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Exploring the Use of Enterprise Content Management Systems in different types of Organisations

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Abstract

Researchers and practitioners are starting to realize that it is unlikely that the full advantage of Electronic Content Management Systems (ECMS) can be realized unless both the technology capabilities and organisational context are taken into consideration. This study explores ECMS use in Replication, Diversification, Unification and Coordination type of organisations. A framework of ECMS-use is proposed suggesting different ways of using ECMS to support diverse organisational needs. Following a qualitative case study research approach, interviews were conducted with IT and business managers and ECMS users from each of the four types of organisations. Results suggest that, depending on the organisation's business needs, ECMS use in organisations can be categorized as 1) Minimal-use, 2) Standard Adoption-use, 3) Customized-use or 4) Leveraged-use. Findings suggest that managers can gain more realistic benefits from ECMS use by understanding why and how different types of ECMS-use can support the way in which their businesses operate.

Keywords

Enterprise Content Management Systems (ECMS), ECMS-use, business processes.

INTRODUCTION

Contemporary organisations whether small, large, public or private face an unprecedented growth in digital information (Cho 2008; Mescan 2004; Smith and McKeen 2003). Vom Brocke et al. (2010b) confirms this aspect by reporting that the amount of digital information produced in 2011 is ten times more than what has been produced in 2006 (Gantz et al. 2008, p.3). Additionally it has been estimated that employees spend up to 30% more of their time searching for the right information (Burnett et al. 2006). Consequently, there has been a significant uptake in Enterprise Content Management Systems (ECMS) in modern organisations lately (Blair 2004; Paivarinta and Munkvold 2005). Munkvold et al. (2006) confirms this aspect by reporting that a survey conducted by the Yankee Group found that among 750 medium and large US businesses, 63 percent were increasing their investment in ECMS (Surmacz 2004). Another study conducted by McLeod et al. (2010), estimates that 80 percent of UK higher education institutions are using ECMS.

Even though organisations invest large amounts of money in implementing ECMS, prior research indicates that many ECMS implementations fail to yield the kind of information management expected to support business operations (Andersen 2008; Dilnutt 2006; Gupta et al. 2001; McKeever 2003; Pullman and Gu 2008). A few researchers mention that ECMS implementation failures can be attributed to the fact that practitioners often focus more on technological and functionalities aspects of ECMS and less on understanding how to actually use these types of technologies once they are implemented (Nordheim and Paivarinta 2004; Tyrvainen et al. 2006; Vom Brocke et al. 2011). In fact, there has not yet been much research published in the Information Systems literature on the topic of ECMS-use that can help practitioners envisage and understand ways in which ECMS can actually be used in different work settings (Paivarinta and Munkvold 2005; Tyrvainen et al. 2006; Vom Brocke et al. 2011). As highlighted by Paivarinta and Munkvold (2005, p.9), *"Whereas practitioners are already facing these challenges, researchers still have provided few aids to manage them from the viewpoint of the enterprise. Research on ECM experiences remains scarce as well."*

Consequently, IT and business managers are left without a clear guidance of what ECMS can actually offer and how organisations can gain benefits from these technologies (Smith and McKeen 2003; Vom Brocke et al. 2011; Vom Brocke et al. 2010a; Vom Brocke et al. 2008). In a paper written by Pullman and Gu (2008) they highlight that organisations are left without critical examinations and clear understanding of why these technologies should be used in the first place and why some of the implementations succeed or fail. Vom Brocke et al. (2011) note *"In particular, the understanding is still vague as to what organisations strive to gain through implementing ECM systems and what results they can expect from the same."* Pullman and Gu (2008) further mention that future researchers should investigate how organisations actually use ECMS, understand why

organisations use these technologies in practice and examine the surroundings that include users, work settings, business environment and norms.

Therefore, based on the literature, this study has reason to believe that the understanding of ECMS-use is important and worth exploring. Bouwman et al. (2005) indicates that exploring the use of technologies (including ECMS) is critical since *"... the use of ICT is not simply the result of the introduction of a new application in an organisation."* In order to fill this gap in ECMS research, this study focuses on the question: *"How and why do organisations use ECMS to support their business operations?"*

In an attempt to find answers to this research question, we structure this paper as follows. First, we explain previous research on ECMS and we then present the business operating model of Ross et al. (2006) that explains how business-related information can be shared using IT (including ECMS) to support business operations. We then present the practice lens theory of Orlikowski (2000) that guides our empirical study followed by the research method. Thereafter, we present our findings and discussions followed by a conclusion.

RELATED WORK

Since this study aims to understand and explore the use of ECMS within organisations, we first consider suggestions made by other authors published in the ECMS literature. Next, we find theories that can act as a lens to guide this study. Current ECMS literature points to a need for research on ECMS-use that: (1) considers an organisation's business process structure as a crucial starting point to understand ECMS-use and (2) examines the interaction between technologies and the organisation that shape ways of using these technologies, as discussed below.

First, Paivarinta and Munkvold (2006) state that the design and implementation of ECMS should support the enterprise model. The concept of an enterprise model refers to what needs to be done in the enterprise including the idea of the business, required support operations, who does what and how organisations reach their partners and customers (Paivarinta and Munkvold 2005). They mention that ECMS implementation should be aligned with the enterprise model to ensure that *"it can build meaningful information systems to support the operations."* A few other authors use the word 'business process structure' instead of enterprise model (Vom Brocke et al. 2011; Vom Brocke et al. 2010a; Vom Brocke et al. 2010b). Likewise these authors also acknowledge the consideration of organisation's business processes as a crucial starting point for ECMS implementation and adoption (Grahlmann et al. 2010; Vom Brocke et al. 2011; Vom Brocke et al. 2010a; Vom Brocke et al. 2010b). These studies suggest that business process structure and ECMS adoption and implementation are strongly related and mutually integrated areas. Thus, this research posits that research on ECMS-use is also related to business process aspects. However, Tyrväinen et al (2006) argue that examples of how the enterprise or business process aspects has actually been modelled remains rare in the ECM literature. On the other hand, Vom Brocke et al. (2010b) argue that the business process perspective has not yet been established in the ECM field.

Second, another group of ECM researchers believe that there is an interaction between the technology (ECMS), the organisation (processes, structure, practices) and human factors (user communities, knowledge) (Bianco and Michelino 2010; Blair 2004; O'Callaghan and Smits 2005, p.1274; Tyrvainen et al. 2006; Vom Brocke et al. 2010a; Vom Brocke et al. 2010b). They mention that ECMS adoption, implementation and use may be intertwined with aspects of organisational purposes, processes, tools and user communities. As highlighted by Bianco and Michelino, ECMS *"... act as a go between the human factor and the firm structure..."* (Bianco and Michelino 2010, p.123) and they suggest that future researchers take this interaction into account when studying the use of these technologies.

As a result, this study selects two theories to address these two concerns. In addressing the first concern, a mature model that highlights how IT underpins a firm's process architecture known as the *Business Operating Model* of Ross et al. (2006) is used to explain how ECMS can be used to support business operations. Second, the practice lens of Orlikowski (2000) is chosen to understand the interaction between ECM technologies, organisation structure, processes and users within an organisation. Both theories are further explained in the sub-sections that follow.

The Business Operating Model

The Business Operating Model of Ross et al. (2006) is an operating model which describes: *"... the necessary level of business process integration and standardization for delivering goods and services to customers. Different companies have different levels of process integration across their business units... Management also must decide on the appropriate level of business process standardization...The operating model involves a commitment to how the company will operate."* (Ross et al. 2006, p.8-9)

Two dimensions are used to classify the Business Operating Model at the level of: (1) Standardization of business processes: organisations with a high level of standardization tend to have similar key business processes across all business units, and (2) Integration of business processes: the level of integration of business processes is evident from the degree of data sharing across and between business processes and between business units. A high level of integration is indicated by a high degree of such sharing. The combination of these two dimensions represents a two-dimensional Business Operating Model with four quadrants namely Replication, Coordination, Unification and Diversification.

Business Operating Model to Study ECMS-use

Previous research provides some insights on how a business operating model can be useful in exploring the use of ECMS. For example the study by Paivarinta & Munkvold (2005) has found that the organisational purpose or goal of implementing ECMS varied among cases and it depends on the business area or domain in which the enterprise is operating. Paivarinta & Munkvold (2005) found that in logistics companies like FedEx and DHL, they emphasize standardization in their operations. Their ECMS are used as a tool to ensure that every business unit share, reuse and follow the same invoice management processes. On the other hand, a company like BOC Gases emphasize integration across its inter-organisational network. BOC Gases is involved in managing inter-organisational projects to build plants and use ECMS as a tool to share documents and information with subcontractors and business partners to complete the plants.

Although previous studies did not explicitly indicate that a business operating model is the way to study ECMS-use, they have illustrated that depending on the type of businesses, organisations use ECMS in unique ways to support its operations. Therefore, this study has reason to believe that the Business Operating Model of Ross et al. (2006) can be used as a foundation to find evidence that explain how and why organisations use ECMS in different ways to support their business needs.

Practice Lens Theory to Understand Use of Technology in Organisations

Orlikowski's practice lens theory for studying the use of technology in organisations is also known as "technologies-in-practice". She explains the technologies-in-practice concept and mentions that when users use a technology, they draw on facilities, norms, interpretive schemes, and other structures. Therefore, users' use of technology becomes structured by the facilities, norms, experiences, knowledge, meanings (interpretive schemes) and other structures available at hand as further explained in Table 1.

Table 1. Enactment of Technologies-in-Practice (Orlikowski 2000)

Concepts	Description
Facilities:	Facilities can be hardware, software and data available at hand. Orlikowski mentions that, *"When people use a technology, they draw on the properties comprising the technological artifact – those provided by its constituent materiality, those inscribed by the designers, and those added on by users through previous interactions (e.g., specific data content, customized features, or expanded software/hardware accessories)."* (Orlikowski 2000, p.410)
Norms:	Is the knowledge of institutional practices (e.g., corporate norms, institutional norms). Norms are the ongoing practices (what is being practiced during work in the organisation by groups of people/in teams/in a unit) whether technology is present or not. Orlikowski (2000) states that, *"Users also draw on their knowledge of and experiences with the institutional contexts in which they live and work, and the social and cultural conventions associated with participating in such contexts."* (Orlikowski 2000, p.410)
Interpretive Schemes:	Users *"…draw on their skills, power, knowledge, assumptions, and expectations about the technology and its use, influenced typically by training, communication and previous experiences* (Orlikowski and Gash, 1994)."
Technologies-in-practice:	Is the use of technology or what people actually do with the technological artifact in practice. The use of technology are structured by facilities, norms, and interpretive schemes and such structuring enacts specific sets of rules and resources in practice and is termed as "technologies-in-practice".
Structures:	Orlikowski mentions that users' interaction with technology will always enact other social structures for example a hierarchical authority structure within a large bureaucracy and corporative structure within a participative workgroup along with technologies-in-practice.

RESEARCH METHODOLOGY

In this study, a qualitative research approach was employed since it was deemed appropriate to answer the concerns discussed in the previous section which among others are to: (1) gain a deep understanding of the interaction between ECMS, human factors and the firm structure, (2) report organisations' experiences in using ECMS, and (3) consider the organisational, social and business issues that provide explanations of why particular ways of using ECMS emerge. A multiple case study approach was chosen since the intention was to clarify whether the four types of organisations (Diversification, Replication, Coordination and Unification) use ECMS in unique ways to support their business processes. Four large organisations (one per organisation type)

were selected and the case studies were conducted between October 2010 and December 2011. These organisations were approached through contacts and selective networking based on recommendations from industry partners and colleagues.

The practice lens theory explained in the previous section formed the main basis for the semi-structured interview protocol and guided the data collection. Interview questions were aligned with categories of ECMS functionalities (facilities), organisation's norms, user's assumptions and knowledge about ECMS (interpretive schemes), use of ECMS, organisational business processes and the organisation context. Each interview lasted approximately 60 to 120 minutes. Between 4 and 13 participants were interviewed in each case organisation with a total of 29 participants across the four organisations. Interviews were conducted with the Chief Information Officer, IT and business managers, IT administrators, Content Managers and ECMS users. Combinations of participants allow the researcher to gather rich opinions from different perspectives.

Although interviews were the major source of information, they failed to provide the full picture or complete evidence of the real state of affairs. Therefore, observations were conducted since they will further provide a reality check on what has been reported in interviews. Other artifacts such as company newsletters and websites, business presentations and business forms were also examined in search of further insights. These provided additional depth and context about ECMS-use in the various organisations. Follow-up interviews were also conducted with certain participants and provided more depth since they covered some specific issues identified during interviews or observations.

Interviews were transcribed and detailed summaries and individual case study reports were created for each business unit. Both summaries and reports were checked and authorized by a key participant from each business unit who have proven to be reliable and in a position to reflect on the case study. Each case was initially coded separately using original transcripts and documents. As data analysis progressed, recurring themes emerged and were coded. For each theme, supporting evidence from the transcripts and documents was coded together with relationships between these themes. These themes and their relationships provided the basic building blocks to conduct the cross case analysis. During the cross case analysis, single case results were compared and resulted in the final framework discussed in the last section.

The data analysis aimed to discover the relationship between the organisational context/structure and ECMS use and understand how ECMS use was shaped by organisational norms, facilities at hand and knowledge of the users. The use of the practice lens theory assisted in providing a deeper understanding and explanation of how and why ECMS are used in each case.

CASE STUDY RESULTS AND FINDINGS

In this section, we first introduce each case organisation followed by the findings of each case. We also include some exemplary statements to facilitate understanding of the conclusion drawn.

Background information of each case organisation is shown in Table 2. The organisations are named with pseudonyms to preserve anonymity. The four sites were from different business sectors that include Consulting, Telecommunication, Retail and a Diversified business (see the 2nd column). This study intends to see similarities and contrasting ways of using ECMS in various industries, hence the selection of different business sectors. The 3rd column of Table 2 indicates that each organisation employs a particular type of business operating model. We also found that each organisation had different motivations for implementing ECMS (see the 4th column). This is in line with the work of Paivarinta and Munkvold (2005) who analyzed 58 cases and found that organisations implement ECMS for different reasons.

Table 2: Background data for case study sites

Co.	Type of Business	Operating Model	Initial Goals for implementing ECMS
PT	Diversified: Oil and Gas, Education, Maritime, Logistic etc.	Diversification	1. Provide a single, standard and unified place for sharing information and knowledge. 2. Collaborate across business units. 3. Gather units' information and making it centrally available.
RP	Consulting Company	Coordination	1. Sharing project drawings internally and externally (clients, contractors). 2. Engineers to collaborate on the design of their project drawings.
TB	Telecommunication	Unification	To gather and provide links to the organisational and units' various business systems, portals and databases.
SH	Electronic retail	Replication	1. Top management staff at the headquarters wants to disseminate accurate information to all stores at the same time. 2. Retain, preserve and share information in a single place.

1.   ECMS-use within RP

RP is a consulting company that provides consulting and project management services in multidisciplinary engineering fields. These services include mechanical, instrumentation, electrical, pipeline, safety and environmental and other engineering-related services. RP is composed of multidiscipline engineering units that include process, mechanical, instrumentation, electrical, structural, architectural and more. These specialized units collaborate to deliver integrated services that include trouble-shooting, procurement and construction projects. While the aim is to provide these services to its clients, every business unit delivers unique products (e.g., pipeline AutoCAD drawings, electrical drawings) and handles unique services. This illustrates that RP satisfies the criteria of a Coordination model (See 3rd column of Table 2).

From the interviews we found that RP used their ECMS in three unique ways, described as follows:

Project Collaboration: From our observations, we noticed that during the early stage of a project it was important for every unit to collaborate in designing their drawings. It was seen that units' engineers used the ECMS to refer to the newly designed, previous versions and revised drawings, as one architect explained, *"It is important for me to view the structural unit's drawings because I have to incorporate their drawings into my drawings. It is also important for me to share my drawings with other units such as the electrical unit, because they design the position of the lighting. Before they can position the lighting they have to refer to my architectural drawings because we design things like walls and doors. They have to fix the lights to be at the right place for example in a room, or else some rooms might end up with no lighting at all."*

From the interviews, we also found that it was extremely important to use ECMS to collaborate in a project, as one engineer said, *"If we at the architectural department make changes to our drawings, we have to share our latest drawing updates with other units like electrical, mechanical and pipeline. Let say we don't want to build a wall and wanted to have an opening instead. We need to share our revised drawings so that other departments can modify their drawings and put nothing at that opening. Same goes to our department, if there are changes made by other departments that affect our drawings, we need to modify ours."*

Project Information Sharing: Further, we noticed that in every project, there were one or two dedicated document controllers who were responsible for uploading all drawings into the ECMS. One of the document controllers explained her role: *"Engineers can't simply share their drawings in SharePoint. Any drawings to be shared in SharePoint have to go through the document controller. Document controller is the person who is responsible for uploading all drawings into SharePoint for sharing. Just imagine if everyone is allowed to share their drawings, it will be haywire! So that is why a document controller is there to manage."*

Document Approvals: During observation, we have seen the document controller issued a reference number and tagged it to a drawing and then uploaded that drawing for approvals. Engineers from all disciplines then reviewed the drawings and lead engineers from every unit were seen giving inputs and comments to drawings produced by other engineering disciplines. The comments were then shared in the ECMS. Based on the comments and feedbacks every unit re-worked their drawings to produce a finalized version.

External Sharing: Finalized drawings were presented to clients through the ECMS. At this stage, it was important for the project team to make sure that all units' drawings were finalized and ready for client review: *"Once the drawings are approved, I will create a transmittal number. The transmittal number is a number that we issue before any drawing is shared with our client. I will then send a notification email to our clients to inform them that I have uploaded the drawings with the exact transmittal number for their reference and provide them with the SharePoint link. Clients can access the finalized drawings in SharePoint."* (Document Controller)

2.   ECMS-use within TB

TB is a Malaysian telecommunications company that offers communication services and solutions including internet and multimedia, data and fixed-line services. TB has many business units that include sales, product, finance, procurement, marketing, IT and networking. This organisation employs a Unification operating model (See 3rd column of Table 2) as both integration and standardization of processes are required to serve different key customers which are wholesale, government, global, small medium enterprises, large enterprises and consumers.

From the interviews, we found that the ECMS at TB was not used to supports the organisation's integrated and standardized processes. Instead, staff used a large packaged system (i.e. global business tracking solutions) to support the interdependence between units and SAP systems to automate and support the standardized processes. Throughout the case study we also realized that TB used various types of other systems, portals and databases. Trying to understand why this happen, we arranged an informal discussion with one of the IT managers. She indicated that the different types of applications were built to satisfy a few highly influential

people. However, these platforms were not capable of communicating with each other, to the frustration of most staff.

We also found that TB business units have built many business applications for various purposes. Management and some staff were unhappy with these heterogeneous units' applications that were mostly known only by the staff of that particular unit. Staff from other units found it was difficult to search for information because they either did not know about the existence of such applications or they could not find the right application to use.

Due to the confusion and frustration of having too many heterogeneous business applications, databases and portals, TB management directed the IT manager to find a way to consolidate all these systems and applications. Therefore, the TB ECMS was implemented as a quick way to solve the problems of having too many individual tools and to provide links to all these systems and applications.

Provide access/links to information systems: The IT manager explained that the ECMS was used as a 'place' that listed all organisational and units' systems, portals and databases and provided links to access those systems, *"...Yeah, we have too many systems but it is just impossible to demolish them. The cost will be huge and our top management is totally against it. But I know that many staff are unhappy about it, they complain that it is very confusing and they don't know which is which. So, as for now we decided to introduce the ECMS and that is where we provide the links to all the systems that we have."*

3.   ECMS-use within SH

SH is an electronic retail company and has more than 100 stores throughout Malaysia. SH sells, delivers and repairs electronic products that include home appliances, computers and handheld phones. Every SH retail store runs their operations in a highly standardized fashion. For example, each store sells all electronic products at the same fixed prices. However, each store does not share information and are not dependent on one another's transaction. This demonstrates that SH employs a Replication model (See 3rd column Table 2).

From the interviews we understand that each store operates autonomously, but they follow standardized work processes (e.g. standardized delivery process). Through observations we noticed that there are few key technologies enabling those standardized processes. For example, each store uses the supply management system to manage their product flow, order and delivery process. Interviewees explained that instead of using ECMS to support and automate their standardized processes, ECMS are used for (1) sharing information about those standardized processes and (2) decision making.

Sharing standardized processes information: From interviews we learnt that SH management staff shared information about "products-on-promotions" in the ECMS. This information includes list of items on promotion, dates of promotions, product models, standard reduced prices, promotion start and end times. Sharing of this information is crucial since all stores need to promote the same items at the same time and at the same prices. One of the store managers explained: *"Items on promotions are announced by the A&P department at the HQ. They will share this information in our ECMS. As the store manager, I need to check the list of items on promotion, the new prices, the item model, the free gifts, the promotion dates and time and other info. I have to be prepared and request more stocks on those promotion items if necessary... I have to be alert all the time with this kind of info. Our company policy is to ensure standardization across all stores. This standardization effort promotes consistency and offers best value to our customers."* From our observations we noticed that the SH ECMS is used for sharing information about standardized processes between the headquarters and all business units. One of the interviewees confirmed that ECMS was not used for sharing any information between stores.

Decision making: From the interviews, we also learnt that SH's top management used the ECMS to monitor each store's daily, monthly, quarterly and annual sales. These sales reports were used for making decisions about future business plans and sales strategies. For example, one of the management staff told us that if they realized there are items which were not selling well for the past 3 months, they will announce a lower promotion price for those items and small gifts are given away free-of-charge as part of their promotion strategies.

In an interview with one of the store managers, we also learnt that the daily, monthly and quarterly sales reports shared in the ECMS were used by each store manager to: (1) make sure that enough stocks are available, (2) make orders if stocks are low and (3) ensure timely shipment of goods from warehouse to stores.

4.   ECMS-use within PT

PT is a large Malaysian oil and gas organisation and is ranked among the FORTUNE Global 500® largest corporations in the world. The organisation has its headquarters in Kuala Lumpur. PT has several diversified business units that include marketing and trading, an oil management unit, fertilizing centre, research and training centre, a private university, in-house consulting, automotive engineering, maritime, transportation and logistics provider. At the time interviews were conducted, PT had more than 30 businesses and it would be

impossible to conduct a case study that covers all of them. Case studies were conducted at three of PT's business units namely the in-house consulting unit, oil management unit and PT University.

From observations, we noticed that there was one centralized ECMS and several dedicated ECMS for each business unit. The content shared in the centralized ECMS was accessible by all staff regardless of the unit they were located in while content shared in each dedicated unit ECMS were restricted to staff of that unit.

ECMS-use within the PT In-house Consulting Unit

PT in-house consultancy provides in-house consulting support and services to all units in the organisation. A number of experts from various areas such as chemical engineering, health and safety and technology are located in this unit. Apart from conducting research, they design standard work procedures and guidelines that need to be followed by certain business units. Standard work procedures are related to the organisation's key operational areas such as the Engineering Value and Improvement Guides, Technical Standards and Operational Capability Standards. From observations, it was seen that this unit used the centralized ECMS for sharing those standardized process information.

Sharing standardized process information: One of the consultants explained the central role of PT's centralized ECMS was to share standard working procedures: *"In this organisation, there are standard ways of doing certain things and we often call it SOPs [Standard Operating Procedures]. For example, engineers must follow the standard way of setting up the compressor or setting up the pipeline. This ECMS is where we share the standard procedures and it is for [engineers'] reference."*

ECMS-use within the PT Oil Management Unit

This unit is responsible in managing PT oil assets as well as processing oil into petroleum products for both domestic and export markets. We found that staff within this unit used their unit's ECMS to (1) share standardized process information and (2) track and rate staff performance.

Sharing standardized process information: The unit manager showed us how they used their unit ECMS to share and publish each division's business process workflows which were integrated into a complete business process framework. We were told that one of the main purposes of sharing the business process workflows was to achieve consistency across all divisions, *"These are the workflows. We can click the boxes and it will tell us what to do next and what need to be completed and such. That is how we create consistency in doing our work."*

Tracking and rating staff performance: From our observations it was evident that this unit's ECMS was also used to automate some of the unit's processes. For example, to duly complete staff recognition tracking processes, information about staff profiles and staff performance ratings were shared among divisions' leaders within the unit. By sharing this information, leaders from various divisions could rate their staff that often worked on multiple projects headed by different leaders. Upon completion of such a staff rating, staff performance information will then be transmitted automatically through the ECMS to leaders in different divisions where particular staff served.

ECMS-use within PT University

Part of this organisation is a private university that offers engineering and technology programs at the undergraduate and postgraduate levels. This university has a dedicated unit ECMS that serve the University's different sets of customers (students), stakeholders (academic staffs and mentors) and business operations.

From our initial observation (day 1 at the university), we noticed that not many staff used the ECMS. We also noticed a few staff logging-into the ECMS for less than 5 minutes. The manager admitted that many staff were reluctant to use the ECMS, *"We hardly see people using the system. Most of the staff just hates it [to use the ECMS]."* A lecturer explained the reason she was reluctant to use ECMS, *"I don't understand why we have to use the system. I know that it is the direction from our top management. It may be useful to other units but not to us in this university. We use the e-learning systems to share most of our stuff like teaching portfolios, course syllabus, student attendances, student assignments, student performance. I don't see the need to use the ECMS."*

From interviews we learnt that the ECMS was introduced to the university just because PT's management wanted to promote a standardized ECMS across all business units. In addition, one of the senior managers admitted there was no proper ECMS implementation planning. Due to these reasons, the ECMS did not suit the way the academic staff worked. Further interviews revealed that most lecturers criticized the rigidity and cumbersomeness of some of the ECMS user interfaces. They preferred other systems e.g. e-learning which is clearly less problematic. On our final day at the site, the senior manager concluded that bringing in the ECMS, (which was not carefully customized to meet the academic staff needs), caused the implementation to be a failure. He believed that these problems could be eliminated if the ECMS was customized to support the way the university operates. However, this was in direct contrast with PT management's direction, which was to implement and use standardized ECMS across all business units. The manager also highlighted that there were a

small number of other business units that requested customization. However, their requests were overruled by the top management's decision.

DISCUSSION

This paper has addressed the research question: *"How and why do organisations use ECMS to support their business operations?"* Our empirical evidences illustrate that various organisations use the same technologies (i.e. ECMS) in different ways across various contexts and practices. This is in line with what was found by Orlikowski (2000) on the use of Lotus Notes. Our evidence has also shown that the different types of ECMS-use emerge in response to particular organisational contexts, diversity of goals, organisational practices and norms, user interpretations and skills as well as facilities available. These findings support the work of previous ECM researchers who believe that there is an interaction between ECMS technology, the organisational context and human factors (user communities, knowledge) (Bianco and Michelino 2010; Blair 2004; O'Callaghan and Smits 2005, p.1274; Tyrvainen et al. 2006; Vom Brocke et al. 2010a; Vom Brocke et al. 2010b).

Based on our evidences, we categorized and propose four types of ECMS-use as shown in Table 3. The first type of ECMS-use is characterized in terms of a *Minimal-use* (See 1st row of Table 3). Minimal use occurs when organisations choose to use technology to *retain their existing ways of doing things*. For example, an organisation may choose to keep their current business systems, applications and databases to support its integrated and standardized processes. Therefore, the introduction of ECMS does not change their current practices or technologies. In this category of ECMS-use users choose to use limited ECMS functionalities and show little or no interest in integrating their ECMS-use into their work processes. Users need very basic user training or no training at all. However, organisations may not gain much long-term benefits from this type of use. From our data, ECMS-use to provide access/links to information systems, fall into this category of use.

Table 3. Proposed Types of ECMS-use

Minimal-use: Minimal-use is characterized by non-use or very limited use of ECMS. Little or no training is provided to users and experimentation is discouraged. The use does not support work process. Users feel a lack of control over the technologies and have very minimal understanding of its capabilities. The technologies are perceived as having little value.

Standard Adoption-use: Standard Adoption-use is characterized by the use of the basic ECMS functionalities. Minimal change is made to the technologies structure, functionalities and interface (i.e. use as it is). Experimentation and enhancements to the technologies is neither encouraged nor discouraged. Adequate training is provided to users for basic system features and functionalities. Users feel they have moderate control over the technologies and have some degree of understanding for its capabilities. Benefits to the work processes are limited.

Customized-use: Customized-use is characterized by the use of ECMS beyond its basic capabilities through user modifications to its work processes to be supported and automated by ECMS. Having ECMS to support and automate certain business processes increase efficiencies (e.g., improve process turn-around time) and effectiveness (e.g., prevent lost of documents) of that process. Adaptations to ECMS supported workflows may lead to new work procedures. Users may feel more control over processes and work tasks than over the technology itself. Users have specific understanding of the ECM technologies and its capabilities. Trainings should be provided in both work procedures and ECMS supported workflows. *Customized-use* requires experts (e.g., programmers, vendors) to understand the business rules, processes and procedures to be supported and automated by the ECMS.

Leveraged-use: Leveraged-use is characterized by ECMS-use that extends both the capabilities of the technologies and the work processes. Users may integrate ECMS with other systems (e.g., finance systems, sales systems) to assemble data from those systems and then make strategic or operational decisions. User believes that ECM technologies can help to make better decisions, business plans and strategies. Adequate trainings and time to learn and experiment with the technologies are provided. *Leveraged-use* involves a dynamic workplace where technologies are continually experimented to enhance work performance.

The second type of ECMS-use is characterized in terms of *Standard Adoption-use*, where organisations choose to *use the basic ECMS functionalities* (See 2nd row of Table 3). Our participants' refer to this type of use as "use-as-it-is" which means there is no enhancement, modification or experiments made to the technologies. These types of use support current work practices. For example, ECMS may be used for sharing standardized process information, organisation-wide information sharing and external information sharing (e.g. with contractors and clients). For this type of use, adequate training should be provided to users on the basic systems features and functionalities. Organisations may be able to conduct certain work process in better ways from this type of use.

The third type of ECMS-use is characterized in terms of *Customized-use* (See 3rd row of Table 3). *Customized-use* takes place when organisations *use the ECMS to support and automate their existing ways of doing things*. From our data, we found that ECMS may be customized to automate integrated processes (e.g., project collaboration) and standardized work processes (e.g., standardized approval process). This type of use would require users to have a moderate, competent or extensive understanding of the ECMS functionalities and the business rules, procedures and processes. Training should be provided on both work procedures and ECMS supported work procedures. Users must also be moderately or highly motivated to use ECMS to enhance their work practices. This type of use often results in noticeable improvements of work processes.

The fourth type of ECMS-use is characterized in terms of *Leveraged-use* (See 4th row of Table 3), where organisations *use the technologies beyond its basic capabilities and alter the way of doing certain things*. This type of use extends both the capabilities of the technologies and work process. Users often integrate ECMS with other systems for example Finance and Sales systems. Users should be given adequate training and time to learn and experiment with the ECMS technologies. This type of use may help managers and leaders to make better decisions and plan for future business strategies. From our data, the example where ECMS are used for decision making falls into this category of use.

Based on findings, this research suggests for organisations to use ECMS for *Minimal-use*, *Standard Adoption-use*, *Customized-use* or *Leveraged-use* that overall may or may not necessarily supports business processes. Consequently, this study claims there is no direct association between types of organisations (Coordination, Replication, Unification and Diversification) and specific types of ECMS-use. However, organisations emphasizing high process standardization (i.e. Replication and Unification) may use ECMS for *Standard Adoption-use, Customized-use* and *Leveraged-use* that overall support standardized requirements. Likewise, those organisations employing high process integration (i.e. Coordination and Unification) should use ECMS for *Standard Adoption-use*, *Customized-use* and *Leveraged-use* for integrated process needs. However, they may choose to do otherwise, for example Replication organisations may choose to use ECMS to support few of its integrated processes (Ross et al. 2006). Nevertheless, for organisations that emphasize low process standardization and integration (i.e. Diversification), ECMS may support few process integration and standardization within a business rather than organisation-wide. On the other note, all types of organisations may use ECMS for *Minimal-use*. However, little benefit is gained through this type of ECMS-use. Yet, this should not stop organisations from using ECMS for *Minimal-use* because as Bouwman et al. (2005) highlight, a small-scale use does not mean that the technology-use is a failure since from the very beginning it was never intended to be used for massive-scale.

The four types of ECMS-use and examples given here may not be comprehensive and exhaustive, but it is a good start for organisations to understand in what ways are already installed ECMS can appropriately be used during post-implementation period as recommended by Jasperson (2005) and seen in the work of Lassila and Brancheau (1999) on engineering decision support systems and Orlikowski (2000) on Notes technologies. However, exploring organisations in other business sectors (e.g. hospitals, banking) may bring more interesting results and increase our understanding on how ECMS may be used in different circumstances and industries.

CONCLUSION

In this paper, we have proposed that organisations may use ECMS for *Minimal-use*, *Standard Adoption-use*, *Customized-use* or *Leveraged-use*. Each type of use may bring certain benefits to the organisations. However, there is no definite answer to which type of use may suit an organisation. The choice of ECMS-use depends on the technologies available at hand (e.g., functionalities, other technologies available), organisational context (e.g., processes, structures, practices) and users (e.g., norms, knowledge, assumptions). This study also supports the idea that the key to successful use of technologies (including ECMS) lies in understanding and managing the relationship between the technology and organisational context.

Our findings contribute to the ECM literature in three ways. First, we introduce the business operating model of Ross et al. (2006) to explain how ECMS can be used to support the way organisations' work, extending previous ECM studies (Paivarinta and Munkvold 2005; Tyrvainen et al. 2006). Second, we examine the interaction between ECM technologies, organisational context and users using the practice lens theory of Orlikowski (2000) that shape certain ways of using the technologies as suggested by previous ECM researchers (Bianco and Michelino 2010; Blair 2004; O'Callaghan and Smits 2005, p.1274; Tyrvainen et al. 2006; Vom Brocke et al. 2010a; Vom Brocke et al. 2010b) and other researchers who studies other technology-use in information systems literature (Jasperson 2005; Lassila and Brancheau 1999). Third, the case studies provide a rich description and evidence on ways in which Diversification, Replication, Coordination and Unification types of organisations use ECM systems to support their businesses.

This study also provides insights to practitioners on the specific value that ECMS may add in supporting different business needs. This is important especially for IT managers since they need to understand how

ECMS-use can be embedded in their firms' business processes to improve work practices which in turn support the way their organisation operates. In addition, this may also guide business managers to understand ways in which they can gain more organisational and business benefits from these types of technologies.

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