Nominal Ranking Methodology: Strategic Information Management Principles for Commercialising Inventions

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Abstract: Strategic Information Management can increase the productivity and efficiency within an organisation, enhance consumer experience and satisfaction through the understanding of consumer needs and furthermore, consumer profiles, this ultimately allows for the creation of innovation that can be commercialised. Strategic Information Management encourages entrepreneurial education, as it focuses on requiring relevant information for product development and business expansion. The study aim was to identify Strategic Information Management principles that can be used to support the commercialisation of new products and innovation. This research used Business Case Study and nominal ranking methodology approaches, where data was collected from the Strategic Information Management Business Case Studies database from the University of Johannesburg Information and Knowledge Management. These case studies were collected from the Information and Knowledge management corporate alumni from their used cases and are not publicly accessible. The sample size for this study was 107 Business Case Studies, and nominal ranking methodology and content analysis were then used to analyse the case studies. Findings revealed various Strategic Information Management principles that can aid the commercialisation of innovation when included within the Higher Education curriculum, principles such as risk mitigation, complexity recognition and management, Business Model Canvas and Total Value Proposition to name a few. Based on the findings these Strategic Information Management principles enable organisations to analyse their internal and external environments, and the value creation processes with the purpose of developing and creating business models for future business sustainability and competitiveness. The study recommends the use of Business Model Canvas, Total Value Proposition and Future Business Environments as the most prominent SIM principles relevant for innovation and commercialisation. The originality of this study is in its use of nominal ranking methodology to identify relevant Strategic Information Management principles for innovation and commercialisation. Furthermore, given the current state of the economy, there is a need to boost businesses through models and systems to continuously produce innovative products and services.

Keywords: Strategy, Strategic Information Management, Commercialisation, Nominal Ranking Methodology, Business Canvas Model

1. Introduction

Strategic Information Management (SIM) is not a new idea or idea, it refers to making appropriate and correct information available to the right people, in the right format, and at the right time (Galliers, 1985; Myburgh, 2002; Ali, Juhari, Basri, Yatin, Hussin, Yatim & Kadir, 2018, Galliers, Leidner & Simeonova, 2020). In the context of this study, SIM refers to good practices that are applied using information and technological tools to execute organisational goals and strategies. This study was mostly interested in SIM's potential to support innovation and commercialisation, specifically for universities to enable the creation of an entrepreneurial environment capable of producing innovative and entrepreneurial students. The primary impetus for this study was the researcher's belief that SIM's potential can be achieved through the development and incorporation of SIM principles in the university curriculum, that can guide students in converting their business ideas and innovation into commercialised products and services. Furthermore, through the utilisation of SIM and its various tools, organisations can compete successfully in a competitive environment (Hussin et al., 2015:679). Other than helping organisations to remain competitive, SIM has been proven to support entities in developing and creating improved products that add value to the market and are quality products (Galliers & Stein, 2018b). SIM enables organisations to respond quicker to market-based trends and to be swift in analysing the competitors' next moves (Fleisher & Bensoussan, 2007; Adom, Nyarko & Som, 2016). SIM can be measured through its products and services that impact on an organisation's performance (Hussin et al., 2015:680). From the literature review, SIM is perceived as a significant component that students should be taught at Higher Education Institutions (HEIs).

2. Literature Review

Strategy can be defined as the state of knowing and understanding where one is, plan of action to where one wants to go, and the plan on how to get there (Web, 2008; Kühl, 2025). The growing nature of competition and market globalisation, and the increase in product and service innovation of competitors have amplified the need to succeed at strategic management and strategic intelligence (Boikanyo, Lotriet & Buys, 2016; Soltanifar et al.,

2021). Successful organisations use strategies and frameworks to address strategic challenges (Web, 2008:6). Strategic planning is closely linked to SIM, which involves the reflection of the vision, mission, and implementation of objectives and critical assessment of Information Technology that support the management of information (Ali et al., 2018). Strategic planning supports the management of performance and of systems, also measures organisational goals against internal performance, and aligns business operations through the strategic management of information (Ali et al., 2018:358).

Strategic management is concerned with the formulation, implementation, and the evaluation of decisions from a cross-functional level to enable organisations to achieve their missions and objectives. It involves the process of identifying and defining the objectives of an organisation, developing plans, coupled with policies to address the objectives (Ibezim & Augusta, 2013:783). Strategic management is made possible by managing information as a strategic asset of an organisation (Fleisher & Bensoussan, 2007; Saremi, 2025).

2.1 Defining Strategic Information Management

SIM is concerned with the delivery of the correct information to the right people, at the right time, thus allowing them to make the right decisions through the support of Information Technology to gather, analyse and disseminate information to improve an organisation's competitive performance, products, and services (Myburgh, 2002; Fleisher & Bensoussan, 2007; Ali et al., 2018). SIM can only occur if strategic information, strategic sources of information, and strategic information systems are involved in strategic planning (Gregus, 2006; Galliers & Leidner, 2003; Galliers & Stein, 2018a; Galliers & Stein, 2018b). SIM plays a significant role in enabling businesses and organisations to better manage their information by means of identifying, storing, processing, and transferring the information (Ali et al., 2018:359). SIM can be identified as a field within Information Management (IM), and it refers to the strategic management of information resources within an organisation to enhance the decision-making processes (Myburgh, 2002).

Systems thinking, information systems, management information systems, and strategic management of information have been researched and debated by scholars, as illustrated in the comprehensive review of discourse summarised by Galliers and Stein (2018a). Of relevance to this study are the components and principles of SIM that address the process of Commercialisation of Innovation (CoI) through strategic management of information in entrepreneurial education to create a safety net for potential student innovators during their academic journey.

2.2 Strategic Information Management Principles

SIM can assist an institution to manage its valuable information resources to enhance the decision making of innovators. However, before investigating SIM in the process of commercialising innovation in HEIs, it is important to clearly understand what SIM is by looking at some underlying principles. SIM is dedicated not only to the management of IS technology of an organisation, but even more dedicated to the managing of information for strategic intelligence (Boikanyo et al., 2016). To illustrate the application of SIM, examples of principles in both components of SIM have been identified by Myburgh (2004), Fleisher and Bensoussan (2007); Mortensen (2009), Du Toit (2016), Mthembu and Du Plessis (2018), and Galliers and Stein (2018a):

1. **IS Fit for Purpose**: To avoid the pitfalls of IT incongruence, impermanence, and insignificance, there must be a fit (best match) between system features and user needs.
2. **IS Metadata Management**: Quality of metadata determines quality of information for decision making.
3. **IS Protection of Personally Identifiable Information**: Although organisations strive to move away from siloed information by creating linkable information, measures to protect personal information must be operationalised per national regulation, for example, the Protection of Personal Information Act (Act 4 of 2013).
4. **IS Quality Information**: Also known as the "garbage in garbage out" adage in system theory, a system is only as good as its content; the quality of information determines the quality of decision making.
5. **IS Single View of Customer**: System integration determines efficiency of front-end system interface, as experienced by client facing support teams and client as end user.
6. **IS Systems Maturity Mapping**: Information Technology audit to identify information architecture gaps.
7. **SI Bridging boundaries**: Knowledge cafés or fishbowls to facilitate problem solving in a safe environment.
8. **SI Conflict of Interest in Strategic Intelligence Line of Duty**: Professional code of ethics in strategic and competitive analyses.

9. **SI Continuous Improvement**: Calibration of People-Process-Technology alignment to achieve total value proposition.
10. **SI Create Constancy of Purpose**: Identify strategic connections by performing social network analysis with strategic planning objective of replacing short-term goal creation with long-term goal planning.
11. **SI Drive out Fear**: Incorporation of core competencies in organisational processes need to be examined to avoid workforce apprehension.
12. **SI Eliminate Management by Objective**: Avoid strategy mis-execution by focusing on the integration of priorities and not assuming past goals are an accurate representation of current strategic direction.
13. **SI Environmental Scanning**: Examine and assess the different elements and components that can influence the performance of an organisation both internally and externally. This is through gathering information using SWOT analysis and other analysis techniques, for example, PESTLE and STEEP.
14. **SI Strategic Competitive Analysis**: The strategic gathering, reviews and analysis of information about direct and indirect competitors to understand their strategies, strengths and weaknesses compared to your strategy, for example, FAROUT.
15. **SI Total Quality Management**: The continuous efforts to create a culture that encourages employees to improve the delivery and production of products and services that customers deem valuable.
16. **SI Value Proposition**: To promise and deliver value from the products and services to the clients in the event they buy the product or use the service produced.

From the list above, the first group of six SIM principles relate to IS (technology and process), followed by ten SIM principles relating to SI (people, process, and technology). SIM is the combination of two components, IS and SI, that enable an organisation to develop and implement its business strategies or an information-based product as part of the strategy execution (Hussin, Othman & Jamaludin, 2015:679; Boikanyo et al., 2016; Galliers & Stein, 2018a). For example, maturity of a country's Income Revenue Service information architecture will affect the quality of service offered to citizens with dire consequences on public management and governance (technology and process). Another example, staff core competencies must be incorporated in organisational processes and through a process of negotiation included in the organisation's online performance management system prior to annual performance reviews to avoid workforce apprehension (people, process, and technology). The list of SIM principles is not comprehensive, but it serves as an illustration of the nature of SIM and its application in strategic management.

3. Methodology

This research utilised nominal ranking methodology with the aid of qualitative data research approach (Saunders, Lewis & Thornhill 2016:136-137). The methods were content analysis and Business Case Study (BCS) analysis. The data collection sources for this research were: Strategic Information Management Business Case Studies (SIM BCSs) and the IKM principles that can best support commercialisation. This paper briefly describes the data collection and data analysis techniques that were used. The researcher obtained access to the UJ Information and Knowledge Management database of Business Case Studies and conducted content analysis of the 107 SIM BCSs. The methodology consisted of four steps, with the Nominal Ranking Technique (NRT) at step 3, as represented in Figure 1. Content analysis was used to analyse the SIM BCSs and derive the most significant themes for identifying relevant SIM principles. The procedure began by defining the core facts and information from the amount of data gathered and expressed in a method to enhance meaning and insight.

Furthermore, permission was obtained from the UJ College of Business and Economics Research Ethics Committee (CBEREC) to conduct research in accordance with the UJ Code of Academic Research Ethics (2007). For example, the researcher had access to anonymised SIM BCSs and confidential information was removed from the IKM SIM BCS database by the database administrator prior to granting the researcher access to BCSs for content analysis. Given the research scope and delineation, the limitation of study must be noted: Commercialisation is a broad concept; this study focused on principles of relevance to IKM.

4. Results and Discussion

This study utilised 107 BCSs for content analysis and the objective was to identify SIM principles that would best support the innovation and commercialisation dynamics of entrepreneurial universities. The researcher received 107 BCSs from the UJ Information and Knowledge Management database that was stored by the researcher on a USB drive and the database was named *UJ IKM Department SIM BCSs Database*.

4.1 Content Analysis: SIM Business Case Studies

Content analysis was deemed to be the appropriate data analysis technique to analyse the rich text contained in the 107 BCSs. Figure 1 depicts the steps that were followed to analyse the data and the final identified SIM principles for innovation and commercialisation.

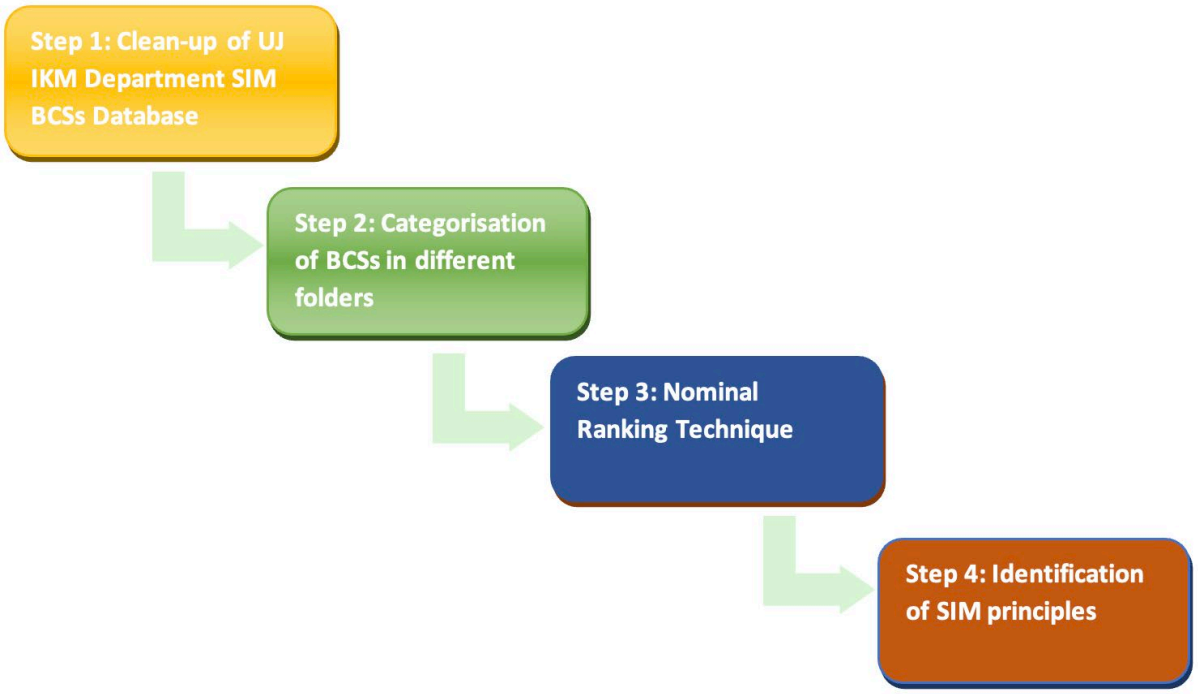

Figure 1: Content analysis steps for data collection and analysis (Own source)

Figure 1 illustrates the content analysis of a process followed to identify the 21 BCSs on SIM principles of relevance to the CoI within entrepreneurial universities. The SIM principles must be incorporated in university curriculum to enable students to commercialise their business ideas.

4.1.1 Step 1: Clean-up of University of Johannesburg Information and Knowledge Management Department Strategic Information Management Business Case Studies Database (107-16=91-46=21)

The first step entailed a clean-up that had to be completed, where out of the 107 BCSs a manual clean-up had to be conducted to assess the number of BCSs that had duplicates – of the 107 BCSs, 16 were duplicates and were colour coded in Yellow. A further clean-up was conducted to identify BCSs that did not focus on SIM principles and of the 91 remaining BCSs, 45 BSCs, colour coded in Green, were not focused on SIM principles and only 46 BCSs remained. This did not mean all the 46 BCSs clearly outlined SIM principles, which meant further analysis was required by means of careful dissection of the content for the identification of SIM principles. Table 1 illustrates the BCS clean-up process, subtracting 107-16=91-46=21. From the 46 BCSs a further analysis was conducted to assess the BCSs clearly outlined SIM principles. Four of the 46 BCSs colour coded in Red did not have SIM principles clearly outlined and only 42 BCSs colour coded in Blue had SIM principles. From the 42 BCSs only 21 BCSs, colour coded in Orange, had SIM principles that were relevant to the CoI.

Table 1: UJ IKM Department SIM BCSs Database Example

UJ IKM Department SIM BCSs Database

Number	File Name	Category
1	BCS_1	
2	BCS_2	
3	BCS_3	
4	BCS_4	
5	BCS_5	

First step of the content analysis of 107 BCSs:

- **Yellow:** Duplicates
- **Green:** Not focused on SIM
- **Red:** Not focused on SIM principles
- **Blue:** SIM principles in general
- **Orange:** SIM principles with relevance to the CoI

The clean-up of the *UJ IKM Department SIM BCSs Database* was followed by the categorisation step.

4.1.2 Step 2: Categorisation of Business Case Studies in Different Folders

The second step was categorisation; the BCSs were placed in their respective folders, from the BCSs that had duplicates, BCSs that did not focus on SIM principles, the BCSs that focused on SIM principles, BCSs that did not clearly outline SIM principles and the final folder with only 42 BSCs with SIM principles clearly outlined and further analysis had to be conducted to extrapolate SIM principles from within the 42 BCSs. From the 42 BCSs only 21 BCSs were relevant to the CoI. Categorisation differed from clean-up where the clean-up was aimed at organising and the correction of omission, whereas step 2 was aimed at organising, placing in folders, and the application of the correct file naming convention in preparation of the nominal ranking technique (NRT), in step 3.

4.1.3 Step 3: Nominal Ranking Technique

NRT was then used in this step to identify BCSs that met the four criteria for the element of SIM principles, which enabled the researcher to identify the BCSs that qualified as BCSs with CoI relevant SIM principles. Table 2 specifies the SIM criteria, and the ranking of 1 to 4 that was applied in the NRT for content analysis.

Table 2: Element of SIM principles

SIM Principles		
Criteria	Information is a key asset to the organisation	**1**
	Information is integrated in the overall strategy of the organisation	**2**
	Information is managed strategically in the organisation	**3**
	Information is crucial to the success of the organisation	**4**

Table 2 presents the **SIM principles** element in the NRT applied in this study and which includes the following SIM principles, namely: Information is a key asset to the organisation (Rank weight 1); Information is integrated in the overall strategy of the organisation (Rank weight 2); Information is managed strategically in the organisation (Rank weight 3); and, Information is crucial to the success of the organisation (Rank weight 4). The 42 BCSs qualified according to the SIM criteria and 42 SIM principles were extrapolated from the BCSs. From the 42 BCSs only 21 BCSs were relevant to the CoI.

4.1.4 Step 4: Identification of SIM Principles

In this step, content analysis was conducted on the 42 BCSs that contained SIM principles, and a further analysis was completed identifying only those 21 BCS containing SIM principles relevant to the CoI, as reported in detail in the below section.

4.2 Summary of Content Analysis

This section summarises the findings of the content analysis. The previous section reported on the NRT findings with the application of the CoI filter. This section presents the distilled findings. The SIM principles relevant to the CoI for entrepreneurial universities, include **Best learning experience**: This SIM principle gives encouragement to learn from experience. Efficient and effective achievement of outcomes depend on the capabilities of an institution's personnel. Therefore, room to learn from experience is required. **Business outputs alignment**: In the public sector the primary benefit of business process management is the increased

effectiveness and efficiency achieved from restructuring the organisation along cross-functional processes. Business outputs should be aligned with resources. **Complexity recognition and management**: The management of resources in the public sector can be a cumbersome exercise. The element of complex management of resources should be under serious scrutiny. **Adoption**: It would be more effective and efficient if the organisation can encourage the active participation of the entire staff in all projects. Information management systems become successful if they are used by all staff.

Visible and tangible benefits: Information management projects must be designed to deliver tangible and visible benefits for the organisation. The deliverance of tangible benefits for the organisation involves that fundamental business needs be satisfied. Information management of projects should target realistic and tangible organisational needs. **Prioritisation based on business needs**: The planning of information management projects requires thoughtful planning and time. Business primary needs should be able to determine the starting point of information management of the project. It is important that the planning process should start by driving projects based on their ability to address the primary business needs. In the public sector, the organisational strategy should drive the information management process to target the most urgent business needs. **Risk mitigation**: The public sector is characterised by an inherent complexity within different departments. The risks involved should be clearly outlined at the beginning of the planning of the information management strategy. Thereafter an approach to tackle each risk must be identified and decided upon on whether to mitigate or avoid the risk involved. A clear management approach should be used to plan all aspects of the project, including activities conducted and budget allocated.

Total Value Proposition: To have enough customer value proposition, there must be a focus on key elements and steps to be successful. These key elements are developing a customer value proposition that starts with an analysis of customers' needs, competitors' offerings, and the organisation's strength to be outstanding within the market. TVP is a subset of the TQM model, managed in incremental steps within innovation spectrum while co-creating new radical innovation value with customers. Total value management, when embedded in SIM and the entire value chain, constitutes the TVP of an institution, which includes knowledge management, innovation information, and analytics ensuring continuous business improvement. **Competitive advantage**: An informed learning curriculum cultivates information fluent and resilient students with the necessary skills to make decisions based on authoritative and quality information, thus improving their competitive advantage as individuals as well as their future employers. This means that an informed learning curriculum should contribute to creating a value proposition to all stakeholders. The curriculum must hone students' decision-making efficiency through leveraging authoritative and quality information. The curriculum must be designed towards a holistic learning experience through utilising information and creating knowledge.

Business model canvas: The BMC is a tool that is useful for analysing organisational value creating processes with the intention of developing a business model and creating future ones. The SIM principle, BMC, can help build in artefacts of the model with the intention of creating a practically implementable business model. **Envision, enable, and enact**: Institutions must envision and align their current client objectives with 4IR ideas. Management needs to be proactive in installing the right behaviour and involve visionary individuals. Institutions must ensure that all long-term ideas are solid within the business strategies. Road mapping is important to see the finer details and how possibly a project might turn out. Identification of internal and external factors is important to keep the momentum and to learn from what the institution can improve on. The institution must incorporate processes and goals of transforming strategies into concrete plans that will be implemented. During the enact stage preparation of transformation is initiated and proposed improvements enacted. **Actively participate in the phases of the commercialisation cycle**: Institutions must gather contextual intelligence to augment their business management and consulting experience. Individuals may need to master methodologies, for example, Six Sigma methodology. Individuals must participate in the phases of the commercialisation cycle, from conceptualisation to operationalisation of business ideas, which entails personal mastery, mental models, shared vision, team learning, and systems thinking.

The above summarised content analysis of BCSs of SIM principles generate the discussion and identification of those SIM principles of specific relevance to the CoI within entrepreneurial universities in the next section.

4.3 Strategic Information Management Principles Relevant to the CoI Within Entrepreneurial Universities

This study introduced various SIM principles that are applicable for innovation and commercialisation and the significance to the HEI; this is ensuring that a graduate has access to fundamental knowledge and information

systems that assist businesses in developing business strategies and ensuring that those strategies are well implemented or executed. These principles are closely linked to the process innovation and commercialisation, this is due to the fact for a business idea or innovation to be implemented, certain business principles need to be adhered to, to ensure that the business idea or innovation can be actualised into a viable business product with capital value. These SIM principles are significant in the CoI as they recognise information as a key asset to the organisation, hence these principles are important and should be incorporated within Higher Education curriculum. Organisations built on SIM principles regard information as being integrated within the organisation's strategy, to ensure that information is managed strategically for business sustainability, and to achieve competitive advantage through competitive intelligence and business intelligence tools and techniques, as described by the SIM BCSs. Therefore, these principles should be incorporated within entrepreneurial institution's curriculum to produce graduates who are not only employable but also entrepreneurial and able to develop their own businesses that are competitive and sustainable.

The three most relevant SIM principles for the commercialising of innovation within entrepreneurial universities include:

- **Business Model Canvas**, which is a tool that is useful for analysing organisational value creating processes with the intention of developing business models and creating future ones.
- **Total Value Proposition** is a subset of the new TQM model, managed in incremental steps within the innovation spectrum while co-creating new radical innovations' value with customers.
- **Future business competitive environment**, this principle focuses on strategic planning and implementation on how to analyse the competitive environment and is linked to project management.

5. Conclusion

It is significant to note that SIM principles, such as the Business Model Canvas and Total Value Proposition have the potential to contribute to converting ideas and innovation into commercial products and services. The insights from the BCSs analysis, findings provided significant data on both negative and positive factors that should be taken into consideration when developing business, and this is crucial to note in the curriculum for any entrepreneurial institution. Based on the findings of this study, it is recommended that BMC and TVP should be the main SIM principles used for the development of business ideas to ensure effective commercialisation of products and services, these principles should be incorporated within Higher Education curriculum in order not to only produce graduates that are employable but also entrepreneurial and able to create business; this will help aid the high employment rate. TVP allows a business idea to be truly tested to ensure that it is beneficial to the customers and the customers will be satisfied with the products and services developed. BMC ensures that whatever products and services are provided by a business deliver value to the customer. In conclusion it significant to note that the other identified principles are mostly related to the sustainability of a business once it has been commercialised but should be incorporated within Higher Education curriculum to ensure these graduates are not only able to create businesses but are able to sustain them.

Ethics Declaration

This research required ethical clearance and was obtained through the University of Johannesburg College of Business and Economics Research Ethics Committee (UJCBEREC).

AI Declaration

I want to declare that no AI tools were used for this research.

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