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Abstract

Sad stories about EDRMS implementation failure are often told among records managers. An EDRMS project, like any other IS implementation, will need key ingredients to be successful. This paper reveals these components of a successful EDRMS implementation from the findings of a Web-based survey on the perspectives of records managers in the three levels of the Australian public sector. It also uncovers these organisations' attitudes towards digital recordkeeping initiatives and an insight on their EDRMS projects.

Keywords

EDRMS implementation, electronic records, success factors, Web-based surveys

INTRODUCTION

The media regularly report incidents relating to the importance of effective recordkeeping practice, failures in which frequently have disastrous outcomes. For example, a German archive building in Cologne collapsed and buried about 65,000 original documents including "*manuscripts by Communist philosophers Karl Marx and Friedrich Engels and items left to the city by figures such as the Nobel Prize-winning author, Heinrich Boell*" (BBC News 2009). In the US, Morgan Stanley & Co. was forced to pay out US$12.5 million because it failed to provide documents (emails) to arbitration claimants (Financial Industry Regulatory Authority 2007). More recently, "*the loss of files and key staff*" were cited as the reason for a US$69m delay in refurbishing Trident nuclear missiles (Sunday Herald 2009). In the Australian State of New South Wales, a series of human errors relating to "*inadequate reporting practices*" led to the collapse of part of the Pacific Highway with consequent loss of life (Collins 2009). A report into the relevant local council's records and asset management system revealed that: about 800,000 electronic documents were stored not in the central database system but rather on individual computer drives; the council's data management was reliant on employee awareness of record compliance requirements; and emails were not entered into the electronic records system because they were not considered official records (Collins 2009).

These disturbing accounts clearly demonstrate the critical need for effective electronic recordkeeping systems that are able to effectively manage both born-digital and made-digital records. Given the on-going confusion concerning the naming of corporate records management systems (Nguyen et al. 2007), we will use the term EDRMS in this paper to indicate corporate electronic records management systems which provide a complete solution for organisational records management. Although there are a number of alternative solutions for electronic recordkeeping such as ERMS (Electronic Records Management Systems) and EDMS (Electronic Document Management Systems), Electronic Document and Records Management Systems (EDRMS) are generally cited as the most effective enterprisewide solution (Benfell 2002).

This paper focuses on the EDRMS implementation activities of Australian public sector agencies at all levels (Federal, State and local), which have been required to implement EDRMS solutions to ensure legal compliance with records management principles (Nguyen et al. 2007). The South Australian government under the Across-Government Records Management Strategy requires all government agencies to implement EDRMS by 2009 (State Records of South Australia 2007). The creation of a whole new recordkeeping system over the next few

years is one of the Commonwealth Government's goals, as identified by the National Archives of Australia (National Archives of Australia 2007).

The paper reports on the initial results of a survey into the implementation of EDRMS within the Australian public sector. We start by providing a theoretical framework for the project, after which we briefly discuss the literature which formed the background for the survey – in particular, EDRMS success factors and the motivation for EDRMS implementation, following this with a description of the research approach taken for the survey. The next section reports and discusses the research findings and the paper concludes with a summary and directions for future research.

THEORETICAL FRAMEWORK

The survey reported in this paper is an extension of an earlier Web-based survey, reported in Nguyen et al. (2008a) and forms a component of a larger research project, designed to develop a framework for the effective uptake of EDRMS by the Australian public sector. The combined goal of these two surveys is to answer the exploratory research question: "What is the current level of EDRMS implementation in the Australian public sector?" At the time this question was originally asked, there was no available answer. Although many State archive authorities have conducted surveys into Records Management generally (State Records of New South Wales 2000; State Records of South Australia 1998), none of these surveys has investigated the current level of EDRMS implementation nationwide.

For the overarching research project, an extensive literature review was conducted in the areas of EDRMS implementation, Enterprise Resources Planning implementation (Nguyen et al. 2008b) and the adaptation of the appropriate theories including: Change Management theory (Lewin and Cartwright 1951), Diffusion of Innovation theory (Rogers 1995) and Technology Acceptance Model (Davis 1993) to provide the foundation for the present project. This led to the development of a first-cut theoretical framework (Figure 1).
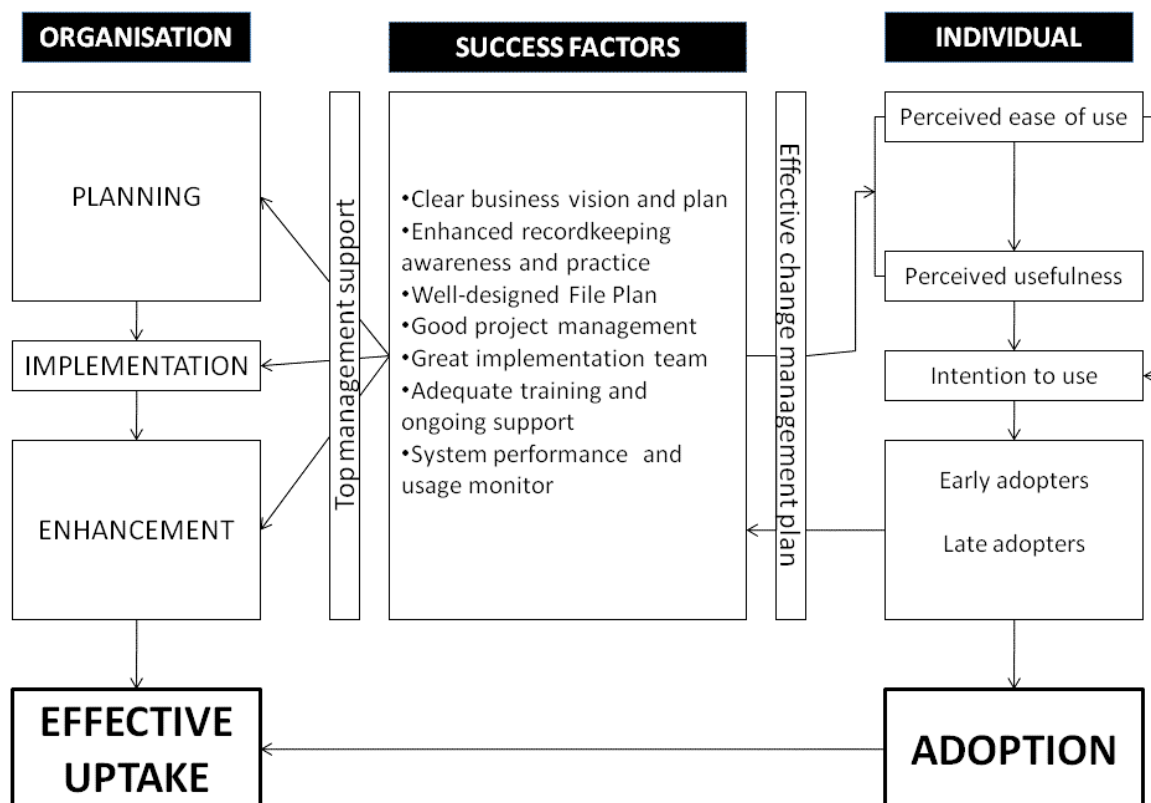

Figure 1: Preliminary Research Framework for Public Sector EDRMS Adoption

As Figure 1 shows, the effective uptake of EDRMS implementation comprises two elements: 'organisation' and 'individual'. Effective uptake of EDRMS is the ultimate goal of this model and occurs when an organisationally successful implementation project is built on widespread staff adoption of the new system. The nine success

factors shown in the centre panel of the model are the determinants for two elements. The model focuses particularly on the Change Management aspect of an EDRMS implementation project.

From the organisational perspective, an EDRMS project will go through three phases: planning ➔ implementation ➔ enhancement. This phased project model is adapted from the model of ERP implementation developed by Parr and Shanks (2000), which provides guidance for successful ERP project implementation. These phases also correspond to the three phases in Lewin's change model of unfreezing-change-re-freezing, in which the planning phase creates the awareness and impetus for the change, the implementation phase imposes the change; and the enhancement phase makes the change into a habit.

There are nine critical success factors for an EDRMS project, seven of which are similar to ERP implementation and two of which are specific to records management (a well-designed File Plan and enhanced recordkeeping practice and awareness). More information about how we compiled this list of success factors can be found in Nguyen et al. (2008b). In the context of this model, we suggest that the factor 'Top management support' is especially important for successful implementation of the project, which the factor 'Effective change management plan is particularly important for a high rate of individual adoption.

Building on the TAM (Davis 1993) framework, our proposed model shows that individual adoption is influenced by individuals' intention to use the new EDRMS which, in turn, is affected by that system's perceived ease of use and perceived usefulness. Users' perception will be positively influenced if an effective change management plan which must be supported by an effective communication strategy. Rogers (1995) classified adopters into five categories: innovators, early adopters, early majority, late majority and laggards. We group the first two categories into 'early adopters' and the remaining three categories into 'late adopters'. The identification of these two types of adopters through the system usage monitoring will identify champions and power users as change agents and provide in-time support to those in need.

This theoretical framework formed the basis for our two surveys of Australian public sector EDRMS users. The purpose of the present survey was: to collect in-depth empirical data about the current situation of EDRMS implementation in the public sector; to validate the presence of the success factors in the initial theoretical framework; and to identify possible reasons for non-adoption of EDRMS by government agencies. To achieve this goal, the 'Success Factors' section of our model provided the foundation for the survey questionnaire. Due to the limited space available in this paper, only the major literature relating to EDRMS success factors is presented below. A more detailed discussion can be found in Nguyen et al. (2008b).

EDRMS success factors

The limited literature on EDRMS case studies indicates that top management support, good recordkeeping awareness and practice, early development of Business Classification Schemes (File Plan/Thesaurus), adequate and on-going training and support; and well-prepared change management strategies are the keys to success in developing enterprisewide electronic records management solutions.

Managerial support and commitment is vital for the successful completion of an EDRMS project (Ellis 2005; Fuzeau 2005). The involvement of senior management will ensure funding for the project and enhance employee awareness of the importance of EDRMS adoption.

A good records management culture needs to be in place before the implementation commences. Staff should be made aware of the importance of recordkeeping and their recordkeeping practice should be enhanced to accommodate the changes brought about by the new technology (Maguire 2005). Technology alone does not improve an organisation's recordkeeping culture – this comes from the employees' awareness, attitudes and practice.

The development of a Business Classification Scheme (also known as a File Plan or Thesaurus) before EDRMS implementation is crucial (Northern Ireland Civil Service 2006; Williams 2005) to ensure staff understand the association between records and to assist them in gaining familiarity with record locations.

EDRMS is associated with 'change' (Jeffrey-Cook 2005): change in terms of organisational recordkeeping culture, as well as in terms of individual working habits and responsibilities. Getting the system into place is (comparatively) easy, but ensuring that employees use it effectively is very difficult. As with any other enterprisewide Information Systems implementation, user resistance is the major hurdle for EDRMS uptake (Miller 2005). Traditionally, records management is often considered to be the boring responsibility of administrative or records staff – but with the implementation of an EDRMS, records management suddenly becomes the responsibility of every employee in the organisation! An all-encompassing communication strategy which involves staff from the very first stage of the project to the very end of the implementation is the core of a successful EDRMS change management plan (Wilkins et al. 2007).

Adequate and on-going training and support ensures staff awareness and maintains ongoing staff commitment to the system (Maguire 2005) – the ultimate goal of such a project. According to an IS manager responsible for an EDRMS project, EDRMS projects cannot be considered complete for at least 5 years after the initial implementation (Wilkins et al. 2007).

These issues made it clear that unless Australian public sector agencies were incorporating these factors into their enforced EDRMS implementations, there was a real danger that many of these systems would not be used at all – or would be used very much less than effectively.

Motivation for EDRMS

Compliance is the major reason given for the adoption of EDRMS projects. More and more regulations, Acts of parliament and statutes have been passed (and extended) by governments around the world to ensure the provision of accurate corporate and governmental records as and when needed. These laws include the US Sarbanes-Oxley Act 2002 (possibly the best-known of all laws relating to records provision) and the UK Anti-Terrorism, Crime and Security Act 2001. The public sector in Australia is subject to strict requirements relating to the provision of information under the Freedom of Information Act (National Archives of Australia 2008)[4].

In additional to legislative requirements, the increasing move from paper-based to digital records (whether made-digital or born-digital) provides a further impetus for the growth in uptake of corporate EDRMS solutions, which not only enable effective management of the entire range of record types, but also offer protection to organisational records and cultural heritage against natural disasters such as the one reported in the German archive building collapse, as well as less obviously natural catastrophes such as fires. In addition, EDRMS offers organisations (both private and public) significant protection against fraud, providing enhanced business efficiency and productivity for the private sector; and accountability and transparency for the public sector (Johnston and Bowen 2005).

RESEARCH METHOD AND DATA COLLECTION PROCEDURE

In attempting 'to understand the current level of EDRMS implementation across the Australian public sector', we included a request for volunteers in our original survey (already reported in Nguyen et al. (2008a)), which focused on identifying those public sector agencies active in (or moving toward) EDRMS implementation. This provided us with a self-selected sample (Walsh et al. 1992), limiting the generalisability of our findings but ensuring we would have enthusiastic (and relevant) respondents.

A Web-based survey was, as in the original survey, once again selected as the most appropriate means of answering this exploratory research question, because it is the fastest and cheapest way of reaching a large, geographically scattered population. A detailed justification for this choice of research method was given in Nguyen et al. (2008a) and is therefore not repeated here in the interests of brevity, but it is clearly relevant to mention the importance of rapid and consistent access to a large group of disparate respondents at varying levels of government.

This survey response came from, as mentioned, a self-selected sample. The initial (very brief) survey reported in Nguyen et al. (2008a) was sent to 1,289 records managers in all identifiable public organisations at all three levels of government (specifically: 568 local government councils, 687 State government organisations and 34 Federal government entities). In addition to the main purpose of gathering broad data about the overall implementation status of EDRMS in the Australian public sector, that initial survey also served as a means of recruiting participants for the second survey, asking whether participants would be willing to contribute to subsequent research activities (the present survey and a series of individual organisational case studies). Of the 385 responses received from the initial survey, 189 respondents expressed interest in participating in further research. The present survey was therefore sent to all 189 volunteers, from which 155 usable responses were received – translating to a very satisfactory response rate of 82%.

The questionnaire was made up of 21 closed and open-ended questions, designed to identify EDRMS implementation in practice, as well as success factors and barriers to effective EDRMS uptake. The first-cut theoretical framework developed from the review of current literature in the area of information systems implementation in general and electronic records management systems in particular (Figure 1) was used as the foundation for the creation of the survey questionnaire (see "Theoretical framework" section).

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[4] A considerably more detailed list of these Acts and regulations can be found in Nguyen et al. (2007)

Data collection and analysis

The questionnaire was made available online for a period of two months (mid-April to mid-June 2008). Surveymonkey, a popular professional survey tool which was also used in the initial survey, formed the data collection method for this survey. The initial invitation was supplemented by extensive email and telephonic follow-ups to increase the response rate. For the purpose of this initial presentation, simple descriptive statistical analysis was performed on the collected data, so that the findings reported in this paper are based on the number of responses for each question. The responses in the open-ended questions are either categorised and grouped with similar answers, or used qualitatively to provide detailed insights into the respondents' organisations.

FINDINGS AND DISCUSSIONS

Demographic characteristics

In demographic terms, just over half the respondents were local government agencies (specifically, local councils), one third were State government agencies and the remainder (a little over 10%) were Federal government agencies. Responding organisations were predominantly located in New South Wales, Victoria, South Australia and Queensland (75%). These demographic characteristics are similar to those of the most recent survey conducted by the RMAA – the Records Management Association of Australasia – in 2008 (Brogan and Roberts 2009) where 630 responses were received.

Local government accounted for the largest cohort of respondents, followed by State and then Federal government. The greatest number of respondents came from New South Wales, Queensland and Victoria. Although the RMAA survey was conducted via a listserv comprising both international and domestic members and both private and public sector respondents, the similarity of the demographic features in both surveys suggests that our survey covers a representative sample of the national records management population.

76% of responses came from medium (80-249 full time staff - FTE), large (250-1000 FTE) and very large (>1000 FTE) organisations. The remaining 24% came from very small (<20 FTE) and small (20-79 FTE) organisations. The survey findings are thus likely to be more accurate in relation to larger organisations.

Records management responsibility was most frequently found in a separate records management unit (50%), or an administration unit (30%). The IT group had responsibility for records management in a further 13% of responding organisations while, in the remaining 7%, some other (unspecified) part of the organisation assumed this responsibility. Although it is not possible to say whether these percentages are typical of all public sector agencies, the fact that 80% of respondents identified records management as an independent function suggests a growing awareness of the importance of this function.

Attitudes to digital recordkeeping initiatives
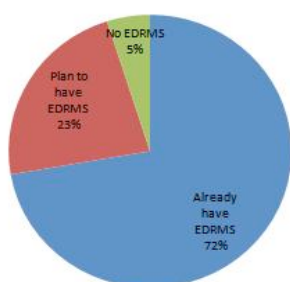

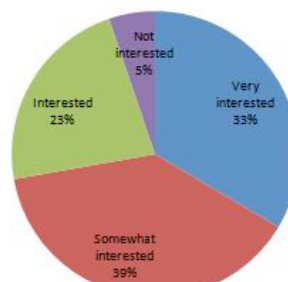Figure 2. EDRMS implementation   Figure 3. Top management support

As Figure 2 shows, 72% of respondents already have an EDRMS in place (not really surprising, given that the respondent sample was self-selected). State and Federal government agencies accounted for most of the 5% organisations which have no plans to implement an electronic recordkeeping system – only one organisation in this group was from the local government sector. Agencies in the Northern Territory, the Australian Capital Territory and Federal agencies had the lowest number of EDRMS implementations.

Half of the 5% of respondents whose top management was not interested in EDRMS (see Figure 3) did not have an EDRMS in place – and the reason for this non-adoption was identified as "*not considered a priority by top management*". Given the importance of top management support for major enterprisewide information systems

(Davenport 1998; Nah et al. 2003), it was reassuring to see that the majority of respondents indicated their top management were interested in digital recordkeeping.

Further research is required to understand why there are still a number of agencies where top management does not see records management as a priority, however. Is it because they do not see the need for electronic records, or are the reasons associated with issues such as cost or implementation complexities? Some individual comments might help to shed a little light on this issue. For example: "*Management [is] not committed to EDRMS due to significant costs to implement and cannot see the need to incur those costs if the 'paper based' system works to best practice level/s*". Then there is the organisation whose changing organisational structure has played a role in its attitude to EDRMS implementation: "*In the meantime, to set up an electronic record keeping system does not make economic sense unless it is one that is likely to be used in the amalgamated organisation*".

Within the majority of organisations who already had (or planned to have) EDRMS, 92% were using or will deploy this system organisation-wide, with only 8% limiting its use to specific workgroups. EDRMS is intended to be a corporate solution for electronic records management and hence should be implemented organisation-wide. Clearly, the majority of responding public sector agencies did indeed take this approach, although a small proportion limited their implementation to certain business units. One might ask: "If EDRMS is only used locally, is it just another shared drive?" Some possible reasons for this latter approach emerged from individual comments: "*Not a critical project to complete. Partial implementation give(s) the Agency compliance*" and "*Some units don't want to play*".

Concerning the motive for implementing EDRMS, legal compliance accounted for 64% and a voluntary decision on the part of the organisation for the remaining 36%. This finding is not surprising, both because public sector agencies are legally bound to implement adequate and proper records management; and because of the self-selecting nature of the survey sample. Brogan and Roberts (2009) also reported that compliance was the explanation for Records and Information Management technology adoption in 51% of the RMAA respondents and that their response was biased towards the government sector.

Interestingly, further analysis showed that the majority of organisations which had already implemented an electronic recordkeeping system had done so compulsorily (69%), while there seems to be less pressure on those planning a future implementation (of the 23% of respondents still planning an implementation, motivation was split 50-50 between compliance and voluntariness). One comment highlights this increasingly strategic attitude towards electronic records management: "*while our original reasons for implementation were driven by a need for compliance … increasingly the further development of our EDRMS is being driven by the benefits it can bring to business*". It is possible that organisations are beginning to see that "*from a business perspective, information needs to be classified to corporate standards so that information is more accessible, controlled and re-usable*" (Waldron 2008 p.102).

In terms of recordkeeping awareness and practices, 74% of responding organisations raised employee awareness by means of communication strategies both before and during the implementation process, while another 15% built up their recordkeeping culture either before the project's commencement, during implementation, or as an ongoing process after completion. 7% of the respondents did not indicate specific timing for their awareness and practices enhancement. The remaining 4% had no strategy for improving their recordkeeping culture.

Insights into EDRMS implementation in practice

When asked about the official electronic recordkeeping system currently used in the organisation, EDRMS, EDMS and ERMS were the most popular solutions (93% of respondents). When asked to provide a start and completion date for their electronic recordkeeping system implementation project, approximately one third of respondents indicated their projects were not yet complete (no completion date). 13 projects (out of 66) have been underway since the late 90s, suggesting that implementing an EDRMS can be a very lengthy process. In those projects where implementation was concluded, the majority (68%) took 1 year to complete, while the remaining third had taken somewhere between 2-6 years. One implementation took 11 years and, even over this long period, the system had only been adopted by 50%-75% of potential users.

Some slightly inconclusive results (only 12 agencies responded to this question) suggest that the average length of electronic recordkeeping system use was 4.5 years, although the 11-year project may well have affected this figure. Further analysis suggested that user uptake achieved its highest proportion (75%-100% of employees using the system) in those implementations which had been in use for 4 years (63%, N=8). This result ties in with a remark made by an IT manager who was involved in a successful EDRMS implementation stating "*the adoption and organisation of an EDRMS is I believe a minimum five years process*" (Wilkins et al. 2007).

Overall, the responses indicate an increasing rate of user uptake (the proportion of actual users in comparison to potential users). Further analysis showed that organisations adopting EDRMS for compliance reasons had a significantly higher rate of uptake (almost 3 times) than those doing so voluntarily. This apparently contradictory finding might possibly be explained by the following comment: "*Still not everyone uses the new version just a few, some said we are too busy, others said **that is not part of my job description** or I am happy with my own system*". The detailed case studies which are underway at the time of writing will hopefully provide a more reliable explanation of uptake motivations and rationales.

Consistent with the literature on EDRMS benefits, the majority of respondents (95%) had positively assessed their electronic recordkeeping systems, in descending order as follows:

- Increase efficiency in records management operations (27%)
- Improve business processes (19%)
- Simple to use (15%)
- Users are satisfied with the system (12%)
- Alignment with organisation's business strategies (11%)
- Top management are satisfied with the system (11%)

A very small number of respondents (1.4%) expressed a dislike of the system because of a need to improve its interface for general users, or simply because "*no-one likes it*". One respondent was ambivalent about the system: "*whilst we have seen [an] increase in efficiency in records management, end users have felt frustrated at some of the 'quirks' of the system*".

Cho (2007) reported that support from top management for IS implementation positively affects user satisfaction and this survey indicated that 24 of 31 respondents whose top management was satisfied with the system also had users who were satisfied with the system. Could top management's positive attitude towards the system also affect users' perceptions?

Northern Ireland Civil Service (2006) identified the importance of developing a File Plan (also known as a Business Classification Scheme or Thesaurus) prior to the implementation of an enterprisewide electronic recordkeeping system, because staff must know where to file their records once the system is up and running (Williams 2005). We were interested in discovering whether Australian public sector organisations had taken this path in implementing their solutions. We found 62% of respondents had developed a File Plan prior to the implementation of EDRMS and another 13% had developed a File Plan during the implementation process. In only three organisations, however, was the File Plan constantly reviewed and updated. 22% of respondents did not know when their File Plan had been created, although this figure might be misleading, because a number of respondents had been employed after the EDRMS was implemented. This lack of clarity as to when File Plans were developed requires further research before any valid conclusions can be drawn with regard to the time of File Plan development and effective uptake of the system.

Training has been identified by Amoako-Gyampah and Salam (2004) as a major factor affecting end-users' perception and uptake of ERP systems . We therefore asked our respondents about their training strategies and discovered that the three most popular approaches included: on-going refresher courses during the implementation (37%), induction programs (35%); and one-on-one sessions tailored for specific roles and job responsibilities (25%). A number of specific training activities were also identified by respondents, including: '*Cheat cards*', '*online tutorials*', '*self-paced learning modules progressing from simple to more complex tasks monitored by the RK (recordkeeping) team*', and '*department-specific champions are responsible for delivering training to staff in their sections*'.

Murphy (2008) believed the ideal EDRMS implementation team would consist of ten people with different roles and skills – these roles include: IT specialist, records manager, change management specialist, trainer and workplace assessor. We wanted to see how far this vision matched the reality. In practice, the dominant participants in the team included: records managers (35%), IT staff (28%), records creators (19%), senior management (15%); and others (3%) – including consultants or implementation specialists. Further analysis shows that the combination of IT and records managers as core team members increased the chances of higher uptake levels. This finding agrees with the lessons learnt from a successful EDRMS implementation in the UK, where "*IT and records management functions work very closely with each other*" (Williams 2005).

Success factors and barriers to an effective EDRMS implementation

Tables 1 and 2 summarise the success factors and barriers for an effective EDRMS implementation in descending order as identified by the survey respondents, with each factor's frequency count (F) to enable the validation of the factor ranking.

<table>
<tr><td colspan="2" align="center">Table 1. Success factors</td><td colspan="2" align="center">Table 2. Barriers</td></tr>
<tr><td>Factors</td><td>F</td><td>Barriers</td><td>F</td></tr>
<tr><td>Adequate and on-going training and support</td><td>135</td><td>User resistance</td><td>93</td></tr>
<tr><td>Top management support</td><td>134</td><td>Familiarity and comfort with paper</td><td>90</td></tr>
<tr><td>Staff recordkeeping awareness and practice</td><td>105</td><td>Poor recordkeeping practices</td><td>66</td></tr>
<tr><td>Excellent strategies of change management</td><td>102</td><td>Lack of top management support</td><td>66</td></tr>
<tr><td>Good project management</td><td>96</td><td>New culture of "sharing information" such as emails with others</td><td>58</td></tr>
<tr><td>Motivated great implementation team</td><td>85</td><td></td><td></td></tr>
<tr><td>Clear business vision and plan</td><td>79</td><td>Bad system design</td><td>39</td></tr>
<tr><td>System performance monitor and management</td><td>78</td><td>Structure of organisations</td><td>27</td></tr>
<tr><td>Well-prepared File plan</td><td>71</td><td>Other</td><td>16</td></tr>
<tr><td>Others</td><td>16</td><td>Lack of funding</td><td>14</td></tr>
</table>

Overall, the findings conform to the literature on EDRMS success factors. The table shows the frequent appearance of all nine success factors in our first-cut framework. Our survey findings also indicate the perceived order of importance from the records managers' point of view.

In Nguyen et al. (2008b) we showed that it is possible to exploit the available literature on Enterprise Resource Planning (ERP) implementation and apply it to the EDRMS domain. Each of these success factors will be discussed in more detail in the context of the literature on EDRMS and ERP implementation.

It is not surprising to see User Training and Support and Top Management Support included in the most important factors, as user buy-in is the ultimate goal of EDRMS projects. Clearly, training and support is not sufficient for staff buy-in (Maguire 2005), but requires top management support as well. Top management support ensures that users and record managers have adequate time allocated for training and maintenance activities relating to EDRMS (Garrido 2008); will raise employee awareness of the EDRMS project; and in the ideal case, their daily use of EDRMS will be the ultimate showcase to ensure staff buy-in. A recent survey in Iceland reported a similar result stating "*managerial support, co-operation of the records management and IT functions in the system development, and in the training of the users in both records management and the system*" (Gunnlaugsdottir 2008).

Employee recordkeeping awareness and practice, and excellent Change and Project Management come in second place. This finding points to the importance of records management as an essential skill that staff should acquire before the system is implemented. "*If records management discipline is not already present, bad habits tend to be quickly replicated in the new environment*" (Di Biagio and Ibiricu 2008). Maguire (2005) also made clear that no electronic records system could automatically bring good recordkeeping practices into the workplace: they must be embedded in the culture beforehand. The importance of proper recordkeeping and its legal and business implications should be emphasised to staff; and the view that records management is an administrative chore should be altered. Once awareness and practice in recordkeeping is improved, user resistance will be less of an issue as the Technology Acceptance Model (Davis 1993) has shown: perceived usefulness and ease of use will lead to an intention to use.

Change management has always been mentioned as the key to success for EDRMS implementation (Di Biagio et al. 2008; Ellis 2005). Allanson and Allen (2007) in a research project conducted at the Queensland Department of Primary Industries and Fisheries recognised that "*technology implementation alone will not achieve the benefits that an EDRMS can bring*": it is essential to maintain the cultural change once this system has been implemented – the human side of technology adoption is essential in ensuring a successful EDRMS implementation. Respondent comments stressed the importance of change management, for example: "*Uptake has been reasonably slow due to a very poor change management program*" or "*The change management issues are by far the most resource intensive*" or "*In respect to this agency implementation, 60% of the implementation effort was 'change management' ... basically if your preparation is correct and reflects user requirements, or a user can relate to the system then there is a better acceptance and tolerance level for change*". Waddell and Sohal (1998) argued that resistance should not be seen as the enemy for change, but a "*constructive tool for change management*". They explained that "*people do not resist change per se, rather they resist the uncertainties and the potential outcomes that change can cause*" and further concluded that regular

communication with staff is the most critical success factors in managing organisational change. This conclusion has also been agreed by Biagio and Ibiricu (2008) who learnt from their EDRMS case study that "*communication and training are powerful tools to help overcome the uncertainties of the transition phase, to help gain confidence in the new working practices and ultimately, counter users' resistance*".

Any project, regardless of its size, will always benefit from using a project methodology. Ellis (2005) noted that "*a more structured framework of governance, budget management and scheduling*" would have been achieved, had a formal project management methodology been used in her case study. Although the lack of a formal project management methodology did not harm Ellis' project, other cases were not so lucky, as noted by Jeffrey-Cook (2005): "[the] *sad fact is most EDRMS projects will fail in the sense they won't be delivered on time, to budget or meet business requirements*". In fact, the results of a records management survey from the ARMA International Conference (Robbins-Gioia LLC 2007) indicated that "*using a structured approach for implementing records management helps to ensure adoption of the plan and an organisation more prepared for tackling major challenges like regulatory compliance*".

The followed success factors of "Business vision and plan", "Motivated great implementation team", and "System performance monitor and management" all relate to a good project management methodology A clear business vision will justify the reasons for purchasing an EDRMS (Middleton 2005) and a detailed business plan of resources, cost, risks, and timeline will help keep the project in focus (Nah and Lau 2001). As discussed earlier, a great implementation team that includes people with complementary skills and expertise will provide a more successful outcome for any major project (Nah et al. 2001). They will regularly report to top management, however, the team should also be trusted to make its own decisions relating to the project implementation – these are important people, in charge of drafting the project plan, providing resources, allocating responsibilities and determining due dates (Umble et al. 2003). System performance monitoring and management are necessary for all IS implementations (Al-Mashari et al. 2003), as this will identify the benefits as well as the weaknesses of the system over time, to enable proper and timely solutions as problems arise. In the case of EDRMS, system usage monitoring is also important to identify different groups of users – earlier adopters, late adopters or laggards, so as to determine appropriate actions: either promoting early users as champions or providing laggards with extra support (Gunnlaugsdottir 2008).

Regarding the final success factor of File Plan (Thesaurus/Business Classification Scheme), the Northern Ireland Civil Service (2006) in their top ten lessons learnt from the three lead implementers highlighted the fact that "*delayed development of the File Plan will have an adverse impact on implementation*", because staff should have enough time to familiarise themselves with record locations before the system is rolled out. "*Strongly believe that a good file system/Business Activity Classification Scheme is the key to success of the EDRM implementation. User Awareness about correct filing and training in the system is also very important having involved with implementation in a large organisation*" confirmed one respondent.

Several additional success factors were added by respondents:

"*Success also strongly depends on the Records Managers/project officer's level of records management expertise. I have seen people trying to implement systems because they think they know a bit about filing and computer systems, but have no idea about standards or best practice for records management.*" "*Incentives for people to change their current behaviour (WIFM)*"

Further analysis was undertaken to discover a possible connection between success factors and the size and level of organisations, as well as the type of system being used:

- Top management: Adequate and ongoing training and support remain the top two success factors irrespective of the size and level of organisations, or the type of system being used

- Organisational size: It is not surprising to see that the bigger the organisation, the more important an effective change management strategy is, while in very small organisations with fewer than 20 employees, change management is not a problem.

- Well-prepared File Plan (Business Classification Scheme/Thesaurus): this is particularly important to small organisations but is not identified as equally important by agencies of other sizes.

- Organisation level: there was no major difference in the ranking of the success factors across the three levels of government agencies, although the two factors that specifically relate to records management (well-prepared File Plan, recordkeeping awareness and practice) seemed to receive more attention at the State level than at the Federal and Local levels.

- Solution types: Organisations using ERMS placed more importance on the factor 'Great implementation team" and organisations using EDMS emphasised the factor "System performance and usage monitor", as Figures 4-6 show. Other than that, they all agree on the ranking of the other success factors.

Factor 1: Top management support

Factor 2:Clear business vision and plan

Factor 3:Adequate and on-going training and support

Factor 4:Good project management

Factor 5:Excellent change management strategy

Factor 6:Great implementation team

Factor 7:Well-prepared File Plan

Factor 8:Recordkeeping awareness and practice

Factor 9:System performance and usage monitor

Factor 10:Others

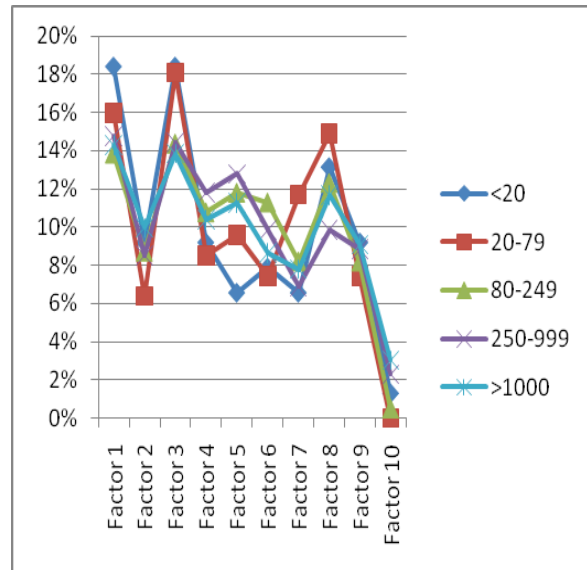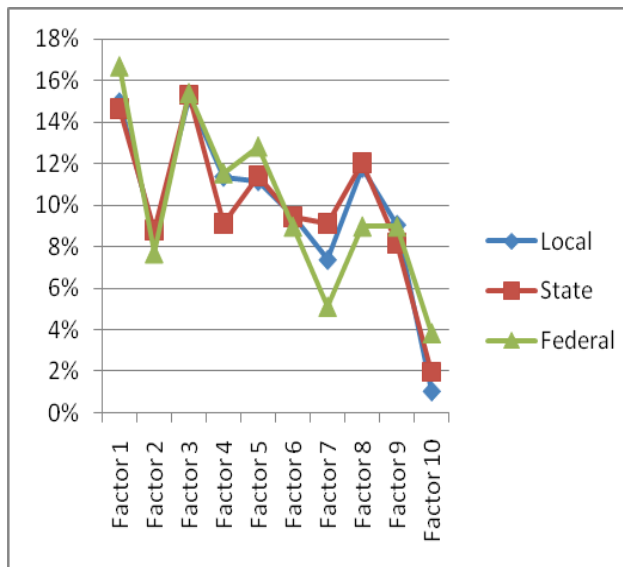Figure 4: Success factors and size of organisation

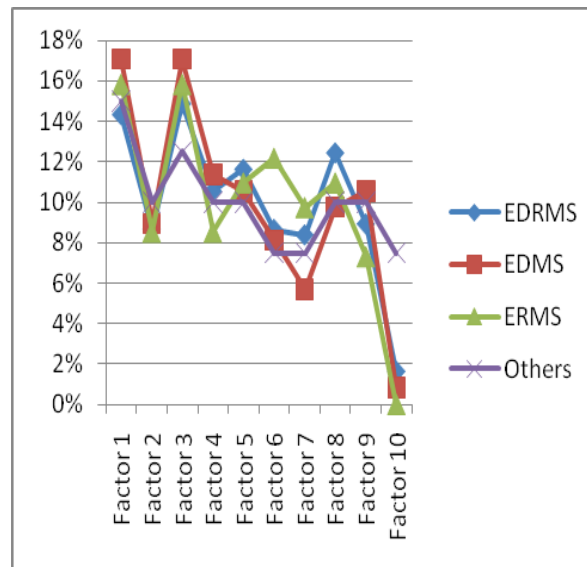Figure 5: Success factors and level of organisation

Figure 6: Success factors and types of systems

These success factors for an EDRMS implementation were consolidated by the records managers' perspective on barriers to EDRMS uptake. User resistance was, not surprisingly, perceived as the major barrier to any new system implementation. The question of "What is the most important criterion in the successful implementation of an EDRMS?" was set and answered by Bidmead (2008) as "*staff must willingly adopt a new EDRMS*". He suggested the key to achieve this goal is to make sure the system is user-friendly and integral to employees' daily work activities. One respondent also suggested this characteristic of the system as "*seamless/integrated*" and another observed that [the] "*EDRMS system was acquired to comply with State Records requirements but little or no thought [was] put into integrating it into business practices or getting staff buy-in*". Miller (2005) suggested that "*effective change management can reduce resistance to EDRMS implementation*".

Familiarity and comfort with paper, a new culture of sharing information such as emails with one another, etc. are typical knowledge management issues and are reasons for user resistance. Some other reasons include "*I once came across a Records Manager who did not get along with many people, and of course the user acceptance of the system was very low*".

The fact that lack of top management support and poor recordkeeping practices are also cited as barriers places further emphasis on the importance of these two issues. System design, the changing structure of organisations (on-going amalgamations) and lack of funding were also specified as minor challenges.

Reasons for non-adoption of EDRMS

We were interested in discovering why some organisations did not have an EDRMS in place, or did not even have any intention of installing an EDRMS in the future. Of 60 organisations which are either about to implement EDRMS or had no intention to use, 45 responded to this question (75% response rate). One obvious reason was that one third of those organisations were currently in the process of building an EDRMS solution, meaning that they would become EDRMS users at some future date. The two other (major) reasons were a lack of resources such as funding, expertise or personnel; and a lack of top management support for the initiative. This finding is consistent with the results of another survey (Brogan et al. 2009) where lack of top management support was cited as the most important reason for non-adoption of RIM technology.

Further analysis of these answers shows that the Federal agencies responding to the survey, while a very small proportion of all respondents (11%), had a larger percentage of organisations in the process of installing an EDRMS (82%), followed by local government (60%). This may well be the result of the strong pressure placed on State government agencies by their respective archive/records organisations – but clearly requires more detailed analysis. Perhaps not surprisingly, local government agencies seemed to suffer the greatest lack of resources, and Federal government agencies were least likely to suffer lack of resources.

CONCLUSION

In summary, this survey has sought to identify the most important implementation factors for successful Australian public sector EDRMS uptake from the records managers' perspective and experience. The results have provided an empirical data for the validation of the success factor list in our first-cut framework.

The factors identified in the survey reported in this paper include: adequate training and ongoing support, top management support, staff recordkeeping awareness and practice, change management, project management, implementation team makeup, business vision and plan, system performance monitor and management; and File Plan development. User resistance as a result of poor recordkeeping practices, familiarity and comfort with paper; and the newness of sharing information with others were identified as the major barriers to an effective EDRMS. "Top management support" was a very highly-ranked critical factor for the success of an EDRMS implementation project and "Effective change management strategy" was particularly important in large organisations where staff adoption of the system is a big hurdle. More research will need to be undertaken to confirm these initial findings, of course, but they provide empirical support for the factors included in our initial theoretical framework, which was based on the emerging EDRMS literature and the better-developed ERP research literature.

Overall, in the organisations responding to the survey, top management were supportive of digital recordkeeping initiatives and the majority of respondents already used an EDRMS or were in the process of obtaining one. Compliance was the principal motive for the majority of these implementations. Our research not only validate the success factors in EDRMS implementation but also determined the ranked importance of these factors: a similar approach has been taken in the ERP area (Somers and Nelson 2001) and it was argued that this would help prioritise the allocation of time and resources for a better outcome.

Several questions arise from these findings which require more research data before a truly reliable answer can be obtained, for example:
- How can those organisations with no intention to implement EDRMS abide by the laws and regulations currently being implemented?
- Why are some organisations deploying EDRMS only in certain workgroups?
- Is there any correlation between the timing of File Plan development and user uptake?

We hope to find answers to these (and other) questions in the next stage of our research, in which case studies are currently being conducted with a variety of public sector agencies using semi-structured interviews and document analysis. The in-depth data collected from these case studies will provide us with more (and richer) information and evidence to enable the provision of adequate explanations for these enquiries. Together, the results of the two completed surveys and the on-going case studies will facilitate the revision of our first-cut framework.

The results of the present survey, while obviously preliminary, have nonetheless enabled us to identify and rank issues and to set the scene for further and more detailed investigations. In the next stage, we would like to study the interrelationship among the ranked success factors; to deepen our understanding of how they influence one another; and to gain an understanding of what implications they have for the success of EDRMS projects. This research direction has been followed in by academics in the ERP arena, but has not yet been applied to EDRMS research (Akkermans and van Helden 2002).

REFERENCES

Akkermans, H., and van Helden, K. "Vicious and virtuous cycles in ERP implementation: a case study of interrelations between critical success factors," *European Journal of Information Systems* (11:1) 2002, pp 35-46.

Al-Mashari, M., Al-Mudimigh, A., and Zairi, M. "Enterprise resource planning: a taxonomy of critical factors," *European Journal of Operational Research* (146:2) 2003, pp 352-364.

Allanson, J., and Allen, J. "The Human Factor - The Workforce Impacts of EDRMS Changes, Stage 1," *IQ InfoRMAA Quarterly* (23:2), May 2007 2007, pp 44-45.

Amoako-Gyampah, K., and Salam, A.F. "An extension of the technology acceptance model in an ERP implementation environment," *Information & Management* (41:6) 2004, pp 731-745.

BBC News "German archive building collapses," 2009.

Benfell, P. "An integrated approach to managing electronic records," *Records Management Journal* (12:3) 2002, pp 94-97.

Bidmead, R. "The EDRMS Missing Links," *IQ the RMAA Quarterly* (24:4), November 2008 2008, pp 28-29.

Brogan, M., and Roberts, D. "From mainstream to bleeding edge-technology in the RIM workspace," *IQ the RMAA Quarterly*) 2009, pp 40-47.

Cho, V. "A Study of the Impact of Organizational Learning On Information System Effectiveness," *International Journal of Business and Information* (2:1) 2007.

Collins, T. "Human error blamed for fatal Pacific Highway collapse," 2009.

Davenport, T.H. "Putting the enterprise into the enterprise system," *Harvard Business Review* (76:4) 1998, pp 121-131.

Davis, F.D. "User acceptance of information technology: system characteristics, user perceptions and behavioral impacts," *International Journal of Man-Machine Studies* (38:3) 1993, pp 475-487.

Di Biagio, M.L., and Ibiricu, B. "A balancing act: learning lessons and adapting approaches whilst rolling out an EDRMS," *RMJ* (18) 2008, p 3.

Ellis, J. (ed.) *Implementing a solution for electronic recordkeeping in the public sector*. Facet Publishing, London, 2005.

Financial Industry Regulatory Authority "Morgan Stanley to Pay $12.5 Million to Resolve FINRA Charges that it Failed to Provide Documents to Arbitration Claimants, Regulators," 2007.

Fuzeau, P. (ed.) *Records management: two case studies from the French private sector*. Facet Publishing, London, 2005.

Garrido, B.G. "Organising electronic documents: the user perspective," *RMJ* (18) 2008, p 3.

Gunnlaugsdottir, J. "As you sow, so you will reap: implementing ERMS," *Records Management Journal* (18:1) 2008, pp 21-39.

Jeffrey-Cook, R. "Preparing to Implement a Corporate EDRMS," Inform Consult Ltd.

Johnston, G.P., and Bowen, D.V. "The benefits of electronic records management systems: a general review of published and some unpublished cases," *Records Management Journal* (15:3) 2005, pp 131-140.

Lewin, K., and Cartwright, D. *Field theory in social science: Selected theoretical papers* Harper New York, 1951.

Maguire, R. "Lessons learned from implementing an electronic records management system," *Records Management Journal* (15:3) 2005, pp 150-157.

Middleton, H. "The long and winding road - EDRMS at Highlands & Islands Enterprise."

Miller, J.M. "User's Issues Arising from EDRMS Implementation," Performance Psychology Ltd.

Murphy, G.E. "Finding the Dream Team: Recruiting for Electronic Document and Records Management System (EDRMS) Projects," in: *IRMA Information and Records Management Annual*, 2008, pp. 187-199.

Nah, F.F.H., and Lau, J.L.S. "Critical factors for successful implementation of enterprise systems Fiona Fui-Hoon Nah, Janet Lee-Shang Lau, Jinghua Kuang The Authors," *Business Process Management Journal* (7:3) 2001, pp 285-296.

Nah, F.F.H., Zuckweiler, K.M., and Lau, J.L.S. "ERP implementation: Chief information officers' perceptions of critical success factors," *International Journal of Human-Computer Interaction* (16:1) 2003, pp 5-22.

National Archives of Australia "The Future of Commonwealth Recordkeeping," 2007.

National Archives of Australia "Records and the Law," 2008.

Nguyen, L.T., Swatman, P.M.C., and Fraunholz, B. "EDMS, ERMS, ECMS or EDRMS: Fighting through the Acronyms towards a Strategy for Effective Corporate Records Management," 18th Australasian Conference on Information Systems, Toowoomba, Australia, 2007.

Nguyen, L.T., Swatman, P.M.C., and Fraunholz, B. "Australian Public Sector Adoption of EDRMS: A Preliminary Survey," Australasia Conference on Information Systems, Christchurch, New Zealand, 2008a.

Nguyen, L.T., Swatman, P.M.C., and Fraunholz, B. "Standing on the Shoulders of Giants: Are ERP success factors relevant for EDRMS Implementation?" " to appear in the proceedings of Bled 2008 - 21st Bled e-Conference, Slovenia, 2008b.

Northern Ireland Civil Service "Electronic Document and Records Management (EDRM) Lead Implementation 2nd Lessons Learned Report," 2006.

Parr, A., and Shanks, G. "A model of ERP project implementation," *Journal of Information Technology* (15:4) 2000, pp 289-303.

Robbins-Gioia LLC "Records Management Survey Reveals Gap Between Requirements and Performance," Robbins-Gioia, LLC, Ontario.

Rogers, M.E. *Diffusion of Innovations*, (4 ed.) The Free Press, Simon & Schuster Inc. NY USA, 1995.

Somers, T.M., and Nelson, K. "The impact of critical success factors across the stages of enterprise resource planning implementations," 2001, p. 10.

State Records of New South Wales "Records Management Survey 1996," 2000.

State Records of South Australia "1998 SA Government Records Survey," 1998.

State Records of South Australia "Administration of the State Records Act 1997," 2007.

Sunday Herald "How the US forgot how to make Trident missiles," R. Edwards (ed.), 2009.

Umble, E.J., Haft, R.R., and Umble, M.M. "Enterprise resource planning: Implementation procedures and critical success factors," *European Journal of Operational Research* (146:2) 2003, pp 241-257.

Waddell, D., and Sohal, A.S. "Resistance: a constructive tool for change management," *Management Decision* (36:8) 1998, pp 543-548.

Waldron, M. "Developing an information management strategy: The foundation stone for an EDRMS," *Business Information Review* (25:2) 2008, p 101.

Walsh, J.P., Kiesler, S., Sproull, L.S., and Hesse, B.W. "Self-selected and randomly selected respondents in a computer network survey," *Public Opinion Quarterly* (56:2) 1992, pp 241-244.

Wilkins, L., Holt, D., Swatman, P.M.C., and Chan, E.S.K. "Implementing Information Management Strategically: an Australian EDRMS case study," in: *20th Bled eMergence: Merging and Emerging Technologies, Processes and Institutions*, Slovenia, 2007.

Williams, D.J. "EDRM implementation at the National Weights and Measures Laboratory," *Records Management Journal* (15:3) 2005, pp 158-166.

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