Towards a unified framework for governance and management of information

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Abstract

Provision of quality information is key in demonstrating accountability and transparency in organisations. However, this task is becoming more difficult to perform in organisations where misunderstanding or ambiguity of information governance (IG) and information management (IM) is leading to ineffective control of information assets. This paper investigates differences between IG and IM in definitions, components, measurement factors, and frameworks by reviewing a significant amount of IG and IM literature and identifies the key building blocks of IG and IM as being the effective control of the information lifecycle to ensure the availability of quality information. This paper's main contribution is the development of a unified framework combining IG and IM to enhance effectiveness and efficiency of organisational performance. Future research will examine IG and IM in the context of Web 2.0 and social media adoption, where information overload and immediate and constant accessibility to information are exacerbating the situation.

Keywords

Information governance, information management, information lifecycle management, information quality

INTRODUCTION

Information is a key asset, the heart and soul of every business (McKeen & Smith, 2007). Ensuring timely and adequate information for managerial activities is essential if organisations are to make the right decisions, improve efficiency and gain competitive advantage (Karim & Hussein, 2008). Information governance (IG) is key to ensuring transparency, accountability, and compliance by organisations because every decision, policy and activity of the organisation is established based on information analysis (McMillan, 2012). Effective IG can be ensured by effective information management (IM) because IM can provide quality information to support IG goals. However, the literature indicates that organisations are struggling to control, manage and extract quality information from 'information overload' generated by the use of new technologies (Bertot, Jaeger, & Hansen, 2012; Whittemore, 2009). Furthermore, previous studies indicate that poor IG and IM practices have led to the retention of information of very little value, difficulty in finding and accessing information, the impossibility of information exchange, risks involving data leakage, breach of information, loss of personally identifiable content, and the high cost of keeping information (Gonsowski, 2013). Such issues lead to inefficiencies in organisational performance; reducing liability and reputation of organisations when stakeholders' information needs cannot be addressed; disclosing confidential information affecting organisational and national security; corruption, and falsification of information (Garvin, 2011; Jaeger, 2007). More serious consequences include organisations' inability to respond to emergencies in a timely manner (Whittemore, 2009), and breaches of legal or statutory obligations (Victorian Government CIO Council, 2013).

The importance of IG and IM is often overlooked by organisations who underestimate their importance in enhancing transparency, accountability and integrity (Mutula & Wamukoy, 2009) and there is a lack of comprehensive governing policies and planning of information (Merzuki & Latif, 2009). There is also a lack of understanding of the separate but interlinked roles of IG and IM that has led to conflict in the use of the terms and the relationship between the two areas. This lack of clarity in the governance and management of

information is becoming a serious issue in the context of Web 2.0 and social media, where information overload and immediate and constant accessibility to information are exacerbating the situation.

This paper examines the literature to identify areas of conflict in determining consistent and distinct meanings of IG and IM. It explores the components of each and identifies the separate but interlinked roles of governance and management of information in enhancing the effectiveness and efficiency of organisational operations. The contribution of the study is to draw together the findings of existing studies in this area to present a unified framework for IG and IM. The unified framework enhances the ability of organisations to more effectively control the information lifecycle to ensure quality information contributes to the effectiveness and efficiency of organisational performance.

This paper is organised as follows. First, the paper describes a literature review process based on the review methods of Webster and Watson (2002) and Mathiassen, Saarinen, Tuunanen, and Rossi (2004). After a discussion on differences between IG and IM, and examination of evidence of confusion in previous studies, a unified framework for IG and IM is proposed and discussed before future research directions are recommended.

LITERATURE REVIEW PROCESS

In any research, conducting a literature review is an essential stage that provides researchers with a comprehensive picture of the research topic and identifies important gaps in previous literature (Onwuegbuzie, Leech, & Collins, 2012; Webster & Watson, 2002). Quality in the literature review analysis is achieved by focusing on the concepts of the topic (Mathiassen *et al.*, 2004). In order to have a better understanding of the phenomenon from various perspectives, this paper is based on reviewing and analysing the literature on IG and IM collected from multiple source types (peer-reviewed journals, conference papers, books, and white papers such as policies, standards, and guidelines) as suggested by Leech and Onwuegbuzie (2007).

The process of conducting a literature review consists of identifying the literature and structuring the review (Webster & Watson, 2002). The process described by Mathiassen *et al.* (2004) was flexibly applied in this paper (See Table 1). The first step began with searching in Scopus with keywords of the topic, then a second step involved selecting references in ranked academic journals and conferences related to definitions, components, processes, frameworks, and issues in IG and IM by looking at over nine hundred titles. The third step was skimming through the body of all academic journals identified in previous steps to select quality and recent references related to the topic. Seeking other academic papers that were cited in the references was performed before synthetising references selected by previous stages and compiling a list of references (See Table 1). In addition, during the literature selection process, some document analysis techniques given by Leech and Onwuegbuzie (2008) was used. For example, keywords-in-context was used for searching and categorising literature of the topic and some academic papers are found from references of reviewed journals based on domain analyses. The volume and quality of literature in each concept are narrowed from step (1) to (3) by the use of constant comparison analysis, whereas taxonomic analyses is applied for identifying specific content within each concept.

Table 1: Literature selection (adapted from Mathiassen *et al.*, 2004, p. 11)

Steps	IG	IM
Step 1: Search in Scopus databases for papers with keywords and titles of documents involving 'Information Governance' and 'Information Management'. Limited to journal and conference papers in social sciences, medicine, business and management.	- Result: 450 (279 journal and 171 conference papers)	- Result: 481 (334 journal and 147 conference papers)
Step 2: Looking through the titles, selecting references in ranked academic journals and conferences related to definitions, components, processes, frameworks, and issues in IG and IM.	- Result: 75 (61 journal and 14 conference papers)	- Result: 118 (80 journal and 38 conference papers)
Step 3: Reading abstracts, headings and skimming through body of all academic journals collected in step 2 to select quality and recent references related to the topic.	- Result: 59 (49 journal and 10 conference papers)	- Result: 78 (60 journal and 18 conference papers)
Step 4: Seeking other papers such as journal and conference papers, books, and white papers that were cited in the references during reviewing process of references selected from step 3.	- Result: 25 (5 journal and 5 conference papers, 3 books, and 12 white papers)	- Result: 23 (4 journal and 7 conference papers, 5 books, and 7 white papers)
Step 5: Combining results of step 3 and 4 to make a list of relevant references of the topic	- Result: 84 (54 journal and 15 conference papers, 3 books, and 12 white papers)	- Result: 101 (64 journal and 25 conference papers, 5 books, and 7 white papers)
Total number of reviewed papers: 178 (114 journal and 39 conference papers, 7 books, and 18 white papers. 7 references mention both IG and IM)		

Structuring the review consisted of developing two concept matrixes (Webster & Watson, 2002) for IG and IM literature. Key findings of previous studies in both areas were identified and categorised into definitions; components and factors; policies, principles, demands; processes and frameworks; risks and issues; transparency, accountability, and openness; and other topics (link to e-Gov, Web 2.0, social media, Big Data, and focus on specific content). Findings of differences in conceptualisation will be discussed in the following sections.

INFORMATION GOVERNANCE (IG)

'Information governance' has received much attention from scholars. Some authors use the term 'data governance' and 'information governance' interchangeably (Faria, Maçada, & Kumar, 2013; Khatri & Brown, 2010). The literature highlights that IG is a leading concern of organisations to enhance operational efficiency. This section focuses on definitions, roles, components and measurement factors, and frameworks of IG.

Definitions of IG

Many different concepts of IG are reflected in the reviewed literature in this paper. Some scholars (such as: Hulme, 2012; Kampffmeyer, 2013; Lynch, Baltzan, & Blakey, 2013) consider the term 'information governance' as a method or a means of management and control of information. Similarly, National Archives of Australia (2013) also states IG is how information assets are managed to support achievement of organisations' outcomes. Other definitions of IG place an emphasis not only on the function of establishing an environment and rules, but also on decision rights and accountability for management of the information lifecycle to support operational processes of organisations. The definition by Silic and Back (2013, p. 75) (See table 2) is an example in which IG is understood as policies, procedures, and processes for information management to support regulatory, legal, operational, managerial and environmental risks in an organisation. Additionally, when defining IG, Logan (2010, p. 1) emphasises decision rights and accountability in enabling the processes of information lifecycle management (ILM)[1] to achieve organisational goals. Another perspective is offered by Kooper, Maes, and Lindgreen (2011, p. 196), who focus on development of an environment, opportunities, rules, and decision-making rights for information lifecycle control to identify necessary information, methods for effective information usage, and responsibilities. Barrenechea (2013) introduces the concept of risk into the IG discussion by emphasising information in variety of different forms and the role of IG. Table 2 shows some typical definitions of IG indicated by previous literature.

Table 2: Typical definitions of IG

Authors	Definitions
(Hulme, 2012)	*Information Governance as a holistic approach to managing and using information for business benefits that encompasses information quality, information life-cycle management, and security, privacy and compliance.*
(National Archives of Australia, 2013)	*Information governance addresses how an organisation's information assets are managed to support organisational outcomes*
(Silic & Back, 2013)	*Information governance is an emerging term which can be used to define different policies, procedures, and processes aimed at managing information at an organisational level providing support for regulatory, legal, operational, managerial and environmental risks.*
(Logan, 2010)	*Information governance is the specification of decision rights and an accountability framework to encourage desirable behaviour in the valuation, creation, storage, use, archival and deletion of information. It includes the processes, roles, standards and metrics that ensure the effective and efficient use of information in enabling an organization to achieve its goals.*
(Kooper *et al.*, 2011)	*Information governance involves establishing an environment and opportunities, rules and decision-making rights for the valuation, creation, collection, analysis, distribution, storage, use and control of information; it answers the question "what information do we need, how do we make use of it and who is responsible for it?*
(Barrenechea, 2013)	*Information governance is about effectively using and managing an organization's information assets to derive maximum value, while minimizing information-related risks. It applies to all corporate information, regardless of form, function, or location. This includes structured and unstructured information, and ranges from content on file systems and email to information within productivity and line-of-business systems, on web, social, and mobile environments.*

[1] ILM is understood as a process for managing information through its lifecycle, from sensing, collecting, organising, processing, maintaining, and using information to the time when it becomes obsolete and is disposed (Marchand, Kettinger, & Rollins, 2001; Rouse, 2005).

The differences between IG definitions cited above are mainly due to the different perspectives of authors. For example, Hulme (2012) generalizes IG as a holistic method for IM because his study refers to the use of IG for reducing costs, improving operational efficiency, protecting privacy, and ensuring compliance with regulatory obligations in organisations. In contrast, Silic and Back (2013) point out the specific functions of IG are establishing policies, procedures, and processes for managing information in order to find factors impacting IG in the context of mobile device use. Other definitions emphasise different aspects of information lifecycle control. Logan (2010) pays attention to decision rights and an accountability for ILM, whereas Kooper *et al.* (2011) highlight establishing an environment and opportunities, rules and decision-making rights for it. However, most definitions cited above refer to effective information control to support organisational outcomes.

The literature shows that poor IG has many consequences such as information which is out of date or unavailable; difficult to find; and of uncertain status or authority. This creates a challenging situation for quality of information exchange and leads to inefficiency in the performance of organisations (Jaeger, 2007); risks related to liability and reputation of organisations when the information needs of customers cannot be addressed; and disclosing of confidential information which affects organisational security and national security (National Archives of Australia, 2013). Effective IG addresses these issues and can ensure authenticity, integrity and reliability of information and provide searchability and accessibility when necessary (Cottis, 2013). Good IG can also help to support transparency, accountability, and openness of organisations (Cuesta & Valor, 2013; Hermalin & Weisbach, 2012; Willis, 2005); improving the speed and effectiveness of decisions and processes (Bunker, Ehnis, Seltsikas, & Levine, 2013; Hagmann, 2013); ensuring compliance with legal obligations, reducing risks and administrative cost; (Barrenechea, 2013; Gonsowski, 2013; Hagmann, 2013), and control of corruption (Krishnan & Teo, 2012).

IG components and measurement factors

The literature reflects many different viewpoints of IG components. Many scholars state IG is a combination of people, policies, and technology (Faria *et al.*, 2013; Samuelson, 2010; Wang, 2010); people, processes, and technology (Freitas, Reis, Michel, Rodrigues, & Gronovicz, 2013) or people, processes, and tools (Hohman, 2011). Other authors (e.g. Donaldson & Walker, 2004; Hulme, 2012; Soares, 2013), who focus on quality of decisions for information maintenance and security, argue key components of IG can involve policies, information protection, information security, information privacy, metadata, master data, and archiving. Additionally, many studies affirm information quality, ILM, and records management are critical components of IG (e.g. Barrenechea, 2013; Kooper *et al.*, 2011; Silic & Back, 2013). Meanwhile, in a study on healthcare IG, Beach and Oates (2014) highlight components relevant for exploring information such as privacy, data access, data sharing, and data usage. The richness and diversity of IG components indicated by previous literature can be categorised into three groups. Group one involves general components as dependent variables which can be constituted by several independent components. Group two includes components deepening specific fields or controlling specific kinds of information. Group three composes components reflecting stages of ILM.

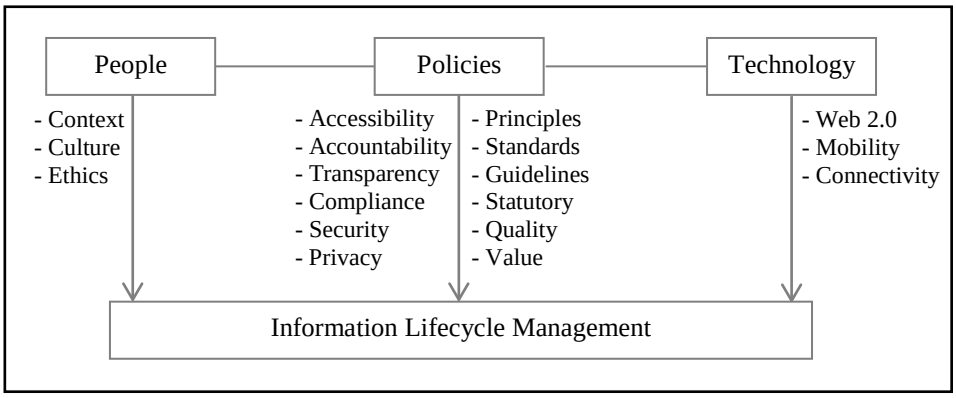
The general components of people, policies, and technology have received much attention from scholars. These components are foundational fields for identifying critical factors to measure effectiveness of IG in organisations. A typical example is a study by Faria *et al.* (2013) which points out twenty measurement factors that are categorised for each IG component such as ethics, culture, and context (people); accountability, security, monitoring, compliance, retention, accessibility, privacy, communication, sharing, transparency, formal structure, standardization, quality, and value (policies); and consumerization, mobility, and systems (technology). Similarly, information quality has also been mentioned in many studies because it is a critical component relating to all others in the second group. The quality of information directly influences the quality of business decisions (Lynch et al., 2013), and it can be supported by information value, security, privacy, and compliance. Furthermore, ILM covers all other components in the third group including information sharing, access, usage, protection, imaging, and archiving..

Good governance plays a decisive role in achievement of organisations' success (Krishnan & Teo, 2012). Willis (2005) indicates that good governance requires transparency, accountability, due process, compliance, meeting statutory requirements, and security. Meanwhile, Kemp, Parto, and Gibson (2005) identify six factors reflecting good governance: openness, participation, accountability, effective coherence, efficiency, and greater sensitivity. Some of the factors cited above such as transparency, accountability, security, and regulation are also used to appraise effectiveness of IG by other authors (e.g. Bunker *et al.*, 2013; Donaldson & Walker, 2004). A significant number of measurement factors can be selected from previous studies including accessibility, accountability, transparency, compliance, statutory, security, and privacy of an ornganisation, principles, standards, and guidelines for IG as well as quality and value of information. IG components and measurement factors are the foundation for IG frameworks which will be explored in the next paragraph.

IG frameworks

According to Lajara and Maçada (2013), an IG framework plays an important role to ensure reliable information is provided to executives and stakeholders. The literature shows that several frameworks for IG have been developed from different aspects based on IG components and measurement factors mentioned in the previous section of this paper. From the perspective of putting IG in the context of rapid development of technology, McKeen and Smith (2007) establish IG as covering many dimensions such as principles, policies and standards; compliance; IM program evaluation; information quality; security; and privacy. Meanwhile, an IG framework posed by Lajara and Maçada (2013) includes a combination of value, quality, and compliance of information. However, many scholars (e.g. Faria *et al.*, 2013; Samuelson, 2010; Wang, 2010) support the opinion of IG as being constituted by people, policy, and technology. People refers to those who are responsible for making decisions on how to control information effectively. Policies are related to the set of principles, guidelines, standards, and legal requirements of effective IG. Technology includes the set of technological mechanisms or associated equipment that support the IG strategy (Faria *et al.*, 2013). Accordingly, an IG framework that provides an overview from the literature is presented in Figure 1.

Figure 1: IG framework (adapted from: Faria *et al.*, 2013)



INFORMATION MANAGEMENT (IM)

The previous section of this paper introduced many conceptions of IG. Most refer to how to *manage* information assets of organisations rather than addressing the *governance* of those assets. Particularly, Wang (2010) uses 'information governance' as a synonym for 'information management', whereas McMillan (2012) highlights one of the key aspects leading to good governance is effective IM. This section discusses the key points of IM, as distinct from IG, exploring definitions, components and measurement factors, processes and frameworks.

Definitions of IM

The meaning of the term 'information management' is varied and rich. Thirty conceptualisations of IM have been found in the reviewed literature of this paper and the vast majority refer to control of the information lifecycle. The main difference among them is in regard to different levels in relevance to information lifecycle control or from diverse aspects of IM. Based on these differences, five groups of IM definitions emerge. While the first group reflects concepts considering IM as a broad term that refers to direction and orientation of information control; authors in the second group focus on operationalizing the whole process of ILM. The third group introduces IM definitions, highlighting some stages of ILM, whereas several representative definitions of IM from information technology and library perspectives are shown in the remaining groups (See Table 3).

Table 3: Typical definitions of IM

Authors	Definitions
Group 1: IM as a broad term referring to directing ILM	
(Entsua-Mensah, 1996)	*IM is a broad term which refers to the planning, operation and control of the resources which are considered as falling within the term 'information'.*
(Schwarze, 1998)	*IM includes the management tasks planning, leading, coordinating and controlling of gathering, processing, transmitting, saving and providing information in order to support the business goals.*
(Saville & Sowerbutts, 1990)	*IM as the process of planning, managing and controlling the creation, flow and distribution of information within an organisation.*

Group 2: Focusing on operationalising whole process of ILM.	
(Mutula & Wamukoy, 2009; Victorian Government CIO Council, 2012)	*IM is the way in which an organisation plans, identifies, creates, receives, collects, organises, governs, secures, uses, controls, disseminates, exchanges, maintains, preserves and disposes of its information, ensuring that the value of that information is identified and exploited to the fullest extent to meet its business objectives as well as to support business activities.*
(Best, 2010)	*IM can be defined as the economic, efficient and effective coordination of the production, control, storage, retrieval and dissemination of information from external and internal sources, in order to improve the performance of the organisation.*
(Choo, 2002; Detlor, 2010)	*IM is the management of the processes and systems that create, acquire, organize, store, distribute, and use information.*
(Lin, 2011)	*IM concerns the control over how information is created, acquired, organized, stored, distributed, and used as a means of promoting, efficient and effective information access, processing, and use by people and organizations.*
Group 3: *Focusing on some stages of ILM process*	
(Best, 2007)	*IM is regarded as the collection and management of information from one or more sources and the distribution of that information to one or more audiences.*
(Hawkins, Young, Hubert, & Hallock, 2001)	*IM involves the creation and application of processes directed toward the collection and review of data in a structured and effective manner.*
(Karim & Hussein, 2008)	*IM involves the collection and dissemination of information.*
Group 4: Referring to information technology support	
(Reponen, 1993)	*IM is a concept which emphasizes management's role in the area of information technology. It is a concept describing management involvement in IT planning and decisions.*
(Fairer-Wessels, 1997)	*IM is viewed as using technology (e.g. computers, information systems, IT) and techniques (e.g. information auditing/mapping) effectively and efficiently to manage information resources and assets.*
(Rick, Vossen, Richert, & Henning, 2010)	*IM includes all management tasks within an organisation or another business entity that are concerned with a computer supported or computer supportable information and communication system; this system is developed according to the existing and possible technical support of the tasks to be solved and according to the needs of people that are assigned with these tasks.*
Group 5: Library perspective	
(Mutula, 2008)	*IM, may include subject indexing, cataloguing, classification and coding; database design and data structures; storage and retrieval of information resources; information audits and reviews; uploading of information into the system; and information extraction, publishing, distribution and access.*

Table 3 indicates that there are many different opinions based on the notion of planning or the lack of it. For example, some scholars state IM refers to planning, directing operationalizing, organising, and controlling information (Entsua-Mensah, 1996; Saville & Sowerbutts, 1990; Schwarze, 1998) (See group 1). Others focus on the process of ILM when defining IM as a means of planning, identifying, creating, receiving, collecting, organising, governing, securing, using, controlling, disseminating, exchanging, maintaining, preserving, and the disposal of information to ensure the value of information is identified and exploited (Mutula & Wamukoy, 2009; Victorian Government CIO Council, 2012). Meanwhile, many authors (e.g. Choo, 2002; Detlor, 2010; Lin, 2011) see IM as the process of ILM which creates, acquire, organize, store, distribute, use and reuse information without planning stage. Best (2010) agrees with this statement and highlights productivity as a result of the coordination of this process (See group 3).

Another finding from the literature shows that several authors use IM to describe some stages of the process of ILM such as collection and distribution (Best, 2007; Karim & Hussein, 2008), collection and review (Hawkins *et al.*, 2001), usage and provision (Ellis & Desouza, 2009) (See Group 3, Table 3, for example). IM also can be defined from an information technology support perspective where Fairer-Wessels (1997) states IM is using technology and techniques to manage information assets and Rick *et al.* (2010) believe IM to be management tasks of an organisation with support from computers or communication systems (See group 4, Table 3). Moreover, from the perspective of librarians, IM refers to all management stages of library materials (Mutula, 2008, p. 90).

Scholars have also emphasised the critical roles of IM in improvement of operational efficiency of organisations. The reason for this is information being the key asset of any business (Shamsuzzoha & Helo, 2012). Ellis and Desouza (2009) indicate that IM plays a central role in maintaining sustainability of organisations. It ensures provision of accurate, relevant, timely and consistent information leading to a significant increase in openness,

transparency, trust and accountability in the public sector (Mutula & Wamukoy, 2009; Waldron, 2008). In the electronic government context, IM plays a fundamental role in the delivery of quality services to citizens (Svard, 2014). In addition, in business management, IM holds a critical position in establishing relationships with stakeholders outside organisations (Spadoni, Canavari, & Rignatti, 2012). Furthermore, many benefits of effective IM reflected by previous studies include improving productivity and quality of information access (Dias, 2001), facilitating decision-making (Karim & Hussein, 2008; Okello-Obura, 2012), effective legal compliance and reducing operational costs (Bruening, Sotto, Abrams, & Cate, 2008; Waldron, 2008). In short, effective IM is key in enhancing acquisition and exploitation of valuable information in organisations (Hicks, 2007). However, one of the big issues for many organisations is how to develop good IM and measure its effectiveness. This issue will be addressed in the following section.

IM components and measurement factors

As previously mentioned, although most definitions of IM focus on the ILM process, the literature indicates many ways to determine the components of IM. Many scholars state IM is established by some general components including people, technology, and information (Ellis & Desouza, 2009; Sedunary, 1993); people, technology, processes, practices, and information (Hicks, 2007) or people, technology, and organisation (Saville & Sowerbutts, 1990). 'Processes' has been considered a critical component of IM in studies by McKeen and Smith (2007) as well as in a significant number of IM definitions mentioned in the previous section. 'Processes' allude to stages for management of the information lifecycle and this has attracted much attention from scholars. For example, with the introduction of a 'corporate portal' as a concept, Dias (2001) identified seven stages of IM as reading, recognition, reinterpretation, reviewing, release, restricting, and retrieval. Meanwhile, Choo (2002) holds the opinion that the IM process starts by identification of information needs, then a range of steps are undertaken such as acquisition, organisation, storage, distribution, and use of information to address the needs. However, most authors focus on ILM consisting of creation, acquisition, organisation, maintenance, preservation, distribution, use and reuse, retrieval, transformation, and disposal (e.g. Larson, 2005; Lin, 2011; Wilson, 2005).

From another perspective, based on an IM framework suggested by Rowley (1998), Middleton (2007) analyses four components of IM including information environment, information context, information systems, and information retrieval. A recent study by Hamilton, Coldwell-Neilson, and Craig (2014) argues IM is a combination of components that directly refer to information lifecycle such as information discovery, information organisation, and information processing. However, according to Flett (2011), typical components of IM involve information governance, information lifecycle, information technology, information architecture, information skills, and information culture. Furthermore, Kloss (2013) believes IG, enterprise IM, and information asset management are major components of IM. On the other hand, Steventon *et al.* (2012) assert IM is constituted by IM capability, IM practices, and IM enablement. The various components of IM and IM processes reflected in the literature can be divided into three groups. Group one includes all general components, whereas the components supporting ILM can be reflected in the second group. The final group covers components as specific stages of ILM.

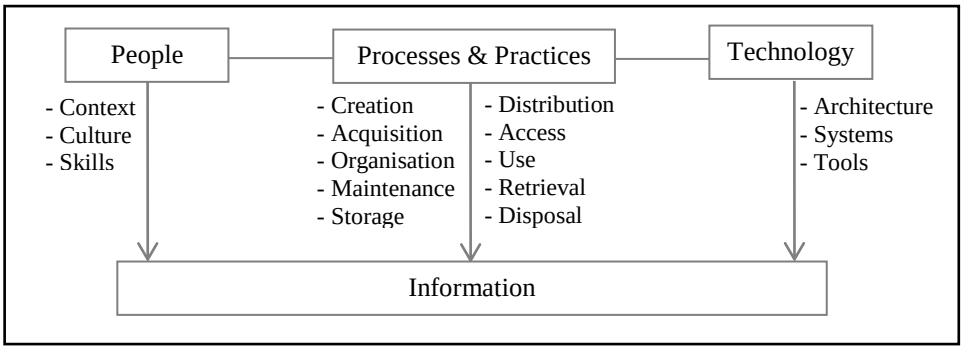
While many studies have alluded to IG measurement, very few papers focus on IM measurement factors. Some authors believe IG measurement factors can be used to evaluate the efficiency of IM because good IG is essential to ensure effective IM (Gianella & Gujer, 2006). However, findings from a study by Karim and Hussein (2008) indicate that the effectiveness of IM can be measured by information quality. The quality of information is presented by accuracy; reliability; credibility; completeness; consistency; timeliness; appropriateness; and uniqueness and information sharing (Lynch *et al.*, 2013; Sweden, 2008). Similarly, Mithas, Ramasubbu, and Sambamurthy (2011) indicate the capability of IM can be measured by appropriate levels of accuracy, timelines, reliability, security, confidentiality, connectivity, and accessibility of information.

IM frameworks

As mentioned earlier, IM components are keys to building IM frameworks. People, technology, and processes are key general components that have received much attention from scholars (e.g. Ellis & Desouza, 2009; Hicks, 2007; McKeen & Smith, 2007). The 'People' component refers to people who directly implement ILM processes in accordance with regulatory and legal requirements. They are responsible for the accuracy, timeliness, consistency, validity, completeness, and redundancy of information in organisations (McKeen & Smith, 2007). While information context (Middleton, 2007), information culture, and information skills (Flett, 2011) have been mentioned as independent components of IM in several studies; they are considered as specific factors belonging to the 'people' component in this paper. Furthermore, according to Sedunary (1993), 'technology' refers to equipment/tools and associated procedures for the practice of IM 'processes'. The component of 'processes' here reflects all stages of the ILM including creation, acquisition, organisation, maintenance, storage, distribution, access, use, retrieval, and disposal of information which are also of particular interest in research (e.g. Choo *et*

al., 2006; Liao, He, & Tang, 2004; Lin, 2011; Wilson, 2005). Components related to architecture, and systems of information are also mentioned in several studies (such as: Flett, 2011; Middleton, 2007; Rowley, 1998). Although a significant number of authors give an analyse of the components of IM from different perspectives, few investigate development of IM frameworks. Based on a classification of the components of IM in the previous section of this paper, a general framework for IM is posed in Figure 2.

Figure 2: IM framework



DISCUSSION

A review of the literature on IG and IM has highlighted the key points of the respective areas which are illustrated in the two frameworks (Figures 1 and 2). These frameworks of IG and IM reflect several similarities and differences between the two areas. A critical similarity is the appearance of two components (people and technology) in both frameworks. The use of the same terminology for these components has led to several scholars overlooking the differences between IG and IM in level and scope.

This is evident when examining the people component. In both the IG and IM frameworks, the people component refers to establishing context and culture of organisations, but there is a difference in the presence of ethics in IG and skills in IM. Khatri and Brown (2010) argue governance refers to making decisions to ensure effective management. This means the people component in IG relates to senior management, presidents, leaders, and executives who are responsible for the development and maintenance of *ethics* in organisations. Meanwhile, in IM, the people component includes middle and lower managers and staff who need to develop and improve *skills* to directly perform information lifecycle management processes.

Regarding the technology component, Faria *et al.* (2013) refer to a set of technological mechanisms supporting the IG strategy. For example, in the context of Government 2.0, technology mechanisms need to ensure the operation of Web 2.0 technologies through mobility and connectivity. Meanwhile, at the IM level, technology refers to tools and technology integration for ILM (McKeen & Smith, 2007). This role of IM is to ensure the design of appropriate architechture, tools, and systems that should address requirements for the operation of Web 2.0 technologies in the context of Government 2.0.

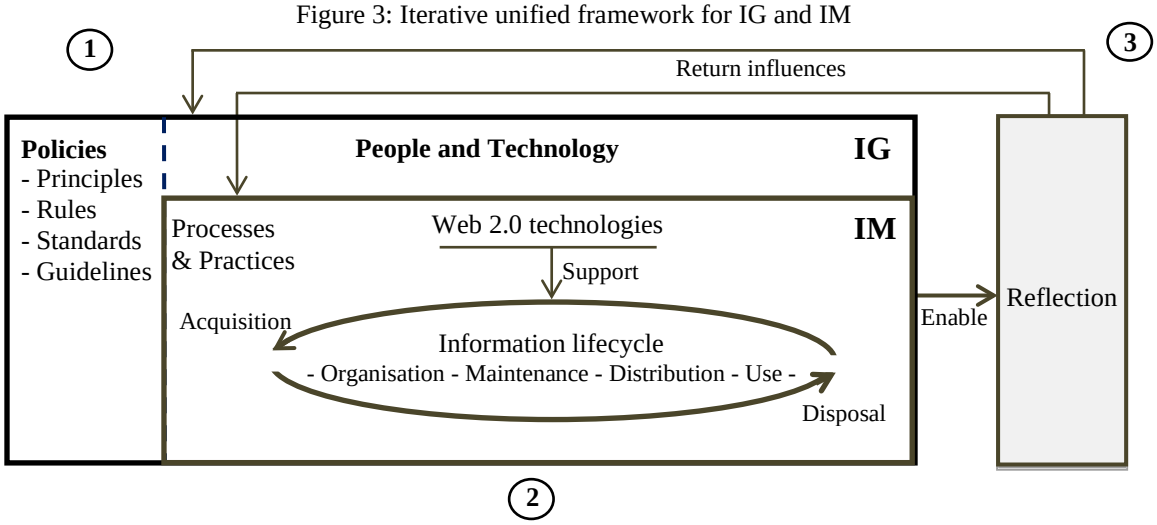
The key difference between IG and IM is the third component of their frameworks. IG focuses on establishing a set of polices to ensure accessibility, accountability, transparency, compliance, statutory, security, and privacy of organisations by the provision of quality and valuable information as the result of an effective ILM. In contrast, IM focuses on operationalising the managerial processes of the information lifecycle as the way to create, acquire, organize, store, distribute, and use information (Mutula & Wamukoy, 2009; Sheng & Zhao, 2006). Accordingly, IM is one of the components of IG. This essential difference provides a clarification of the role and responsibility of IG and IM that can help organisations to develop strategies for information control as well as effective arrangement of human resources in these two areas in organisations.

Regardless, the fundamental building block in the two areas of study is information. While IG establishes a legal framework for controlling the information lifecycle, IM has responsibility for putting into practice the specific processes of the ILM effectively, following a legal framework. Both IG and IM aim for effective and efficient control of the information lifecycle to enable reliable, usable, and available quality information, enhancing effectiveness of organisational operation. Therefore, the combination of IG and IM can be established via the following proposition: *IG and IM combine for effective control of an information lifecycle to ensure quality information enhancing effectiveness and efficiency of organisational performance.*

To illustrate this and drawing from the constructs discussed above, a framework for both IG and IM to enhance effectiveness and efficiency of organisational operations is presented in Figure 3.

Figure 3 depicts the combination of IG and IM in information lifecycle control to enhance effective and efficient operation of organisations. Stage 1 consists of IG and has a focus on the prerequisite of development and comprehension of policy as a legal framework and accountability for management of information. This legal framework provides principles, rules, standards, and guidelines for how information is controlled effectively during its lifecycle. In Stage 2 IM is situated in IG and the information lifecycle is enacted. This stage's focus is on the application of these regulations to develop and practise the processes of the ILM in a Web 2.0 context, the role of technologies in supporting the lifecycle occurs here. Accordingly, information lifecycle (from acquisition, organisation, maintenance, distribution, use, and disposal) is performed in legal compliance. In the context of Government 2.0, although the support of Web 2.0 technologies facilitates ILM in a timely and convenient manner, they also create many new forms of information on the various platforms and devices as well as pose many issues and requirements in online acquisition, analysis, and exchange of information (Gonsowski, 2013; Owen, Cooke, & Matthews, 2012). However, current policies of IG have not addressed a range of issues related to using Web 2.0 and social media (Bertot *et al.*, 2012). In Stage 3, reflective practice is used to consider areas for improvement, emerging issues and lessons learned. This stage loops back to Stage 1 as a key feature of the iterative unified framework.

Figure 3: Iterative unified framework for IG and IM



CONCLUSION

This paper provides a better understanding of the differences between IG and IM. This literature review has revealed a high level of misunderstanding and ambiguity regarding IG and IM that is a result of the vast array of confused meanings for similar terms and concepts. IG determines how an organisation's information assets should be managed and controlled to support effectiveness of organisational performance (Kloss, 2013). Accordingly, IG aims to ensure the provision of people, policies, technologies, and decision making rights for effective direction and control of IM. IG products can be a set of principles, demands, standards, and guidelines for ILM. Effectiveness of IG can be measured by the degree of transparency, accountability, openness, participation, effective coherence, standardization, legal compliance, statutory, security, privacy, and corruption control in organisations (Faria et al., 2013; Kemp et al., 2005). On the other hand, IM refers to processes of ILM encompassing creation, acquisition, organisation, maintenance, preservation, distribution, usage, appraisal, transfer to archives or disposal (Larson, 2005; Lin, 2011). IM aims to ensure the provision of practices, technology and skills to ensure authenticity and quality of information and maximise the value of information supporting organisational activities. Effective IM arises from the outcomes of the implementation process of IG decisions. IM measurement can be reflected by the convenience of information access and use, as well as by satisfaction of all staff in agencies and stakeholders in regard to accuracy, reliability, credibility, completeness, consistency, timeliness, appropriateness, and uniqueness of provided information (Mithas et al., 2011; Sweden, 2008).

Another contribution of this paper has been to develop a unified framework combining both IG and IM that clarifies the scope of similar components. This addresses a current lack of effective frameworks of IG and IM in the literature. This unified framework is derived from a wide range of literature, but will be used by the authors in the context of Government 2.0 where information policies and processes are particularly required for supporting the application of new technologies as a result of the adoption of Web 2.0 and social media. This framework will be examined in future qualitative research through collecting data across multiple countries having different levels of Government 2.0 adoption. Nevertheless, the framework is applicable to IG and IM across a range of organisational contexts.

The full list of references and the two concept matrices are available from the authors of this paper upon request.

References:

Barrenechea, M. (2013). Information Governance is Good Business. Retrieved 20 October 2013 http://www.opentext.com/connect/global/ceo-whitepaper-series-part9.htm

Beach, J., & Oates, J. (2014). 'Information governance and record keeping in community practice'. *Community Practitioner, vol. 87*(no. 2), pp. 43-46.

Bertot, J. C., Jaeger, P. T., & Hansen, D. (2012). 'The impact of polices on government social media usage: Issues, challenges, and recommendations'. *Government Information Quarterly, vol. 29*(no. 1), pp. 30–40.

Best, D. P. (2007). 'The future of information management'. *Information Management and Computer Security, vol. 79*(no. 1), pp. 69-78.

Best, D. P. (2010). The future of information management'. *Records Management Journal, vol. 20*(no. 1), pp. 61-71.

Bruening, P. J., Sotto, L. J., Abrams, M. E., & Cate, F. H. (2008). 'Strategic Information Management'. *Privacy & Security Law, vol. 7*(no. 36), pp. 1361-1363.

Bunker, D., Ehnis, C., Seltsikas, P., & Levine, L. (2013). *'Crisis Management and Social Media: Assuring Effective Information Governance for Long Term Social Sustainability'*. Paper presented at the Source of the Document 2013 IEEE International Conference on Technologies for Homeland Security, Waltham, MA

Choo, C. W. (2002). *Information management for the intelligent organization: The art of environmental scanning* (3rd ed.). Medford, NJ: Learned Information.

Choo, C. W., Furness, C., Paquette, S., Berg, H. v. d., Detlor, B., Bergeron, P., & Heaton, L. (2006). 'Working with information: Information management and culture in a professional services organization'. *Journal of Information Science, vol. 32*(no. 6), pp. 491-510.

Information Governance Policy, V5 December 2012, The Queen Elizabeth Hospital King's Lynn NHS Foundation Trust 20 (2013 20 October 2013).

Cuesta, M. d. l., & Valor, C. (2013). 'Evaluation of the environmental, social and governance information disclosed by Spanish listed companies'. *Social Responsibility Journal, vol. 9*(no. 22), pp. 220-240.

Detlor, B. (2010). 'Information Management'. *International Journal of Information Management, vol. 30*(no. 2), pp. 103-108.

Dias, C. (2001). 'Corporate portals: a literature review of a new concept in Information Management'. *International Journal of Information Management, vol. 21*(no. 4), pp. 269-287.

Donaldson, A., & Walker, P. (2004). 'Information governance - A view from the NHS'. *International Journal of Medical Informatics, vol. 73*, 281-284.

Ellis, P., & Desouza, K. C. (2009). 'On information management, environmental sustainability, and cradle to cradle mentalities: A relationship framework'. *Business Information Review, vol. 26*(no. 4), pp. 257-264.

Entsua-Mensah, C. (1996). 'Towards effective information management: A view from Ghana'. *International Journal of Information Management, vol. 16*(no. 2), pp. 149-156.

Fairer-Wessels, F. A. (1997). Information management education: towards a holistic perspective. *South African Journal of Library and Information Science, vol. 65*(no. 2), pp. 93-102.

Faria, F. d. A., Maçada, A. C. G., & Kumar, K. (2013). *'Information Governance in the Banking Industry'*. Paper presented at the 46th Hawaii International Conference on System Sciences.

Flett, A. (2011). 'Information Management Possible?: Why is information management so difficult? *Business Information Review, vol. 28*(no. 2), pp. 92-100.

Freitas, P. A. d., Reis, E. A. d., Michel, W. S., Rodrigues, M. A. d. M., & Gronovicz, M. E. (2013). *'Information Governance, Big Data and Data Quality'*. Paper presented at the IEEE 16th International Conference on Computational Science and Engineering.

Garvin, P. (Ed.). (2011). *Government Information Management in the 21st Century*. England: Ashgate Publishing Limited.

Gianella, S., & Gujer, W. (2006). *'Improving the information governance of public utilities through an organizational knowledge base'*. Paper presented at the World Congress on Engineering Asset Management, July 11-14, Gold Coas, Australia.

Gonsowski, D. (2013). 'Predictive Information Governance: Getting The Right Data To The Right People At The Right Time'. *The Metropolitan Corporate Counsel, June 2013*(27).

Hagmann, J. (2013). 'Information governance –beyond the buzz'. *Records Management Journal, vol. 23*(no. 3), pp. 228-240.

Hamilton, A. L., Coldwell-Neilson, J., & Craig, A. (2014). 'Development of an information management knowledge transfer framework for evidence-based occupational therapy'. *The journal of information and knowledge management systems, vol. 44*(no. 1), pp. 59-93.

Hawkins, H., Young, S. K., Hubert, K. C., & Hallock, P. (2001). 'Conceptual Database Modeling for Understanding and Developing Information Management Applications'. *Radiographics, vol. 21*(no. 3), pp. 781-787

Hermalin, B. E., & Weisbach, M. S. (2012). 'Information Disclosure and Corporate Governance'. *The journal of finance, vol. 17*(no. 1), pp. 195-233.

Hicks, B. J. (2007). 'Lean information management: Understanding and eliminating waste'. *International Journal of Information Management, vol. 27*(no. 4), pp. 233-249.

Hohman, C. (2011). Information Governance: Who is watching over your information. Retrieved 20 May 2014, from Lexmark's Perceptive Software http://www.incontextmag.com/articles/2011/information-governance--who-is-watching-over-your-information-.html#sthash.nSKt4GMf.dpuf

Hulme, T. (2012). 'Information Governance: Sharing the IBM approach'. *Business Information Review, vol. 29*(no. 2), pp. 99-104.

Jaeger, P. T. (2007). 'Information policy, information access, and democratic participation: The national and international implications of the Bush administration's information politics' *Government Information Quarterly, vol. 24*(no. 4), pp 840–859.

Kampffmeyer, U. (2013). *Information Governance: Basics, Principles, Importance*. Hamburg: PROJECT CONSULT Unternehmensberatung.

Karim, N. S. A., & Hussein, R. (2008). 'Managers' perception of information management and the role of information and knowledge managers: The Malaysian perspectives'. *International Journal of Information Management, vol. 8*(no. 2), pp. 114-127.

Kemp, R., Parto, S., & Gibson, R. B. (2005). 'Governance for sustainable development: moving from theory to practice'. *International Journal Sustainable Development, vol. 8*(no. 1), pp. 12-30.

Khatri, V., & Brown, C. V. (2010). 'Designing data governance'. *Communications of the ACM, vol. 53*(no. 1), pp. 148–152.

Kloss, L. L. (2013). 'Leading Innovation in Enterprise Information Governance'. *Journal of the American Health Information Management Association, vol. 84*(no. 9), p. 34-38

Kooper, M. N., Maes, R., & Lindgreen, R. (2011). 'On the governance of information: Introducing a new concept of governance to support the management of information'. *International Journal of Information Management, vol. 31*, pp. 195-200.

Krishnan, S., & Teo, T. S. H. (2012). 'Moderating Effects of Governance on Information Infrastructure and E-Government Development'. *Journal of the American Society for Information Science and Technology, vol. 63*(no. 10), pp. 1929-1946.

Lajara, T. T., & Maçada, A. C. G. (2013). *'Information Governance Framework: The Defense Manufacturing Case Study'*. Paper presented at the Nineteenth Americas Conference on Information Systems, Chicago, Illinois, August 15-17.

Larson, R. R. (2005). Information Life CycleData, Metadata and the Information Life Cycle. http://www2.sims.berkeley.edu/courses/is202/f98/Lecture2/index.htm.

Leech, N. L., & Onwuegbuzie, A. J. (2007). 'An array of qualitative analysis tools: A call for data analysis triangulation'. *School Psychology Quarterly, vol. 22*, pp. 557-584.

Leech, N. L., & Onwuegbuzie, A. J. (2008). 'Qualitative data analysis: A compendium of techniques for school psychology research and beyond'. *School Psychology Quarterly, vol. 23*, pp. 587-604.

Liao, S. S., He, J. W., & Tang, T. H. (2004). 'A framework for context information management'. *Journal of Information Science, vol. 30*(no. 6), pp. 528-539.

Lin, X. C. (2011). *'Three prspectives of Information management'*. Paper presented at the 3rd International Conference on Information Management, Innovation Management and Industrial Engineering.

Logan, D. (2010). What is Information Governance? And Why is it So Hard? Retrieved 20 October 2013 http://blogs.gartner.com/debra_logan/2010/01/11/what-is-information-governance-and-why-is-it-so-hard/

Lynch, K., Baltzan, P., & Blakey, P. (2013). *Business Driven Information Systems* (2nd ed.). Australia: McGraw-Hill Education - Europe.

Marchand, D. A., Kettinger, W. J., & Rollins, J. D. (2001). *Information orientation: the link to business performance*. Oxford: Oxford University Press.

Mathiassen, L., Saarinen, T., Tuunanen, T., & Rossi, M. (2004). 'Managing Requirements Engineering Risks: an Analysis and Synthesis of the Literature'. *Sprouts: Working Papers on Information Systems, vol. 4*(no. 26), 4-26.

McKeen, J. D., & Smith, H. A. (2007). 'Developments in Practice XXIV: Information Management: The Nexus of Business and IT'. *Communications of the Association for Information Systems, vol. 19*(no. 3), pp. 34-46.

McMillan, J. (2012). *Effective Information Management – the Keystone of Good Government*. Paper presented at the 10th World Conference on Information Commissioner of the International Ombudsman Institute, Wellington, New Zealand, 15 November 2012.

Merzuki, S. E., & Latif, H. A. (2009). 'Information Management (IM) for Academic Staff Advancement Programme in Higher Institutions'. *Journal of technology management & innovation, vol. 4*(no. 1), pp. 94-104.

Middleton, M. (2007). 'A framework for information management: Using case studies to test application'. *International Journal of Information Management, vol. 27*(no. 1), pp. 9-21.

Mithas, S., Ramasubbu, N., & Sambamurthy, V. (2011). 'How information management capability influences firm performance'. *MIS Quarterly, vol. 35*(no. 1), pp. 237-256.

Mutula, S. (2008). 'Evolving Paradigms in the Networked World and their Implications for Information Management in African Libraries'. *African journal of library, archives & information science, vol. 18*(no. 2), pp. 89-102

Mutula, S., & Wamukoy, J. M. (2009). 'Public sector information management in east and southern Africa: Implications for FOI, democracy and integrity in government'. *International Journal of Information Management, vol. 29*(no. 5), pp. 333-341

National Archives of Australia. (2013). Information Governance. Retrieved 20 October 2013 http://www.naa.gov.au/records-management/strategic-information/information-governance/index.aspx

Okello-Obura, C. (2012). 'Records and information management practices among SMEs in Tororo district, Uganda'. *Library Review, vol. 61*(no. 6), pp. 447-469.

Onwuegbuzie, A. J., Leech, N. L., & Collins, K. M. T. (2012). 'Qualitative Analysis Techniques for the Review of the Literature'. *The Qualitative Report, vol. 17*(no. 56), pp. 1-28.

Owen, B. B., Cooke, L., & Matthews, G. (2012). 'Information policymaking in the United Kingdom: The role of the information professional'. *Journal of information Policy, vol. 2*, pp. 51-78.

Reponen, T. (1993). 'Information management strategy - an evolutionary process'. *Scandinavian Journal of Management, vol. 9*(no. 3), pp. 189-209.

Rick, U., Vossen, R., Richert, A., & Henning, K. (2010). *'Designing Agile Processes in Information Management'*. Paper presented at the 2nd IEEE International Conference on Information Management and Engineering ,2010,Vol.4,.

Rouse, M. (2005). 'Information life cycle management'. Retrieved 20 September 2014, from TechTarget http://searchstorage.techtarget.com/definition/information-life-cycle-management

Rowley, J. (1998). 'Towards a framework for information management'. *International Journal of Information Management, vol. 18*(no. 5), pp. 359-369

Samuelson, K. (2010). “Recognizing the value of controlled and flexible governance”. *Information management, May/2010*.

Saville, J., & Sowerbutts, T. (1990). *Information management: people, organisations and technology*. South Melbourne: The Macmillan Company of Australia Pty Ltd.

Schwarze, J. (1998). *Information management*. Berlin: Planung, Steuerung, Koordination und Kontrolle der Informations versorgung im Unternehmen.

Sedunary, M. E. (1993). 'A strategic approach to land information management'. *Computers, Environment and Urban Systems, vol. 17*(no. 3), pp. 243–251.

Shamsuzzoha, A. H. M., & Helo, P. T. (2012). 'Development of modular product architecture through information management'. *The journal of information and knowledge management systems, vol. 42*(no. 2), pp. 172-190.

Sheng, Q., & Zhao, X. (2006). *'The Mode of Information Management Based on Topologic Space'*. Paper presented at the International Conference on Management Science and Engineering

Silic, M., & Back, A. (2013). 'Factors impacting information governance in the mobile device dual-use context'. *Records Management Journal, vol. 23*(no. 2), pp. 73-89.

Soares, S. (2013). 'Keeping information governance agile'. *IBM Data Management Magazine, vol. 10*(no. 14).

Spadoni, R., Canavari, M., & Rignatti, E. (2012). 'Information Management as a value-enhancement tool in the small pelagic fish supply chain'. *New Medit, vol. 11*(no. 1), pp. 33-40.

Steventon, A., Jackson, T. W., Hepworth, M., Curtis, S., & Everitt, C. (2012). 'Exploring and modelling elements of information management that contribute towards making positive impacts: An outcome based approach for senior managers in a local government setting'. *International Journal of Information Management, vol. 32*(no. 2), pp. 158– 163.

Svard, P. (2014). 'Information culture in three municipalities and its impact on information management amidst e-government development'. *International Federation of Library Associations and Institutions, vol. 40*(no. 1), pp. 48–59.

Sweden, E. (2008). *Data Governance – Managing Information As An Enterprise Asset: Part I – An Introduction*. Lexington: NASCIO.

Victorian Government CIO Council. (2012). *Information Management Roles and Responsibilities*. Victorian Government Chief Technology Advocate.

Victorian Government CIO Council. (2013). *Information Management Principles*. Victorian Government Chief Technology Advocate.

Waldron, M. (2008). 'Developing an information management strategy: The foundation stone for an EDRMS'. *Business Information Review, vol. 25*(no. 2), pp. 101–104.

Wang, A. (2010). 'How to improve your practice's approach to information governance'. *MGMA Connexion/Medical Group Management Association, vol. 10*(no. 10), pp. 27-28.

Webster, J., & Watson, R. T. (2002). "Analyzing the past to prepare for the future: Writing a literature review". *MIS Quarterly, vol. 26*(no. 2), pp. xiii-xxiii.

Whittemore, S. (2009). *'Finding and learning: Exploring the information management practices of a technical communicator'*. Paper presented at the IEEE International Professional Communication Conference

Willis, A. (2005). 'Corporate governance and management of information and records'. *Records Management Journal, vol. 15*(no. 2), pp. 86-97.

Wilson, T. D. (2005). Introducing information management *The nonsense of knowledge management* (pp. 151–164). London, UK: Facet Publishing.

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