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Elements of an Information Management Framework:
Findings From Existing Literature

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ABSTRACT

Frameworks support the realization of goals. Information management is essential in all sectors in today's environment. It is essential to establish an information management framework to guide the realization of the goal of information management in different sectors. Information Management Frameworks (IMFs) are scanty and are designed for specific contexts leading to difficulty in thinking when developing and evaluating IMFs in sectors that want to streamline their information management practices. Documented IMFs were reviewed to establish elements of an underlying information management framework. The findings show that people, processes & practices, technology, budget, leadership, facilities and facilitation, and rules & regulations are essential elements.

KEYWORDS

Information Management, Frameworks, Information Management Frameworks

INTRODUCTION

Information management is the coordination and control of the acquisition, storage, processing, distribution and use of information (ECM, 2021). As such, the goal of information management is to ensure realization of value out of information. In different sectors like e-agriculture, education, governance, business and health, getting value out of the information in these sectors is critical. In order to have value for information, it is essential to establish an information management framework (a structure that supports the realization of the goal of Information Management) to support the realization of the goal of information management in different sectors. Consequently, different sectors have sought to conceptualize different sector-specific information management frameworks in order to achieve this goal. Sector-specific information management frameworks are designed for specific contexts and address information management needs for that given context. This makes it difficult to have a consistent thinking pattern when developing and evaluating information management frameworks in institutions/ sectors that seek to streamline their information management practices. As a result, extending an existing information management framework and developing a new one becomes a challenge. Therefore, this research set out to conduct a narrative review of existing literature on information management frameworks with a focus of identifying essential and crosscutting elements

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of an underlying information management framework. This paper presents a catalog of essential elements that constitute an information management framework. Such a catalog is vital to serve as a reference point for developing an information management framework for a sector/ institution that wants to streamline its information management practices.

The purpose of this study, therefore, was to review existing sector-specific information management frameworks in order to suggest the underlying elements that constitute an overarching information management framework. The remainder of this paper presents the theoretical background of information management, the methodology for this study, results, conclusion, limitations and suggestions for further research.

Information Management as a Series of Tasks

Different authors explain information management in terms of tasks involved (Bytheway, 2015; Choo, 2002; Butcher and Rowley, 1998). Butcher and Rowley (1998) look at information management as composed of acquiring information, information custodianship, dissemination of information, and disposal. Choo (2002) views information management as a series of the following tasks; Establishing information needs, information acquisition, information organization and storage, information services and products, information distribution, information use, and adaptive behavior. Information management is depicted as a series of related tasks that result in adaptive behavior and then the process starts all over again with information needs and information acquisition.

Detlor (2010) perceives information management as the management of the processes/activities and systems/resources that create, acquire, organize, store, distribute, and use information. Information management aims to help people and organizations access, process, and use information efficiently and effectively (Detlor, 2010). As a result, people become more informed and organizations more competitive and strategic. The discussion in the previous paragraphs indicate that information management is composed of tasks. For the purpose of this study the tasks suggested by Choo (2002) are the basis for which information management in this study was conceptualized and limited to acquisition, storage, distribution and use of information. Choo, (2002) was opted for because the tasks suggested (acquisition, storage, distribution and use of information) are clear and hinted on by other authors as reviewed in the previous paragraphs.

A Highlight of Existing Information Management Frameworks

Different information management frameworks have been suggested by different authors. For instance, in the global enterprise sector, Peppard (1999) proposed an organizing framework for information management that focuses on global business strategy, global business drivers, global information strategy, and global business model. Rowley (1998) suggested a general information management framework that proposes information environment, information context, information retrieval, and information systems as crucial components. Middleton (2007) suggested improvements in Rowley (1998)'s framework after testing and applying it in the context of science and technology information management. In the organizational sector, Nguyen et al. (2014) suggested an information management framework consisting of people, processes and practices, technology, and information. These frameworks have been substantial in streamlining information management practices and ensuring that the goal of information management in these sectors is attained. However, these frameworks are fundamentally sector-specific and no efforts have been made to review and analyze the existing information management frameworks in order to facilitate a consistent thinking pattern when developing ad evaluating information management frameworks.

METHODOLOGY

Among the journals that acted as the sources of data in this investigation are Science Direct, Emerald and IEEE. These journals were selected because they are among the journals that the university in

which the authors work have subscription. In addition, google scholar was used as a strong source of information. Multiple combinations of keywords were used to search for information. Among them are: Information Management, Frameworks, Information Management Frameworks, frameworks for information management and conceptual framework. Articles returned after the search using the mentioned search terms were reviewed and filtered to remain with those articles that focus on information management frameworks. The prior strategy was to concentrate on only academic journal articles, but this yielded very few candidates. It was decided that even other articles that are not necessarily academic but reflect evidence of thorough investigation based on citation rates and credibility of their authors, were considered. In order to have a wider understanding of the field of information management, a theoretical understanding of the field was provided that attempts to define information management and later a description of the information management frameworks was provided. Later, a descriptive analysis was conducted on the data obtained from these sources. A table was developed to represent the different sample documented information management frameworks and the authors that suggested them plus the major focus of each of the frameworks (See Table 1). Then another table (Table 2) was developed that shows categories of components and then each framework was scored based on those components. The last column of Table 2 shows the components that the conceptualized information management framework contains.

RESULTS

Information Management Frameworks

There are several authors such as (Choo, 2002, Rowley, 1998, Deasy et al., 2016; Middleton, 2007; Peppard, 1999; Nguyen et al., 2014) that have attempted to develop information management frameworks that are applied in different contexts. These frameworks are presented in Table 1.

Table 1 depicts that the elements that constitute the different information management frameworks, as suggested by different authors, are diverse with little commonality among them. It was imperative therefore to posit categories in which the diverse components could attempt to fit. These categories are: People, Processes and practices, Technology, Budget, Rules and regulations, Leadership and Facilities and facilitation. Table 2 shows how each of the different information management frameworks finds its way in these categories (see Table 2).

Table 2 depicts the conceptualized categories in which different frameworks have been made to fit. A tick (✓) has been placed at the intersection of a conceptualized category (table row) and the author (table column) that suggested an information management framework that has any indication of implying this conceptualized category. The intersection gets a cross (×) if the framework suggested by the author in question has no element that is close to the given conceptualized category. The last column (named derived framework) depicts all ticks meaning that all the conceptualized categories will be part of this framework.

A Discussion About the Frameworks Presented

The evaluation of the frameworks presented in the previous paragraphs is intended to generally and sketchily search for some common components that can be relevant and applicable in the conceptualization of an overarching information management framework. The frameworks serve as aids to the conceptualization of the elements of an overarching information management. The framework by Nguyen *et al.,* 2014 has components that are shared with other frameworks and it is very clear. Therefore, this framework provides foundation for the conceptualization of the overarching conceptual information management framework that this study sought to develop. In addition, other components have been added to the components of the framework suggested by Nguyen et al., 2014. The conceptualized overarching information management framework is shown in Figure 1 and a discussion of each of the components of the framework follows.

Table 1. Elements in existing information management frameworks

Author	Information Management framework components/ elements	Focus
Rowley, (1998)	**Information Environment** -Political forces -Economic forces -Legal forces -Regulatory forces -Social forces -Technological forces **Information Systems** -Store Information -Requires a big storage capacity -Requires a good logical database structure -Information Systems include: -Hardware -User -Software -Data **Information Context** -Context houses the user -Context influences system design -There are categories of context like: -Organisational -Home -Community -Education -Business **Information Retrieval** -User interaction with the information or information resource to meet the user information requirements. -Involves actions, methods and procedures for recovering information from stored data	Guides general information management
Middleton, (2007)	**Information Environment** -public policy development -Disciplinary demand -Technological change **Information Systems** -Systems analysis and design organization -Evaluation **Information Context** -Information as a resource -Circumstances affecting functionality -User information needs **Information Retrieval** -Information selection -Information -Information design -Information retrieval	Guides management of information in the context of Science and Technology
Nguyen *et al*., (2014)	**People** -Context -Culture -Skills **Information** **Processes and Practices** -Creation -Distribution -Acquisition -Access -Organization -Use -Maintenance -Retrieval -Storage -Disposal **Technology** -Architecture Systems -Systems -Tools	Guides management of information in an organization.
Deasy *et al*., (2016)	**Information is an Asset** **Generate** **Share** **Manage** **Preserve** **Protect**	Guides information in the European public sector
Peppard, (1999)	**Global business model** **Global information strategy** **Global business strategy** **Global business drivers**	Guides global enterprise information management.
Butcher and Rowley, (1998)	**Reading** **Review** **Retrieval** **Recognition** **Release** **Re-interpretation** **Restructuring**	Guides general information management

The components that have been proposed to be added to Nguyen et al. (2014) are presented in text boxes that are within a box with dotted/dashed boarders. The added components (Budget, Leadership, Facilities & Facilitation, and Rules & Regulations) plus the original components suggested by Nguyen et al. (2014) (Information, Process and Practices plus Technology) have been conceptualized as critical based on the citations in the preceding paragraphs. In this paper, the element of information, as seen in Figure 1, has been taken as a given.

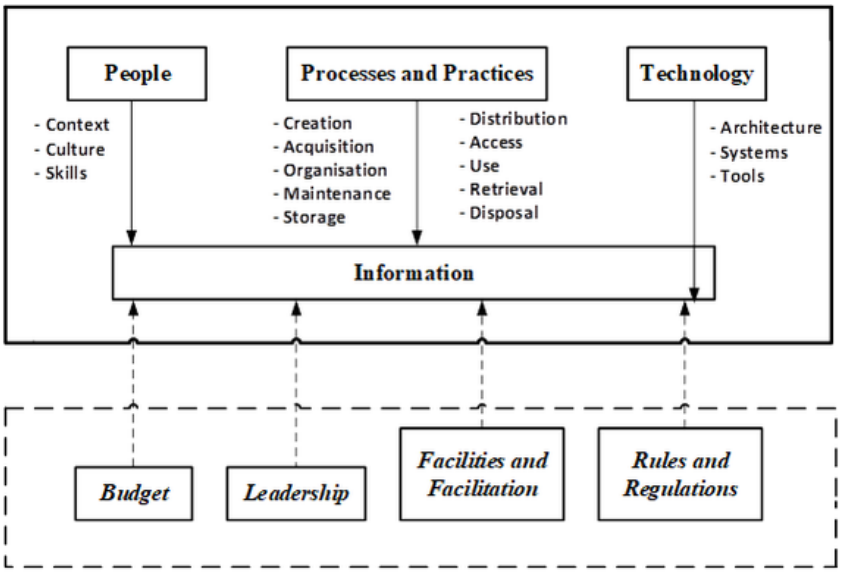
Description of Components That Constitute the Conceptualized Overarching IMF

Nguyen et al. (2014) suggested the following components as key in information management: People, processes & Practices, Technology and Information. These are shown enclosed in a frame (see Figure 1) The other components are not rooted directly from Nguyen et al., 2014. These components or elements are: Rules and regulations, leadership, budget and facilities and facilitation. These are enclosed in dashed frame (see Figure 1). To justify these components, we present information from different authors that either directly or indirectly point to the value of these components in information

Table 2. A matrix of frameworks and the conceptualized categories of components

Derived Framework Components	Authors and year						
	Rowley (1998)	Middleton (2007)	Deasy et al. (2016)	Peppard (1999)	Butcher and Rowley (1998)	Nguyen et al. (2014)	Derived Framework
People	✓	✓	×	×	✓	✓	✓
Processes and Practices	✓	✓	✓	✓	✓	✓	✓
Technology	✓	✓	×	×	✓	✓	✓
Budget	×	×	×	×	×	×	✓
Rules and Regulations	×	✓	×	×	×	×	✓
Leadership	×	×	×	×	×	×	✓
Facilities and facilitation	✓	×	×	×	✓	×	✓

Figure 1. The conceptualized overarching information management framework (IMF)



management. We explain each of the components of the conceptualized information management framework below:

- **People:** *People* are a determining component/ element of information management and the criticality of this factor has been asserted by different authors (for example, Nguyen et al., 2014; McKeen and Smith, 2007). People are critical because they directly implement processes in the information life-cycle management (ILM) following prescribed regulatory and legal requirements (Nguyen et al., 2014). People ensure that information is complete, valid, consistent, accurate

and timely (McKeen and Smith, 2007). Therefore, people need information skills in order to be useful in the process of information management. In addition, their information context and information culture are significant in the information management activity.

- **Technology:** In information management, technology refers to the tools or equipment plus all the related procedures that are needed in the practice of information management (Nguyen et al., 2014). Technology is required at every stage of the ILM like information creation, information acquisition, information organization, information storage, information maintenance, information distribution, information access, information processing, information use, information retrieval and information disposal (Lin, 2011; Nguyen at al., 2014). The technology component/ element of information management also incorporates design of suitable architecture and systems that facilitate information management (Rowley, 1998; Middleton, 2007).
- **Processes and Practices:** Processes and practices are critical success factors of information management since they define and constitute the overall information management process (Nguyen et al., 2014; Mutula and Wamukoy, 2009). Processes and practices encompass the realization of the managerial processes of the information life cycle in order to create, acquire, organize, maintain, store, distribute, access, use, retrieve and dispose information (Nguyen et al., 2014). Therefore, coordinating these processes of the ILM is a critical success factor of information management.
- **Budget:** Apart from the fact that one of the challenges in information management in e-agriculture in Uganda is cost, the element of budget cannot be divorced from information management. This is because tools used in information management (like information systems, information dissemination systems, research tasks and processes) all need a budget. The users of information need money to obtain information or access information. Infrastructure used in information management like phones and electricity also needs a budget or cost. There are certain authors that have pointed to the strength of cost or budget in the information management process. NSW Government (2018) (in its information management framework that targets government) highlights this budget concept in form of funding. Funding is seen in maintaining tools used in information management like archives, information risk assessments, data retention and disposal.
- **Rules and Regulations:** Masuku et al. (2017) presented an information management framework in the context of e-government in Zimbabwe. This framework, *inter alia*, highlights the legislative standards as an important component in information management. This clearly points to policy as a key factor that determines information management. In the information management framework by Blumenthal (2009), the pillar of policy is indirectly pointed to in the compliance component of the framework. It is suggested in that framework that compliance to records management and privacy is key. These (privacy and records management) are policies and standards, because compliance is to standards and policies plus regulations. Chauhan and Abugho, (2013) highlighted the centrality of policy in ICT use, pointing out the mobile money system as being used by people to make and receive payment. Chauhan and Abugho, (2013) assert that policy about mobile money transactions contributes to higher chances of their use by people. Therefore, policy is also valuable in case of the information systems that are used in the information management process.
- **Leadership:** Leadership helps organizations to achieve specified goals. The goal of the organization motivates that organization to ensure proper information management aided by proper leadership. There is a goal that is aimed at by improving information management. This goal needs to be set, realized, revised, communicated, streamlined, focused, prioritized and aligned. At another level, different objectives may be set in line with the goal of information management. The pillar of goal has also been articulated and stressed by Hausmann et al. (2014) in their information management framework in the context of a given enterprise. In that context, they refer to goal as vision and strategy. In the pillar of vision and strategy, the vision, mission, strategy, goals and objectives plus value propositions are highlighted and it is through proper leadership that the goals can be attained.

- **Facilities and Facilitation:** Facilities and facilitation are a key parameter in information management since these facilities are the elements that are used in managing the information management lifecycle. Facilities are used in storage, processing, dissemination, and processing, archiving and acquiring information. Therefore, Facilities and facilitation suites to form an independent element in the overarching information management framework.

CONCLUSION

This study set out to investigate information management frameworks with an aim of reviewing them in order to establish elements of an overarching information management framework that can serve as a basis for the construction and evaluation of other information management frameworks in specific sectors like e-agriculture, health, business, governance and education.

The findings indicate that information management frameworks documented are isolated and have little unifying factors. However, the framework by Nguyen et al., 2014 was selected to act as a foundational framework for the review and based on this framework, a conceptual overarching information management framework was proposed with additional components that were extracted from literature and ratiocination. The conceptual overarching information management framework has the following components/ elements: People, processes and practices, technology, budget, leadership, facilities and facilitation, and rules and regulations. This conceptual overarching information management framework, with the highlighted elements, facilitates thinking in the development and evaluation of information management frameworks by different sectors or institutions that seek to improve their information management practices.

LIMITATIONS AND SUGGESTIONS FOR FUTURE WORK

The review was based on papers that are available to the researchers particularly papers that do not need payment. It is suggested that the review that has even the papers for paying would be more comprehensive. We suggest that this conceptual overarching information management framework be tested in the field so as to validate the components/ elements that it contains.

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