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**A HISTORICAL CONTEXT ANALYSIS OF
CHANGES IN CONTENT MANAGEMENT IDEOLOGY**

THESIS

William Lee, Jr., MSgt, USAF

AFIT/GIR/ENV/05M-09

**DEPARTMENT OF THE AIR FORCE
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AFIT/GIR/ENV/05M-09

**A HISTORICAL CONTEXT ANALYSIS OF
CHANGES IN CONTENT MANAGEMENT IDEOLOGY**

THESIS

Presented to the Faculty

Department of Systems and Engineering Management

Graduate School of Engineering and Management

Air Force Institute of Technology

Air University

Air Education and Training Command

In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Information Resource Management

William Lee, Jr., B.S.

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March 2005

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**A HISTORICAL CONTEXT ANALYSIS OF
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Abstract

Digital content has grown continually over the past 5 years, yet acceptance of a common definition of what is “content management” still generates debates in IS communities. This research will be a qualitative study using a combined approach of historical and context analysis of literary artifacts for drawing inferences to explore the evolutionary changes in content management ideology. Using a seven-step process, a specific structure is designed with a systematic approach to encounter the phenomena being researched and present the evidence of the results. Performing an analysis on the evolution of content management from a historical perspective will benefit researchers and practitioners with foundational knowledge about this progression and provide insights into understanding concepts and strategies within the content management community.

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William Lee, Jr.

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A HISTORICAL CONTEXT ANALYSIS OF CHANGES IN CONTENT MANAGEMENT IDEOLOGY

I. Introduction

*Content is the information and interactivity that organizations must harness in order to
deliver value to their customers*

(Boiko, 2002).

Background

Despite the recent economic downturn, digital content has grown continually over the past 5 years, accounting for 18 percent of enterprises' total storage capacity in 2002; it will grow to 39 percent by 2006 (Balaouras and Gruener, 2004). This information supports a requirement for more storage capacity and management of digital content. Management of data can be performed by database managers, supported by database management systems. In the digital realm, data and content are relative forms of digital assets. Managing content versus managing data requires similar technologies, but different approaches. In 1995, Vingette receives credit for introducing the first content management system (Doyle, 2004).

The dynamic capability of digital content to be transformed from one format to another is advantageous, but presents a dilemma. The only thing harder than finding any particular item of information may be finding it again (Roberts-Witt, 1999). If we are to

obtain value from the content we possess or use, that content must be accessible and available in the appropriate context for our purpose. As digital environments continue to grow and evolve, so does the challenge to deliver changing content in a continuous flow of information to the user without interruptions.

Along with the favorable aspects of “right time” and “right place” comes the need to manage this content in various stages and locations. Even though technology has enabled the flow of data or information to be continuous through a myriad of pipelines, we still need the beforehand knowledge and ability to organize this asset into a useful product for the specific purpose of the user. One key aspect of this flow of information is the fact that the more this information can be reused, the less costly the effort required to manage it. Reuse allows one to create the content once and use it many times for different purposes. For example, content used in multimedia products can be included in audio files, displayed on the Web, or printed in a brochure.

Content management (CM) can be effective or ineffective based on the data being structured or unstructured. This structure entails consolidating and reusing data to make information products serve the social, economic, and intellectual needs of the customer. A consolidation effort requires more than just a database to store the data. It requires a concept that content must be supplied to an entity according to a need, even if the need changes, but not be inflexible due to the change. “Whether they are talking about their mailbox, office desk, company information, or the World Wide Web, most people suffer from the overload of disorganized, indigestible, always-in-your-face-but-never-there-

when-you-need-it information” (Boiko, 2002). Therefore, a unified approach to managing this content is important.

Content management has a historical background related to activities from data, web, information, and knowledge management. One primary connection within this relationship is a digital format for storing assets, however a deeper understanding of this relationship warrants investigation to promote a better understanding of how content management is linked to these domains. Also, other terms from these domains are linked with content management: context management, digital asset management, and Web content management. These terms have also been shared throughout several digital technologies such as E-commerce, Customer Relationship Management (CRM) systems, Learning Content Management Systems (LCMS), electronic Communities of Practice (CoPs), E-Business, Enterprise Content Management, and Media Asset Management.

Problem Statement

Most organizations are struggling with managing their content. Is it because we don't understand what content management is, or because we only recognize content within the domain of our unique environments? Is a consensus on the definition of content management necessary before one can manage it and is managing content different than managing data, information or knowledge? Because content management requires a combination of capabilities from various information technologies, an investigation of how the merging of content (data, information, knowledge) and management (strategies, techniques, tools, systems, practices, processes and people) has formulated the evolving ideology of content management.

Research Questions

This research seeks to answer the question: How has the ideology for content management evolved since 1999?

Multiple questions will be addressed in order to answer the research question:

1. What is content?
2. What is content management?
3. What events influenced the concepts for content management?

Assumptions/Limitations

This research is limited in scope by the availability of textual content and the relationship of the contextual information within the respective timeframe. It is also limited by the validity of the research design and methodology associated with conducting a historiography, and the experience level of the researcher conducting historical research. No assumptions are stated beforehand, due to the infancy and experience with conducting historical research. Although measures are taken to make the process as objective as possible, the researcher indirectly imposes certain limitations by defining the boundaries and qualities or characteristics to be examined.

Implications

The need to understand content management is very important in this era of information technology. A study of history is necessary to provide a temporal and contextual meaning for each of the three forms of knowledge (Mason, McKenney et al., 1997). Performing an analysis on the evolution of content management from a historical

perspective will benefit researchers and practitioners with foundational knowledge about this progression. Secondly, by reviewing the literature pertaining to content management, identifying significant factors of the change in concepts, and contextualizing these concepts over time can provide some insight to understanding current issues and events occurring within the environment. Finally, this research effort will benefit organizations by providing exploratory data for historical observation that could lead to new paradigms or theories about content management.

Preview

This chapter introduced the idea of content management, described the dilemma of understanding how content should be managed, stated the research questions, and discussed the scope and implications of this research study. The rest of this thesis will address the effort involved to answer the research questions. Chapter 2 will present the literature review of relevant text to date from published sources written by practitioners and academics. Chapter 3 will present the research methodology and design. Chapter 4 will state the research results and analysis of the collected data. Finally, Chapter 5 will examine the implications of the research and provide conclusions, as well as future research possibilities.

II. Literature Review

Knowing the past can provide focus for the future (Crampton, 2004).

Overview

This chapter summarizes the relevant literature this research will use to answer what changes have evolved within content management ideology. Reviewing the literature from peer-reviewed journal articles, academic books from experts, trade journals, and white papers will provide the foundation to define what content management is, identify where content management lives within the information domain, and build a reference framework that identifies factors which have influenced content management concepts.

Definitions

Webster's Collegiate dictionary defines content in the objective sense as something contained; the topics or matter treated in a written work; essential meaning or significance; the amount of specified material contained (Websters, 2003). This definition works well in the traditional sense. It provides a foundation to understand our focus for this research on digital content.

There are many frequent uses of the term "content" however there is no general consensus about what this term really means or describes (Kunkelmann and Brunelli, 2002). Content is the text, documents, images, Web pages, graphics, and audio files that are used to provide and communicate information, typically through a Web site (Fatwire,

2004). Several research findings generally state content moves through various phases of development, such as creation, review, management, and delivery (Rockley, Kostur et al., 2003); (Curtis and Draper, 1999); (Goodwin and Vidgen, 2002). These phases are collectively known as the *content life cycle* (Rockley, Kostur et al., 2003).

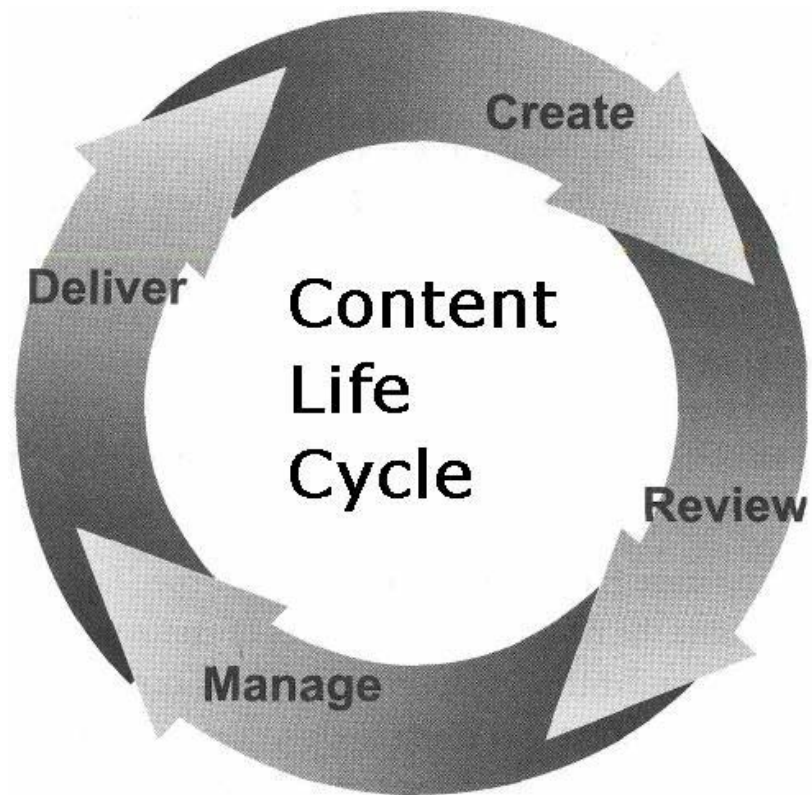


Figure 1. Content life cycle

“The content creation phase can include planning, design, authoring, and revision...Content is usually reviewed before it is delivered to users. The review process can involve one or many reviewers, in addition to multiple reviews as content is refined before approval. Approval usually happens when content is considered accurate,

complete, and ready for delivery...Content is managed in many ways...Some groups use a web content management tool...others may use revision control software...and still others may have manual control systems using paper copies and traditional file cabinets...During the delivery phase, content is provided to users through a variety of methods, such as multiple media publication of content....publication is rarely automated unless a content management system is in place” (Rockley, Kostur et al., 2003).

One author, David Marques, CTO, Elsevier, presents this view of content from a case study:

“Elsevier publishes more than 20,000 products and services, including journals, books, electronic products services, databases and portals. In the publishing business, content is more than a by-product of doing business; it *is* the product. Content is a publisher’s greatest asset. Customers who purchase online content want more than simple search and retrieval; they want to go directly to a precise piece of content, and analyze it within the context of other pieces of relevant content. Content becomes much more valuable when it is optimized for a specific use and framed within the context of the user’s goal” (Marques, 2002).

From a case study of Cedar-Sanai Medical Center, this definition of content is given by MARK Logic Corporation:

“First, most clinical data is actually “content,” i.e. textual and unstructured data such as patient consent form and self-reports, medical charts, and scientific research. It is created and stored in a variety of formats, and the different bodies

of content are not linked. In addition, gaps often exist in the information due to variations in the way it is collected by different people. Conversely, information is often redundant because different researchers use different terms with the same meaning” (Agus, 2002).

“Content is the digital stuff we use everyday in our work lives to sell and service, help and maintain our customers, our partners and ourselves. Content is the evidence of what we do. Content is the documents, messages, collaborations, and results” (Moore, 2001). It can be fixed/structured or unstructured content (e-mail, office documents, financial statements, contracts, digital files, etc.)

In the context of the financial industry, content refers to the pieces of information in the enterprise (in particular its Web sites), including financial research, market commentary, calendar events trading ideas, bond offerings, and so on (Kwok and Chiu, 2004). In the context of the Internet, we have to take into consideration many attributes of what we see on the website –authorship, authenticity and reputation (Bhattacharyya, 2002). If content is “stuff,” how does this “stuff” get managed?

Several research documents expressed this view of content management: The expression “Content Management” is largely used in industry, but sometimes with different meanings (Canfora, Manzo et al., 2002); (Miller, 2003); (McNay, 2002). “Content Management is a term used to refer to systems that manage the content objects which form documents. It can be used to differentiate compound document management systems from simple document management systems. Increasingly being used as an

alternative, technically more accurate, term for an electronic document management system” (Cimtech, 2004).

Doyle (2003) states that the Association of Information and Image Management (AIIM) organization defines Enterprise Content Management (ECM) as both product and strategy. “From a product perspective, it is the tools and technology to capture, manage, store, preserve and deliver content throughout an enterprise. From a strategy perspective, it is being able to formulate a plan to manage all information whether structured or unstructured” (Doyle, 2003). Web-enabling traditional fixed content, making it available on an as-needed basis, enhances competitive advantage and complies with regulations.

Rodriguez states that content management is defined by AQPC as “a practice to provide meaningful and timely information to end users by creating processes that identify, collect, categorize, and refresh content” (such as ensuring new information and knowledge is correctly categorized and outdated information is properly achieved) “using a common taxonomy across the organization” (Rodriguez, 2004). “Content management is a way to create material which can be re-used at a later time by anyone with authorization, with outputs” (Iverson, 2002).

Content Management is a general term that refers to the organization, categorization, and structuring of information resources (text, images, documents etc.) so that they can be stored, published, and edited with ease and flexibility (Fatwire, 2004). Asprey & Middleton define content management as “the procedures for handling the authoring, organization, and dissemination of digital documents in an enterprise, often used specifically in relation to Web-based documents” (Asprey and Middleton, 2003).

The Yankee group defines enterprise content management as the technologies required to capture, index, store, manage, integrate and deliver content in support of business processes, regulatory compliance and broader information lifecycle management strategies.

In case studies on Content management by Miller, Manafy states “Content management is the catch phrase of the moment and its kin—WCM, ECM, and FCM—the darlings of technology acronyms. Its predecessors, document management and knowledge along with relative newcomer, digital asset management, nip at its heels as it leads the pack as the end-all and do-all for managing today’s information imperative and accompanying overload. But while content management may purport to be all things to all people, its true power may actually lie in its flexibility to change shape to fit new business problems set before it” (Miller, 2003).

McKeever states “Boiko (2001), author of “Understanding Content Management” provides the following definition of content management: At the highest level, Content management is the process behind matching what “you” have with what “they” want. “You” are an organization with information and functionality of value. “They” are a set of definable audiences who want that value (staff, partners, customers). Content management is not just a way to create large Web sites, but upon closer examination, it is in fact an overall process for collecting, managing and publishing content to any outlet” (McKeever, 2003). However, McKeever (2003) offers this definition for content management:

“Web content management incorporated the activities involved in the creation and deployment of digital content to Web based audiences, where these audiences may consist of customers, suppliers, partners and staff accessing Web content via extranet, Internet, or intranet.”

Influences

Information Management

Information life cycle management (ILM) is a comprehensive approach to managing the flow of an information system's data and associated metadata from creation and initial storage to the time when it becomes obsolete and is deleted (Whatis, 2004). According to Legato (2003), information lifecycle management should incorporate content and storage management requirements while satisfying regulatory requirements.

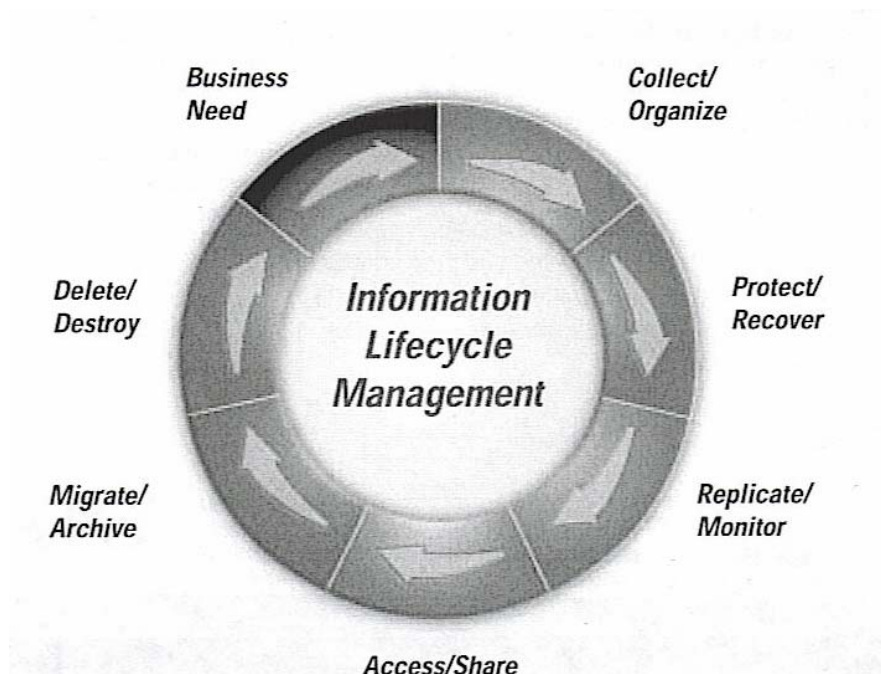


Figure 2. Information Lifecycle Management (Legato, 2003)

Content management, along with storage capability, can deliver a platform for information management throughout its lifecycle.

Although there are an estimated 15,000 government regulations both domestically and internationally which mandate specific requirements for the retention of data, there are several regulations that have cross-industry or vertical impact on information life spans (see Figure 3):

- **The Sarbanes-Oxley Act**, which requires the retention of financial accounting and auditing records for 4 years after an audit
- **SEC 17a-3 and SEC 17a-4**, which require the retention of broker/dealer electronic and written communications with clients, including e-mail and instant messaging, for a variety of life spans (6 to 10 years depending on the document)
- **The Health Insurance Portability and Accountability Act (HIPAA)**, which requires retention and protection of medical records for varying periods (21 years for minors, 2 years after a death, and 5 years for other records)
- **21 CFR, Part 11**, which requires retention of clinical trials and data on manufacturing of products (typically for 5 years or more)

E-Business

E-Business - A way of conducting business electronically, leveraging technology initiatives such as e-commerce, electronic data interchange (EDI), and electronic funds transfer (EFT). Electronic storefronts, self-service Web applications, and Web-based supply chain integration are a few examples of new e-business opportunities. E-business happens as either (a) the transaction of business over an electronic medium such as the

Internet or (b) any organization (for example, commercial, industrial, nonprofit, educational, or governmental) that transacts its business over an electronic medium such as the Internet. An e-business combines the resources of traditional information systems

Exhibit 2
The Growth of Information Life Spans

Source: The Yankee Group, 2004

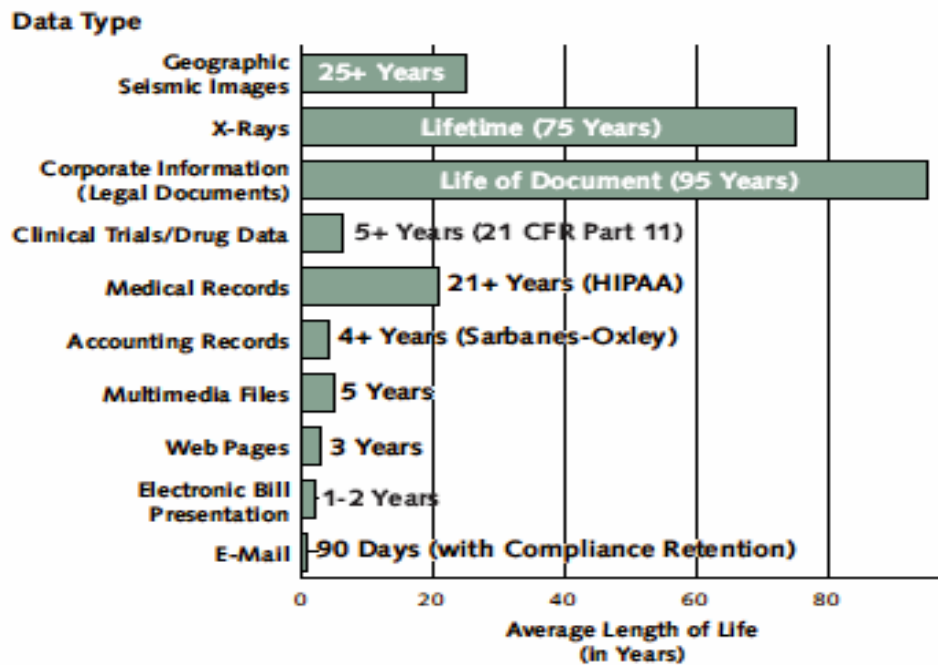


Figure 3. The Growth of Information Life Spans (Balaouras and Gruener, 2004)

with the vast reach of an electronic medium such as the Internet (including the World Wide Web, intranets, and extranets); it connects critical business systems directly to critical business constituencies--customers, employees, and suppliers. The key to becoming an e-business is building a transaction-based Web site in which all core business processes (especially all processes that require a dynamic and interactive flow of

information) are put online to improve service, cut costs, and sell products (Caledonian, 2004).

E-business can be defined as the transformation of internal and external business processes toward customer-centricity based upon service delivery opportunities offered by new communications technologies (such as web-based technologies) to better fulfill the purposes of private entities to provide efficiency and effectiveness as well as profitability (Mdy, 2004).

Fensel states content management is the key issue in B2B electronic commerce and it faces a number of serious problems: Product descriptions are unstructured, they are unclassified, they must be classified and described in various dimensions because no standard product classification exist, and product description must be personalised to enable customers to find the products they are looking for (Fensel, 2001).

Fensel and Omelayenko relate the challenges in inter-enterprise content management to Business-to-Business (Fensel) electronic commerce in the context of production information integration and ontology in electronic marketplaces. Kung et al relates knowledge to enterprise Web content management with focus on superimposed information and domain ontology. But the basic understanding of what content is and how it should be managed in this process is not described (Kwok and Chiu, 2004).

Strategies

Content management strategies are integrated with related information management strategies, past and present, due to the changing concept and context within which the term is used. CM has been associated with Web Content Management and

more recently Enterprise Content Management. A report by CMSWorks, Inc. provides a summary of these relationships (CMSWatch, 2001):

SCM - Is referred to as Software Configuration Management, Source Code Management, and Change Management. SCM came on to the IT scene around 1980. The core purpose of SCM is to reduce technical costs/bugs/downtime and improve time-to-market by coalescing development and systems teams around a documented system of platform builds. SCM targets source code and configuration files, as well as associated documentation. It's related to CM because code and content management have similar requirements, while IT departments are frequently saddled with CM software selection and implementation.

DM - Is referred to as Document Management and Enterprise Document Management. Its core purpose is to manage the production, editing, distribution, and archiving of core business documents in an orderly way, saving staff time while enforcing standardization and business rules. DM occurred on the IT scene around 1985. It targets documents (files) and associated metadata. CM is increasingly superseding DM in the workplace as companies seek to manage text and other content components at the sub-document level.

DAM – This refers to Digital Asset Management, Asset management, Media Asset Management. Its core purpose is to reduce costs and realize greater value from media assets by enabling users to digitize, catalog, convert, transform, and distribute them. DM came into the IT community around 1990. It mainly focuses on media assets (files) and associated media. Its relationship with CM is because related text content is critical to adding context and other dimensions of added value to digital assets.

KM – This refers to Knowledge Management and Enterprise Information Portals. Its core purpose is to expose latent corporate knowledge to those who truly need it, at the right time, in a usable format so that companies can gain competitive advantage by leveraging what they know. *KM* arrived on the IT scene around 1992. It relates to *CM* because the line between controlled “content” and free-form “knowledge” is blurring amid expanding corporate and ecosystem-based networks.

DRM – This refers to Digital Rights Management and Privileges Management. Its core purpose is to regulate and control information distribution by applying granular access rights and downstream privileges to specific pieces of content. *DRM* came on to the IT scene in 1997. *DRM* targets documents or discrete content objects. Its relationship with *CM* is because the ability to control the distribution of content becomes more important as that information grows in value.

CMSWatch also reports that *CMs* purpose is to align the Web content lifecycle—content production, publishing, and distribution—with core business and editorial processes to yield greater value from online investments (CMSWatch, 2001).

These information domains signify the integration of several terms and technologies that add to the effort of trying to understand the concept of what is content management and what influences these strategies contribute to the evolution of the ideology of content management. The outcome of an activity producing content is common within these terms, influences, concepts, and strategies. This commonness provides evidence to the predication that the ideology has changed within the last five years, as a result of the integration of these activities.

Summary

This chapter presented a literature review of the ideas from academics and practitioners discussing content and content management. The information obtained from this literature review provided key ideas and terminology within the content management arena, indirectly chronologized historical background related to content management by article reference date, and identified influences that have contributed to content management concepts and strategies.

III. Methodology

The study of history offers a valuable perspective with which to view our present circumstances; it provides the context within which IS phenomena occur.

(Bannister, 2000)

Overview

This chapter describes the research methodology chosen for the study, describes the research design used to answer the research questions, and describes the methods for data collection and analysis. Finally, this chapter will provide justification for using the historical research method for Information Systems (IS), propose why it benefits this research study, and identify the limitations of this research effort.

Historiography

Historiography is an empirical research paradigm using an interpretive or qualitative approach which focuses on a chronology over a substantial period of time in order to obtain a fuller and richer understanding of a situation or set of circumstances (O'Brien, Remenyi et al., 2004). It involves more than just collecting facts and dates. It is a study of events and the influence surrounding those events. Historical inquiry can provide data to observe the area of study. Knowing the background to any situation or to any issue embraces our comprehension and improves our ability to see what is important and what is not (O'Brien, Remenyi et al., 2004). Historical research involves interpreting past events so that ideas surrounding those events can be better understood and

communicated towards new ideas. It is the goal of this research to investigate the past events surrounding content management and communicate the changes in concepts since 1999.

Stanford (1986) describes the structure of history as follows:

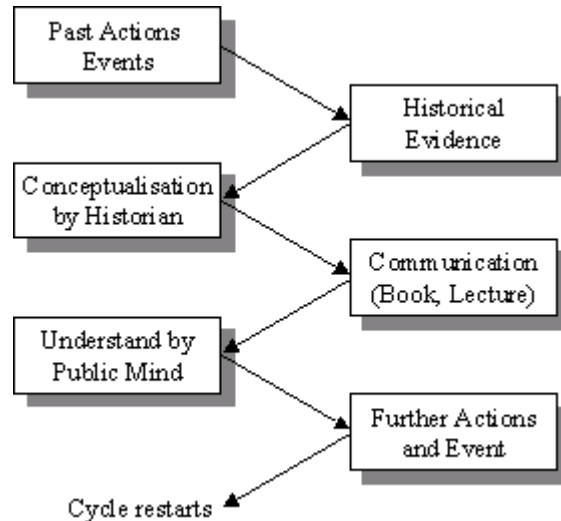


Figure 4. Structure of History (Stanford, 1986)

Scott restates that Bannister (2002) describes the Stanford model as significant in the interpretive processes encountered from historical research, over a long period of time, when the researcher may not have been present (Scott, 2004).

According to Mason et. al (1997), the outcome of historiography may be described under five headings which are:

1. An account of a significant fragment of the past;
2. An explanation of present circumstances or events;
3. Validation or invalidation of some theory;

4. A recognition of patterns or principles derived from inductive reasoning arising out of this account; and

5. A source of new research.

This research proposes to achieve these outcomes by examining the period between 1999 and 2004. As a result of examining this time period, the focus of the reporting will communicate those circumstances and events that occurred within this timeframe. This research study is not an attempt to validate or invalidate the theory of content management concepts. According to Edwards, history presents observational data, making it impossible for the historian to state that “x causes y.” (Edwards, 2000). Analysis of the data will be performed to identify those events or issues that have contributed to the change in context of content management concepts. As a result of this research study, it is the hope of this researcher that this study will contribute exploratory knowledge for future research efforts on content management concepts.

This research will be a qualitative study using a combined approach of historical and context analysis. Qualitative tools can serve a useful purpose for drawing inferences, eliminating hypotheses, pattern-matching, and making generalizations (Edwards, 2000). Utilizing the contexts only, informative or indicative summaries of articles are constructed almost mechanically with minimum editing (Bhattacharyya, 2002) . Through this combined approach, this research attempts to explore the literature to answer the research question:

How has the ideology for content management evolved since 1999?

The framework for this research study is based on a seven-step methodology by Mason et. al (1997) for conducting historical research in MIS:

- Begin with focusing questions
- Specify the domain
- Gather the evidence
- Critique the evidence
- Determine patterns
- Tell the story
- Write the transcript

This seven-step process provides a specific structure to design a systematic approach to encounter the phenomena being researched and present the evidence of the results. This process allows the research to be dynamic and free-flowing, in the event certain steps need to be repeated.

Research Design

Begin with focusing questions

Historical studies, as with all research, must begin with a question or a cluster of coordinated questions which serve to focus all subsequent inquiry (Mason, McKenney et al., 1997). According to Bouchard (1976) “The key to good research lies not in choosing the right method, but rather in asking the right question and picking the most powerful method for answering that particular question.” The focus of this research effort is established by asking the following investigative questions which will be answered through the literature review:

What is content?

What is content management?

What factors influenced the concepts for content management?

Specify the domain

To define the domain of the research, this study will focus on content management ideology from 1999 to 2004. The unit of analysis will be specific documents written during this time period that have identified their own content management definitions, ideas, or concepts within the text or abstract. If no original definitions, ideas, or concepts exist, the document will be analyzed for definitions, ideas, and concepts referenced within other documents or sources.

Gather the evidence

The primary source of evidence utilized for this research study is the collection of peer-reviewed journal articles that focus on content management. The articles were collected from conducting a content search within electronic research databases on the keyword “content management” and the time period “1999 to 2004”. Secondary sources of evidence are white papers, conference proceedings, and case studies from content management practitioners. These articles were collected from conducting a content search within electronic research databases on the keyword “content management” and the time period “1999 to 2004”. The primary sources journals are considered “peer-reviewed” journals by the research community and publish important research. The primary source artifacts are listed in Table 1. The secondary source artifacts are listed in Tables 2 through 4.

Table 1. Listing of Information Systems Journals

Journal	Year
Communications of the Association for Information Systems	2003
Computing & Control Engineering Journal	2002
Computing in Science & Engineering	2004
Engineering Management Journal	2002
Government Information Quarterly	2004
IBM Systems Journal	2002
Industrial Management & Data Systems	2003
Information Management Journal	2002, 2004
Information Technology and Libraries	2004
Institute of Electrical and Electronics Engineers	1999-2004
Library & Information Science Research	2004

Table 2. Listing of White Papers

Title	Year
An Archival Platform for Corporate Data Assets	2003
Delivering content that makes a difference	2003
Guilty, Until Proven Innocent: Enterprise Content Management Aid in Regulatory Compliance	2004
E-learning Content Management vs. Content Delivery	2002
Emerging Knowledge Technologies for ECM: natural language Technology	2002

Table 3. Listing of Conference Proceedings

Conference	Year
DRTC Workshop on Information Resource Management	2002
DRTC Workshop on Semantic Web	2003
Proceedings of the 26 th Annual International Computer Software and Applications Conference	2002
Proceedings of the 28 th Euromicro Conference	2002
Proceedings of the 35 th Hawaii International Conference on System Sciences	2002
Proceedings of the 37 th Hawaii International Conference on System Sciences	2004

Table 4. Listing of Case Studies

Title	Year
Cedars-Sanai Medical Center	2002
Content Management	2003
Online Publishing Solution for NRMA Insurance Limited	2001

Critique the evidence

The collection of artifacts on content management from refereed journals is a valid source for analysis. These articles listed from Table 1 are representative of documents that are utilized in information systems research and identify content management within the title as the focus of the article. The collection of white papers, conference proceedings, and case studies listed in Tables 2, 3, and 4 represent research data from subject matter experts, academic researchers, and practitioners within the information systems domain. These sources provide important concepts and insights that are evolving within the content management community.

Determine patterns

A context analysis of the collected articles will be conducted. This analysis will categorize the articles by year and examine the article's focus according to the title of the article and strategies discovered from the literature review. These strategies are identified by this researcher as significant influences to content management texts and enables building a framework to formulate an understanding of content management ideology. The attributes for identifying these strategies are listed in Table 5, Attributes of CM documents.

Articles that contain content management within the title of the article will be identified as Group 1. The articles will be categorized for their relationship to the domains discovered during the literary review: SCM, DM, DAM, KM, DRM and CM. After assessing the relationship of the articles to these five domains, the articles will be analyzed for specific definitions and ideas related only to that domain or related to general definitions, ideas, and strategies for content management. The result of the categorization is in Appendix A.

Articles that do not contain content management within the title of the article will be identified as Group 2. These articles contain the phrase "content management" within the document. The articles will be analyzed for their relationship to the domains discovered during the literary review: SCM, DM, DAM, KM, DRM and CM. After assessing the relationship of the articles to these five domains, the articles will be analyzed for specific definitions, ideas and strategies related only to that domain or related to general definitions, ideas, and strategies for content management. Groups 1 and

2 will be cross-examined to corroborate contextual agreement on content management.

The results of the categorization are in Appendix A, Categorization of documents by title.

Table 5. Attributes of CM documents

Attribute	Definition	Purpose
Year	The year the article was published	To distinguish timeframe used in relation to other articles
Domain	The purpose for using content management	To distinguish the domains of content management technology
Source	The source of the definition of the term within the context	To distinguish the uniqueness or non-uniqueness of the term
Focus	Focus on content management strategy identified	To distinguish correlation of title to subject matter

Tell the story

A narrative account of the findings from this study will be addressed in Chapter 4, Analysis and Results, of this thesis. This narrative describes the investigative results from synthesis of the collected data, which was analyzed to answer these questions:

What is content?

What is content management?

What events influence the concepts for content management?

Write the transcript

The transcription of this research effort is the completed composition of this thesis. Chapter 5, Conclusions and Recommendations, will contain a descriptive summary analysis of the research effort. The summary presents a historical perspective on changes in content management ideology since 1999.

Design Quality

Construct Validity

Historical research is a seldom used methodology for information systems. However, more research efforts and proponents support this method along with other research methods such as content analysis and case studies (Mason, McKenney et al., 1997). A literature review revealed prior research efforts using historical methods. O'Brien (2000) states that historiography constitutes a useful research paradigm which may be used in the field of business and management research. His emphasis for historiography's applicability is compared to other research methods in Table 6.

Table 6. Different emphasis used in historiography, case studies, and ethnography

		Historiography	Case Studies	Ethnography
1	Key focus	Chronology	Event/s	Culture
2	Sources of Evidence	Any authentic and credible source	Primarily interviews and corporate documents	Primarily observation
3	Potential for the use of analytical or computer tools	Low	Medium	Low
4	Delivery of results	Narrative leading to hypothesis	Narrative, hypotheses and theory	Narrative, hypotheses and theory
5	Generalisability	Not relevant	Some scope	Some scope
6	Validity	Strong potential	Strong potential	Strong potential
7	Potential for academic rigor	Strong	Strong	Strong
8	Major challenges	Finding authentic and credible evidence and objectively interpreting it	Obtaining adequate access to the people or organizations required	Usually a single view point. Having the time required to acquire the deep understanding and then presenting it objectively

Internal Evidence

For this historical research, the observational data will be used for discovering relationships and documenting associations between events, but not for establishing causality. Therefore, the internal validity of this research is supported by the proposition that literary artifacts chosen for observation will provide genuine data from which general interpretations can be extracted. The interpretations of the data will be based on the two assumptions: (1) characteristics, traits, and factors of content management are identified within the literature, and (2) the researcher can classify and categorized these attributes from the text as correctly as possible.

External Evidence

The validity of the research data is from credible research sources. These sources have been utilized in or resulted from previous research studies. A representative set of artifacts from accepted research journals is customary for academic research efforts. To corroborate the authenticity of the selected documents, only those documents which emphasized their focus on content management were utilized. Secondary sources were acquired for their contributions to content management initiatives. Although these documents may potentially introduce some bias into the analysis of the data, the benefits of using these documents should not be ignored.

Limitations

In historical analysis, interpretation has to be made involving the events reported. Therefore, the researcher must remain objective to reduce bias in the analysis and

interpretation of secondary data. Synthesizing the data from years of reporting from various perspectives can be difficult. Interpreting key words correctly within the text to reduce ambiguity is also a factor when making assumptions on the connotative meanings within the text. A context analysis may reduce some bias associated with this interpretivistic research approach. Leedy states that when judgments are entirely objective (e.g., when the study involves looking for the appearance of certain words in a text), only one judge is necessary (Leedy and Ormond, 2001).

Summary

This chapter provided a conceptual understanding of historical research. It provided a strategy to conduct historical research for Information Systems (IS) and described a systematic approach to answer the research questions. Finally, the chapter covered the reasoning for selecting the historical method, the validity and reliability of the research effort, and the limitations for conducting this research.

IV. Analysis and Results

Since summarization of historical research data involves logical analysis rather than statistical analysis, the researcher must take care to be as objective as possible.

(Gray, 1996)

Overview

This chapter will discuss the findings of this research effort by answering the research questions presented in Chapter One. The answers are presented in a manner consistent with the research questions and organized in a format to assist the reader in understanding the information presented.

Analysis of Historical Artifacts

Research Question One

The first investigative question asked, “What is content? “

Of the documents analyzed for this research study 18 of 38 stated definitions for content or content management. The remaining 20 documents discussed content in reference to the focus of the article. Of the 20 documents, 6 discussed content activities such as what a publishing author, content editor, or content manager would do. The documents in Group 1 were not any more specific about a definition than the documents in Group 2. Of the 18 documents that contained a definition of content, the recurring terms used in every definition were emphasizing the digital content and the use of content in that environment. The documents from 2004 were more closely related in definition

terminology than the documents of other time periods. The documents from Group 1 stated more definitions related to web and enterprise content management from the five year period investigated for this study. The definition for content was mostly used in context with Web content, but moving towards enterprise content. Only 3 documents focused on content as digital assets.

The definition of content changed slightly during these five years as a result of content owners identifying more data as content. Moving data and text files from silo type storage practices to an integrated storage environment led to labeling more digital data as content. As content owners and users realized the possibility of integrating more content because of this digital format, the necessity to understand what content is from different perspectives brought environments together. Owners understood content needed to remain flexible to be shared between information environments, but structured so that it could be shared among storage environments.

Content is evolving towards dynamic and rich intellectual objects. Content owners are identifying more content from unstructured locations and housing it within content management systems. It is becoming structured for business processes and in turn flexible to the users. The users are given more use of the content for what they need versus how it can be used. The content is being consolidated from different environments and redistributed. As a result of this flexibility, users utilize content for more than just presentation. The digital format in unique environments is becoming less of a differentiating factor for content. The integration of content is possible for many formats; therefore the content is part of the processing activity, rather than the output.

Research Question Two

The second investigative question asked, “What is content management? “

The term “content management” has various definitions. Since 1999, the definition of content management has changed, depending on the focus of the content initiative.

Organizations need a strategy that involves defining processes to perform content management. Vendors are promoting a system that has capabilities to solve data structure consolidation. Content management switched focus in the late 1990s from Web delivery towards providing the opportunity to enhance the information management experience.

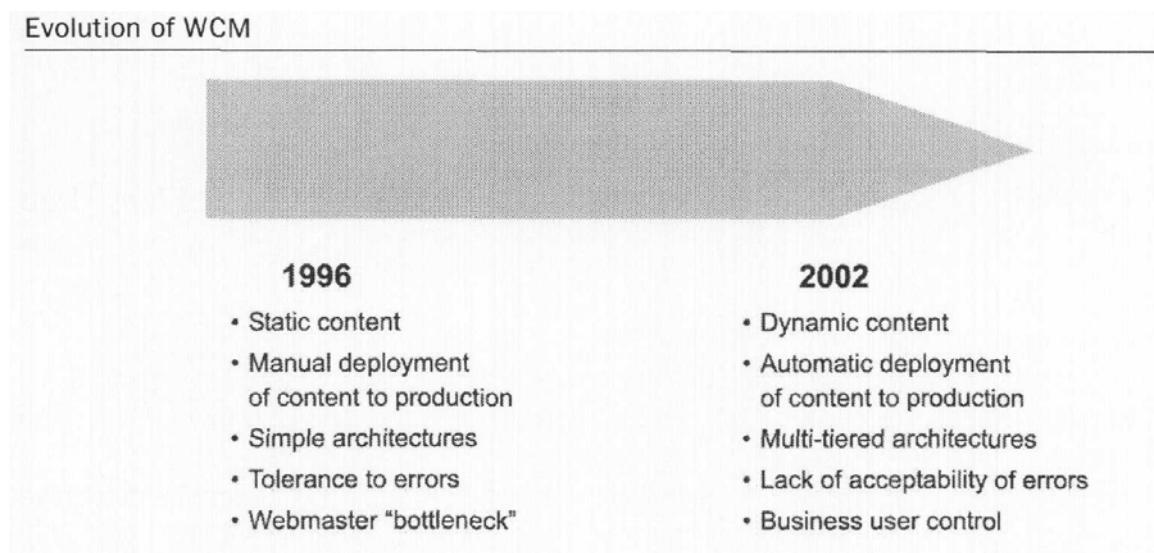


Figure 5. Evolution of WCM (McKeever, 2003)

In Figure 5, McKeever (2003) diagrams the progression of content management systems, illustrating how content management has developed between 1996 and 2002.

This progression has continued to 2004 with content management evolving towards an enterprise organization strategy for all types of formats. Content management

has gone beyond dynamic Web publishing to supporting all types of data for business applications. Different applications were developed based on the business needs of the environment. As businesses pushed towards expanding their electronic capabilities with information, they realized that storage necessities required more than database management systems. These organizations realized that a content solution involved having the capacity to store and manage increasing amounts of digital content and having the opportunity to gain business advantages from content objects.

The definition of content management has changed to reflect the capability of content users. As users from more domains saw the advantages of integrating content across environments, content management became redefined to reflect a strategy more than a process. Within the information lifecycle, managing content was process driven due to the activities of storing different media formats. As enterprises started consolidating processes aided by technical capabilities, content management evolved into a strategy to achieve reuse and corroboration.

Content management has evolved to enterprise content management because the focus is not on independent functions in organizations. Of the 38 documents in the research study, content management was defined as strategy in 11, as system technology in 13, and as part of both in 7 documents. This differentiation may be due to the influence that E-business activities require more than just data storage or Web publishing or online transactions. E-business requires integrated processes that take into account these three activities, based upon the business strategy and not the transaction processing. Content management is more than just the “manage” phase of the content lifecycle.

Research Question Three

The third investigative question asked, “What events influence the concepts of content management?”

The information management lifecycle directly influences the concepts of content management. The accepted phases of the lifecycle have remained constant over the years. The functions in the lifecycle had been performed separately with different applications and techniques. Due to increases in content types, more management and storage capability is needed from a system that can integrate all types and activities. With the capabilities of content management systems, a strategic solution can now be achieved within the system to perform all the functions in the lifecycle.

The artifacts from this research study indicated a shift in 2002 from performing web content management. The definitions indicated the increased capability by content management systems to perform general management of all content assets, versus storing documents like document management systems or publish and delivery like web content management systems. Content management systems extend the capability of information management systems by providing an opportunity to integrate management of information that was un-integrated with information management applications.

E-business also continues to affect content management concepts. Organizations primarily used electronic publishing to disseminate their information to users. Organizations realized that E-business activities produced more content, therefore the traditional information management solutions had to be expanded. As the value of

content became more obvious, the capability was realized that a system must be able to handle structured and unstructured data.

E-business produces collaborative content as a result of conducting business processes. The business processes are bringing several applications together and content management systems are becoming the center of consolidation. The concept of content management was reflected in documents as a strategy to handle this integration and as a system to manage the output. The shift from web content management to enterprise content management was influenced by the need to share different types of content between business partners and their activities.

Summary

This chapter discussed the results of the analysis, providing answers to the research questions. The results provided an understanding to the events and circumstances that have defined what content management is and the influences that have played an important part in forming the concepts of content management ideology.

V. Conclusions and Recommendations

In the final analysis, the principle product of historical research is context--an understanding of the organization, individual, social, political, and economic circumstances in which MIS phenomena occur

(Mason, McKenney et al., 1997).

Overview

This chapter will summarize the research study, report the significance of conducting this study, state the limitations encountered during the study, and suggest recommendations for further study and investigation. Finally, a summary of the research effort is provided.

Conclusions of Research

This purpose of this research is to answer the question, “How has the ideology for content management evolved since 1999?”

The definition, concept, and strategy for content management continues to change. This change is a result of the progress users have made in using information for more opportunities. Because those opportunities are happening in so many environments, the definitions are evolving to capture these new results. To define content management with one definition is not easy because it would be difficult to describe all the activities from many environments. Therefore, defining content management is accomplished with respect to the environment and content initiative that an organization is pursuing.

Going from web content management to enterprise content management is the result of organizations realizing the value and purpose of their content. No longer is content just digitally stored data that is managed by a web administrator, it is intellectual capital. It is more than a by-product of doing business; it is the product, especially within E-business, that binds all processes together. Content management evolved from being a web-centric storage solution to being the solution for businesses needing a way to manage their different information products from various business activities.

“Ten years ago, people came to computers to input, process, and output data. Today, most people come to find and consume content” (Boiko, 2002). Digital content has continued to grow because business processes generate a need for more usable content, increased storage capabilities, and decreased storage costs. Since 1999, the focus has shifted from systems and how they store data to applications and content flow within business processes. The flow of content has become just as important as the flow of monetary funds in the organization. During the Year 2000 (Y2K) concerns, interoperability separated data content because of issues between hardware capabilities and business functions. Since that time period, content has evolved as an integrated data product which provides flexibility to support business processes, rather than a limitation due to system incompatibility.

Content management is changing because information processing needs are changing. Data processing was the result of businesses conducting transactions to arrive at more data or information. Now, data and information are processed as content to arrive at more information and knowledge. Transaction processing used data organized within

databases. Content processing uses “rich” content that is stored within content management systems. Database management provided organization to the data, but to process that data into information required a cognitive process by the user.

Content management is changing because of the influences of information management lifecycle activities. As the requirement to comply with regulations for information security and accountability grows, so does the necessity to manage this information from various locations in various stages. Responsibility for information is harder to determine and maintain when the content is integrated within several business processes. As integrated applications work with content management systems, the line becomes blurred between where information ownership begins and ends. Content management focuses on handling content, irregardless of how dynamic the process is that creates it or distributes it.

Content management is changing because of the activities resulting from E-business. As different entities participate in the business activities that were traditionally done by paper and post prior to E-business, the resulting products and processes generate a need for new strategies for handling content. An enterprise generates many forms of content which continue through the information flows towards one or many receiving activities. This cycle is dynamic, creating reusable content which benefits from the capability of content management systems to contain structured and unstructured information.

Significance of Research

The goal of this research study was to perform an analysis on the evolution of content management from a historical perspective. By completing this study, researchers and practitioners will benefit from the foundational knowledge about this progression and have insights into understanding concepts and strategies within the content management community. The collection, analysis, and interpretation of empirical materials are always conducted within some broader understanding of what constitutes legitimate inquiry and valid knowledge (Doolan, 1998). Because of the differences in context of published information about content management from community sources, this research effort sought to encounter the phenomena being researched and present the evidence of the results.

Limitations

“The researcher’s repertoire of interpretations limits the possibilities of making certain interpretations” (Alvesson and Skoldberg, 2000). The results must be accepted with the confidence that the researcher’s systematic process led to objective conclusions from the data. The data set was random, only in the sense that the articles were selected by title. By choosing this level of exclusivity to title along with the time period chosen for the study, the samples of articles reflect a snapshot of the population. The researcher can also be biased through repetitive analysis of the data, even though the effort is being made to corroborate the data. Another aspect of researcher bias could come from inexperience with the research methodology chosen to conduct the study. Historical

analysis for fairly new disciplines can require more interpretation by the researcher than a discipline built upon a long-standing research foundation.

The ability of the researcher is significant for the execution of this study. Interpretivistic conclusions are the result of human effort; therefore the context of this historical analysis is not validated by further statistical measurements. The interpretations are solely those of the researcher. The use of other research methods, such as case studies or Delphi studies, is expected to produce similar interpretive results. The systematic process used for this research is based on past historical research efforts in Information Systems. Therefore a historiography is not discredited in terms of this research approach, only in the quality of the research results.

Recommendations for Action

The infancy of the content management discipline supports a need for convergence towards common ideology of content management. Observing many viewpoints can contribute to the fullness in the field of understanding, however confusion is possible without a vantage point that originates from the same view. “If there are no easy answers, then there are no common definitions, and that means rule sets are out of whack” (Barnett, 2004). Historical evidence shows that defining content management has been a moving target. The growing interaction and converging of concepts from related fields have contributed to this changing concept. Content management is a term to recognize this change. This progress is not a negative effect, but a positive result of discovering better solutions to managing digital content.

Recommendations for Future Research

Citation analysis, as a method of historical research into content management issues and concerns, might be useful in conducting additional research. In this model, scientific work is represented by the papers written and published to report it, and the relationships between discrete pieces of work are represented by the references in the papers (Garfield, 1983). This approach could be used to develop a networking diagram of the cumulative research efforts that have been conducted on content management concepts. This diagram would provide a number of insights into ways in which content management differs between domains and industries, and how it interacts with technologies and business practices. It could also be used to clarify the interaction between content management and related fields such as database management or digital asset management.

Another beneficial research topic would be the implementation of content management practices within government. A case study on public organizations that implemented a content management strategy could reveal helpful strategies to other public agencies which are planning to implement content management practices. E-government initiatives are very dependent upon sharing information between agencies and with public customers. The unit of analysis in a case study defines the focus that the case study will revolve around (Yin, 2003). Also, the vast amount of information being shared between different agencies requires more integration of tools and techniques. Lessons learned from successful organizations would supply knowledge that could save the government agencies time and money with new implementations.

Summary

Digital content has grown continually over the past 5 years. This historical research investigated the evolution of content management ideology since 1999. The idea of content management is not new, yet there is a dilemma of understanding how content should be managed. Understanding content management from a historical perspective provides historical data, benefiting organizations with information that could lead to new paradigms or theories about content management.

A literature review of relevant text to date from published sources written by practitioners and academics provided key ideas and terminology within the content management arena, indirectly chronologized historical background related to content management by article reference date, and identified influences that have contributed to content management concepts and strategies. There are many frequent uses of the term “content” however there is no general consensus about what this term really means or describes (Kunkelmann and Brunelli, 2002). Likewise, several research documents expressed the view of content management being largely used in industry, but sometimes with different meanings.

Using a combined approach of historical and context analysis, the study followed a systematic approach to conducting a context review of articles to discover insights on issues and events in the content management community within the specified time period. Grouping these articles by domain and focus resulted in two groups of documents to corroborate differences and similarities. These informative summaries presented contextual patterns upon which to make inferences.

Content is evolving into dynamic and rich intellectual objects. The content can be consolidated from structured or unstructured formats from different environments. As a result of this flexibility, users utilize content for more than just presentation. The digital format in unique environments is becoming less of a differentiating factor for content. The integration of content is possible for many formats; therefore the content is part of the processing activity, rather than the output.

The definition of content management has changed to reflect the capability of content users. Because information processing needs are changing, users from more domains take advantages of integrating content across environments. Within the information lifecycle, managing content was process driven due to the activities of storing different media formats. As enterprises started consolidating processes aided by technical capabilities, content management evolved into a strategy to achieve reuse and corroboration. Content management has evolved to enterprise content management because the focus is no longer on independent functions in organizations.

This research adds to the foundational knowledge of the content management community. Observing many viewpoints can contribute to the fullness in the field of understanding, however confusion is possible without a vantage point that originates from the same view. Furthermore, historical evidence shows that defining content management has been a moving target. Because of the differences in context of published information from community sources, future research such as content analysis could provide convergence among publications and researchers. Convergence is not a negative effect, but a positive act of discovering better understanding.

Appendix A. Categorization of documents by title

Group 1.

Title	Year	Domain	Focus
Customization of Enterprise Content Management Systems: An Exploratory Case Study	2004	CM	enterprise
Guilty, Until Proven Innocent: Enterprise Content Management Aid in Regulatory Compliance	2004	CM	enterprise
E-learning Content Management vs. Content Delivery	2002	CM	content
Emerging Knowledge Technologies for ECM: natural language Technology	2002	CM	enterprise
A Web Services Implementation Framework for Financial Enterprise Content Management	2004	CM	enterprise
Effective Web Content Management	2002	CM	web
Evaluating Strategic IT Investments: An Assessment of Investment Alternatives for a Web Content Management System	2002	CM	web
ContentP2P: a peer-to-peer content management system	2002	CM	content
Advanced Indexing and retrieval in Present-day Content Management Systems	2002	CM	content
Digital Multimedia Content Management For Networked Information Access: Issues and Discussion	1999	DAM	multimedia
Multimedia Content Management – Provision of Validation and Personalisation Services	1999	DAM	multimedia
Extracting Motion Annotations from MPEG-2 Compressed Video for HDTV Content Management Applications	1999	DAM	digital asset
XML Content Management based on Object-Relational Database Technology	2000	CM	content
Multicache-based Content Management for Web Caching	2000	CM	web
Challenges in Content Management for B2B Electronic Commerce	2001	CM	content
The High Cost of Web Content Management	2002	CM	web
Content Management Beyond English	2002	CM	content
Enterprise Content Management: An Overview	2002	CM	enterprise
Building the Mosaic: Writing tips for Content Management	2002	CM	content

Group 1. continued.

Title	Year	Domain	Focus
Understanding Web content management systems: evolution, lifecycle and market	2003	CM	web
Developments In Practice VIII: Enterprise Content Management	2003	CM	enterprise
Content Management Strategy for a College Library Web Site	2004	CM	content
An Enterprise Content Management Primer	2004	CM	enterprise
Why Content Management Should Be part of Every Organization's Global Strategy	2004	CM	content
How do government agencies review and approve text content for publication on their Web sites? A framework to compare Web content management practices	2004	CM	web
Plone and Content Management	2004	CM	content

Group 2.

Title	Year	Domain	Focus
An Archival Platform for Corporate Data Assets	2003	CM	content
Delivering content that makes a difference	2003	CM	enterprise
Content Creation, Organization and Management: Transition Time for Information Professionals	2002	CM	content
Content Development: Where Do We Go Wrong?	2002	CM	content
The Road to Single-Sourcing: A Case Study	2001	CM	content
An Overview of the Semantic Web	2003	CM	web
Content, content, everywhere...time to stop and think?	2002	CM	web
Bringing together content and data management systems: Challenges and opportunities	2002	CM	content
An enterprise internet content implementation method and case study	2002	CM	content
Cedars-Sanai Medical Center	2002	CM	content
Behind the Web site: An inside look at the production of Web-based textual government information	2004	CM	content
Online Publishing Solution for NRMA Insurance Limited	2001	CM	content

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Vita

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