledge, Trust, International Research, Delphi Method

1. Introduction

The problem of knowledge loss has been around for centuries, even millennia, but research on its importance is not a preferred area of research (Massingham 2018; Levallet and Chan 2019). This gap is evident at both theoretical and practical levels. Research on the long-term preservation and sustainability of knowledge is therefore essential. This means that the integration of the knowledge management (TM) process into organisational operations is also a key to the future success of the organisation. A specific set of tools is needed to ensure synergy between organisational knowledge and long-term organisational performance. Sustainable organisational functioning has been a strategic priority for many years. It is a development process or organisational principle that meets the needs of the present without compromising the ability of future generations to meet their own needs (Our Common Future 1988). This definition opens the door to a sufficiently wide range of choices and actions. Thus, the different disciplines and organisational needs determine to a large extent the current actions behind the 'slogans'. The present research does not consider the application of traditional indicator systems but uses their values to develop an option focusing on the transferability and long-term preservation of knowledge.

The research questions were formulated as follows:

- What does the sustainability of knowledge mean for knowledge management experts and researchers?
- What conditions are needed for the long-term sustainability of knowledge?

The research aims to define the definition of knowledge sustainability and to define the organisational conditions for knowledge sustainability. To answer the research questions and to achieve the objective, a practical study was launched using the Delphi method after a literature review. These are presented in the following chapters. The significance of the study is that it (1) fills a gap in the definition of sustainable knowledge, (2) articulates the conditions for sustainable knowledge, (3) provides an international comparison between the views of KM experts, academic researchers and practitioners.

2. Literature Background

2.1 Sustainable Knowledge

According to the resource-based approach, knowledge is a unique internal resource (Freeman *et al.* 2021) that can only bring a competitive advantage if it is used wisely to develop the internal capabilities and competencies that best support the sustainable practices of the organisation. When the market is uneven, competition is at its

peak, profit is dominant, and the strategic position of organizations can be compromised (Gibson *et al.* 2021; Mishra 2019). In such a situation, traditional practices fail to deliver the expected results. Therefore, organizational knowledge becomes a potential resource that can make a pioneering contribution to building the strategic position of organizations (Torres *et al.* 2018). Lopez-Torres *et al.* (2019) in their research have shown how SMEs can adopt knowledge management as an effective strategy to make their operations sustainable. A knowledge culture thus developed is vital for organisations to operate effectively and sustainably (Shujahat *et al.* 2019; Caniglia *et al.* 2021; Glikson and Woolley 2020). Sustainable knowledge and knowledge management go beyond the typical expectations of sustainability in general (such as the preservation of the environment, the necessary use of renewable energy sources, etc.) and think on a scale that seeks not only to create the physical conditions and theoretical possibilities but also to imagine the conditions for an innovative future while achieving social well-being. As is well known, the most critical issue in the knowledge management process is how to solve the problem of sharing knowledge and thus preserving what has become common knowledge. In discussing the sustainability of knowledge, the research logic that characterises sustainability in general is reversed. It is not a question of how knowledge management helps an organisation to operate sustainably. The question is what organisational conditions and operations are needed to preserve and maintain common organisational knowledge in the long term. Phrased in this way, the role of trust in influencing knowledge sharing, capture, collaboration, culture building, etc. becomes clear. These factors call for a holistic approach and a complex way of thinking (Muhammad *et al.* 2020). In summary, to assess knowledge sustainability, it is necessary to go beyond the published knowledge to explore opinions that provide a legitimate basis for a more precise and broader definition and, at the same time, to explore the organisational conditions.

3. Research Methodology

The research represents a new approach and contribution to current knowledge in the field, both in theory and practice. We used both qualitative and quantitative methods, which were conducted using the Delphi method. We conducted a two-round questionnaire survey involving professionals from 7 continents. Respondents were classified into 3 groups: TM experts, business experts, and academic staff. In the first round of the survey, respondents expressed their views and ideas on the sustainability of knowledge in a free-form format. In the second round, the respondents were asked to rank the statements of the questionnaire, based on a content analysis of the first round of responses, on a 6-point Likert scale. The free-form responses of the first round were analysed using Atlas.ti. The statements ranked in the second round were evaluated using IBM SPSS 25 statistical software and then tested for the validity of our hypotheses.

3.1 Delphi Method

The Delphi method is a well-structured visioning method based on expert opinion, which gathers the opinions of experts on a given research problem in at least two rounds. It facilitates the acquisition of a variety of information that can help to provide a more comprehensive understanding of the research topic. Its anonymity and iterative nature ensure the expression of open ideas and opinions and allow for multiple returns to help further refine opinions.

The Delphi technique has four main features:

- anonymity between participants,
- iteration with controlled feedback from the group,
- statistical aggregation of the group's responses
- expert input.

Anonymity allows views to be expressed and changed in private, controlled feedback iteration ensures communication between participants and the sharing of perspectives, statistical aggregation of group responses allows data to be analysed and interpreted, and finally the concept of expert input suggests that all participants are knowledgeable in the area under study (Trevelyan and Robinson 2015).

A large body of research has marked the application of the method and it is often added to the palette of research methodologies in different disciplines (Hirschhorn, 2019). In recent years, it has been used successfully, mainly for research in education and health (de Villiers *et al.*, 2005; Chitu & Pawlowski, 2004; Hsu & Sandford, 2019; Vogel *et al.*, 2019; Chalmers *et al.*, 2019; Varndell *et al.*, 2021; Sablatzky, 2022).

A key part of the Delphi method is to select the right experts to ensure the quality of the results (Paré *et al.* 2013). The target group for our research is a group of experts with a high level of professional experience in the research topic.

The experts in this research are divided into seven panels and two-panel groups. The first-panel group is defined by the main source of opinion of the responding experts. The second group of panels is composed of four panels based on the continent from which the experts' views originate: Europe, America, Asia and the fourth panel is classified as Other. The panels allow the identification of cultural and contextual differences, which can contribute to the reliability and relevance of the research. Experts were selected using the multi-stage approach proposed by Okoli and Pawlowski (2004). A 'knowledge source identification worksheet' was developed to identify the relevant background and skills of the experts. The main selection criterion was the experts' years of experience in knowledge management and their work experience. The questionnaires were sent out online to experts from academic professional societies, websites, professional journals, conference participants, university websites, corporate websites, LinkedIn groups, etc. at the international level. Both rounds of the survey were conducted in approximately 3 months. In the first round, experts were asked to freely express their views on the topic of "**sustainable knowledge as the key to a successful, sustainable future**". The second questionnaire, based on the analytical results of the first round, asked respondents for their value judgements on the statements made, organised around four groups of questions. The second questionnaire followed the procedure of the "ranked" Delphi tests as defined by Schmidt (1997). The statements in the questionnaire were ranked individually and independently using a six-point Likert scale.

Question groups for Questionnaire 2:

- Knowledge sustainability goals and values
- Organisational culture, the role of leadership
- The link between knowledge management and knowledge sustainability
- The link between technological background and knowledge sustainability

3.2 The Sample

Delphi 1 - 1000/106 answers

Respondents:

- TM experts - 38,2%
- Business professional - 28,3%
- Academic sector - 33,5%

7 continents

- Europe - 44,8%
- Asia - 21,9%
- North America - 13.5%
- South America - 10.4%
- Africa - 5.2%
- Australia - 4.2%

Delphi 2 - 1000/126 answers

The characteristics of the first round of respondents are shown in Table 1.

Table 1: Characteristics of Delphi first-round respondents

Features	n	%
The main point of view/source of opinion comes from the following experience:		
• Knowledge management expert	48 persons	38 ,2%
• Individuals working in academia	42 persons	33,5 %
• Company specialist	36 persons	28,3%

Features	n	%
<u>Professional experience in a field related to knowledge management:</u>		
• Less than 5 years	9 persons	7,1 %
• Between 5 and 10 years	21 persons	16,7 %
• More than 10 years	96 persons	76,2 %
<u>Field of qualification:</u>		
• General Business Management / Economics	63 persons	54 %
• Human resource management	58 persons	46 %
<u>Highest level of education:</u>		
• Bachelor training	9 persons	7,2 %
• Master training	62 persons	49 %
• Doctoral studies (PhD.)	55 persons	43,8 %
<u>The continent from which the main point of view/opinion originates:</u>		
• Asia	28 persons	21,9 %
• Africa	7 persons	5,2 %
• North America	17 persons	13,5 %
• South America	13 persons	10,4 %
• Antarctica	0 persons	0 %
• Europe	56 persons	44,8 %
• Australia	5 persons	4,2 %

Source: own editing

Hypotheses

H1. There are significant differences in the way knowledge management experts, academics and business professionals define knowledge sustainability.

H2. There are significant differences between the opinions of experts from different continents.

4. Analysis

Atlas.ti software was used to evaluate the data. The software was used to perform a content analysis based on the first round of expert opinions. The content analysis process consisted of six steps.

- create a new project using the software (name, save location)
- importing replies received
- automatic encryption
- making memos
- list of most common words
- raw data processing

The most common terms are listed and also in the form of a word cloud.

Table 2 shows the most common terms.

Table 2: Delphi first round list of most common terms

Terms	Frequency of occurrence (n)	Frequency of occurrence (%)
Knowledge Management	126 pieces	100%
Organisational processes	112 units	89%
Organisational goals	109 pieces	87%
Corporate (business) strategy	106 units	84%

Terms	Frequency of occurrence (n)	Frequency of occurrence (%)
Competitive advantage (added value, organisational performance)	102 pieces	81%
Long-term thinking	99 pieces	79%
Cooperation (collaboration)	97 units	77%
Organisational culture	94 units	75%
Extremely important/essential/key	93 db	74%
People at the centre	90 pieces	71%
Strategic decisions/decision making	88 pieces	70%
IT solutions (IT, technology)	85 pieces	67%
Skills, competences	83 units	66%
Ethical issues	82 units	65%
A rapidly changing world	79 pieces	63%
Knowledge creation/creation	78 units	62%
Knowledge sharing	78 units	62%
Knowledge management system(s)	75 pieces	60%
Knowledge development/improvement	72 pieces	57%
Knowledge identification	72 pieces	57%
Ownership of knowledge	71 units	56%
Use of knowledge	71 units	56%
Tracking and tracing	67 units	53%
Dissemination	66 pieces	52%
Investment	64 pieces	51%
Communication	63 pieces	50%
Knowledge preservation	59 pieces	47%
Knowledge transfer (handover)	59 pieces	47%
Innovation	57 pieces	45%

Source: own editing

After identifying the most common terms and words, the second phase (questionnaire) was prepared. In this case, starting a new project with the software, the aim was to formulate the groups of questions and the questions to be asked to design the questionnaire, based on the most frequent expressions, words and phrases. The groups of questions and the questions assigned to them are shown in Table 3. After finalisation, the questionnaires were sent again online to the previous target group.

Table 3: Delphi Round 2 question sets and questions

Questions	Description of questions
Knowledge sustainability goals and values	- Organisational goal of knowledge sustainability - Knowledge sustainability as an organisational competitive advantage - Helping to achieve organisational goals - Integration into organisational activities - A vital factor for the 21st century - Making better decisions
The role of organisational culture	- An organisational culture based on trust - Cooperation and shared values between organisational members and management - Implementing the principles of sustainability management - Adequate and continuous training of employees - Ethical issues raised

Questions	Description of questions
The link between knowledge management and knowledge sustainability	• Incorporating elements of the knowledge management process • Continuous, unconditional knowledge sharing between organisational members • Knowledge development/learning renewal • The role of organisational memory • Aligning knowledge management with organisational goals
The link between technological background and knowledge sustainability	• The important role of IT background • Organisational members' trust in technology • Appropriate level of technological background • The role of artificial intelligence • IT solutions as a key role • IT knowledge and skills of organisational members

Source: own editing

The Delphi method and the SPSS program were used to test the hypotheses (to detect differences between expert and national panels).

The Delphi method allows a group of experts to measure consensus. For the second questionnaire, the mean and standard deviation of the responses were examined during the data analysis to understand the heterogeneity or homogeneity of the responses. Next, we focused on measuring the consensus by calculating the median and the interquartile range. In the case where the responses to a query are ordinal, the median can be defined as a measure of central tendency and the interquartile range (IQR) as a measure of dispersion (Hsu and Sandford 2007; Garson, 2014). The interquartile range is a statistical measure used to characterise the dispersion of data. IQR is the range between 25-75 percentile points above and below the median. So IQR represents the middle 50% of the distribution of the data. The interquartile range helps to measure consensus among respondents. In cases where the IQR is relatively small, we can speak of a higher consensus. Conversely, if the IQR is high, it means that opinions are spread over a wider range and there is no consensus. Outlier values are not included in the calculation of IQR and therefore do not bias the result. This allows for a clearer and more objective assessment of the degree of consensus. The use of IQR allows comparisons of consensus between different groups. Following Kittel-Limerick (2005), a value of 2.5 was set to determine consensus. SPSS software was used for this process, with a 5% significance level. The software summarised the results in a table, which allowed us to determine the degree of consensus for each panel group. Due to space limitations, we present as an example in Table 4 the results of the first (knowledge management expert, academic, corporate) and second (European, American, Asian, other continent) panel groups for the six statements related to the first group of questions (Knowledge Sustainability Goals and Values). Following a similar procedure (also analysing the other three groups of questions), we obtained the terms and vocabulary from the experts' opinions which, when summarised, define knowledge sustainability.

Table 4: Results of the first and second-panel groups' responses to the first set of questions.

Knowledge management expert			Individuals working in academia		Company specialist			
Claim	Median	IQR	Median	IQR	Median		IQR	
1	5.00	1	4.00	1	5.00		2	
2	5.00	1	5.00	2	4.00		1.5	
3	5.00	1	4.00	2	4.00		2	
4	5.00	1	4.00	2	5.00		1	
5	5.00	1.5	6.00	1	6.00		1	
6	6.00	1	5.00	1	6.00		2	
Europe			America		Asia		Other	
Claim	Median	IQR	Median	IQR	Median	IQR	Median	IQR
1	5.00	1.5	6.00	2	5.00	2	5.00	1.5
2	5.00	2	5.00	2	5.00	2	5.00	2
3	6.00	2	6.00	2	6.00	1	5.00	2

Knowledge management expert			Individuals working in academia		Company specialist			
Claim	Median	IQR	Median	IQR	Median		IQR	
4	5.00	2	6.00	1	6.00	1	6.00	1
5	6.00	1	6.00	1	6.00	1	6.00	1
6	6.00	1	5.00	1.5	6.00	1	5.00	1.5

Source: own editing

In order to verify the validity of the definition, we focused on the questions in the four groups of questions that received the highest scores from the experts. These results are illustrated in Tables (5, 6, 7, 8) below.

Table 5: Knowledge sustainability goals and values

Claims	N	Average	Source
The organisational goal of knowledge sustainability is to increase the added value for stakeholders within the organisation.	126	4,71	1,24
Ensuring knowledge sustainability has become a key source of competitive advantage for organisations in a rapidly changing world.	126	4,93	1,01
Knowledge sustainability helps to achieve organisational goals.	126	4,68	1,24
Knowledge sustainability must be embedded in organisational activities.	126	4,92	1,10
In the 21st century, knowledge sustainability is a vital factor for organisations, regardless of the industry they operate in.	126	5,22	0,83
The value of knowledge sustainability is used to make better decisions.	126	5,04	1,00

Source: own editing

Table 6: Organisational culture and knowledge sustainability

Claims	N	Average	Source
A key to the sustainability of knowledge within an organisation is an organisational culture based on trust, where members of the organisation and its management work together.	126	4,79	1,17
Ensuring the knowledge sustainability cycle depends on the cooperation and shared values of the members of the organisation and its management.	126	4,94	1,01
To make knowledge sustainable in the long term, it is necessary to apply the principles of sustainable management.	126	4,82	1,09
Appropriate and continuous training of employees is a key element for successful knowledge sustainability.	126	4,66	1,29
Knowledge sustainability within the organisation raises ethical issues (e.g. inappropriate data management, etc.) that need to be addressed.	126	5,00	0,88

Source: own editing

Table 7: The link between knowledge management and knowledge sustainability

Claims	N	Average	Source
The integration of elements of the knowledge management process into organisational processes is a prerequisite for the long-term sustainability of knowledge within an organisation.	126	5,06	0,88
The continuous, unconditional sharing of knowledge between organisational members plays an important role in the cycle of knowledge sustainability.	126	5,02	1,05
Knowledge development/knowledge renewal is an important step in the organisational application of knowledge sustainability.	126	4,91	1,14
Organisational memory plays an important role in knowledge sustainability.	126	4,86	1,04

Knowledge sustainability requires the alignment of knowledge management objectives with organisational objectives.	126	4,89	1,07
--	-----	------	------

Source: own editing

Table 8: Technological background and knowledge sustainability

Claims	N	Average	Source
The organisation's IT environment plays an important role in making knowledge sustainable within the organisation.	126	4,35	1,20
To ensure the long-term sustainability of knowledge within the organisation, organisational members must have IT knowledge and skills.	126	4,75	1,18
IT solutions are more important than other conditions.	126	2,85	1,58
Without artificial intelligence, the sustainability of knowledge cannot be ensured.	126	3,72	1,49
To make knowledge sustainable in the long term, it is necessary to have the right level of technological background.	126	4,91	1,14
A vital element of successful knowledge sustainability is the trust that organisational members have in technology.	126	5,02	1,05

Source: own editing

A definition of knowledge sustainability, summarised from the above peer review and opinions:

Knowledge sustainability is a vital organisational strategy to make better decisions for ethical and sustainable organisational operations by preserving the value and usefulness of knowledge (tacit and explicit) in the organisation over the long term. It contributes to gaining and maintaining a competitive advantage by continuously updating existing and new knowledge, embedded in organisational activities. At the heart of knowledge sustainability is human capital, the prerequisites for its provision within an organisation:

- An organisational culture based on trust (personal and impersonal), where members and management of the organisation work together in a spirit of sustainable leadership.
- Integrating the elements of the knowledge management process into organisational processes, ensuring a continuous, evolving, knowledge-sharing cycle of knowledge.
- Ensuring a high level of availability of the technological background supporting the knowledge management process, maintaining the stress-free operation of technology, ensuring digital and workplace well-being.

The definition also answers the research questions.

An ANOVA test was performed to test the validity of the two hypotheses. In order to explore the differences in mindset between each panel group, a Post-Hoc analysis was conducted. It allows us to make further detailed comparisons between groups or variables. Within the group of Post-Hoc analyses, we used Tukey's HSD (Honestly Significant Difference) test, which is mainly used to perform multiple comparisons in ANOVA analyses. The result was that there was no significant difference between the panels. Although there were statements with different perspectives in the two panel groups of experts interviewed, overall there were no significant differences.

5. Discussion and Conclusion

The definition of TM confirms that investment in intellectual capital is a key to competitiveness (Zsigmond and Mura 2023). The need to build knowledge management systems and to integrate them into organisational operations is a decades-old business model in Western societies, but a less preferred business model in less successful economies, such as in Central and Eastern Europe (Marquardt *et al.* 2023; Talmo and Bonanomi 2015). The need to build systems is often expressed at the level of management and strategy, but very few firms reach the level of operational implementation. *Organizational* competitiveness and success are inextricably linked to

learning and knowledge, which can be combined into ultimate performance at the organizational level through knowledge management processes (Ayatollahi and Zeraatkar 2019; Škudienė 2021; Abrams *et al.* 2003). In recent years, there has been a lot of research and publications discussing the results of this research on the relationship between knowledge sharing and trust (Darroch 2005; Sankowska 2013; Paliszkievicz and Koohang 2013; Alsharo *et al.* 2017; Kipkosgei *et al.* 2020; Ayadi *et al.* 2020). Without exception, all confirm that trust influences the occurrence, quality and depth of knowledge sharing, and thus is closely related to the construction and functioning of organizational knowledge management systems. Competitiveness and economic success are interrelated in the so-called "knowledge management". "In this context, competitiveness and economic efficiency are interrelated with 'soft' factors, with a back-and-forth effect. These are long-term factors, focusing on short-term economic indicators can diminish their value, but ignoring them is an untapped opportunity. Knowledge management systems provide organisations with a framework for the long-term preservation of knowledge within a culture of trust (Miller 2019). However, research has not yet reached the point of defining the conditions and practices for the sustainability of necessary and up-to-date knowledge. To formulate an answer, we sought a basis - based on the wisdom of collective thinking - using the Delphi method. The results of a free-form consensus search based on the opinions of international expert groups and their analysis led to a definition of the long-term sustainability of knowledge and the organisational conditions for it. The definition was developed on the basis of expert ratings of the statements of the four groups of questions. The terms of the statements with the highest average score appear in the definition. The results of the consensus search show that the opinions of the expert groups and scientists from the continents on the sustainability of knowledge are converging.

5.1 Research Limitations and Further Possibilities

The limitations of the research are all factors that are specific to questionnaire surveys. First of all, the willingness to respond, which is a problem apparently all over the world. Although the Delphi method combines qualitative and quantitative approaches, at its core, the bias of expert respondents' informal expression of opinion must be taken into account. Professionalism, honesty, reservations about identifiability, possible misinterpretation of questions can be questioned. Despite our best efforts, these factors may affect the outcome. In the future, it would be useful to extend the studies by collecting additional samples. The results obtained, the definition could be further refined by increasing the sample size and/or ensuring representativeness. The inclusion of additional countries from different cultural backgrounds would allow for a more refined comparative analysis and provide an even deeper understanding of the knowledge sustainability practices of organisations and the possible cultural influences in their context.

References

- Abrams, L.C., Cross, R., Lesser, E., and Levin, D.Z. (2003) 'Nurturing interpersonal trust in knowledge-sharing networks', *The Academy of Management Executive*, 17(4), pp. 64-77. <https://doi.org/10.5465/AME.2003.11851845>
- Alsharo, M., Gregg, D. and Ramirez, R. (2017) 'Virtual team effectiveness: the role of knowledge sharing and trust', *Information & Management*, 54(4), pp. 479-490. <https://doi.org/10.1016/j.im.2016.10.005>
- Ayadi, A. D., Zhang, Ch., Zouaoui, S.K. and Ohana, M. (2020) 'Interpersonal Justice and Innovative Behaviours: The Role of the Workgroup', *International Journal of Innovation Management*, 24(3), 2050073, <https://doi.org/10.1142/S1363919620500735>
- Ayatollahi, H. and Zeraatkar, K. (2019) 'Factors influencing the success of knowledge management process in health care organizations: a literature review', *Health Information and Libraries Journal*, 37(2), pp. 98-117. <https://doi.org/10.1111/hir.12285>
- Caniglia, G., Luederitz, C., von Wirth, T. et al. (2021) 'A pluralistic and integrated approach to action-oriented knowledge for sustainability', *Natural Sustainability*, 4, pp. 93-100 <https://doi.org/10.1038/s41893-020-00616-z>
- Chalmers, J., Armour, M. (2019) The Delphi Technique. In: Liamputtong, P. (eds) *Handbook of Research Methods in Health, Social Sciences*, Springer, Singapore, pp. 715-735. https://doi.org/10.1007/978-981-10-5251-4_99
- Chitu O. S. & Pawlowski, D. (2004) 'The Delphi method as a research tool: an example, design considerations and applications', *Information & Management*, 42(1), 15-29. <https://doi.org/10.1016/j.im.2003.11.002>
- Darroch, J. (2005) 'Knowledge management, innovation and firm performance', *Journal of Knowledge Management*, 9(3), pp. 101-115.
- de Villiers M.R., de Villiers P.J. & Kent A.P. (2005) 'The Delphi technique in health sciences education research', *Med Teach*. 27(7), 639-43. <https://doi.org/10.1080/13611260500069947>. PMID: 16332558
- Freeman, R.E., Dmytriiev, S.D. and Phillips, R.A. (2021) 'Stakeholder Theory and the Resource-Based View of the Firm', *Journal of Management*, 47(7), pp. 1757-1770. <https://doi.org/10.1177/0149206321993576>
- Garson, G. D. (2005) *The Delphi method in quantitative research*, Asheboro: Statistical Associates Publishers,

- Gibson, C.B., Gibson, S.C. and Webster, Q. (2021) 'Expanding Our Resources: including community in the Resource-Based View of the Firm', *Journal of Management*, 47(7), pp. 1878-1898. <https://doi.org/10.1177/0149206320987289>
- Glikson, E. and Woolley, A.W. (2020) 'Human Trust in Artificial Intelligence: Review of Empirical Research', *Academy of Management*, 14(2), <https://doi.org/10.5465/annals.2018.0057>
- Hirschhorn, F. (2019) 'Reflections on the application of the Delphi method: lessons from a case in public transport research', *International Journal of Social Research Methodology*, 22(3), 309–322. <https://doi.org/10.1080/13645579.2018.1543841>
- Hsu, C. C., and Sandford, A. B. (2007) 'The Delphi technique: making sense of consensus. Practical Assessment', *Research & Evaluation*, 12(10), pp. 1-8.
- Hsu, Ch. & Sandford B.A. (2019) 'The Delphi Technique: Making Sense of Consensus', *Practical Assessment, Research, and Evaluation*: 12. Article 10. <https://doi.org/10.7275/pdz9-th90>
- Kipkosgei, F., Kang, S.W., and Choi, S.B. (2020) 'A Team-Level Study of the Relationship between Knowledge Sharing and Trust in Kenya: Moderating Role of Collaborative Technology', *Sustainability* 12, 1615, <https://doi.org/10.3390/su12041615>
- Kittel-Limerick, P. (2005) *Perceived Barriers to Completion of The Academy doctorate: A Delphi Study*, Texas: Texas A&M University
- Our Common Future (1988) *The Brundtland Report*, Budapest.
- Levallet, N. and Chan, Y.E. (2019) 'Organizational knowledge retention and knowledge loss', *Journal of Knowledge Management*, 23(1), pp.176-199. <https://doi.org/10.1108/JKM-08-2017-0358>
- López-Torres, G.C., Garza-Reyes, J.A., Maldonado-Guzmán, G., Kumar, V., Rocha-Lona, L. and Cherrafi, A., (2019) 'Knowledge management for sustainability in operations', *Production Planning & Control*, 30(10-12), pp. 813-26.
- Marquardt, C., Charles, A.P. and Scholz, S.G. (2023) 'An Approach for Sustainable Knowledge Management and Policy Upstreaming for Industry4.0 in Central Europe'. In Scholz, S.G., Howlett, R.J., Setchi, R. (eds) *Sustainable Design and Manufacturing. SDM 2022 Smart Innovation, Systems and Technologies*, vol 338. Singapore: Springer https://doi.org/10.1007/978-981-19-9205-6_23
- Massingham, P. (2018) 'Measuring the Impact of Knowledge Loss: More Than Ripples on a Pond?', *Management Learning*, 39(5), pp. 541–560. <https://doi.org/10.1177/1350507608096040>
- Miller, D. (2019) 'The Resource-Based View of the Firmfree', *Business and Management*, <https://doi.org/10.1093/acrefore/9780190224851.013.4.83>
- Mishra, N. (2019) 'Knowledge Management Practice for Effective Operations in SMEs', *Production Planning and Control*. 30(10-12), pp. 795-798. <https://doi.org/10.1080/09537287.2019.1582108>
- Okoli, C. and Pawlowski, S.D. (2004) 'The Delphi method as a research tool: an example, design considerations and applications', *Information & Management*, 42(1), pp. 15-29, <https://doi.org/10.1016/j.im.2003.11.002>
- Paliszkievicz, J. and Koohang, A. (2013) 'Organizational trust as a foundation for knowledge sharing and its influence on organizational performance', *Online Journal of Applied Knowledge Management*, 1 (2), pp. 116-127.
- Paré, G. Cameron, E-F. Poba-Nzaou, P. and Templier, M. (2013) 'A systematic assessment of rigor in information systems ranking-type Delphi studies', *Information & Management*, 50(5), pp. 207-217, <https://doi.org/10.1016/j.im.2013.03.003>
- Sablatzky, T. (2022) 'The Delphi Method', *Hypothesis, Research Journal for Health Information Professionals*, 34(1), 1-6.. <https://doi.org/10.18060/26224>
- Sankowska, A. (2013) 'Relationships Between Organizational Trust, Knowledge Transfer, Knowledge Creation and Firm's Innovativeness', *Learning Organization*, 20(1), pp. 85-100. <https://doi.org/10.1108/09696471311288546>
- Schmidt C.R. (1997) 'Managing Delphi surveys using nonparametric statistical techniques', *Decision Sciences*, 28(3), pp. 763-774.
- Shujahat,M., Sousa, M. J., Hussain, S., Nawaz, F., Wang, M. and Umer, M. (2019) 'Translating the impact of knowledge management processes into knowledge-based innovation: the neglected and mediating role of knowledge-worker productivity', *Journal of Business Research*, 94, pp. 442-450.
- Škudienė, V., Augutytė-Kvedaravičienė, I. and Gabrieliūte, U. (2021) 'Knowledge Management and Perceived Organisational Innovativeness in Global Organisations', *Central European Business Review*, 10(3), pp. 51-65.
- Talamo, C. and Bonanomi, M. (2015) *Knowledge Management and Information Tools for Building Maintenance and Facility Management*, Springer
- Torres, A.I., Ferraz, S.S. and Santos-Rodrigues, H. (2018) 'The impact of knowledge management factors in organizational sustainable competitive advantage', *Journal of Intellectual Capital*, 19(2), pp. 453-472. <https://doi.org/10.1108/JIC-12-2016-0143>
- Trevelyan, E.G. and Robinson, N. (2015) 'Delphi methodology in health research: how to do it?', *European Journal of Integrative Medicine*, 7(4), pp. 423-428, <https://doi.org/10.1016/j.eujim.2015.07.002>
- Varndell, W., Fry, M. & Elliott, D. (2021) 'Applying real-time Delphi methods: development of a pain management survey in emergency nursing', *BMC Nurs* 20, 149. <https://doi.org/10.1186/s12912-021-00661-9>
- Vogel, C., Zwolinsky, S., Griffiths, C. et al. (2019) 'A Delphi study to build consensus on the definition and use of big data in obesity research', *International Journal of Obesity*, 43, 2573–2586. <https://doi.org/10.1038/s41366-018-0313-9>
- Zsigmond, T., and Mura, L. (2023) 'Emotional intelligence and knowledge sharing as key factors in business management - evidence from Slovak SMEs', *Economics and Sociology*, 16(2), pp. 248-264. <https://doi.org/10.14254/2071-789X.2023/16-2/15>