Towards a Model to Understand ECMS-use in Supporting Business Processes

Noreen Izza Arshad\textsuperscript{a}, Rachelle Bosua\textsuperscript{b}, Simon K. Milton\textsuperscript{c},\textsuperscript{a}\textsuperscript{*}

\textsuperscript{a}Universiti Teknologi PETRONAS, Computer and Information Sciences Department, Bandar Seri Iskandar, Tronoh, Perak, Malaysia
\textsuperscript{b}University of Melbourne, Department of Computing and Information Systems
The University of Melbourne, Victoria, Australia, 3010.

Abstract

The aim of this paper is to design a conceptual model that can be used by practitioners and researchers to better understand how they can possibly use Enterprise Content Management Systems (ECMS) in supporting their business operations. In designing the model, this research has reviewed ECMS literature that provides insight on how these technologies work. ECMS researchers point to two possible ways to understand and explore how ECMS is used to support business operations. These two possible ways provides a direction to this study which is, to: (1) consider organization’s business process structure as a starting point to understand ECMS-use; and (2) examine the interaction between technologies (ECMS), the organizational context, processes, business needs and users that shape certain ways of using these technologies. At the end of this paper, a research model that guide practitioners to understand ways to maximize and benefit from ECMS-use is presented. Business and IT managers could use the model to better understand ways to apply ECMS in their daily work practices to conduct business. On the other hand, IS researchers could use this model to further conduct empirical investigation to get a deeper understanding of ECMS-use and uncover qualities that have not been discovered in this study.

Keywords: Enterprise Content Management Systems (ECMS) ; business processes ; enterprise content management.

1. Introduction

Enterprise Content Management Systems (ECMS) can be considered as a convergence of technologies that supports ECM (Dilnutt 2006a; Dilnutt 2006b; Mescan 2004; Perry et al. 2002; Reimer 2002).

\textsuperscript{*} Corresponding author. Tel.: +605-3687498.
E-mail address: noreenizza@petronas.com.my.
However, there is no common definition or model that clearly identifies what type of technologies constitute ECMS. Dilnutt (2006b, 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.

Furthermore, Grahlmann et al. [7] state that it is necessary to understand the various ECMS functionalities because it explains ‘what these technologies can actually do’. Grahlmann et al. [7] divide ECMS functionalities into four main categories: (1) Access, (2) Process, (3) Service, and (4) Repository.

Despite that the ECMS functionalities mentioned by Grahlmann et al. [7] is useful to organizations for selecting an ECMS product and compare the functionalities offered by different vendors [7], it is found that there is a lack of understanding as to how these technologies and its functionalities is important to support specific organizational goals and business needs [1]. Vitari et al. (2006) claim that choosing suitable ECMS to support organizational needs is a complicated task since there is no framework that guides organizations to understand how to actually use these technologies. Similarly, Votsch (2001) argues that without a clear guidance about what functionalities needed to support organizational goals, the solution offered by vendors often fails to match with organizational needs.

As a consequence, this study is grounded in the perception that the understanding of the use of ECMS to support organizational needs and business goals is still one of the rather ambiguous topic in IS field. Therefore, the study on ECMS and its use to support organizational goals should be given an attention, especially with regard to supporting business processes [1],[2],[6] (Salminen et al. 2006;). 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.

Therefore, this has motivated this study to further explore and answer the following research question: “What are the ways that can guide IS researchers and practitioners to use ECMS to support their business processes?”

In an attempt to answer the research question, this paper is structured as follows. Section 2.0 describes what is known from the ECM literature and highlights the gaps found. A description and justifications of how this study addresses these gaps are also presented. Following this, explanations of the use of the business operating model of Ross et al. [9] and the practice lens theory of Orlikowski [13] as a way to address the gaps are presented in Section 3.0 and 4.0 respectively. In Section 5.0 a formulation of specific research model that address the research question is explained and discussed. The paper ends with a summary.

2. Related Studies

As mentioned earlier, there is a lack of ECMS research that focus on providing guidance to practitioners on how they can use ECMS to support business operations [2]. However, one exception is a study conducted by Paivarinta and Munkvold [3] 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.

Paivarinta and Munkvold [3] found 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” [3, p.5]. Similar to Paivarinta and Munkvold
[3], a few other researchers also consider that an ECMS implementation has to be aligned with a company’s business process structures [4-8]. However, Tyrvainen et al. [2] 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. Thus, the challenge is to find a generic representation of organizations business process structure. Considering this challenge, this study introduces and uses Ross et al.’s [9] generic business operating model that relates to firms’ operations, expressed in terms of business processes, and the use of IT.

Besides that ECMS-use has to be aligned with a company’s business process structure, a study conducted that Grahlmann et al. [7] have expressed their views that there are additional factors which may be related to ECMS-use in organizations. However, the authors did not elaborate on what factors that may relate to ECMS-use but instead leave this subject for further research.

In search for the answer, this study has found that there are ECM researchers who believe that there is an interaction between the technology (ECMS), the organization (processes, structure, practices) and the users (knowledge and behavior towards the technology) [2, 10, 11, 12, p.1274]. In these papers, the authors agree that ECMS adoption, implementation and use may be intertwined with aspects such as organizational purposes, processes, tools and user communities. This is in agreement with Tyrvainen et al. [2] who acknowledge that ECMS is a complex field and involve a rich research phenomenon involving four perspectives: enterprise, processes, content and technology. In this paper, the authors indicate that research on ECMS should “… considers organizational, social and business issues … [it] is often tightly intertwined with the process perspective …”

Nevertheless, existing ECMS literature provides limited guidance on how a research can explore the interactions between technology, organizational context and users to understand ECMS-use in organizations.

Consequently, this gap in the ECMS literature guided this study to consider other general IS literature as a conceptual basis to guide this research. Thus, the ‘practice lens theory’ of Orlikowski [13] is adopted and used as a lens through which the differing ways organizational use of ECMS can be understood and explained.

Summarizing, this study selects two theories to address the two main concerns arise from the literature. The business operating model of Ross et al. [9] is explained in the following section and the practice lens of Orlikowski [13] is described in Section 4.0.

3. The Business Operating Model

Recall that Tyrvainen et al. [2] 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 introduce the business operating model of Ross et al. [9] that relates a firm’s operation, expressed in terms of business processes and the use of IT. Ross et al. [9, p.8-9] classify the business operating model into two dimensions:

- Standardization of business processes: Organizations that are highly standardized tend to have similar key business processes across all business units. The benefits of having high process standardization are efficiency and predictability across the organization. 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. This sharing of data and information between processes and between units enables end-to-end processing of business operations.
4. A Practice Lens Theory

The practice lens paradigm of Orlikowski [13] referred to as ‘practice lens theory’ throughout this paper, takes the view that when people use technologies they draw on their knowledge, assumptions, experiences, situations at hand, facilities available to them, norms that inform their ongoing practices and organizational structures. This is in line with many ECMS researchers who believe that there is an interaction between the ECM technology-in-use, the organization (processes, structure, practices) and the human factor (user communities, knowledge) that shape the way in which ECMS is used [2, 5, 6, 10, 11, 12, p.1274]. Therefore, the practice lens theory is considered to be appropriate for increasing the understanding of how organizations actually use ECMS in practice.

Orlikowski explains that practice lens theory is a concept about technology-use or what people do with the technological artifact in practice. When people use technologies, they draw on facilities, norms, interpretive schemes, and organizational structures. Thus, the use of technologies are structured by agency in the form of: (1) the facilities available at hand, (2) norms, and (3) users knowledge and assumptions towards the technology (interpretive schemes) and (4) organizational structures, as presented in Figure 1.

One might ask why the practice lens theory [13] and not others. A number of researchers develop different research perspectives on technology and organizations for example contingency theory [14-16], transaction-cost economics [17, 18] and structuration models [19-21]. Although these theories are useful to study technology-use, this study has chosen the practice lens theory of Orlikowski [13] because this
theory addresses the concept of “emergent structure and enactment”. These two concepts provide a practice-based extension to the existing structurational perspectives [19-21]. Orlikowski asserts that a new practice lens is needed because modern technologies and contemporary organizations have changed their forms and functions. Orlikowski [13] has therefore extended the structurational perspective and posits that (1) structures are emergent and not embodied in technologies and (2) technologies are enacted and not appropriated.

![Diagram of Model to Understand ECMS-use in Supporting Business Processes](image)

**Fig. 2. A Model to Understand ECMS-use in Supporting Business Processes**

**5. A Model to Understand ECMS-use in Supporting Business Processes**

Specifically, this study uses the two theories mentioned above to design a model that can guide IS practitioners and researchers to better understand ECMS-use in supporting their business processes. This is in agreement with Klein and Myers [22, p.75] who indicate that, “… theory plays a crucial role in interpretive research, and clearly distinguishes it from just anecdotes.”

In designing the model for this study, Orlikowski’s [13] practice lens theory has been adapted to the version depicted in Figure 2. The following changes were made to better fit this study on ECMS-use (refer to Figure 2):

1. ‘Facilities’ on Figure 1 was replaced by ‘ECMS functionalities’ to incorporate ECMS specific functions.
2. ‘Ongoing, Situated Use of Technology’ in Figure 1 was replaced by ‘ECMS-use’ to focus on ECM technologies and its situated use in organizations. ECMS-use in this study refers to the use of ECMS and the interaction that takes place between the user, the technology, organizational context (processes, norms, practices, structure) and other systems. In agreement with Orlikowski [13], this
study takes the view that the use of ECMS is always located within a broader context that include people (e.g. management), other systems and interactions within which that use is situated.

3. The block ‘Technologies-in-Practice’ in Figure 1 was termed by the researcher as ‘ECMS-in-Practice’ to focus on how ECMS is being used in practice as opposed to general technology-use as proposed by Orlikowski.

4. The dotted lines surrounding the elements of agency in Figure 1 was removed and the arrows were slightly changed to better illustrate that ECMS-use is: (1) influenced by organizational structures, (2) shaped by the interactions between the elements of agency, and (3) depends on how the technology is actually being used in practice (i.e. ECMS-in-Practice).

5. A few examples of ‘organizational structures’ including integrated process structures and standardized process structures of Ross et al. [9] were added to the model (in Figure 2) to illustrates that this study constitutes business process structures as organizational structures. Nevertheless, using this model, one would not be able to explore specific aspects that relate to user behaviour, that is, emotional attachments and use intentions that users may develop with respect to the use of ECM technologies. Therefore, one would be missing the richness of users’ emotions and behaviours that could offer deeper explanations for why users in organizations use ECMS in certain ways.

6. Conclusions and Future Work

In summary, the model shown in Figure 2 answered the research question indicated at the beginning of this paper which is: “What are the ways that can guide IS researchers and practitioners to use ECMS to support their business processes?” The model embed two important elements that IS researchers and practitioners should bear in mind when using these technologies that include, to: (1) consider the organization’s business process structure as a starting point to understand ECMS-use, and (2) examine the interaction between technologies (ECMS), the organizational context, processes, business needs and users that shape certain ways of using these technologies. These are the two important elements that this paper would like to inform to both researchers and practitioners about ways they can use ECMS to support business processes, work activities or work practices.

However, it is important to note that real evidences where this model has been assessed and used to understand ECMS-use in organizations are not presented in this paper. There are some case studies results already shared in publication elsewhere [23-27]. Future publication may be directed towards sharing the cross case analysis results where the model has been assessed in more than ten case organizations. This may lead to a different framework that can assist researchers to get a deeper understanding of ECMS-use.

References


