

Exploring the Use of Enterprise Content Management Systems in Unification Types of Organizations

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Abstract. The aim of this paper is to better understand how highly standardized and integrated businesses known as unification types of organizations use Enterprise Content Management Systems (ECMS) to support their business processes. Multiple case study approach was used to study the ways two unification organizations use their ECMS in their daily work practices. Arising from these case studies are insights into the differing ways in which ECMS is used to support businesses. Based on the comparisons of the two cases, this study proposed that unification organizations may use ECMS in four ways, for: (1) collaboration, (2) information sharing that supports a standardized process structure, (3) building custom workflows that support integrated and standardized processes, and (4) providing links and access to information systems. These findings may guide organizations that are highly standardized and integrated in fashion, to achieve their intended ECMS-use, to understand reasons for ECMS failures and underutilization and to exploit technologies investments.

1 Introduction

Previous research on technology-use highlights the distinction between 'technology as artifact' and technology-use as important [1-3]. Orlikowski [1, p.425] reinforces this point by stating that "technology per se can't increase or decrease the productivity of workers performance, only use of it [technology] can." However, most research tends to emphasize technology as an artefact and neglects the study of technology-use. By not examining and understanding what actually happens during the use of a technology, how a technology is actually being used and why users choose to use a technology in certain ways, important nuances and critical aspects that describe ways in which people interact with technologies in their day-to-day activities, may be overlooked.

The recognition of the above limitation is also found in the ECMS literature. Prior Enterprise Content Management Systems (ECMS) research concentrates mostly on two specific areas: (1) technology aspects such as ECMS components and customizations of these components [4-8] and (2) ECMS deployment aspects that include change management and implementation [9, 10]. Even though these areas are important, a number of authors have expressed their views that these studies provide insufficient evidence to understand practices that

relate to ECMS-use in organizations (Bianco and Michelino 2010; Nordheim and Paivarinta 2006; Paivarinta and Munkvold 2005). As Paivarinta and Munkvold [9, p.1] point out, "[a] few sources [limited research literature] have reported research on actual ECM practices in organizations."

Furthermore, previous ECMS literature highlights two main concerns. Firstly, a few researchers contend that ECMS and business process structures are two strongly related fields that have not yet been related through empirical research [10-15]. These authors suggest that future research needs to study how business process structures relate to organizations' implementation, adoption, design and use of ECMS. Secondly, a number of researchers suggest that there is an interaction between ECM technology, the organizational context and its users that has not yet been fully explored. As Bianco and Michelino [16, p.123] indicate, ECMS "... act as a go between the human factor and the firm structure ...". They suggest that future research needs to investigate these interactions to better understand ECMS-use in organizations [13, 14, 15, p.1274, 16-18].

Considering these limitations identified in the ECMS literature, there is limited understanding and empirical evidence on how: (1) ECMS is actually used in practice, (2) business process structure influences ECMS-

use, and (3) the ECMS, the organizational context and users together shape ECMS-use.

Therefore, the main objective of this study is to understand and explain how unified businesses use ECMS to support their business processes and the following research question is addressed: “How do unified organizations use ECMS to support business processes?”

2 Background of Study

ECMS can be considered as a convergence of technologies that supports content management [4, 5, 19-21]. Dilnutt [5, p. 40] found that vendors generally promote ECM technologies as, “...an integrated set of content, compliance, and collaboration solutions which enable people to collaboratively create, manage, deliver, store and archive information during everyday business operations.” Specifically, Dilnutt conducted observations on the commercial ECMS marketplace and found that ECMS may include an integration of technology components that include electronic document management systems, electronic record management systems, workflow management systems, website content management, and others.

Despite the fact that ECMS functionalities is useful to organizations for selecting an ECMS product and compare the functionalities offered by different vendors [8], it is found that there is a lack of understanding as to which categories of functionality is important to support specific organizational goals and business needs (Benevolo and Negri [22]). Similarly, there are other papers which present and describe ECMS functionalities [4, 5, 20, 21, 23-26] and technical aspects of ECMS components [27-29]. These papers are mostly published based on author experience and experimentation with the technology and their observations of the ECMS marketplace. Therefore, there is a lack of systematic and rigorous studies into how organizations actually use the technology supporting work practices and business processes.

As a consequence, this study argues that business and IT managers are left without a clear guidance on which functionalities are needed to support their business operations and work practices, and how can those functionalities be used to support business processes. Specifically, this study intends to highlight that such explanation and understanding is necessary to assist business and IT managers to effectively use ECMS. This study’s perception is in agreement with a few other studies who state that it is the organization’s responsibility to evaluate ECMS functionalities to match them with their business requirements [22]. Vitari et al. [30] claim that choosing suitable ECMS to support organizational needs is a complicated task since there is no framework that guide organizations to evaluate ECM technologies. Similalry, Votsch [31] argues that without a clear guidance about what functionalities needed to suport organizational goals, the solution offered by vendors often fails to match with organizational needs.

Consequently, McNabb [32] makes two important suggestions: (1) organizations should adopt ECMS products that align with their corporate goals, and (2) ECM vendors should be evaluated based on the purchaser’s long-term strategy.

As a consequence, this study is grounded in the perception that the understanding of the use of ECMS functionalities to support organizational needs and business goals is still one of the rather ambiguous topic in IS field. Therefore, the study on ECMS functionalities and its use to support organizational goals should be given an attention, especially with regard to supporting business processes [13, 14, 33]. This has indeed call for this study to explore what is already known in the ECMS literature that further establishes the need to focus on understanding and explaining how organizations use ECMS to support business processes, as elaborated in the next section.

3 Literature Review on ECMS

Based on the literature review, it becomes apparent that most studies are ECMS design-oriented in nature, thus proposing methods, standards and frameworks for ECMS adoption and implementation [6, 9, 10, 15, 34]. This is in agreement with Vom Brocke et al. [12] and Munkvold et al. [9] who found that most of the early work on ECMS mainly discusses implementation, adoption and customization of these systems. Although these topics are useful, it does not help practitioners to understand the ways in which ECMS can actually be used in a specific organizational context.

However, one exception is a study conducted by Paivarinta and Munkvold [10] that is found to be useful in this regard. In their paper, the authors identify a framework for ECMS implementation and has call for managerial attention. The framework of Paivarinta and Munkvold (2005) explain that the realization of ECMS objectives vary among cases and is seemingly dependent on the business area or domain in which the enterprise is operating. They mention that an ECMS implementation should be aligned with the enterprise model to ensure that “*it can build meaningful information systems to support the operations*” [10, p.5]. The concept of an enterprise model is important as described by Paivarinta and Munkvold [10], because it refers to what needs to be done in an enterprise including the idea of the business, required support operations, who does what and how organizations reach their suppliers and customers.

Similar to Paivarinta and Munkvold [10], a few other researchers also consider that an ECMS implementation has to be aligned with a company’s business process structures [12, 13, 18, 21, 35]. The authors contend that when ECMS implementation is aligned with an organization business process structure, ECMS will progressively influence the effect on the overall business performance. For example, ECMS-use can reduce the cost of handling information during business process executions. It is also mentioned that business process executions can be supported by ECMS

thus simplify process flows and may increase organization competitiveness.

Specifically, this study intends to highlight that previous studies suggest that business process structures, also called enterprise model, and ECMS implementation and adoption are two strongly related areas [10, 13, 21]. However, Tyrvainen et al. [14] argue that a gap exists where there is no model of business process structure identified in the ECMS literature that can fully represent all types of organizations. Considering this challenge, this study introduces and uses Ross et al.'s [36] generic business operating model that relates to firms' operations, expressed in terms of business processes, and the use of IT.

Ross et al. [36, p.8-9] describe the business operating model as, "... *the necessary level of business process integration and standardization for delivering goods and services to customers ... Integration enables end-to-end processing and single face to the customer, but it forces a common understanding of data across diverse business units. ... Process standardization creates efficiencies across business units but limits opportunities to customer services. The operating model involves a commitment to how the company will operate.*"

From this definition, two dimensions are used to classify organizations' business operating model:

- Standardization of business processes: Organizations that are highly standardized tend to have similar key business processes across all business units. On the other hand, companies with low level process standardization have very few identical key business processes.
- Integration of business processes: The level of business process integration 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. However, as mentioned before, this paper only explores the way unification organizations use ECMS to support its business processes. Unification type of business operating model refers to high levels of both integration and standardization of processes. When business units are tightly integrated around a standardized set of processes, organizations benefit from a unification model. Business units typically share transaction data often including customers and suppliers. Unification organizations need enterprise systems reinforcing standard processes and providing global data access.

To find answers to how unification organizations use ECMS to support their business processes, an appropriate

research method has been selected as explained in the next section.

4 Research Methodology

In answering the above concerns, a multiple case study approach was chosen for this study as it would be extremely difficult to simulate this type of research in a laboratory environment or through surveys. Multiple case studies also provided the ability to collect rich data and enabled cross-case analysis to be carried out [37, 38]. The ability to conduct a cross-case analysis significantly contributed to a deeper understanding of ECMS-use.

Two unification organizations were selected: (1) a telecommunication company (Telco) and (2) a mobile service provider (Mobile_Pro). Data collection in Telco was conducted in November 2010 and followed by Mobile_Pro in November 2011. These organizations were approached through contacts and selective networking based on recommendations from industry partners and colleagues.

Semi-structured and open-ended interviews formed the major data collection instruments for this study. Although an interview protocol was followed, the nature of the interviews allowed re-direction of some questions towards specific issues that arose during the interviews. Interviews were conducted with, and concentrated on, participants who actively used ECMS in their daily work. Participants were asked to describe how they used ECMS to perform particular work processes. Specific questions were also asked about the role of the ECMS in users' work and how it was embedded in the organizational business process flows.

In Telco, eight participants were interviewed and four participants represent Mobile_Pro. Participants' roles included Chief Information Officer, IT managers, business unit managers, IT officers, engineers and project managers. This combination of different roles allowed the gathering of rich data that represented opinions from different perspectives. Each interview lasted approximately 60 to 75 minutes. Most interviews were conducted face-to-face requiring the interviewer to visit each case organization. A few interviews were conducted in locations other than the organization, which were more convenient to participants.

Although interviews were the major source of information for this research, they by no means gave the full picture of the real state of affairs. Therefore, interviews were followed by observations. In addition to interviews and observations, the researcher conducted discussions with a few participants about the ECMS as a technology artefact (i.e. organizational websites, the organization chart and article about the ECMS which had been published online) in each organization. Observations and discussions were considered as providing a reality check on what had been reported in the interviews. The use of these research methods allow the researchers to capture useful insights which is presented in the next section. However, it is important to note that using other research approaches to gather data

may bring other insights which may or may not appear from this research work.

5 Results and Discussions

This section is structured as follows. Firstly, the Mobile_Pro case is presented in Section 5.1 which is followed by the Telco case in Section 5.2. At the beginning of each case, the organization is briefly introduced. Following this, the ways in which the organization satisfied the characteristics of a unification operating model are explained. Next, a brief description about ECMS planning and implementation within the organization is given. Subsequently, the results of the way ECMS is used in the organization are presented. At the end of this section, these two cases are brought together in a cross-case analysis to better understand and explain how unification organizations can use ECMS to support their business processes.

5.1. The Mobile_Pro Case

Mobile_Pro is a Malaysian-based mobile communications organization founded in 1995. The headquarters is located in Shah Alam, Selangor. At the time of conducting the interviews, Mobile_Pro had more than 2,000 employees. In 2006, it was reported that Mobile_Pro's revenue was approximately MYR 806 million. This organization was one of the first in Malaysia to launch and operate digital cellular networks, followed by GPRS and later EDGE, 3G and more new technologies (i.e. LTE-equipped networks).

Mobile_Pro satisfied the criteria of a unification organization when measured using the criteria outlined by Ross et al. (2006) because the organization's business processes are highly integrated and highly standardized across business units. The organization's specialized business units (e.g. technology, business and marketing, networking and risk management) are tightly integrated (or interdependent) around standard sets of processes. The standard sets of processes include standardized global tendering processes, standard purchasing processes.

5.1.1 Background on Mobile_Pro's ECMS

Before the ECMS was introduced, employees used emails to share project documents, reports and network designs among units. They reported that it was not easy to use emails to share project documents because it was difficult to determine who had modified which documents. One of the engineers indicated that: "when there were too many emails with attachments being passed around, you lost track and I often got confused and ended up not knowing which was the latest one."

In addition to using emails, employees used communication tools to collaborate between business units. They used communication facilities such as instant messaging, discussion forums and chat rooms. However, management realized that they failed to capture the discussions or communication threads written in these

online forums and instant messages. Consequently, when an engineer left the organization, there was no way they could capture his or her experiences, ideas and knowledge.

Due to these reasons, management realized the need to have a better technology to share information and to collaborate among units. Thus, in 2009, they decided to invest in ECM technologies. One of the project managers explained that Mobile_Pro's initial ECMS implementation goals were to: (1) support collaboration and sharing of project documents among business units, (2) allow project monitoring, (3) reduce the size of emails and (4) support inter-unit communication.

Eventually, the use of the ECMS grew and project teams started using these technologies to integrate and standardize some of their work processes including the approval and monitoring processes. However, it was highlighted that not all work processes were facilitated by their ECMS. Management had decided to continue using their existing Oracle enterprise systems to handle the finance and human resources processes, as an engineer confirmed: "... but invoicing, that's handled by the finance unit, we don't have that information in SharePoint [the ECMS]. It's handled by our Oracle enterprise systems ... we don't plan to demolish any of these [enterprise] systems." Management did not see the need to replace its organizational enterprise systems (i.e. enterprise Oracle finance and HR systems) with the ECMS. Consequently, the ECMS was only used to facilitate some processes which had previously been handled manually, as listed below:

1. Mobile_Pro project team members used the ECMS to jointly prepare project documents (e.g. site survey reports, procurement lists) between units.
2. Mobile_Pro project managers used the ECMS for (1) reviewing and approving project documents (e.g., reports, risk issue register) and (2) monitoring progress among units.
3. Mobile_Pro engineers used the ECMS as a single point of reference through which to access standard operating procedures (e.g. risk mitigation guidelines).

Based on the data analyzed, it emerged that Mobile_Pro used ECMS for: (1) collaboration, (2) building custom workflows that supported integrated and standardized processes, and (3) information sharing that supported a standardized process structure, as described below:

1. Collaboration

Mobile_Pro used its ECMS to support collaboration among its specialized business units. In this organization, the need to use ECMS was indeed crucial because business units had to jointly prepare project documents such as site survey reports, risk registers and project portfolios. Business units were located in different buildings and to meet face-to-face regularly was difficult. Therefore, the ECMS became a medium for collaboration and was used as a point for updating documents, to alert others with new updates and as a document repository. Any latest documents and reports were updated in the ECMS repository for reference by business units, management and project stakeholders (i.e. project owner and project sponsor).

2. Custom workflows that support integrated and standardized processes

Mobile_Pro also used their ECMS to support its integrated and standardized processes in two ways. Firstly, ECMS workflows were used to handle the movements of documents from one approver to another following the sequence of approvers. Secondly, ECMS workflows were used to facilitate document review and project monitoring processes among business units. By using ECMS workflows to facilitate these processes (i.e. approval, review and monitoring processes) allowed process standardization to be achieved across all business units thus supporting Mobile_Pro's standardized process structure.

3. Information sharing that supports a standardized process structure

Finally, it was found that Mobile_Pro used their ECMS for information sharing. In this case, the ECMS was used as a single point of reference for employees to access standard operating procedures. This included standard procedures such as the network design guidelines and risk mitigation operation manuals. ECMS-use for this purpose has, in fact, enabled employees to easily and efficiently retrieve standard procedures, and prevented situations in which employees referred to outdated procedures.

5.2. The Telco Case

Telco is a large Malaysian telecommunications organization with more than 25,000 employees. The organization was established in 1984 and had revenue of approximately MYR 17 billion at the time when interviews were conducted. Telco offers communication services and solutions including internet and multimedia, data and fixed-line services. Telco also offers products including broadband packages, Unifi broadband and wireless phone to businesses and homes. Fixed line infrastructures are also provided to local service providers by this organization.

Telco is comprised of many business units that include sales, product, finance, procurement, marketing, IT and network, and business strategy. These business units collaborate and serve various key customers that include government sectors, wholesale enterprises, global companies, small to medium enterprises and home consumers. Furthermore, business processes were highly integrated and standardized across these units, which confirmed the criterion of a unification operating model.

5.2.1 Background on Telco's ECMS

Telco has a great number of systems, databases and portals. Some were centralized enterprise systems and others were business units' IT applications that were built for various needs. The centralized enterprise systems included the SAP financial and human resources systems, as the IT manager explained: "[w]e have an overtime system, claim system and leave application system running on SAP." The IT manager then gave an example of a unit's IT applications: "the IT and network unit has a helpdesk system to handle IT requests. So users can

lodge reports about problems related to hardware, software, the network, telephone, and intranet and internet services through that system."

Having distinct types of systems which were not capable of communicating with one another frustrated many staff. The IT manager admitted that many staff were having problems in finding the right system to use: "[m]any staff are unhappy about it [having too many IT applications] and they complain that it's confusing and they don't know which is which [what the system is doing]." Due to this reason, many systems were only utilized by a small number of people while some were abandoned.

Although having distinct systems created many problems for Telco, the IT manager indicated that it was impossible to demolish the existing systems and replace them with an integrated IT system that could handle organizational and units' processes. The IT manager indicated that management was unwilling to spend the cost of replacing the current systems with an integrated system.

Due to the above mentioned reasons, management had instructed the IT manager to consolidate the various systems in a 'one-stop centre'. The 'one-stop centre' was to provide links to all systems (i.e. organizational, unit systems) and to include descriptions about each system.

Finally, the IT manager had chosen ECM technologies to gather and provide links to all Telco systems, as explained below.

1. Provide access/links to information systems

Telco used their ECMS as a 'gateway' to access links to enterprise and units' applications, portals and databases. In this case, the organization had bureaucratic structures and therefore management was in control of the IT and business applications. Management had introduced many business applications to support the organization's processes. For this reason, the ECMS was used as a gateway that provided links and access to these business applications and systems.

It appears that in Telco, ECMS-use was limited with the technology only used as a point of reference where all organizational and unit systems, portals and databases were listed and accessible. Besides using the ECMS to access systems and databases, users had no idea how they could use the ECMS for any other purposes. They were not keen to explore and experiment with the technology and considered the technology as not important and contributing very little value to their work. This could be attributed to the fact that they were instructed by management to use other enterprise systems (e.g. Oracle and SAP) to facilitate business processes thus using the ECMS was deemed as being less important. From the analysis of these two cases (i.e. Mobile_Pro and Telco), it was evident that, despite the fact that unification organizations could use their ECMS to support their standardized and integrated processes, some unification organizations preferred not to embed their business processes in ECMS workflows as was seen in the Telco case.

Therefore, based on the cross-case analysis, this study has reason to believe that unification organizations may use ECMS for: (1) collaboration, (2) building

custom workflows that support integrated and standardized processes, (3) information sharing that supports a standardized process structure, and (4) providing access and links to organizational and units'

applications, databases and portals. The ways in which unification organizations could use ECMS are proposed in Table 1.

Table 1: Proposed Types of ECMS-use for Unification Organizations

Proposed types of ECMS-use	Descriptions
ECMS-use for collaboration	<p>Unification organizations may use ECMS to support collaboration among specialized business units. Using ECMS for this purpose would benefit organizations that have strong collaborative and integrated process structures. An organization's ECMS could be a medium that enables specialized business units to exchange documents, jointly prepare a report, communicate and monitor each other's progress.</p> <p>From this mode of ECMS-use, organizations could expect business units to enjoy better ways in which to collaborate, share and exchange documents, to jointly prepare reports and to communicate. Therefore, organizations could anticipate reinforcement of their collaborative and integrated process structures.</p>
ECMS-use for information sharing that supports a standardized process structure	<p>Unification organizations may use ECMS for information sharing that, to some extent, supports the organization's standardized process structure. For example, organizations may use this technology to share standard operating procedures, manuals and guidelines.</p> <p>From this mode of ECMS-use, organizations could expect to enjoy better ways in which to retrieve updated standard procedures, thus situations in which outdated procedures had been referred to could be prevented.</p>
ECMS-use for building custom workflows that support integrated and standardized processes	<p>Thirdly, as shown in the last row of Table 6.4, unification organizations may use ECMS to support their integrated and standardized processes. For example, ECMS custom workflows could facilitate the approval processes such as handling the movements of documents from one approver to another and from one business unit to another.</p> <p>Through the use of ECMS custom workflows, organizations could expect to improve their efficiency in handling integrated and standardized processes. For example, ECMS workflows could efficiently handle standardized processes thus process standardization would be achieved across business units (or organization-wide).</p>
ECMS-use to provide links and access to information systems	<p>Unification organizations may choose not to use ECMS to support any of their business processes. This type of ECMS-use may be useful to organizations that already have stable enterprise systems and global applications supporting their integrated and standardized processes and prefer not to redundantly use ECMS to support processes. ECMS could be a point of reference where all organizational and unit systems, portals and databases are listed, described (i.e. the system's purpose, who can use it and the steps to use it) and linked.</p> <p>Despite the fact that this type of ECMS-use brings very limited or almost no contribution to organizational processes, it would benefit organizations that plan to maintain their legacy and heterogeneous information systems at the organizational and unit levels. This type of ECMS-use could help users to easily locate and access the right application to perform a particular task.</p>

6 Conclusions

This paper has presented the analysis results and empirical evidence that explained the ways in which unification organizations used ECMS to support their integrated and standardized processes. One of the cases (i.e. Mobile_Pro) illustrated that ECMS workflows were customized and used to support unification organizations' integrated and standardized processes. In the same case, it appeared that the organization also used ECMS for collaboration and information sharing. In the other case (i.e. Telco), the unification organization preferred to not tie its business processes to the ECMS but chose to limit its use to serving as a 'gateway' that provided links and access to other business applications and systems. Therefore, this study proposed four types of ECMS-use to unification organizations (as explained in Table 1),

ECMS-use for: (1) collaboration, (2) information sharing that supports a standardized process structure, (3) building custom workflows that support integrated and standardized processes, and (4) providing links and access to information systems.

This research work concludes that, as with other enterprise-wide information systems, ECMS-use needs to be aligned with and support the organization's business process strategy to ensure effective use of this technology. It is with this focus in mind that this work informs both researchers and practitioners about ways they can use ECMS.

However, it is important to note that this paper has concentrated on ECMS-use that occurred in unification organizations. The use of ECMS in other types of organizations (i.e. replication, coordination and diversification) has been presented and published elsewhere.

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