World Applied Sciences Journal 12 (Special Issue on Computer Applications & Knowledge Management): 55-58, 2011
ISSN 1818-4952

Electronic Document Management System

[1]P.A. Emelia Akashah [2]R. Syamsul Rizal [3]Kamaruzaman Jusoff and [1]E. Christon

[1]Department of Computer and Information Sciences Universiti Teknologi PETRONAS,
Bandar Seri Iskandar, 31750 Tronoh, Perak, Malaysia
[2]School of Business, Asia Pacific University College of Technology and Innovation,
Technology Park Malaysia, Bukit Jalil, 57000 Kuala Lumpur, Malaysia
[3]Faculty of Forestry, Universiti Putra Malaysia, 43400 Selangor, Malaysia

Abstract: Electronic Document Management System (EDMS) is needed by many organizations to properly managed large volumes of physical documents. One of them is Supply Chain Management (SCM) department of Oil and Gas (O&G) company in Malaysia. The objective of this research is to develop a framework of EDMS that is tailor-made to the SCM department, which is believed could help the department to manage their physical documents which are now located in their rented external storage due to the lack of space in the department itself. The requirements gathering is conducted by using interview method. The current business flow which involved the usage of the documents from one unit to another needed to be fully understood before developing the EDMS framework. This research has successfully developed an EDMS framework of SCM department and it could be used in developing the EDMS for future research.

Key words: EDMS · Framework · Physical documents · Supply Chain Management · Oil and gas

INTRODUCTION

Organizing large volumes of physical records are difficult and there are instances where it can be difficult to extract a record from a large volume of them. Without the use of an efficient and effective document management system, it is almost certain that management of documents will be prone to human error [1]. Some studies have shown that the use of electronic records management give birth to foundations that produce efficient governance and commendable performance as well [2]. One of the significant advantages of having such a system is the ease of information retrieval. Supply Chain Management (SCM) department in the O&G company in Malaysia has a lot of contract or procurement related documents that it needs to manage. Most of these documents are physical documents that are currently kept in physical folders. Due to lack of storage space in their department, very often, older files have to be sent to an external storage facility in another place in Bangi, with the distance of 40 km. Such documents are usually not easy to keep track of and are hard to find, especially if they are located in Bangi. When large volumes of documents are produced, it will definitely difficult to managed [3]. Usually a certain person is assigned to manage certain documents. Once that person leaves or is transferred from the department, it is hard to find the documents managed by that person. The problem faced here is the difficulty of retrieving documents if staff have left the department or have been sent to an external storage facility. Also, management of physical documents is a difficult challenge and is definitely prone to human error. There is always the risk that documents may be misplace or even lost.

Yao [4] stated that many problems will arise when we are dealing with traditional paper-based documents. A noteworthy challenge in coordinating supply chain management, the bullwhip phenomenon, happens because of distortion of information as well as delay in obtaining information [5]. Most of the document management system, either physical or electronic must comply with a number of criteria. According to ISO Records Management Standard 15489, there are three primary characteristics for records that are managed by a recordkeeping system. These three characteristics are: a) Authenticity; b) Reliability and c) Integrity. The authenticity refers to the ability to prove the relevant record is what it is supposed to be, its creator and time produced. Reliability, related to authenticity is how much

Corresponding Author: P.A. Emelia Akashah, Department of Computer and Information Sciences Universiti Teknologi PETRONAS, Bandar Seri Iskandar, 31750 Tronoh, Perak, Malaysia.

Fig. 1: Information Life Cycle

a record can be trusted to be used as proof. Reliable documents should be assured of their quality in delivering accurate representations of whatever information is documented [6]. Business process modeling is important to ensure the project is being tailored to the needs of the department. The objective of carrying out this modeling process is to find out the dependencies between processes, their behaviour and also the function of each process [7]. An issue that comes out of this scenario is that both the business process model as well as the data model needs to be integrated at some point of the development process of the system [8].

One thing to consider when looking into data models and process models is the life cycle of records. Choksy [9] claims that the records life cycle is the perspective that will provide the greatest benefit to an organisation. It presents a methodology people can use to take care of their organisation's documents. Fig. 1 shows the records life cycle or information life cycle.

Using the records life cycle, it is possible to properly work out the way that an organisation should manage and organise its documents, whether to improve the current system it uses or to build a whole new one. Having an electronic document management system (EDMS), testifies the embrace of e- business technologies into business organisations. For SCM departments, openness and transparency of the recorded information are important [10]. An e- business technology such as the EDMS will allow SCM users to have an open view of all the information stored according to their user access levels. This system is hoped to ease the process of knowledge transfer from one SCM user to another. This will most certainly boost the ability for collaboration amongst system users, improving staff as knowledge management works [2]. In the case that SCM department staffs have to leave the department, the replacements can easily track all of the documents needed through the system. The new users will not have to rely on the staff leaving to obtain the information needed. A plus point in this case is that information management is then less dependent on people, which also suggests that it could be less prone to human error. As much as an EDMS can help a business organisation, the challenges of physical document management are not alienated from it. According to [11], all of the problems found in managing physical paper documents are also present in managing electronic documents. Challenges related to indexing and organizations of documents have been assumed to be unique to electronic systems by those who are learning document management, but this is not the case. Such issues have already been present in physical document management systems for a long time. Improper design and implementation of an EDMS can create problems and defeat the purpose of creating one in the first place. Among the risks or consequences of not having an efficient and effective EDMS include: a) Incomplete paper-based records and poorly organized; b)Electronic records not yet complete or organized properly; c) Authentic data stock hard to recognize as redundancy occurs due to duplication of electronic records; d) Without limits for document storage, even more storage capacity is demanded; e) Lack of overview on how to find information and f) Archive processes do not have a distinct interface [12]. Another issue to ponder while developing EDMS is the acceptance rate of the end user. A user friendly EDMS could be one of the factor that could contribute to the higher user acceptance rate. The acceptance rate of the user is the success factor of EDMS, not the technological aspect [13,14].

The objective of this research is to develop a framework of EDMS that fulfill the business requirements of the said organization.

MATERIALS AND METHODS

In gathering the data of the current workflow of SCM department, an interview and discussion approach was conducted. An interview with a senior manager from within the said department is planned. The purpose of the interview will be to further understand the challenge the department faces in managing its documents. Also, it is expected that the interview should help to draw out the basic requirements of the system that the department needs. The interview is aimed at finding the more detailed information that will translate into the form of the desired system. More detailed discussions will assist to form the exact framework of how potential users of the proposed system would want it to work.

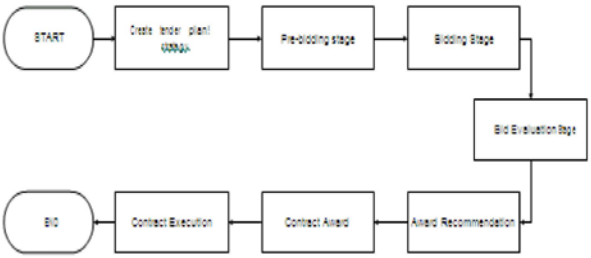

Fig. 2: Contract creation process flowchart

Scm Process and Workflow: The main focus of the proposed EDMS is to facilitate the storage and extraction of documents from a database that relate to the processes of producing a contract between the organization and its vendors/suppliers. If put in a simplistic form, there are approximately four processes, tender plan preparation, sending bid invitations, bid evaluation and award recommendation. Fig. 2 shows the basic flowchart of the SCM process workflow required to successfully complete a contract, from initiation to contract execution.

The workflow outlines all the main contract creation steps and this is the main process to be integrated in EDMS.

RESULTS AND DISCUSSION

Much emphasis is put on streamlining processes that the document management system will implement and the actual business processes of creating a typical SCM contract that the organization does on a regular basis. Fig. 3 describes an activity diagram, based on the business process workflow information obtained from the organization thus far.

It shows the processes or activities that an SCM user should conduct in managing the system. Firstly, users need to login to the system. Second, they should choose which organizational division tender project they need to refer to. From there, they will select which type of contract document they need to work on. Lastly, the user must decide which actions must be taken on the document being selected. Fig. 4 shows the relevant classes and how they relate to each other in the proposed electronic document management system.

It illustrates the relationship between the SCM users of the systems and the documents involved throughout the whole process of creating a valid contract. The class diagram tallies with the business process flow by highlighting documents that are dependent on other documents. As an example, Intension To Bid

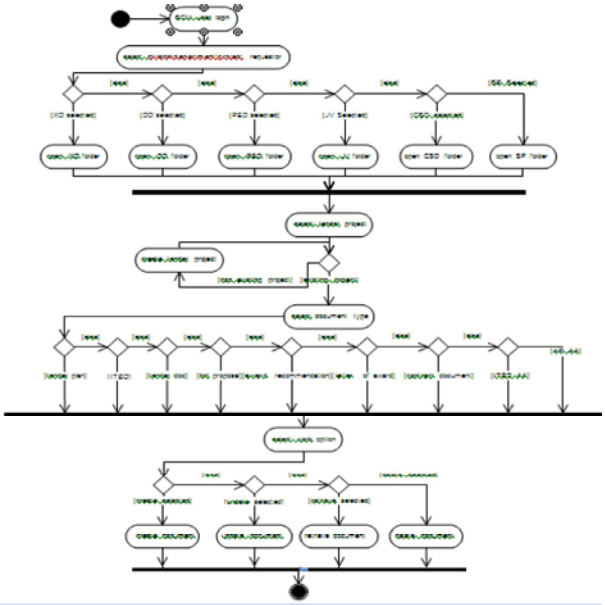

Fig. 3: SCM EDMS Activity Diagram

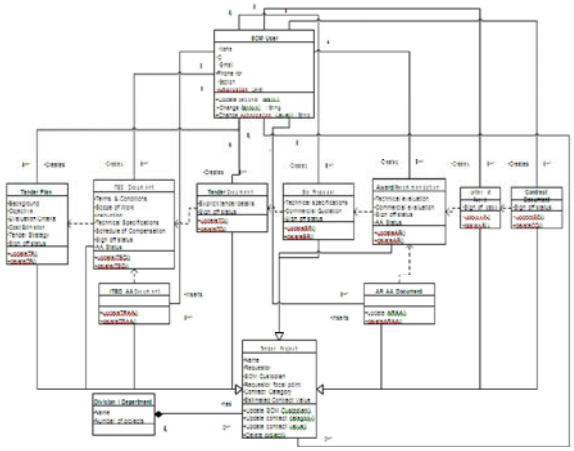

Fig. 4: SCM EDMS Class Diagram

Document (ITBD) is dependent on the tender plan. This indicates that ITBD cannot be created unless the tender plan has already been created. The dependency referred to in this instance is between the 'create tender plan/strategy' stage and pre-bidding stage, whereby one must come before the next.

CONCLUSION

EDMS is definitely the best solution adopted by SCM department in this particular organization. Besides to facilitate the retrieval of the documents in the department, it could provide a secure place to store the documents compared to the traditional filing system.

This research has successfully developed a customize framework of the system. Thorough research is carried out while gathering the system requirements to ensure that the developed framework is tally with the business requirements of the said department. For future research, EDMS for the said organization will be developed based on the framework proposed in this research paper.

REFERENCES

1. Heckman, J., 2008. Why Document Management: A White Paper. Retrieved 13th February, 2010, from http://www.heckmanco.com/docs/DMWhitePaper.pdf
2. Xiaomi, A., 2009. The Electronic Records Management in E-government Strategy: Case Studies and the Implications. 2009 International Conference on Networking and Digital Society, Guiyang, Guizhou, China, 30 – 31 May 2009, pp: 17-20.
3. Finch E.F., R. Flanagan and L.E. Marsh, 1996. Electronic Document Management in Construction using Auto-ID. Automation in Construction, 5(4): 313-321.
4. Yao,Y.H., A.J.C Trappey, P.S Ho., 2003. XML-based ISO9000 Electronic Document Management System. Robotics and Computer-Integrated Manufacturing, 19(4):355-370.
5. Yucesan, E., 2007. Impact of Information Technology on Supply Chain Management. Trends in Supply Chain Design and Management, 1: 127-148.
6. Bantin, P.C., 2008. Recordkeeping Systems: Understanding Data and Information Systems for Recordkeeping. New York: Neal-Schuman Publishers.
7. Boonyathan, P. and L. Al-Hakim, 2007. Procedure for Modelling and Improving E- SCM Processes. E-Supply Chain Technologies and Management, pp: 1-21.
8. Hee, K.V., J. Hidders, G.J. Houben, J. Paredaens and P. Thiran, 2009. On the Relationship Between Workflow Models and Document Types. J. Information Systems, 34(1): 178-208.
9. Choksy, C.E.B., 2006. Domesticating Information: Managing Documents inside the Organisation. Lanham: Scarecrow Press.
10. Bak, O., 2007. The Use of Collaboration Tools in Supply Chain: Implications and Challenges. E-Supply Chain Technologies and Management. Hershey: Information Science Reference.
11. Gilheany, S., 2003. Brief Overview of Document Management. Retrieved 15th February, 2010, from http://www.archivebuilders.com/whitepapers/21954p.pdf.
12. Klischewski, R., 2003. Towards an Ontology for e-Document Management in Public Administration – the Case of Schleswig-Holstein. 36th Hawaii International Conference on System Sciences, Hawaii, USA, 6-9 January 2003, pp: 48-54.
13. Hung, S.Y., Z. Tang, C.M. Chang and C.D. Ke, 2009. User Acceptance of Intergovernmental Services: An Example of Electronic Document Management System. J. Government Information Quarterly, 26(2): 387-397.
14. Gunnlaugsdottir, J., 2008. As you sow, so you will reap: Implementing ERMS. Records Management J., (18)1: 21-39.