

Information Technology Leadership on Electronic Records Management: The Malaysian Experience

Rusnah Johare¹, Mohamad Noorman Masrek² and Haziah Sa'ari¹

¹Faculty of Information Management, Universiti Teknologi MARA, Shah Alam, Malaysia

²Accounting Research Institute, Universiti Teknologi MARA, Shah Alam, Malaysia.

r.johare@yahoo.com

mnoormanm@gmail.com

azie.crystal@gmail.com

Abstract: Managing records in electronic environment is not only a major challenge but also increasingly a strategic issue for organizations in both the public and private sectors. The success of electronic records management (ERM) in an organization depends greatly on partnership of the different key players on managing these specialized records namely records managers, archivists, administrators and most importantly the IT personnel. A strong IT leadership on electronic records management would provide an excellent foundation towards developing a credible electronic records management in an agency. This paper presents the findings of a study carried out pertaining to the IT personnel involvement in electronic records management in sampled agencies in Malaysia and how IT leadership could have an impact on the management and preservation of these records as part of the organizational memory and collectively as memory of the nation.

Keywords: e-government (EG), electronic records, IT leadership, preservation, records management, records practitioners

1. Introduction

Malaysia is going through a period of active administrative reforms and development; hence an efficient records management service is essential to support such a process. Unless this need is met the EG development plans may not be achieved if they are not sufficiently supported by an ERM infrastructure. The only way to achieve the results targeted is by ensuring the availability of an efficient ERM infrastructure that performs electronic recordkeeping functions needed to back up those EG development plans. The nature of human resources needed to run an ERM program has been much debated by records and archival profession ever since it became clear that computers were transforming the way governments are doing business (Millar, 2009). One of the significant outcomes of computerization is that managing electronic records now relies on Information Technology (IT) and it needs to be integrated into the business processes of an organization. Therefore ERM not only requires the involvement of key players in recordkeeping, such as records managers and archivists, but most importantly IT personnel under a common shared responsibility to establish a successful and credible ERM program (McLeod, Hare & Johare, 2004). Against this background, this paper reports the findings of a study aimed at investigating whether Malaysian IT leaders fulfil their roles in establishing ERM programs. Specifically, the study intended to answer the following research questions: (i) What are the IT leaders' perspectives with regards to their responsibilities on electronic records in their respective organizations? And (ii) What are the IT leaders' perspectives with regards to their responsibilities in managing electronic records within the context of EG implementation?

2. Literature review

Records Management Standard ISO15489-1: 2001 indicates that records management inclusive of electronic records responsibilities should be assigned to all employees of the organization, including records managers, allied information professionals and systems administrators. The standard emphasized that specific leadership responsibility and accountability for records management should be assigned to a person with appropriate authority within the organization which includes the IT personnel and their leaders or managers (ISO 15489-1:2001 page 5). Whereas ISO/TR 13028 Standard for Information and documentation – Implementation guidelines for digitization of records outlines the types of skill areas and tasks of staff engaged in digitization. Among others, these include the skill area of systems analysis tasks on selection of scanner hardware; defining storage requirements; integration of hardware, imaging equipment and software; integration of digitization requirements into existing organizational IT infrastructure; compliance with national and organizational IT standards; testing configurations; ongoing support of digitization equipment (where necessary); and definition of policies and procedures to ensure authenticity and integrity of digital images (ISO/TR 13028:2010(E) page 29). On the other hand, ISO16175 Information and documentation – Principles and functional requirements for

records in electronic office environment Part1, 2 and 3 detailed out the nature of electronic recordkeeping functional requirements which also fall under the purview of IT leaders and experts. Thus, IT leadership is essential for stimulating the variety of electronic records activities involved at each stage of the electronic records life cycle-creation, maintenance and use, and disposition (McDonald, 2003). Under their leadership, the IT personnel are recognized as a driving force for the functioning of ERM programs (Duranti, 2011). IT leaders, managers or experts and their staff are responsible for designing, implementing and maintaining systems that should conform to requirements for the creation, capture, maintenance and preservation of records. As suggested by Roper & Millar (1999) the IT leaders are the experts within the organization or agencies who can advise on how technology can be used to support recordkeeping requirements. In addition, librarians are also an excellent source of knowledge regarding recordkeeping.

2.1 The nature of electronic recordkeeping

International Records Management Trust (IRMT) Glossary of Terms defines electronic records as “a record that is created, generated, sent, communicated, received, or stored by electronic means and that requires some form of computer technology to access and use”. On the other hand, Millar (2009) argued that electronic records can be created in a range of different formats such as data sets, text-based documents, multi-dimensional documents and multi-media documents in different file formats such as PDF, TIFF and JPEG. Thus the nature and characteristics of records in electronic environment fundamentally have changed the nature and role of recordkeeping as new types of records are brought into existence. They are more difficult to identify and therefore challenge the record keepers’ ability to capture them in a static or permanent form that will enable them to provide evidence of business and administrative transactions (Park, 2011).

In traditional paper-based recordkeeping systems, the media and format used for a record has been the same for the entire history of the record from creation, transmission, usage and reference, through to storage. There is no difference between preserving the form and preserving the content because of the permanent relationship between the physical format of the paper and the information it contains. In the electronic environment, the priority is to ensure that at the point of creation, the electronic records are captured and fixed with all the attributes of recordness so that it can provides evidence of and information about the business transaction to which it relates (McLeod, Hare & Johare, 2004). Duranti (2011) explains that the attributes of recordness consist of stable content, fixed form and unique characteristics of the records that demonstrate its identity, expressed in properties or metadata and requires specific preservation measures. These attributes are critical in ensuring the reliability, accuracy and authenticity of the records which need to be protected. If this is the case, managing electronic records require intervention at the computer systems design stage to guarantee appropriate creation, capture and preservation to ensure the integrity and authenticity of those records as evidences required for accountability (Fernandez, 2009). No longer could the records managers and archivists work in isolation to face the technical challenges post by electronic records but to work together with the IT managers and experts.

2.2 The involvement of IT leaders in ERM research projects

Since early 1990s until the time of writing, in developed countries, consortium of research projects were carried out on ERM which deals with defining and developing functional requirements for the management of electronic records; to look at the long-term solutions in preserving electronic records, and finally to develop best practices guidelines against which institutions and organizations can be measured when assessing the effectiveness of adopted ERM programs (Guercio, 2009). Almost all ERM research projects as suggested by the literature have made appropriate arrangement for the inclusion of IT personnel, IT managers and IT experts as project team members. Prominent ERM research projects among others include Victoria Electronic Records Strategy (VERS-1990s); Exemplars in Digital Records (CEDARS-1990s); The Long-term Preservation of Metadata for Electronic Records (LMER – 2005), Effective Strategic Model for the Preservation and Disposal of Institutional Digital Assets (ESPIDA – 2005); Clever Recordkeeping Metadata Project (CRKM – 2007); Digital Archiving in Flemish Institutions and Administrations (DAVID – 2007); Repository for Preservation of Authentic Digital Records (RODA – 2007); Digital Repository Infrastructure Vision for European Research (DRIVER- 2009); Data Preservation Alliance for the Social Science (Data-PASS – 2009); Digital Preservation Europe (DPE – 2009), International Research Project on Permanent Authentic Records in Electronic Systems (InterPARES – 1999 - 2012); and InterPARES-Trust: managing records in the cloud computing environment (2013). In these research projects, IT leaders and experts have made significant contributions to collaborative efforts in finding solutions

to ERM problems and issues through national and international research projects in leading advocate countries such as Australia, Canada, UK and USA.

2.3 Responsibilities of IT leaders for ERM

Due to the significant roles of IT leaders and experts in designing, implementing and maintaining systems where electronic records reside, much of ERM literature discusses their responsibilities. Roper & Millar (1999) listed seven (7) main responsibilities of the IT leaders in which they should carry out this role by:

- incorporating recordkeeping policies, practices and requirements into information systems policies and practices
- managing the migration of electronic records through changes in software, hardware and storage media
- establishing, with the records manager, standards, procedures and controls for managing electronic records
- implementing standards, procedures and controls on the exchange or sharing of information between departments across a network
- notifying records managers when new systems, or enhancements to existing systems, are planned, especially where these affect electronic records
- advising records managers on a regular basis of new technological solutions concerning the preservation of and continued access to electronic records
- ensuring the effective retention and disposal of electronic records, including their transfer to an archival institution, in accordance with approved standards and procedures.

Literature on ERM issues and challenges supports the notion that for successful implementation of ERM, IT personnel and their leaders must execute their task as mentioned above.

3. Research methodology

Saunders et al. (2012) argue that naturalistic, qualitative and interpretative studies help people to understand detail problems of an organization, since other forms of research methods often fail to probe deeply into the intricacy of a problem. In this case qualitative data are appropriate as they allow researchers to peer deeply into the heart of the issues surrounding the IT leaders' responsibility on ERM. There is a range of players involved as stake holders for ERM: these include administrators, records managers, archivists, the public, elected officials, civil servants, auditors and many more. Based on ISO15489 in the context of ERM, creators and users of records, managers of records and archives, and technical staff dealing with the design and maintenance of the systems can be termed as record keepers because they are directly involved with the creation, usage, maintenance and management of electronic records (Rusnah, 2006). Many previous studies were conducted on the involvement of these different record keepers especially records managers and archivists on ERM (Irwan Kamaruddin, 2013; Nurrusobah, 2013; Alwi, 2013; Rusnah & Mohamad Noorman, 2011; Asmadi, 2011; Azman, 2010 and Aliza, 2009). However, studies on the involvement of IT leaders specifically on ERM were given minimal attention. Thus within the limited scope of this study, only the IT leaders were chosen as subjects. Although other IT staff at subordinate level was included in the ISO 15489 list as having responsibility on ERM, they were not included in this study as they were represented by their superior. Accordingly interview sessions were conducted with five IT leaders (Head of IT Division/Department) from five agencies, who were willing to participate in the study. The sample was selected by using purposive sampling method. A set of open-ended questions were posed in face-to-face interviews, the intention being to gather opinion and experiences from the informants with regards to ERM. All interviews were recorded for inductive and indexing coding purposes. These were transcribed verbatim to text documents and were analysed for recurrent themes, patterns and relationships in the data (Merriam, 2009) and Lewin (2005). In this case the number of times a word appears in the interview transcript document is applied to the data in which words such as "many", "some", "a few", "almost all", "forcefully said" and so on. The numbers help to clarify what is meant by frequency in the context of qualitative data analysis (as opposed to quantitative data analysis) that signify one word occurs many times in all the text documents. This adds to the validity and reliability of the data as a whole. Data used in this paper constituted part of the overall data collected from the five agencies. The analysis focused on exploring the relationship and understanding of the IT leaders on their responsibilities and involvement in ERM.

4. Research findings

As perceived by the five informants, three main issues emerged in the area of IT leaders' responsibilities on electronic records. These were identified by inductive and indexing coding analysis of the answers to the two research questions. These are the national approach in protecting the security of electronic records, shared and individual responsibilities on electronic records and the training needs on electronic records.

4.1 National approach in protecting the security of Government information

The five informants have interesting views with regards to their responsibilities on electronic records in their respective organizations. Informant 1 emphasized the importance of legislations, policies and procedures on electronic records when he said, "legislations, policies, standards and procedures are critical to protect the security of Government information". He indicated that IT personnel in his organization are able to perform their tasks on electronic records functions when he added, "Government makes policies based on evidence, evidence based on records. Records must be kept accurately because it has legal implications. It is best for us to address all these issues, to keep the policy correct regarding security, sanctity, reliability, authenticity, audit trails and whatever we need to keep are kept well". When asked whether recordkeeping policies, practices and requirements are incorporated into information systems policies and practices, Informant 2 forcefully insisted that "these are taken into consideration when all the EG systems were designed and planned for because it is critical to protect Government documents and records". Whereas, Informant 3 views his responsibilities in furnishing his IT staff with guidance on how to manage data, information and documents for the reason, "Our Government is very committed towards security of records ... IT security entails confidentiality, authenticity, availability and lastly integrity. We have approved IT policies, records policies and also we have studied the relevant recordkeeping standards for these purposes". When question about how he regarded his responsibilities in managing electronic records as required by standard procedures, Informant 4 focused on describing his roles and responsibilities by saying, "We are very much technology people, talking about how to create the EG systems, and we also think about how the filing elements, metadata and so on to be fitted into the systems...". Informant 4 added that "these are related very much to the rules and regulations governing records in this country like in any other government; legislations and circulars from the Treasury for example; and from the Prime Minister's Department and not to forget the 'Akta Rahsia Rasmi' (the Official Secrecy Act.) In describing his responsibilities, Informant 5 emphasized his role and responsibilities by pointing out that, "Yes, we have government filing requirements, a standard filing system in the public sector that we applied in the systems. These are the requirements that we have to adhere to when planning for the EG systems". He further explained, "Electronic records are our prime concern, even within the sensitive area of recording individual identity; electronic systems are making steady advances ... a national approach of protecting the security of information". Further to this, Informant 2 affirmed that "The rule of law has a correlation of making sure that facts are accurate and correct. We cannot afford to lose the records, if there is a case, if there is a liability to be established; it has to be maintained at whatever expense ..."

Table 1: Data on national approach in protecting the security of Government information derived from the interviews

| Informant 1 | Informant 2 | Informant 3 | Informant 4 | Informant 5 |
|--|---|--|---|--|
| Legislations, policies, standards and procedures on electronic records are critical to protect the security of Government information. | Recordkeeping policies, practices and requirements are taken into consideration when all the EG systems were designed and planned for because it is critical to protect Government documents and records. | We have approved IT policies, records policies and also we have studied the relevant recordkeeping standards for these purposes. | There are rules and regulations governing records in this country. Legislations and circulars from the Treasury for examples; and from the Prime Minister's Department. Not to forget the 'Akta Rahsia Rasmi' (Official Secrecy Act.) | Yes, we have the Government filing requirements, a standard filing system in the public sector that we have applied in the systems. These are the requirements that we have to adhere to when planning for the EG systems. |
| Government makes | The rule of law has a | Our Government is | We are very much | Electronic |

| Informant 1 | Informant 2 | Informant 3 | Informant 4 | Informant 5 |
|---|---|---|---|---|
| policy based on evidence, evidence based on records. Records must be kept accurately because it has legal implications. It is best for us to address all these issues, to keep the policy correct regarding security, sanctity, reliability, authenticity, audit trails and whatever we need to keep are kept well. | correlation of making sure that facts are accurate and correct. We cannot afford to lose the records, if there is a case, if there is a liability to be established; it has to be maintained at whatever expense. | very committed towards the security of records. IT security entails confidentiality, authenticity, availability and lastly integrity. | technology people, talking about how to create the EG systems, and we also think about how the filing elements, metadata and so on to be fitted into the systems. | records are our prime concern, even within the sensitive area of recording individual identity; electronic systems are making steady advances, a national approach of protecting the security of the information. |

4.2 Shared and individual responsibilities on electronic records

Early intervention by a range of players for ERM (records managers, archivists and IT personnel) is a crucial aspect in the creation, maintenance, appraisal and preservation of electronic records created by the EG systems. The EG systems comprising Project Monitoring System (PMS); Human Resource Management Information System (HRMIS); Generic Office Environment (GOE); Electronic Procurement (EP); Electronic Services (E-Services); Electronic Labour Exchange (ELX); E-Syariah (Islamic Court Information System); Electronic Land Management System (E-Land) and various online services systems developed under the Special Task Force to Facilitate Business (PEMUDAH).

When asked who were involved in the design and development of the EG systems in their respective organizations, all five informants agreed that among others who were involved are the IT managers and experts, national archivists, security officers, legal advisors, administrators from leading policy making agencies such as the Treasury, Malaysian Administrative Modernization and Management Planning Unit (MAMPU), Public Services Department and IT consultants. However, further examination of the qualitative data indicates that the records managers are involved in other related areas which are different from that of the IT personnel such as work concerning the formulation of electronic records programs in their respective organizations; and establishing links with the National Archives pertaining to policies, standards, procedures and controls for managing departmental records. Informant 1 supported this view that the national archivists were involved in ensuring the effective retention and disposal of electronic records by confirming that "We adhere to specifications issued by the National Archives on acquiring and developing electronic records systems."

Further to this statement, Informant 2 added that, "We seek advice from the archivists who are the subject matter experts on records management." When questions were asked to ascertain whether their records formats could be ingested into the archival management system for permanent preservation, Informant 3 said that "there are policies and guidelines from the National Archives on the transfer of electronic records from public offices". Although data from all five Informants imply that the IT personnel in the IT department of their organizations are responsible for the preservation of electronic records, they also discharged routine activities such as making backups and ensuring migration. Significant involvement of the archivists in the preservation aspects of electronic records is also evident through data provided by Informant 4. He said, " ... we attended periodical meetings of Government IT and Internet Committee (GITIC) on the issues of permanent preservation of records for archival purposes which are now actively pursued by the archival authority". On the other hand Informant 5, when questioned about how the systems ensure that the records are retrievable, accessible and readable by researchers in the future, he said repeatedly, "technically all organizations have to plan from now onwards, and the EG systems have taken this into consideration". In addition, Informant 5 explained his job in making sure data and records are managed and preserved in accordance to Electronic Government Information Technology (EGIT) policy guidelines and standards. Even though Informant 5 admitted that his organization's electronic records are yet to be transferred to the National Archives but he strongly believed that preservation measures were being implemented in his organization. Forcefully and convincingly he said, "For many years our department has been careful to secure and protect the life-long electronic records that citizens demand. Since the 80s we have started collecting the data and records in

electronic format and we have migrated data bases to quite a number of environments. All government departments at that time used open systems so that data bases can be migrated without any problems". Giving his views on the same subject, Informant 1 asserted, "Yes, we are exposed to the weaknesses of systems, obsolescence etc. with that, we must make aware of it at a very early stage. When we tried to develop a system, we always take into account how to migrate the legacy systems to the new systems".

Table 2: Data on shared and individual responsibilities on electronic records derived from the interviews

| Informant 1 | Informant 2 | Informant 3 | Informant 4 | Informant 5 |
|---|---|--|---|--|
| IT managers, IT experts, national archivists, consultants, administrators from leading policy making agencies such as the Treasury, MAMPU, Public Services Department and IT consultants are involved in the planning, design and development of the EG systems. | IT managers, IT experts, legal advisors and security officers from the Prime Minister's Department, administrators from the Public Services Department and IT consultants are involved in the planning and development of the EG systems. | IT managers, IT experts, security officers, administrators from MAMPU, Public Services Department and IT consultants are involved in the design and development of the EG systems. | IT managers, private consultants and administrators from leading policy making agencies such as the Treasury, MAMPU, Public Services Department are involved in the planning of the EG systems. | IT managers, IT experts, security officers, manager of legal services, officers from Auditor's Department, and administrators from Ministry of Finance, MAMPU, Public Services Departments and other Government authority are involved in the development of the EG systems. |
| The records managers are involved in other related areas which are different from that of the IT personnel such as work concerning the formulation of electronic records programs in their respective organizations; and establishing links with the National Archives pertaining to policies, standards, procedures and controls for managing departmental records. Yes, we are open to the weaknesses of systems, obsolescence etc. with that, we must make aware of it at a very early stage. When we tried to develop a system, we always take into account how to migrate the legacy systems to the new systems". | We seek advice from the archivists who are the subject matter experts on records management. | Electronic records could be ingested into the archival management system for permanent preservation as there are policies and guidelines from the National Archives on the transfer of electronic records from public offices. There are policies and guidelines from the National Archives on the transfer of electronic records from public offices. | We attended periodical meetings of GITIC on the issues of permanent preservation of records for archival purposes which are now actively pursued by the archival authority. | Records are managed and preserved in accordance to EGIT policy guidelines and standards. For many years our department has been careful to secure and protect the life-long electronic records that citizens demand. Since the 80s we have started collecting the data and records in electronic format and we have migrated data bases to quite a number of environments. All government departments used open systems so that data bases can be migrated without any problems. |

4.3 Training needs on electronic records

The EG provided common rationale for IT personnel and records practitioners to be trained in ERM. All the 5 Informants cited EG as the main driver for their education and training needs. Informant 1 said, "... for the maintenance of legacy systems, nothing much was said on the necessity of training for these records, but now since the EG systems are running, training is important for the purpose of protecting government's vital data and information". On the other hand, Informant 2 stressed his belief on training by saying, "... to maintain these records, the evidence on the use, retrieve and access that differ from what we are accustomed to... training on how to manage these records is important and to be given priority". Likewise the data suggests that the categorization of IT personnel in accordance to their roles and responsibilities would enable them to be trained in ERM in their respective areas of concern. As suggested by Informant 3, "awareness and training on electronic records should reach different levels of those involved, even in IT work which involved the managers, system analysts, programmers, data base administrators and so on".

When asked what types of training programs suitable for the IT personnel, Informant 3 said, "short briefings for the managers... may be few days coaching by vendors for system analysts and programmers". However, when the same question was asked to Informant 4, he believed that, "Few days' practical training with experts for system analysts and data base administrators" was sufficient. The IT leaders interviewed strongly believed that their personnel should have the related knowledge and skills on electronic records specifically on the issue of migration. In this context, Informant 5 said that, "Sometimes we forget about the migration aspect. When we buy a new system suddenly the old ones cannot be used. The process of migration is a prime consideration". To ascertain the types of specialised skills that the IT personnel should possess in managing electronic records, all Informants agreed that the skills required in designing system that should conform to ERM requirements, filing records in systems, records creation, metadata, digitization, managing email, migration and digital preservation. It is not surprising that none of the Informants mentioned subjects on appraisal, retention and disposition of electronic records to be included in the specialised skills needed by the IT personnel, as these are not the IT leaders' area of expertise. However, the IT leaders are concerned with digital preservation, metadata and migration as these are closely link to systems development and maintenance.

Table 3: Data on training needs on electronic records derived from the interviews

| Informant 1 | Informant 2 | Informant 3 | Informant 4 | Informant 5 |
|---|--|---|--|---|
| For the maintenance of legacy systems, nothing much was said on the necessity of training for these records, but now since the EG systems are running, training is important for the purpose of protecting government's vital data and information. | To maintain these records, the evidence on the use, retrieve and access that differ from what we are accustomed to... training on how to manage these records is important and to be given priority especially on the preservation aspects that conform to records management standards. | Awareness and training on electronic records should reach different levels of those involved, even in IT work which involved the managers, system analysts, programmers, data base administrators and so on. Short briefings for the managers... may be few days coaching by vendors for system analysts and programmers. These should include training on the preservation of records. | Few days' practical training with experts for system analysts and data base administrators was sufficient. They should also be given training on the creation and preservation of records. | Training on the specific skills involved designing system that should conform to ERM requirements, filing records in systems, records creation, metadata, digitization, managing email, migration and digital preservation. |

5. Discussion of findings

The emphasis on the protection of government information may be taken as an indicator of the importance given to ERM by the IT leaders and authorities such as MAMPU, the National Archives of Malaysia and related

ministries. It is evident that the IT leaders' roles and responsibilities who are involved in this study are influenced by three major factors: National approach in protecting the security of Government information, the need for shared responsibilities and the need for training on electronic records. The EG emerged as a common context/driver for the IT leaders and the national archivists in implementing their individual and shared responsibilities over electronic records. When the roles and responsibilities of the IT leaders are placed in the context of the objectives of this study, it is evident that the IT leaders to a certain extent have fulfilled their responsibilities as suggested by Roper et.al. (1999). Data from interviews with 5 IT leaders revealed their actual work situation in their respective organizations. The data suggests that the IT leaders regarded ERM to be an inevitable extension of their existing jobs. This is evident as there are strong similarities between data gathered from the 5 Informants on their responsibilities pertaining to incorporating recordkeeping policies, practices and requirements into information policies and practices; managing the migration of electronic records through changes in software, hardware and storage media; implementing standards, procedures and controls on the exchange or sharing of information between departments across network through the EG systems; and ensuring the effective retention and disposal of electronic records in accordance with approved standards and procedures. The existence of shared activities among IT leaders and national archivists is evident in four areas of electronic records – responsibility for the records, administrative overseeing of electronic records, issuance of electronic records policy and implementation of electronic records work practices in accordance to standard practices. Although there is limited evidence on the involvement of organizational records managers in the context of shared responsibilities with the IT leaders and personnel over electronic records (among the responsibilities suggested by Roper et.al.), the data suggested that the IT leaders believed that IT personnel need related training in order to perform their daily tasks on ERM.

6. Conclusion

The Government of Malaysia has developed comprehensive strategic plans, associated tools and techniques for the management of electronic records in achieving vision 2020. The development and oversight of agency records management initiatives is being coordinated by MAMPU of the Prime Minister's Department, in collaboration with the National Archives of Malaysia. Implementation wise, the qualitative data gathered in this study suggested that fundamental issues are emerging in harnessing Malaysian government agencies towards the preservation of electronic records with significant involvement of IT leaders and their personnel. Through the findings of this study which consist of the national approach in protecting the security of Government information, IT personnel's individual and the shared responsibilities with national archivists and their belief on the training needs on electronic records, the IT leaders have made an impact on the management and preservation of electronic records as organizational memory and collectively as memory of the nation.

References

- Aliza Ismail (2009). Assessing the practice of trusted electronic records management in Malaysian Government-Controlled Companies. *PhD thesis*. Faculty of Information Management, Universiti Teknologi MARA (UiTM), Malaysia.
- Alwi Mohd. Yunus (2013). Development of a model for preservation of primary research data and records for research in digital format. *PhD thesis*. Faculty of Information Management, Universiti Teknologi MARA (UiTM), Malaysia.
- Asmadi Mohamed Ghazali (2011). Development of competencies profile for records managers in the Malaysian federal government. *PhD thesis*. Faculty of Information Management, Universiti Teknologi MARA (UiTM), Malaysia.
- Azman Mat Isa (2009). Records management and the accountability of governance. *PhD thesis*. University of Glasgow, United Kingdom.
- Duranti, L. (2011). "The InterPARES General Studies: Independent, Mixed Methodology Research in Support of the Case Studies". Paper presented at the *InterPARES 3 International Symposium*, Kuching, Malaysia, 16 June.
- Fernandez, M.S. (2009). "The Preservation of Vital e-Records in Universities". Paper presented at the *InterPARES 3 International Symposium*, Seoul, Korea, 4 June.
- Guercio, M. (2009). "Keeping and Preserving E-mail." Paper presented at the *InterPARES 3 International Symposium*, Seoul, Korea, 4 June.
- Irwan Kamaruddin Abdul Kadir (2013). Electronic records management practices at the Malaysian Federal Ministries: Exploring the fundamental organizational and professional issues. *PhD thesis*. Faculty of Information Management, Universiti Teknologi MARA (UiTM), Malaysia.
- ISO/TR13028:2010 -*Information and Documentation – Implementation Guidelines for Digitization of Records*.
- ISO15489: 2001-*Information and Documentation – Records Management - Part 1: General and Part 2: Guidelines*.
- ISO16175-1:2010 –*Information and Documentation-Principles and Functional Requirements for Records in Electronic Office Environments-Part 1: Overview and Statement of Principles*.
- ISO16175-1:2010 –*Information and Documentation-Principles and Functional Requirements for Records in Electronic Office Environments-Part 2: Guidelines and Functional Requirements for Digital Records Management Systems*.

- ISO16175-1:2010 –*Information and Documentation-Principles and Functional Requirements for Records in Electronic Office Environments-Part 3: Guidelines and Functional Requirements for Records in Business Systems*.
- Lewin, C. (2005). "Elementary Quantitative Method". In B. Somekh & C. Lewin (Eds.). *Research Methods in Social Sciences* (pp.207-214). London: SAGE Publication Ltd.
- McDonald, J. (2003). *Report on the Working Meeting between the International Records Management Trust Team (IRMT) of Advisers and the Electronic Records Team*. IRMT (Unpublished).
- McLeod, J., Hare, C. & Johare, R. (2004). "Education and training for records management in the electronic environment – the (re)search for an appropriate model", *Information Research*, 9(3) paper 179 [Available at <http://InformationR.net/ie/9-3/paper179.html>].
- Merriam, S. B.(2009). *Qualitative Research: A Guide to Design and Implementation*. San Francisco: Jossey-Bass.
- Millar, L. (Ed.) (2009). *Managing the Creation, Use and Disposal of Electronic Records*. London: International Records Management Trust.
- Nurrusobah Hussin (2013). Development of recordkeeping functional requirements for electronic records in the Superior Court of Malaysia. *PhD thesis*. Faculty of Information Management, Universiti Teknologi MARA (UiTM), Malaysia.
- Park, E. (2011). "Case 02: Certified e-Document Authority". Paper presented at the *InterPARES 3 International Symposium*, Kuching, Malaysia, 16 June.
- Roper, M & Millar, L. (Eds.) (1999). *Managing Electronic Records*. London: International Records Management Trust.
- Roper, M & Millar, L. (Eds.) (2009). *Records Management Glossary of Terms*. London: International Records Management Trust.
- Rusnah Johare (2006). The development of a model for education and training in electronic records management. *PhD thesis*. School of Computing, Engineering & Information Sciences, Northumbria University, Newcastle, United Kingdom.
- Rusnah Johare & Mohamad Noorman Masrek (2011). Malaysian archival heritage at risk? A survey of archivists' knowledge and skills in managing electronic records. *Library Review*, Vol. 60 No.8. pp.685-711.
- Saunders, M., Lewis, P. & Thornhill, A.(2012). *Research methods for Business Students*. London: Pearson Education Limited.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.