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Enterprise Content Management solutions—Roadmap strategy and implementation challenges

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ABSTRACT

Enterprise Content Management (ECM) solutions provide robust functionality to control and analyze information. ECM solutions help reduce search times, manage data, and enable institutions with regulatory compliance. The correlation between impact on a business process through ECM implementation stage is demonstrated and been shown to follow reported hypothesis by Reimer (2002). The objective of this article is to provide (1) a typical architecture of an ECM, (2) identify key challenges in implementation and (3) implementation road map strategy.

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1. Introduction

Enterprise content management (ECM) systems help organizations to cope with the increasing complexity and volume of data and information (Tyrvainen, Paivarinta, Salminen, & Iivari, 2006). Laws are being passed in many countries mandating businesses to archive vital business communications for a period of time set by industry standards (Engel, Hayes, & Wang, 2007). ECM is broadly defined as the strategies, tools, processes, and skills an organization needs to manage all of its information assets (regardless of type) over their lifecycle. An ECM system can capture, process, access, measure, integrate, and store all of this information, regardless of whether it is in structured (databases) or unstructured (e.g., e-mail, word, spreadsheet, image, audio, video) format or in hard copy. ECM offers robust functionality for systematic analysis and control of all information throughout its life cycle with a complete suite of product options to manage and integrate data systems, automate document handling, and reduce the burden on IT departments for information storage and retrieval. The operational benefits include saving cost and reducing workload by streamlining tasks, traceability, version control, reducing duplication, and improving search and retrieval for information across platforms. Process efficiency, as the main driver, has led to accessing of data and information from a centralized repository at a central location (Bentley & Young, 2000). Regardless of its customer size or nature of business, each organization has diverse, unique needs for information management as its business processes require information related to product details, inventory, accounts receivable/payable, customers, research and development, financials, facilities, assets, and human resources, such as payroll, benefits, and retirements.

Transitioning to an ECM can help an organization improve customer service, streamline processes, enhance employee productivity, track information, comply with regulations, eliminate unneeded information on servers and in filing cabinets, and implement business continuity measures. The main goal of ECM implementation is to have transparent content sharing by making different and incongruent applications (for example, web content management, and records management) interoperable. One of the important considerations before implementing an ECM system is to clearly identify the needs, type of organization culture, data type and other Enterprise Resource Planning systems that ECM would be integrated with. The described strategic value of ECM includes increasing decision making capabilities and, facilitating creativity and enhancing the professional representation of the enterprise in the eyes of its stakeholders.

Paivarinta and Munkvold (2005) have demonstrated that the success stories from ECM practitioners should be supported by critical research. They have also noted a number of topics requiring further research, such as: the practical means of evaluating the main impacts sought by ECM investments, unwanted impacts, and realized risks of ECM development projects. A detailed study on how the functionalities of an ECM System and the nature of ECMS-supported processes influence the impact of implementing an ECMS in an organization have been discussed by Grahlmann (2010). The quantitative estimation of ECM impact on a business process is the culmination of several business process enhancements, such as: reduction of physical handling of paper documents; tracking of business processes; access to information to accomplish business

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Table 1
ECM development and pioneering research.

Author(s)	Focus/main theme
Reimer (2002)	ECM basic structure and fundamentals
Rockley, Kastur, Manning (2003) (Meicher, 2013)	Development of unified content methodology
Smith and McKeen (2003) (Meicher, 2013)	ECM information governance, benefits, content stewardship
Nordheim and Paivarinta (2006) (Meicher, 2013)	Strategic development and ECM implementation method
Nordheim and Paivarinta (2004) (Meicher, 2013)	ECM customization
O'Callaghan and Smits (2005) (Meicher, 2013)	ECM development
Munkvold (2006) (Meicher, 2013)	Improvement opportunities for ECM
Paivarinta and Munkvold (2005)	ECM impact, objectives, content management, enterprise information architecture

process; and covering legal liability. Such quantitative estimations tend to be complicated due to various factors agreed to by industry and academic peers (Irani, 2002). To our knowledge, after reviewing existing literature, this is the first empirical evidence that reinforces Remer's hypothesis (Reimer, 2002). Research in ECM concepts including knowledge, data and information resource management, and compliance are still a nascent field (Brocke, Simons, & Cleven, 2011). Brocke (2007) provide a good timeline of ECM research and development in the field. Table 1 (adapted from Brocke, 2007) shows the selected contributions in ECM development.

2. ECM architecture

ECM solution typically consists of four essential components (Fig. 1); – (1) *User interface* –a process through which information (digital or non-digital) is brought into ECM. This is accomplished either by converting hard copy documents by image capture scanning or by uploading electronic version of information into ECM. The information consists of documents in the hard copy format or digital format (generated by Microsoft/Mac, or by Google Documents).

(2) *Information governance* – This is a key ECM functionality that separates ECM from other digital archival systems. The incoming information is now designated at this stage as an official record. ECM solutions offer a capability to assign a record with functional area specific records and retention rules. ECM automatically deletes such records after the records retention duration, which, thus, provides regulatory compliance.

(3) *Attributes* – ECM is equipped with features meant to achieve specific business purposes. *Data archive* provides a systematic approach to archive and retrieve the information using select keywords; *Intelligent Data Capture* – for converting image based information to a computer readable format by optical character recognition; *Workflow* – an automated process based on a pre-configured logic where information flows through different stages; *Integration/Data processing* – a built in information management solution to connect different data streams; and *Information disposal* – a deletion time affixed to certain information to be automatically applied in order to delete the documents to be in compliance.

(4) *Repository* – ECM systems provide a secure approach to store the information for on demand access. There is a variety of

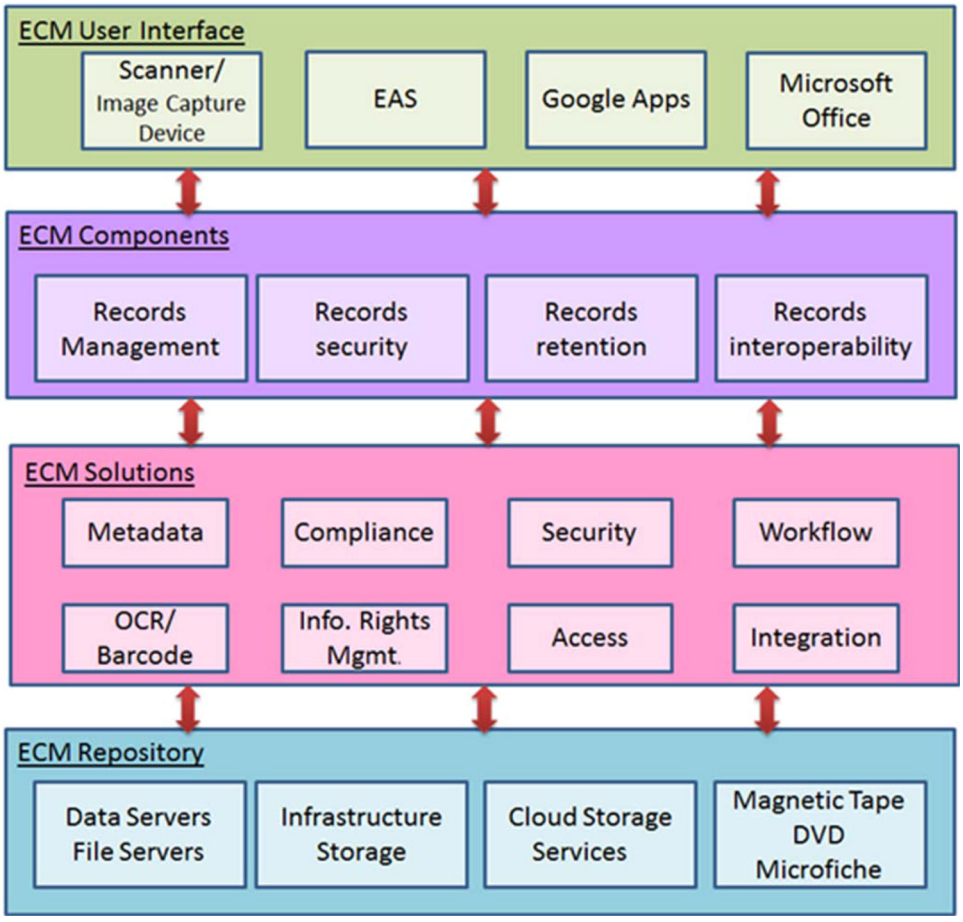

Fig. 1. Typical ECM architecture in institutions of higher education.

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