

A short history of Information Management

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ABSTRACT

This paper aims to provide a theoretical overview of the development of Information Management in recent years. It explains where Information Management comes from and its related fields. Additionally, this paper will pay attention to different dimensions of Information Management regarding an organisational and process view. It will establish a relation to new and emerging technologies such as AI and Blockchain.

Keywords: Information Management, IMS,

1. INTRODUCTION

Organisations rely on Information Management to facilitate information acquisition from different sources and enhance its distribution, depending on the underlying policies. Riedl et al. (2017) define Information Management on a high-level view as a critical organisation's management's functional part that ensures the "best possible use of information for the organisation's goals" (p. 475), whilst Detlor (2010) uses a process-oriented view and defines Information Management as "the management of the processes and systems that create, acquire, organise, store, distribute, and use the information, and the goal of information management is to help people and organisations access, process and use information efficiently and effectively" (p.1) Information Management has led to remarkable output through its development, primarily in the academic literature, creating changes in data management, organisational strategies, technology, and information systems and processes. Riedl et al. (2017)

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also note that several researchers have broadened Information Management's view, encompassing the various corporate levels. Since its inception in the 1970s, Information Management has grown as a concept in allowing businesses to achieve their goals. Its future is likely to focus on shaping organisations' competitive advantages through information handling.

2. History of "Information Management"

The term "Information Management" comes from two aspects: information and management, contributing to the organisations' achievements. According to Kirk (1999), information has developed through a "hierarchy of definitions," under "information policy studies," with its application occurring due to its recognition of qualitative differences and its more appropriateness to organisations than to "the individual information user" (p. 4). The author regards information primarily as a resource, commodity, perception of specific pattern, and constitutive force. Information is a resource because its users, processors, and even creators remain isolated and discrete entities (Kirk, 1999). It is a commodity drawing from its ability to gain economic value and incorporates "the exchange of information among people and related activities as well as its use" (Kirk, 1999, p. 4). Information's pattern draws from its past and future, which faces effects from causal and environmental factors, motive, and itself. Besides, it is an actor that affects existing elements in the society's environment (Kirk, 1999). These definitions have pushed organisations to manage their information to attain

their desired goals based on innovation and future actions.

The management aspect depends on individuals, mainly managers, who can develop and implement strategies to attain their goals. Kirk (1999) focuses on the managerial functions under the classic view, entailing "planning, organising, communicating, coordinating, and coordinating" (p. 6). However, the author also considers agenda setting, implementation, and network building as managerial functions that are only successful when managers figure out how to handle enormous information and make appropriate decisions. Therefore, by implementing Information Management, Kirk (1999) argues that the managers can increase their effectiveness in the diverse organisational mandates, meet their information needs, recognise the formal and informal information sources, and integrate business information and strategy. Despite the contrasting opinions that researchers have, they agree that Information Management can ensure information's placement to use, allowing it to gain value in an organisation.

3. The evolution of Information Management

Scholars argue that Information Management, as a concept, commenced in the early 1970s when it became an international concept, with the economy forming self-management as its particular section. Willcocks (2013) admits that the primary idea involved achieving innovation and market orientation, with many individuals incorporating information technology (IT) "as it progressed up the matrix" (p. 110). Initially, organisations relied on papers due to a lack of digitalisation. However, according to Lazim et al. (2018), many managers felt that papers could cause undesired possibilities, including misplaced or missing forms, instigating the supervisor or coordinator to "fill out the form several times because it does not have a copy in the database" (p. 17). With the increasing

automation of multiple business activities and the shift to address market-related applications, many companies, particularly those that supplied information services, began to reflect on the need to increase their market-influencing applications (Willcocks, 2013). For instance, Reuters introduced Stockmaster, "a computerised stock-price transmission device, which replaced cumbersome stock tickers on brokers' desks" (Willcocks, 2013, p. 110). The approach proved vital, especially in improving the brokers' productivity, reducing paperwork, and providing fast access.

The changes experienced in the early 1970s led to the increased usage of Monitor in the mid-1970s. Many organisations adopted the device to offer foreign exchange information and minimise risks (Willcocks, 2013). Although it gained a monopoly status, Monitor attracted the need to manage information under IT systems and enhance control. Despite the contrasting evidence on the developments, Galliers and Leidner (2009) agree with Riedl et al. (2017) that the 1970s focused on data processing (DP) in IT to promote operational efficiency. Eroshkin et al. (2017) insist that the 1970s helped companies shift to computers as their core working tool. The approach aided in "Information Management" from a central position, lowering data loss as experienced before. Although the period mainly encompassed data processing, senior managers did not give strategic thoughts on improving their organisations' operational efficiency or attempting to cut costs" (Galliers&Leidner, 2009, p. 8). While they could manage their information, high costs proved challenging to their operations.

Several scholars agree that the 1970s witnessed substantial growth, especially in utilising computers to facilitate decision-making in business management. For instance, Somogyi and Galliers (1987) indicate that having computer-based management information systems (MIS) helped managers assimilate the organisational information, responding to the

increasingly complex and dynamic environments. They also improved the companies' information processing capacities through hardware and software technologies, which "provided more thorough situational analysis capability, and offered solutions for many complex but well structured, tactical problems" (Somogyi & Galliers, 1987, p. 46). Additionally, the introduction of distributed data processing systems (DDPS) and database management systems (DMBS) facilitated information availability to managers. Unfortunately, despite the new advances, Somogyi and Galliers (1987) argue that organisations could not fulfil "the predictions of computer-based strategic decision-making systems" (p. 46). However, managers remained convinced that they could transform DP into information processing to achieve MIS, satisfying the underlying informational needs. The expectation entailed that mid-1970s, organisations' top management could receive substantial assistance, mainly from computers, to aid in strategic decision-making processes. Although they did not realise their expectation, the change broadened tactical applications in the decision-making systems. Managers also expanded operational support to accommodate "material requirements planning (MRP), traffic routing, word processing, and physical facilities management" (Somogyi & Galliers, 1987, p. 47). Through the processes, the decade attracted MIS applications to improve information control.

The MIS applications extended towards changing the strategic management information systems (SMIS) development. Since top managers wanted strategic decision-making sustenance, SMIS development became critical towards producing "an infallible management decision" (Somogyi & Galliers, 1987, p. 47). Despite the success, SMIS development faced multiple obstacles. The first challenge entailed organisational structural deficiencies, primarily in the unchanging data processing functions, affecting

computer applications to the existing functional areas. Another obstacle involved the inability of the DP personnel to manage information and communicate efficiently. Although DP personnel received training in specific management skills, Somogyi and Galliers (1987) maintain that they could not conduct effective system design and analysis, failing to yield mutual understanding on SMIS development. The last impediment included "strategic management model deficiencies" (Somogyi & Galliers, 1987, p. 48). Such deficiencies occurred due to the complexity of strategy models, which could not reflect authenticity when managing information. Notwithstanding the emergence of SMIS methodologies in the decade, the sophistication caused their delineation, affecting the undertaking of computer-based planning (CBP) systems (Somogyi & Galliers, 1987). While scholars insist that these challenges influenced SMIS development negatively, they established an avenue to improve Information Management.

Many managers shifted to personal and commercial computing in the 1980s. According to Riedl et al. (2017), IT innovations' adoption by organisations necessitated change management to facilitate support in Information Management. The process attracted "individual data-processing supported by personal computers, office software packages, and local area networks in companies that had previously used mainframes or mid-range computers" (Riedl et al., 2017, p. 480). Several companies also adopted commercial computing since they wanted to utilise technology efficiently for their operational purposes. In their review, Galliers and Leidner (2009) indicate that the motive was to enable organisations to identify specific information systems (IS) applications that could meet their business needs and improve their competitive advantage. Besides, the managers increased investment in technology that could meet the shifting information requirements. For example, the

proactive application of commercial computing expedited the establishment of Business Process Re-engineering or Redesign (BPR), automating the companies' streamlined processes with their customer requirements (Galliers&Leidner, 2009). While the period led to the development of executive information systems (EIS), managers still needed to rethink their businesses' information systems strategies by identifying crucial data entities. Therefore, the scholars agree that the period opened an avenue in managing organisations' information to align with customers' attributes.

During the 1980s, organisations realised that it was challenging to offer vital information systems that could support their managerial activities due to the changing management's information requirements' nature. According to Somogyi and Galliers (1987), managers wanted to consider "information as a resource, requiring proper management" (p. 65). Although the MIS proved crucial, especially in the traditional aspect, managers realised that such systems could not adequately manage information resources. The process led to the need to shift from the MIS design's technical aspects to "managing the information resource in the organisational context" (Somogyi & Galliers, 1987, p. 65). Through such a realisation, the researchers report that managing information, primarily as a corporate asset, became crucial to boost productivity within the various IS and meet the demand for IS services. Besides, Somogyi and Galliers (1987) maintain that the decade witnessed the urge "to plan for the adequate provision of information for the acquisition of appropriate IT and associated resources" (p. 65). It prompted the introduction of Information Systems Planning (ISP), which required expertise and skills, with nations like the United Kingdom (UK) adopting it to enable organisations to manage their specific information resources appropriately. Embracing these mechanisms

allowed companies to improve their managerial mandates through effective information resources management.

Information Management gained a boost following the introduction of internet computing in the 1990s. Scholars have described the Internet as the ultimate change in Information Management, with Riedl et al. (2017) referring to it as the carrier medium. Organisations mainly wanted to invest in information and communications technology (ICT), which could serve the dynamic business environment and improve their operations, irrespective of the location. Many companies introduced the Internet internally under 'intranets,' providing them with requisite flexibility. Unfortunately, they still struggled to upgrade their "legacy systems, both in terms of the meeting changed information needs and integrating them with new systems and technology" (Galliers&Leidner, 2009, p. 22). Due to its open nature and new sources and customers' emergence, many companies could not answer the "alignment with whom?" question, leading to enormous complications in their Information Management's strategic development. The Internet also attracted the spawning of dot-com companies, with some researchers arguing that it rendered IS strategies obsolete (Galliers&Leidner, 2009). However, some scholars insisted that although Internet had proved effective, organisations ought to use unique Information Management strategies to distinguish themselves from others. Despite such contrasting aspects, the Internet established an opportunity for companies to manage their information remotely and connect with individuals, primarily their customers, globally.

By the mid-2000s, the world had started experiencing a digital transformation, which became a critical turning point in Information Management. Riedl et al. (2017) define the concept as the shift "from partly digitised business and society models into fully digitised

business and society models" (p. 481). The authors maintain that the transformation relied heavily on the Internet, changing the business model's managerial-technical viewpoint. Companies wanted to utilise the digital levels to attain innovation and ensure that they did not absolve Information Management from its original terms of achieving value creation through information. According to Hinton (2006), the primary idea that managers have held includes process control, which has allowed them to convert their physical measurements to digital forms and introduce software that applies mathematical models in data analysis and information storage. The digital transformation aspect also focused on enabling companies to determine how to automate their business processes, manage risks, obtain insights into the collected information, and engage their customers and partners. Accompanied with the Internet's explosion, Hinton (2006) admits that organisations have altered how they work and diffused ICT to achieve Information Management. Therefore, Information Management has improved corporate functioning and stimulated progression in handling information through digital transformation.

4. Information Management Today

Information Management has experienced multiple transformations since its commencement. As a conscious process, Hinton (2006) indicates that Information Management favours the planning procedure, allowing decision-making to occur through professional expertise and discretion. Despite the current perception that Information Management is a control mechanism that benefits only shareholders and senior managers, researchers maintain that its utilisation has enhanced decision-making processes between and across organisation levels while relying on human and technology-based systems. Currently, organisations depend on Information Management when creating specialised functions and broadly utilising ICT to distribute the obtained information

(Hinton, 2006). Besides, they utilise Information Management to boost innovation and design structures to understand and even respond to various challenges. Since modern organisations use multiple resources, Hinton (2006) insists that they have shifted to Information Management to align their functionalities with the set goals, primarily by combining information and people to achieve competitive advantage and superior performance. The approach extends to using Information Management to support functional applications, including companies' functions, accounting and finance, operations, and human resources. Although some organisations cannot navigate smooth paths through technological changes, Information Management is vital in sustaining operation excellence, resource optimisation, and process improvement, upholding its conscious state.

An example of Information Management along other processes can be seen at the Universiti Teknologi Malaysia, where modern Information Management has been introduced to replace paper based processes and the whereas the project developed into the Information Management and the Bachelor Project (PSM) Evaluation System that pushes for the elimination of the Faculty of Computing's existing system and links teachers with their students. Despite its manual implementation, Lazim et al. (2018) maintain that the evaluation system applies "two phases; PSM1 and PSM2," which depend on "the TEAMMATES system" (p. 17). The latter is "an online system for feedback and peer assessment tools for student projects" (Lazim et al., 2018, p. 17). Designing such a system, which utilises the Google App Engine, has made learning effective, allowing teachers to send feedback to their students. Scholars argue that learning is critical towards changing the world, requiring appropriate measures to enhance concrete decisions. Following the introduction of the PSM evaluation system, Lazim et al. (2018) argue that

educational institutions have established the PSM's Information Management system and assessment that verifies the users' usernames and passwords. Its testing has also depicted a success in generating reports and updating PSM learners' information (Lazim et al., 2018). While the adjustments show changes in Information Management, they also illustrate how the educational institutions are currently relying on the concept to improve information security and attain seamless communication between teachers and students.

Today, researchers maintain that Information Management has shifted to creating a unified categorical and conceptual apparatus. The main idea entails summarising the Information Management's apparatus "in a logically connected international system, which will enable the manager to navigate the numerous international abbreviations" (Eroshkin et al., 2017). Since people are currently living in a networked world economy accompanied by some concepts, including digital technology and binary arithmetic, they rely on specific conceptual systems to manage information using international and English terms. For instance, they use Business Process Management (BPM), which is essential in managing their business and processes. They also utilise Business Process Modeling (BPM), a concept that models the existing business processes. Other approaches entail Total Quality Management (TQM), BPR, Continuous Process Improvement (CPI), and Balanced Scorecard (BSC) (Eroshkin et al., 2017). The modern world also experiences other tools and systems, which they implement to improve Information Management. A unique system is BI, which Eroshkin et al. (2017) admit has components of Decision Support System (DSS) and Executive Information Systems (EIS). Although BI's concepts are gradually disappearing, its application of Online Analytical Processing (OLAP) and Data Mining tools are helping organisations to

improve security in their information databases (Eroshkin et al., 2017). While one agrees that such tools and methodologies are changing and may not remain the same in the future, they have enhanced an international connection between organisations, facilitating information sharing.

Researchers admit that many organisations are currently implementing ISM for their industrial enterprise resource planning (IERP). In their study, Voronkova et al. (2017) reported that since companies need to form new and unique industrial activity reputations and profiles, they push for an enterprise development strategy that can guide them long-term. Accompanied by the shifting techniques and rules in the market, businesses focus on innovative strategic activities that display their qualitative and quantitative characteristics and attain the desired goals (Voronokova et al., 2017). Several scientists also indicate that when planning for organisations' strategies to achieve a competitive advantage, the latter relies heavily on specific factors. They include "the life cycle of goods and services, technologies, and strategic business zones, the development stages of the enterprise itself, and the elements of micro and macro environments" (Voronkova et al., 2017, p. 3). Such factors also apply to a large multi-industry enterprise (LMIE), which, when implemented effectively, facilitates innovative development strategies. According to Voronkova et al. (2017), scholars encourage organisations to incorporate Information Management in the IERP using key principles, entailing "variability, mobility, and flexibility" (p. 2). While the principles have instigated ERP processes, they have also enhanced supply chain management (SCM) systems, allowing improved logistics management and enterprise goal achievement. However, not only processes and methodologies will continue to develop further. From a more technological standpoint, Abdalnaser et al. (2021) explain in their

paper "it is imperative to employ artificial intelligence for the management information" and highlight that "this can effectively eliminate the manual process of information search, indexing, classification, and acquisition." Another emerging technology that will impact traditional information management is the Blockchain, which builds on distributed ledgers. As Salleh et al. (2018) outline in their work "the impact of blockchain to IM (Information Management) should be taken into consideration." (p.1.) Everything done with information management is based on data that is stored or available somewhere. Blockchain enables greater traceability and security of such data. It can be considered tamper-proof, allowing verification and audibility (e.g. time and date stamps) of stored and utilised data. (Salleh et al 2018; Berdik et al 2021). Secure storage and trustworthiness of data become especially important in the light of ever-increasing data privacy and security requirements whilst governments increase their efforts to digitise their abilities. According to Finck (2019), "blockchain technologies might be a suitable tool to achieve some of the GDPR's (General Data Protection Regulation) underlying objectives (Finck, p.7.).

5. Conclusion and Outlook

Researchers agree that Information Management's future will have a different outlook, drawing from its evolution. While none can ascertain how it will look in detail, they maintain that Information Management's past and today form a robust future foundation. Voronkova et al. (2017) admit that organisations will incorporate Information Management in their production, procurement, warehouse, and sales management subsystems to improve their information handling capabilities with the growing information technologies. For instance, "the production management subsystem" will prove crucial in automating the system, ensuring that it "compiles the production plan implementation report" (Voronkova et

al., 2017, p. 7). Besides, with the Customer Relationship Management System (CRM) introduction, Voronkova et al. (2017) feel that enterprise managers will easily exchange operational information between the SCM and ERP systems, establishing a vital management cycle. Due to the shifting changes in the current market, future Information Management will have to embrace information provision at all the enterprise management levels to assure companies of their competitive advantages.

Information Management's future outlook will also thrive through BI's implementation and utilisation of AI (Artificial Intelligence). According to Eroshkin et al. (2017), apart from ERP and CRM systems, many companies are encouraging Knowledge Management (KM) and Business Process Model and Notation (BPMN) in their operations. They are also pushing for Product Lifecycle Management (PLM), Building Information Model (BIM), and Building Lifecycle Management (BLM) to improve their entire life cycles (Eroshkin et al., 2017). The world continues to experience new technologies and concepts that can replace or transform the old completely. Thus, many scholars hope that Information Management will have unique information systems that will change the "entire spectrum of automation tasks of the company from strategic management to levels of control of technological processes" (Eroshkin et al., 2017, p. 612). Whilst Abdunaser et al. (2021) highlight the importance of artificial intelligence for the future of information management, Finck (2019) also indicates that future information management needs to be aligned with data protection laws that can be achieved with blockchain technology. Irrespective of the approach taken, Information Management will encompass changes to improve information handling and enhance business intelligence, which is vital towards advanced operations.

Information Management has evolved since the 1970s, with research showing that it has helped organisations attain their goals. Drawn from information and management as its key aspects, Information Management has facilitated SMIS development and enhanced IT innovations, with several companies utilising it to achieve competitive advantages. Through the transformation that it has experienced, several businesses are currently using Information Management in their planning procedures, with learning institutions also implementing it in their PSM evaluation systems. Accompanied by its creation of unified apparatus that allows managers to navigate the international concepts, Information Management has also proved crucial in ERP implementation. Furthermore, the increasing capabilities of AI (Artificial Intelligence) algorithms are utilised for information management purposes, such as in BI (Business Intelligence) scenarios.

Additionally, secure storage and transaction with pieces of information become increasingly important, for which the use of blockchain technology seems to be a viable option. Despite the challenges experienced in numerous organisations, Information Management has proved an integral foundation towards enabling the former to handle information with flexibility and improved security. Therefore, while one can insist that it is impossible to predict Information Management's future outlook, its evolution and current importance in organisations depict a concept that will aim to incorporate business intelligence and efficiency when dealing with information.

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