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# **AN INVESTIGATION INTO THE AFFECT OF POOR END USER INVOLVEMENT ON ELECTRONIC DOCUMENT MANAGEMENT SYSTEM (EDMS) IMPLEMENTATION.**

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## **Abstract**

*Electronic Document Management Systems (EDMS) are employed by many companies to improve the flow of information by improving document handling both inbound and outbound through their organisation. However as EDMS are a form of information system they are susceptible to flaws in design. End user satisfaction is one of the more common measures of success of an information system. The purpose of this study is to establish whether a link between end user satisfaction and the perceived success of an EDMS really exists. To assess the impact of end user satisfaction on the implementation of an EDMS existing academic theory was applied to a case study of a north-east firm in the construction sector. Primary data was collected using semi-structured interviews and questionnaires and were analysed using a conversation analysis and simple statistical analysis. Findings based on the information gathered were that end users felt there was a lack of involvement during the design and implementation phases, feedback was actively collected but there was a distinct lack of communication between end user and development staff. The amount of interaction end users believed they had during the design stage directly impacted on their overall happiness with how the system affected their working practices. The conclusions drawn for this study were that there indeed exists a link between the perceived success of an EDMS and the involvement of its end users during its implementation stage. The end user's requirements need to be carefully assessed before implementing an EDMS to significantly improve the chances of the systems success.*

**Key Words:** user involvement, systems, implementation, case study.

# **1. Introduction**

## **1.1 Background**

Electronic Document Management Systems (EDMS) are utilised in business environments as a solution to handling information needs. A company may adopt an EDMS to: save costs (Saffady, 2004), reduce staff time spent on document handling (Björk, 2006) or increase the value of linked software (Gillespie, 1995). However as with all information systems they are flawed in ways as they themselves go through a design process (Sauer, 1993).

Studies into information systems have led to numerous conclusions and no real evidence to suggest there is a single factor contributing to systems failure. Similarly there are few standard guidelines to evaluate the success of information systems implementation.

However a single quantifiable factor leading to systems failure must exist. In this body of work, as suggested by Fortune & Peters (2005), end user involvement is considered this quantifiable factor.

*“End-user satisfaction (EUS) is one of the most widely used measures in assessing the success of an information system (Delone and Mclean 1992), and also is particularly critical in IS implementation” (Au, Ngai & Cheng, 2008, p44).*

Two further views strengthening the argument that end user involvement is a viable way in which to measure the success of an EDMS

Therefore the purpose of this paper is to investigate whether the success of an EDMS can be directly linked to the quality and quantity of end user involvement in the systems implementation and development.

## **2. Literature Review**

### **2.1 Information Society**

Information Technology (IT) and advances in communication can be taken for granted in modern society but just as the Industrial age was a revolution to the Agricultural age so too has been the ‘revolution’ to the Information age (Osterle, 1995).

Coined by Tadao Umesao in 1963 the information Society has been documented by Braman (1993) to have three stages, electrification of communications, convergence of technologies and finally harmonization.

Believed to have started during the 19th century electrification of communication increased the capacity and speed of information flow. During this phase the first modern international organizations were born along with news agencies both

national and international (Braman, 1993). Braman (1993) also stated that toward the end of the century the flow of information took centre stage of the global economy.

Braman (1993) recorded that by the 1960s the flow of information was so omnipresent it penetrated further into society and during this period it was the use of new IT systems which led to new organizational forms. Feather (2008) states the convergence of computing and communication technologies through the introduction of satellites, fibre optics and mobile phones not only allowed for faster transmission of information but also to deliver it worldwide.

During the late 20<sup>th</sup> century harmonization of systems began. This was as suggested making the new technologies work in harmony. Co-operation and co-ordination now was as important a factor as competition to businesses (Braman, 1993).

In its modern state the Information Age or Information Society has empowered the human race to transmit almost any data worldwide almost instantly (Feather, 2008).

This has lead to further issues with the protection of personal information. Even though not a new concept Feather (2008) stated that this is linked to advancement of IT systems and the dependence of bodies such as governments, businesses and varied institutions upon it.

Applegate, Austin & McFarlan (2003) believed that even now in the 21<sup>st</sup> century businesses fundamentally still operate in the same manner that they always have. However with rapid advancements in mobile technologies, increasing channels which businesses operate and e-commerce have all contributed to organisations having more means to manage core activities and handle business relationships.

## **2.2 Knowledge society**

Arguing against Feathers (2008) view some consider the Information Society to have already passed and transformed into something else.

Cope (2000) believes we are in the Knowledge era and that business knowledge is soon to be the core commodity for years to come. Handy stated it is easier to sell expertise rather than time as a product furthering the belief that knowledge management is an asset to future business success (Cope, 2000).

Sommerville & Craig (2006) describes knowledge hard to measure or identify. Kahin & Foray (2006) considered knowledge more elusive than information as it is a further transformation of data. Knowledge can be gained from the analysis of information, as a genetic trait or acquired through experience

Regardless of which society we find ourselves businesses still considers both information and knowledge as valuable assets when attempting to gain competitive

advantage. Additionally Fong believes knowledge should be considered as the 'primary economic resource' (Sommerville & Craig, 2006). Hedstrom & King believe businesses are open to more competition and increasing numbers of service providers and rising expectations from their customers (Kahin & Foray, 2006). This means that businesses must do more to compete with their rivals.

### **2.3 Information and knowledge management**

Information management encompasses the management and maintenance of Information Systems (IS) and ensures that information is effectively stored, processed, archived and retrievable (Dixon, 2000).

Tiwana (2000) declares that as time passes markets shift, competition increases, technologies advance and become outdated. Knowledge is an ever more precious business asset and can allow for better decision making (Tiwana, 2000).

Knowledge management obtains, collates, stores and re-uses acquired knowledge that is useful to organizations (Feather, 2008). Additionally Tiwana (2000) believes management of organizational knowledge generates greater value for customers. As stated by Sommerville & Craig (2006) knowledge management systematic in presenting information so to improve understanding on topics or interest areas.

Nonaka (1991) believes in modern economy the only constant source of competitive advantage is through the exploitation of knowledge and that western society only considered quantifiable knowledge as being useful and that tacit knowledge was effectively worthless.

### **2.4 Decision making within business**

IS in organisations is heavily dependent upon human interaction and for it to be successful the interaction needs to be easy and appropriate (Sommerville & Craig, 2006). Henderson, Venkatraman & Oldach describe IS as complex and difficult for less experienced users to comprehend, yet essential for executives to understand enough to make accurate long term decisions based upon information gathered and presented using modern technologies (Luftman, 1996).

Businesses are becoming more dependent on IS to conduct business with customers and interact with business partners. More business processes transforming inputs to outputs can be automated using IS processes (Combs, 1995) but the issue is the complexity of the operation to be automated. Combs (1995) adds technology based systems are only capable of delivering certain types of information. These described by Scarbrough & Swan (1999) as inaccurate and difficult to verify so a manager who can interpret this information is essential.

Business performance analysis is essential when making viable decisions for both immediate action and the future. Clifton, Sutcliffe & Ince (2000) considers IS useful

at calculating risks and probabilities when managers have several options open to them. IS are capable of collating data and identify trends (Clifton, Sutcliffe & Ince, 2000). This allows for business actions to be planned and executed quickly and efficiently (Combs, 1995).

## **2.5 EDMS**

Adam (2008) maintains that as long as civilization has existed humans have attempted to manage information systematically, be it writing on cave walls or the modern methods that we now use.

Adam (2008) also states that modern systems for managing information, such as Document Imaging Processing (DIP), have existed since the 1980's. These DIP systems were an electronic equivalent to physical filing cabinets. EDMS emerged during the 1990's initially only identifying physical locations of documents making them easier to find then gradually incorporated handling and storing electronic documents.

Zantout & Marir (1999) describe EDMS's as a means of managing, storing and retrieving either abstracts or entire documents. The National Archives of Australia (2005) describe EDMS as an automated system used to manage and improve the workflow of information (Sommerville & Craig, 2006).

Gillespie (1995) states documents used within EDMS are not limited to just alphanumeric items. The documents referred to in EDMS can contain anything classified as information or as data (e.g. audio, video, images/drawings etc).

Both Adams (2008) and Zantout & Marir (1999) identify four processes that all EDMS have in common: scanning, indexing, storage and access.

### **2.5.1 Scanning and indexing**

The scanning and indexing processes are interlinked. The first process of the EDMS is capturing the information (Gillespie, 1995). Once a hard copy document ready for storage it is scanned to generate an electronic version.

Scanning of hard copy documents is described, by Kennedy & Scaunder (1998), as a shortcut data entry method as the user does not depict/type what information is contained in the document.

When the e-version of the document is ready it is then assigned indexing information using a number of keywords defined into index fields. This is carried out either manually or automatically. Indexing differentiates documents from others should it need to be retrieved. Gillespie (1995) identifies this as the most important process of an EDMS because during this process if there is a mistake in the indexing of a document it may be lost to the system indefinitely.

### **2.5.2 Storage**

Indexing and storage of documents is closely linked. The indexing is dictated by the folder structure of the EDMS. This structure is dependent upon how the documents are to be accessed.

After indexing the document is then transformed into a compressed format and moved to a storage device (often a hard drive).

Gillespie (1995) states an ideal EDMS allows for input of documents from a wide variety of data capturing devices. Allowing flexible indexing and provides means to be able to store files on different storage devices.

The storage of information is also very important in a legal sense. The freedom of information act (Freedom of Information, 2009) states that individuals and organizations have the right to request information that companies may hold on them. The company in question is obligated to provide this information thus having an EDMS allows clerical staff to find this information faster (Adam, 2008).

Due consideration must also be made to the Data Protection Act of 1998. These guidelines outline how personal information should be held and also what security should be in place ensuring the information is safe, processed lawfully, accurate as possible and held no longer than necessary (Data Protection Act, 2009).

### **2.5.3 Access**

Zantout & Marir (1999) describe that retrieval of documents using an EDMS is performed on keywords input during indexing. Gillespie (1995) believes the access should allow the user query the whole document database with ease. A document viewer provides a visible version of the document so end users can easily identify documents they are looking for (Gillespie, 1995). This viewer should provide navigation between documents and provide information regarding the document such as last modified, last accessed, created by etc. More importantly protect the document from unauthorised modification (Gillespie, 1995).

### **2.5.4 New technologies**

Along with the key processes there are modern additions that make EDMS more useful at managing and improving the flow of information.

Zantout & Marir (1999) provide examples of advances in EDMS: GroupWare products, Knowledge Management tools and Workflow Management Systems (WFMS's).

Khoshafian & Buckiewicz (1995) define GroupWare as software accessed by multiple users via electronic communication. GroupWare products reflect the emphasis that businesses place on the importance of collaboration on work projects (Zantout & Marir, 1999).

Fisher (1995) states that Workflow is regarded to belong to a broader category of GroupWare (Zantout & Marir, 1999). WFMS are an automated system used to pass information between multiple users based upon set pre-defined procedures (Basu & Kumar, 2002). WFMS's benefit organisations by allowing documents to be routed automatically to members that require access thus increasing efficiency (Zantout & Marir, 1999). Gillespie (1995) states that WFMS's also allow for tracking on status and locations of documents in real time.

Essentially all of these new technologies have all been designed to make information handling easier and decision making more informed.

## **2.6 Benefits gained from an EDMS**

Technology is employed by organisations to gain a competitive advantage over their rivals. Using IS companies can automate processes making them efficient and reducing costs. This is highlighted by Kennedy & Schaunder (1998) as they state EDMS can reduce costs relating to storage (both space and equipment) and staff time on documents handling. This view is shared by Björk (2006) who claims time savings being the primary cost benefit.

Saffady (2004) also backs up this argument. Saffady (2004) states that operating costs can be reduced by minimizing office space for filing and also reduce the cost of labour of having to have an employee sift through hundreds of paper based files searching for one document.

Other reasons to deploy an EDMS are summarized by Gillespie (1995). Providing a monetary return on the capital spent on the systems implementation. The EDMS should increase the value of other 'linked' software from the company's perspective. Additionally EDMS provide 'future proofing' for the company in relation to document handling (Gillespie, 1995). Finally, it is claimed by Gillespie (1995) that a comprehensive EDMS is more likely to be accepted by its end user than several packages.

Another benefit of company-wide EDMS is that it decreases data redundancy and duplication of information. There is no need to make several copies of a document as several folders can have the same document in them by simply 'pointing' to the original instead of making another copy (Gillespie, 1995). The document is either updated by the end user or it is marked up by the editor so that everyone can see the changes/updates.

Sommerville & Craig (2006) state having the documents linked to a database using workflow management results in user accountability and traceability for error checking and clarification purposes.



Security is often better managed using EDMS. Security levels can be applied by the system administrator meanings only staff that needs access to the data will be able to do so. As stated by (Kritzinger & Smith, 2008) security levels can be set so that any particular group of stakeholders will not be overburdened with information they do not need and access to sensitive information is limited to higher access levels.

Surveys carried out by Version One (document management specialists) targeting senior finance professionals found that the majority of employees could tamper with documents to suit their own ends. One quarter of these asked claimed to have witnessed document fraud (Version One, 2008). This not only damages the company but also is against the Data Protection Act. EDMS have the potential to solve this issue as the documents are locked for viewing by only necessary employees.

Downing (2006) claims that decision making is indeed made more accurate because of EDMS based on better record keeping practices.

## **2.7 Problems relating to EDMS**

There are notable security benefits from implementing an EDMS but it does not make it any more secure when compared to paper-based systems. An article by (British Broadcasting Corporation, 2008) highlights that due to electronic documents having no physical attributes like size they are easily stolen in the smallest of vessels like compact disks or memory pens making the information vulnerable difficult to trace.

Kennedy & Schaunder (1998) claim the storage of electronic documents can be fifty times larger than word based documents (e.g. .doc files) containing the same information. This is because the electronic documents are predominantly images (e.g. .gif, .bmp).

Issues deciding where to store documents also exist. They can be stored on local access networks if they are accessed or required frequently or on optical media such as CDs, DVDs or USB pen drives (Kennedy & Schaunder, 1998) if used less often.

Sutton (1996) highlights several problems related to the implementation of EDMS within organisations, these being:

- Disapproval of staff finding paper based documents easier to use. Old paper based documents will need to be re-entered along with starting with recent documents.
- Lack of discipline relating to the way documents are filed or policies used to ensure the documents are stored securely.
- Some organisations do not regard information as an asset so a system that manages information is not a priority.

- Staff can become disheartened when companies 'roll out' new IS without adequate resources to training and skills building.

(Sutton, 1996)

Sutton (1996) pointed out some organisations have not kept up to date with modern technologies thus not have the networking capabilities of routing electronic documents throughout their organisation.

Sommerville & Craig (2006) believes initial monetary costs of setting up an EDMS provides a possible explanation for many companies not adopting them. In addition Sommerville & Craig (2006) also state the negative impact changes can have on working culture within an organisation as another deciding factor whether a company will buy into an EDMS.

## **2.8 System implementation and complications that may arise**

IS failures are difficult to categorise often being the result of a number of factors like poor planning and accidents during implementation or whilst being used (Sauer, 1993, p.18). Complimenting this statement Fortune & Peters (2005) believe not meeting user requirements constitutes as IS failure.

Sauer (1993) also notes that IS are a result of a process of design and implementation themselves thus they are open to faults and flaws from human error.

Downing (2006) states successful EDMS implementation will make system processes transparent to the end user. Users often resist change to working practices so the user interface must be easily operated (Downing, 2006). Supporting this Lapointe & Rivard (2005) consider overcoming this resistance an important success factor

Downing (2006) believes end user expectations play a big role in the success of an EDMS. Psychologically it is better for organisations to 'under-sell' and over deliver rather than 'over-selling' as the end users expectations are better met.

Intended end users of the system also have impact on the success of EDMS implementation. Tom (1991) recorded menial clerical workers were more willing to change working methods and adopt IS to carry out daily tasks. Managers are more resistant as they do not en-trust IS with their 'more important' tasks considering the system as intrusive or daunting (Tom, 1991).

If the users of the system have not been trained at an individual level (making it easier for them to understand benefits the system can bring) issues may arise both in EUS and the quality of the EDMS (Downing, 2006).

Sauer (1993) points out if a system does not address business problems brought forward then development issues occur and as a result may not be easily corrected.

## **2.9 Implementation and the importance of its end-user involvement**

Jones (2008) argues some companies regard IS successfully installed and ready to be used as successfully implemented, however this is a limited view.

Arguments constructed by (Au, Ngai & Cheng, 2008) and DeLone & McLean state EUS, or lack of it, is often the reason for IS failure. There has to be willingness and ability from employees to operate the system effectively. Many organisations neglect to ask the end users their needs or aspirations for the system. This involvement is needed from the beginning of implementation to ensure there are no issues regarding the system's ability to fulfil its purpose (Au, Ngai & Cheng, 2008).

Gillespie (1995) argues end users will accept one easily used package rather than several. Agreeing with this Davis (1989) and Jones (2008) believes ease of use is fundamental to user acceptance. However users may still feel overwhelmed by new working procedures of the EDMS. This is also highlighted by Beatriz Garc a (2008), end users may feel that new system are more restrictive than previous working methods.

Similar to these views Kennedy & Schauder (1998) state user involvement is paramount to making a system implementation successful. End user support is essential and measures should be made to gain this and one of the most effective methods is to give the end users direct involvement in the systems development and implementation (Kennedy & Schauder, 1998).

## **3 Methodology**

### **3.1 Research Approach**

In light of the purpose of the research a qualitative data approach was chosen as rich information of opinions and views about user involvement in the implementation of the EDMS was required, according to Cooper & Schindler (2008), qualitative is significantly more effective at achieving this.

### **3.2 Research Design**

Several qualitative research designs could have been employed examples of which are case studies, ethnography, action research or grounded theory. These methods are discussed and evaluated below.

#### **3.2.1 Case studies**

Remenyi *et al.* (1998) defines case studies as observing real-life problems allowing for a holistic view of a situation. Benbasat, Goldstein & Mead (1987) continue, that though multiple data capture techniques are used no experimental controls are enforced to alter the phenomenon occurring.

Benefits of case studies, according to Kumar (2005, p.113), are they allow for in-depth analysis of precise details sometimes unobserved by other research designs plus comparisons can be applied to similar case models within the context of the study. Benbasat, Goldstein & Mead (1987) state case studies are better suited to capturing people's knowledge and experiences.

#### **3.2.2 Ethnography**

Ethnography, described by Rosenthal and Rosnow, as field observations in which the researcher participates in the environment for a number of months, in business environments a number of days is more common (Remenyi *et al.*, 1998). The background of the working culture is observed when using this particular design (Remenyi *et al.*, 1998).

Time needed to carry out this particular design renders it unfeasible when considering this particular studies overall objectives. The scope of this study does not require such in-depth observation of the working culture of the organisation studied.

#### **3.2.3 Action research**

Action research has roots in the study of management of change (Remenyi *et al.*, 1998). As the name suggests this has two components, action and research (Kumar, 2005).

Remenyi *et al* (1998) states the process involved is collecting feedback in relation to a system (research), then considering the feedback and altering variables (action). Re-evaluating how these changes affected the system is important. Action research follows experimental research in which control groups are used and the manipulation of extraneous variables to the researches own needs (Gill & Johnson, 2002).

The experimental aspect of this design makes it less effective at obtaining the data required as this study is to understand a phenomenon occurring naturally and not altering it in any way.

### **3.2.4 Grounded theory**

This research design was devised, according to Corbin & Strauss (2008), by Glaser and Strauss in 1967. Chell (1998) believes grounded theory works on the basis that the researcher has no prior knowledge of the study and builds understanding through the conceptualisation of information during research. Eriksson & Kovalainen (2008) state that grounded theory has a wide applicability and its particular strengths lie in its capturing of context and its linking of theory to organisational actions.

### **3.2.5 Chosen research design**

Having considered the strengths and limitations of the above designs in relation to the research question an instrumental case study was chosen. Pickard (2007, p.86) claims an instrumental case study focuses more on single phenomenon than the actual case being studied, this means the case being studied becomes more of a 'means to an end' of analyzing the phenomenon.

The purpose of this study was to gain a holistic view of the perspectives of end users so an instrumental case study is considered a good method of obtain rich qualitative data (Mayers, 1997).

## **3.3 Study Design**

As case studies often use more than one data collection technique (Benbasat, Goldstein & Mead, 1987) consideration had to be made as to what techniques are available and what advantages may be gained from using each.

### **3.3.1 Observations**

Observations, as the name suggests, systematically observes a phenomenon whilst it is occurs (Kumar, 2005, p.119). Though observations are carried out in a different manner to other techniques it is still planned and implemented as any other would be (Pickard, 2007, p.201).

Problems using observations are when individuals or groups are made aware that they are being observed natural behaviour alters in either positive or negative manner (Kumar, 2005. P.120). This is contested by Symon & Cassell (1998), they note that observations are an unobtrusive technique for carrying out research.

Another issue according to Pickard (2007) is the researcher must be constantly aware of everything going on within the scope of the observation. This is very hard to achieve so some behaviours can be missed/misinterpreted (Kumar, 2005, p.120).

### **3.3.2 Interviews**

Easterby-Smith, Thorpe & Lowe (2002) state that though interviews are an excellent method for gathering qualitative data, the complexity of this collection method and its analysis should not be underestimated.

Interviews can be carried out in two ways. Structured where the researcher asks a set list of questions that are required to answer the research question and the others being un-structured, offering more flexibility allowing the opinions and thoughts of the interviewee to become free flowing (Easterby-Smith, Thorpe & Lowe, 2002).

Easterby-Smith, Thorpe & Lowe (2002) state depending how the interview is going the interviewer may need to alter the line of enquiry or clarify what it is the interviewee is being asked. This must be done in an unobtrusive manner so not to affect the response from the interviewee.

Gillham (2005) states strength of interviews come from the interviewee and researcher being both present throughout the enquiry, allowing for clarification of questions that are not clear or easily misunderstood. The answers given by the participant are more accurate in comparison to methods that do not allow for this interaction (Gillham, 2005).

Interviews, according to Burgess, gives “*the opportunity for the researcher to probe deeply and uncover new clues, open up new dimensions of a problem and to secure vivid, accurate inclusive accounts that are based on personal experience*” (Easterby-Smith, Thorpe & Lowe, 2002, p86), precisely the purpose of this study.

### **3.3.3 Questionnaires**

Questionnaires obtain information that is not readily available in written format elsewhere or is difficult to observe (Remenyi *et al*, 1998). Remenyi *et al* (1998) also claims that the underpinning of this data collection technique is that a general ideal exists and this is a fair reflection on how the population at large view the situation also.

Questionnaire advantages, according to Kumar (2005), are that they are not heavily dependant on time or money and provide anonymity for their participants.

Kumar (2005) identifies disadvantages to questionnaires. They receive low response rate from participants, there is no opportunity to clarify questions and there can be forms of collusion making the data collected less accurate or open to scrutiny.

Pilot questionnaires can be conducted to establishing whether the questions are clear and concise, identify the shortcomings in design and if it is structured in a way that it links back to the research question (Remenyi *et al*, 1998).

#### **3.3.4 Chosen study design**

For the purpose of this study, both questionnaires and interviews would be conducted as observation was deemed less beneficial when answering the research question as subjects' opinions can be obtained more efficiently using the other two methods.

The interview that would be carried out was to be semi-structured using 'how' and 'why' questions (please see Appendix A) allowing the flow of as much participant opinion as possible and, as described by Eriksson & Kovalainen (2008), whilst keeping structure and being systematic it makes the interview more informal.

Questionnaire (Appendix B) would be piloted then handed out amongst the target population so that a generalised opinion could be formulated instead of carrying out tens of interviews which would be extremely time consuming.

#### **3.4 Analysis of data**

Easterby-Smith, Thorpe & Lowe (2002) identify limitations of qualitative data as condensing highly complex contextual information into a format so meaningful conclusions can be made.

This study used interviews and questionnaires, these two methods were analysed separately then collated once they had been formatted allowing for comparison.

Interviews were analysed to a specification drawn up by Symon & Cassell (1998). These interviews were recorded, transcribed into written documents (please see Appendix C), then formatted to improve readability and to separate questions from responses (Gillham, 2005). These 'transcripts' were then coded adapted from a procedure devised by Gillham (2005).

To summarise substantive statements relevant to the research question were highlighted and categorised through comparison to one another then referenced. These are then added to an analysis spreadsheet by theme for 'axial coding' (Corbin & Strauss, 2008).

Conversation analysis was then carried out (comparing one interview transcripts to another) (Eriksson & Kovalainen, 2008).

Questionnaires analysis used a far simpler statistical analysis, working out percentages of opinion with substantive statements recorded and added to the analysis spreadsheet.

## **Chapter 4: Research analysis and discussion**

The primary data obtained from the interviews and questionnaires was analysed and synthesised with the secondary research to present the following analysis. This is segmented into sections relating to the main themes identified during the analysis subdivided by interview and questionnaire. Interview participants are identified by a simple notation P1, P2 etc.

### **4.1 EDMS implementation end user opinions**

#### **4.1.1 Interview analysis**

Au, Ngai & Cheng's (2008) state end users must be involved in implementation to ensure no complications or issues regarding the systems use or its ability to fulfil its purpose. Participants of the study expressed varied responses regarding this. P1 stated *"They address problems when they arise they haven't actually been around to ask for any feedback on the system from our view point"* suggesting there was little end user involvement in the implementation stage from their perspective. This view is not shared throughout the entire organisation however. P4 claimed they had been involved early on and were involved at *"Every opportunity, we were consulted at various stages"*. The difference between these participants is they are from different departments (surveying and admin respectively). This suggests there that priority was given to admin over surveying. Questioning these participants further asking whether they felt that the system was useful and whether a link to EUS exists it can be concluded that P4 is happier with how the system operates compared to P1. P4 noted that *"Yes I find that it is (information being easier to locate)."* and *"It is better (the system compared to legacy systems) because it makes it our work more flexible"*.

P1 and P2 (both surveying employees) are able to identify issues not encompassed by the EDMS. Sauer (1993) stated if a system does not address the problems brought forward from a business process context then there will be development issues and may not be easily corrected. P1 said *"if there is a problem in a house that was done in this three month period this information of who installed what components for a boiler or whatever will be very hard to find"* P2 added *"I initially disagreed with what they were attempting to do as they seemed to be basing it on a factory production which never happens on a construction site"* highlighting future issues *"In theory for a new build it will be great but because of some work practices it will never be one hundred percent beneficial"*. Proving their lesser involvement has resulted in business processes being overlooked.

To conclude these findings proves Au, Ngai & Cheng's (2008) opinions to be valid, that increased involvement in system implementation leads to fewer issues and the system being better suited to for its purpose. Sauer's (1993) opinion also seems to be backed up (at least by P1 and P2) as issues now identified could have been resolved



had there been more consultation during the EDMS development. However this is in perfectly contrasted with the admin members whom seem satisfied with the system.

#### **4.1.2 Questionnaire analysis**

Results from the questionnaire respondents suggest a lack of end user involvement throughout the organisation. 75% of respondents claimed to not have been told about the EDMS in its design stage and only 60% of respondents acknowledged being asked for their views on the system at any stage. From this analysis it is apparent that there was no formal collection of end user opinions, one respondent stated *“The development team would come round for little afternoon chats once in a while”*.

### **4.2 EDMS initial expectations from the end user perspective**

#### **4.2.1 Interview analysis**

Downing (2006) claims end user expectations play a big role in IS success and that psychologically it is better to ‘under-sell’ and over deliver a system. This section assesses how the system had been explained to the end users and how well this description matches the current system.

P3 *“assumed it would be a system that would do everything and it would combine several steps in one and save us a lot of time”* and felt the system in place matched this description. In contrast P2 stated the system *“doesn’t seem to likely meet what I initially thought the system would do”* and continued *“I really believe it is because they are not listening to the advice we are giving to them”*. Once again proving a lack of communication.

P2 commented that *“I initially disagreed with what they were attempting to do as they seemed to be basing it on a factory production which never happens on a construction site”* possibly a pre-determined opinion that affected expectation. P3 believed *“From what I was told initially it sounded great, it seemed like it would do everything that we wanted it to do and it looked very clever”* possibly a broader description and easier to match.

To summarise there is an existing link displayed between how the system was initially described to end users and how happy they are with the system, as Downing (2006) suggested.

#### **4.2.2 Questionnaire analysis**

Respondents told about the system during design commented *“I find it easier to use than FileMagic”*, *“The system helps me to locate invoices much faster”* and *“There is less need to have to chase others for information”* regarding their expectations of the EDMS. All responses seem positive suggesting expectations have met what they had been told about the system.

### **4.3 Feedback collection and its use**

#### **4.3.1 Interview analysis**

From the employees' perspective constant interaction are important to create the impression of involvement. This is an opinion formulated by Kennedy & Schauder (1998). Active collection of feedback to appease the end user can be considered as a necessity by developers trying to get people to adopt an EDMS. P1 recalls *"I don't think there has specifically been anyone round to get our feedback"* and P2 stated *"We are like mushrooms... we are kept in the dark"* regarding changes to the system. In contrast P4 claims with *"regards to feedback I see it as my responsibility to collect the feedback from the girls and then consult the development team once we have some issues we need to resolve"* suggesting that P4 actually taken action attempting to start an interaction with the developers, as mentioned by Kennedy & Schauder (1998).

This highlights the developers are not doing enough to gather feedback and proved by system developer P5 *"there is no formal feedback gathered to speak of or a form to fill in on a weekly basis"*. This may prove Jones (2008) argument as correct on this occasion that the organisation regards the EDMS successful on the basis that it is operational.

#### **4.3.2 Questionnaire analysis**

An impressive 70% of respondents agreed that there is a means for feedback regarding the EDMS. Comments suggest *"Via e-mail mainly"* and *"There is an intranet page for system requests"*. Another comment to be noted was *"It is not a specific thing, it's for all system requests"*. Suggesting there is opportunity for feedback but not EDMS specific, showing feedback is welcomed but not actively sought after.

### **4.4 Affect of EDMS on department working practices**

#### **4.4.1 Interview analysis**

Downing (2006) believes a successful EDMS implementation makes system processes less obtrusive and more transparent.

P2 said *"if you get someone to make a system the system should suit the users and the users shouldn't really have to change to suit the system"* stressing the system is quite obtrusive to the way in they worked than preferable. P3 commented *"The scanning works great but when it comes to the inputting of the document information, the indexing rather, it wasn't very good at the start"* illustrating the system developers acknowledged issues with work practise and reduced these actively.

P4 stated *"But as it stands the system is a lot easier to use than the old system"* adding *"I think it is more user friendly and useful than the old system"*. However P4

continued *"I am not very familiar, to be fair, with the old FileMagic system but it seems quite complex as I hadn't used that a great deal"* meaning having not previously used the legacy system her opinion may be biased in favour of the new system.

P5 agreed walking users through change may have been beneficial *"For certain departments people who aren't too IT literate"* it was acknowledged the system had affected the end users working practices *"They (the admin staff) used to file everything away even every e-mail but now we have urged them to change this so that they only store away the necessary documents, or at least the most important ones"*. To conclude this EDMS could be considered obtrusive and possibly contribute to its failure Downing (2006).

#### **4.4.2 Questionnaire analysis**

60% of respondents claimed there had been changes to the way they work following the EDMS's introduction. Two distinct opinions of this change were obvious. Half felt the change was beneficial commenting *"It has made my desk far tidier because all my documents are electronic"* and *"It makes things much faster in my department"*. Other end users were less impressed, *"I prefer working with paper documents"* or *"It has made my job more confusing, I'm not very IT literate"*. Differences between the groups appeared to be how IT savvy they are. Regardless the evidence collected demonstrates a notable change to working practices linked to the EDMS, be it good or bad.

### **4.5 EDMS work practice changes satisfaction**

#### **4.5.1 Interview analysis**

Tom (1991) argues clerical workers are willing to change their methods of working and adopt IS whereas end users who viewed their work as 'more important' would be more resistant. Testing this theory was possible by comparing admin departments (clerical) and surveying department (more 'important') working practices.

Admin participants of this study feel the system has benefited them. P3 stated *"We are more efficient as a department because we now have access to information that we did not really have before"*, continuing, *"when it is all up and running it will be a real benefit to the company. It will make everything run faster and more accessible"*. This adoption of the system also was acknowledged by the system developer as he clearly stated *"the admin department have changed how they go about work"*. P5 commented that as a result *"this is very beneficial in our opinion as it takes away a lot of wasted time from their day so they can focus on other tasks"*. P4 claimed that *"indexing is really an ideal job to be doing when you are sat on the switch board because it doesn't take a lot of thought process because it's quite mechanical"*.

Proving clerical workers are willing to change their working practices to adopt an IS Tom's (1991).

Surveyor opinion differs. P2 said "*currently things (the working practices) are affected quite badly to be honest*" and "*on the whole the system needs to be adapted to rather than the system suiting us so to speak*" suggesting negative changes to daily routine. P1 stated "*As it is at the moment I am still pretty much working to old practices even with the system in place*" proving workers with more 'company centric' are far more reluctant than clerical staff to adopt IS Tom (1991).

#### **4.5.2 Questionnaire analysis**

An alarming 65% of respondents were unhappy with changes in working practices resulting from EDMS implementation. There were a number of reasons for this, like "*I find it hard to read things from a screen*", "*I was more accustomed to FileMagic*" (the legacy system) and "*I have to wait for indexing to be performed, where as I used to be able to use paper straight away*". Other respondents were happier with the EDMS's effects, "*I can concentrate more on harder tasks now*", "*I do less chasing operative time sheets*" and "*Information is right at hand*". These comments, mostly from admin end users, back up Tom (1991) view that clerical workers are more willing to adopt IS.

### **4.6 Improvements that could have been made at the design stage**

#### **4.6.1 Interview analysis**

All participants agreed they would have liked more interaction with the development team during the EDMS's implementation.

This is shown in a many interviews. For example P1 commented "*if there was more staff involvement very early on the whole system would be better*". P1 and P4 state respectively: "*it would have been more beneficial if John (the system developer) had come down to our office and spent a couple of hours or better still a day with us*" and "*I think if maybe it had been delivered in shorter bursts might have helped me get a better understanding of how the system worked rather than sitting in a meeting and being told this is what is going to happen*".

The main theme from the interviewees was that end users wished to be involved more with the developers during implementation to ensure the EDMS would not interrupt with original working practices. P2 confirms this saying "*The advice I would have given him (the system developer) was to make the system more user friendly*", P3 also commented "*We have also discovered that the searching function does not always return exactly what we want*". Had users been involved more these minor usability flaws may have been avoided confirming Downing's (2006) belief that users will resist changes to working practice.

#### **4.6.2 Questionnaire analysis**

Only 40% of respondents felt they had been consulted enough during the design stage of the EDMS. A selection of the other 60% stated *“I wasn’t consulted at all so that clearly is not enough”* and *“I don’t think we were asked our opinion enough”* showing that respondents possibly felt disgruntled. Improvements suggested were *“The security of the documents could be looked at because I think there are a lot of people who don’t really need to see documents have access”*, *“The system needs to be more user friendly”* and *“Because it’s a pain there should be some way of automatically replace re-entered documents”*. These suggestions are a reflection of the current system and demonstrate that with additional end user input the system could be improved.

### **4.7 EDMS improving information flow**

#### **4.7.1 Interview analysis**

Kennedy & Schaunder (1998) believe EDMS reduces staff time on locating and retrieving documents and Sommerville & Craig (2006) describe an EDMS as an automated system designed to improve the flow of information.

P4 gave evidence *“There is a potential to scan and read the benchmarks which will take that job off the girls, they do spend a lot of time on that”* supporting the theory of reduced staff effort. P3 said *“When it works as it should it makes all of my jobs quicker and as a department in the whole gives us more time”*. This supports Kennedy & Schaunder (1998).

Supporting Sommerville & Craig (2006) P3 said *“When it is all up and running it will be a real benefit to the company. It will make everything run faster and more accessible”* and continued *“Technology will hopefully be able to give better answers than some individuals provide at the moment”*. This opinion is shared by P2 who commented how the flow of information has increased *“For the new builds very much so but for the revites and none standard works not at all in my opinion”* but as highlighted P2 identified some business processes had not been integrated successfully with the system.

Sommerville & Craig (2006) also states by having documents linked to a database using workflow management increased user accountability for error checking and clarification. Backing this up P5 commented *“Now because when we index documents its all stored within our central data base, it can be accessed from any of our developed systems”* and also *“With it all being on our SQL server we will be able to access information easier and quicker along with creating more accurate reports so say how much stuff is coming in”*.

#### **4.7.2 Questionnaire analysis**

The analysis relating to Sommerville & Craig's (2006) theory provides further evidence the EDMS does indeed improve information flow, "*Following up jobs is faster and easier*", "*Generally information is easier to locate*" and "*Everyone seems to have access to more information, which is a good thing*" were only some of the comments made. This trend found in more than half of the respondents suggesting the majority of the organisation felt the EDMS improved the flow of information.

#### **4.8 Summary of findings**

From the objectives the following summary of findings can be made.

From this case study participants expressed they were not happy with the amount of involvement they had in the design and implementation of the EDMS. 75% of those questioned claimed to not have been told about the system during its design and many felt unhappy with the amount of input they had been allowed to provide.

Feedback was less of an issue. More than 60% of respondents admitted that there were facilities to provide feedback. However a number of participants stated that they were unhappy with the lack of communication with the developers regarding systems improvement.

The EDMS had an apparent affect on end users either being positive or negative. Half of respondents reporting there had been an affect by the system claimed it made work harder. In perfect contrast the remaining users who claimed the system made work more efficient.

Participants concluded that had they been involved more in the design stage the EDMS may have been more beneficial.

Evidence collected suggests there is indeed a relation between EUS and the success of an EDMS implementation and the way to improve EUS evidently is to involve staff in the implementation process as much as possible.

As this study focused on only two departments within the organisation further study is required in the affect EDMS's have on different departmental work processes.

#### **4.9 Credibility and reliability of research data**

This study was carried out using a qualitative approach Piantanida & Garman (1999) state the credibility is largely down to the researchers' ability to collate and express knowledge fairly and accurately. The data collection methods used in this study had been designed and justified as the most appropriate to ensure accurate results. The analysis was conducted to specifications and guidelines set out by some of the top authors in their field. To reduce interview bias a thorough critical review was conducted of the literature on the subject.

The reliability of the research could be considered limited as only three departments were interviewed. To improve the reliability, the interview data collected had been backed up with questionnaire responses from various departments throughout the organisation including some department heads.

#### **4.10 Critical evaluation of research project**

A Weakness of the research is that only one case study was conducted. This makes it difficult to generalised results out of context (Zikmund, 2003). Additionally having been conducted using qualitative data there may be a dependency on quantitative data to refute or back up the findings concluded (Cooper & Schindler, 2008).

Although weaknesses exist in this research project there is a great deal of reliability in the findings as there were two types of data collected allowing for triangulation (Thomas, 2004). Additionally case studies are a method of generating well designed new hypotheses (Cooper & Schindler, 2008) and devising areas for further research (Zikmund, 2003).

#### **4.11 Areas for potential future work**

Findings from this research contribute to existing theory in the field by delivering a perspective of how a system developer of a company can maximise the success of an EDMS.

An identical case study should be conducted in similar organisations so to solidify findings and allowing for the conclusions to be generalised with less scrutiny. If the study was conducted in several other organisations quantitative surveys could be devised to assess the findings of these case studies and then be distributed amongst hundreds of organisations to test the hypothesis of this qualitative project on various sectors of business.

It has been established in this project that EUS does affect the perceived success of an EDMS. This work can be used to discover how to maximise the involvement of end users with system implementation.

## **Chapter 5: Conclusion**

The purpose of this study was to justify previous studies into EUS and determine whether this can affect the success of an EDMS within organisations.

Methods used to collect the primary research used was an instrumental case study using interviews and questionnaire to gather rich contextual data on participants' opinions and views relating to the research question.

Analysis of primary data was carried out using statistical analysis for the questionnaire responses and by transcribing and coding the interviews conducted. This data was then compared against other similar responses then related back to literature examined during the literature review.

Limitations of this study included timescale in which it was conducted. As a result only one case study was carried out, with more time another case study would have been conducted so a holistic view of the research question could have been gained.

Findings of this particular investigation into the affects of EUS are below:

Mixed responses from participants suggested that some were not entirely happy with the amount of involvement they had in the implementation of the EDMS. Other respondents felt they had been consulted at every opportunity but departmental divides suggesting priority may have been given to some business areas over others. It was concluded that there was a correlation between the amount of interaction with developers and the happiness with the system.

According to the study 70% of participants agreed that facilities to provide constant feedback on the system existed. Though the means for this feedback to be collected existed the general opinion was that EDMS feedback was not actively sought after. The system developer agreed more could be done to interact with end users. Some members of the company felt disgruntled by this lack of interaction and other members attempt to start the interaction with the system developers themselves.

A worrying 65% of end users felt that there had been a negative change to their working practices as a direct result of the EDMS. These participants found it difficult to operate the new software. This is in perfect contrast with the remaining participants who felt that the improved flow of information was a real benefit and made business decisions better informed.

Although 40% of respondents felt involved during implementation all participants agreed that they would have liked more interaction with the developers during the design of the EDMS. The general opinion was that the development team should have sat through an average day in each department and adapted the system



accordingly. If users had more interaction they would have changed the delivery of the system, the security levels and overall made it more useable.

These findings relating to the objectives allows for the conclusion that there is indeed a relationship between the perceived success of an EDMS and the involvement of its end users during its implementation stage, at least from the end users perspective.

Credibility of qualitative research projects is based on the researchers' ability to collate and express findings fairly and accurately. The methods used in this study were rigorously designed and justified to be appropriate and the analysis was also conducted following guidelines set out by some top authors in their field.

Reliability could be considered limited as interviews were only carried out in three departments. However questionnaires were distributed amongst departments throughout the organisation. These backed up the evidence provided by the interviewees and improved the overall verity of this research project. To improve the reliability of the interviews they were conducted in a friendly environment and all participants were aware of the studies purpose.

As only one case study was carried this is not a holistic view but does allow for the theories to be proved through quantitative testing. However this study used two collection methods triangulation was able to be carried out on the data obtained

Recommended further research would be to conduct identical case studies in other organisations allowing for the conclusions to be generalised with less scrutiny. Further to this a survey could be devised to assess the findings of these case studies then be distributed to hundreds of similar organisations to test the hypothesis of this project using a quantitative survey. An additional study could be to establish what processes can be used to maximise the involvement of end users with system implementation.

It is my firm belief that an organisation wishing to implement an EDMS can greatly increase their chances of making it a success if they understand the link between information system success and the importance of end user satisfaction as demonstrated within this body of research.

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