

Master's Thesis

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Business Benefits of Content Management

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<p>Hyvällä sisällönhallinnalla on mahdollista vaikuttaa myönteisesti liiketoiminnalliseen tulokseen, jos sisällönhallinnan eri vaikutusmahdollisuudet tunnistetaan. Kun organisaatiossa syntyvä tieto on vapaasti saatavilla, ja sitä voidaan tulkita ja hyödyntää erilaisiin tarpeisiin, tietojärjestelmän avulla voidaan vauhdittaa kehitystä ja uuden tiedon löytämistä. Tiedon keskeisin tehtävä on kehittää ja parantaa organisaation osaamista, jolloin pitää olla tietoa siitä, mitä, miksi ja kuinka tietoa on käytetty organisaatiossa. Kaiken liiketoimintaprosesseissa tuotetun tiedon kohdalla pitäisi miettiä kolmea tiedonhallinnan osa-aluetta: tiedon luontia, hallintaa ja hyödyntämistä. Tavoitteena on saavuttaa yrityksen määrämuotoisen tietopääoman paras mahdollinen hallinta.</p> <p>Työssä kuvataan sitä, mitä sisällönhallinta on, sen eri tasoja, sen käsitteellistä sijoittumista tietämyksenhallintaan, sisällönhallinnan järjestelmiä ja niiden merkitystä liiketoimintaprosesseissa. Lisäksi tarkastellaan niitä syitä, joiden vuoksi yritykset kiinnostuvat organisaatiossa olevan määrämuotoisen tiedon sisällönhallinnasta. Lopuksi analysoidaan, millaisia voivat olla liiketoiminnalliset, kilpailulliset tai rahalliset tavoitteet, joita asetetaan sisällönhallinnan tietojärjestelmäprojektille. Työn tueksi on haastateltu neljän suomalaisen suuryrityksen sisällönhallinnan tietojärjestelmäprojektin asiantuntijoita. Heidän kommenttejaan on analysoitu ja niiden perusteella on tehty johtopäätöksiä niistä syistä, joiden vuoksi yritykset yleensä sijoittavat resurssejaan sisällönhallintaan.</p>	

ABSTRACT

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Good content management can have a positive effect on business, if the real possibilities are recognised. If there is free access to all organisational information and it is easy to utilise and socialise to various needs, an information management system can support development actions and it can help to find new knowledge. The most important role of information is to use it to improve organisational knowledge, in which you need to know how, why and what information is utilised in the organisation. All the information that is produced in business processes should include three areas: content creation, content management and content utilisation. The goal is to achieve the best possible way to manage explicit knowledge in a company.

This is a description of content management about the different levels it has, content management compared to knowledge management, content management systems and their influence on business processes. In addition to that it covers the reasons why companies have been interested in managing content of explicit knowledge. In the end, there is an analysis of business benefits and competitive advantages of IT projects on content management system. To find out concrete business drivers, there are comments from experts of four large Finnish companies. The comments are analysed and the conclusions are written based on the analysis.

FOREWORD

This thesis was carried out for TietoEnator Technology Oy to find out investment drivers for content management.

I wish to express my gratitude to Professor Jorma Papinniemi for supervising the work and supporting me in the good times and the bad. I also wish to thank my instructors Sissi Kolbe and Juha Ekberg from TietoEnator for their patience and useful advice throughout the project.

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TERMS AND ACRONYMS

BI	Business Intelligence
CMS	Content Management System
CRM	Customer Relationship Management
DM	Document Management
ECMS	Enterprise Content Management System
ERP	Enterprise Resource Management System
GUI	Graphic User Interface
HTML	Hypertext Markup Language
PDA	Personal Digital Assistant
PDM	Product Data Management
ROI	Return On Investment
UML	Unified Modelling Language
WAP	Wireless Application Protocol
WCM	Web Content Management
XML	Extensible Markup Language

1 INTRODUCTION

1.1 Background of the Study

The amount of information is increasing enormously. Information is located in many different information management systems in the company and it is almost impossible to find the relevant information when you need it as fast as possible from separate databases. There may be a problem with access rights, search capabilities, key words, document titles, content descriptions, information categories and so forth.

Ron Sanchez has written in his book that “management thinking has changed while managing organizational knowledge effectively is essential to achieving competitive success and managing knowledge is now a central concern – and must become a basic skill – of the modern manager” (Sanchez, R. 2001). We can see the need for organisational knowledge management also in continuous development of knowledge management tools.

One of the leading ideas is based on the Ron Sanchez’s view that the structure of IT systems can constrain the utilisation of knowledge. The question is how well we recognise the possibilities that Web services architecture can bring us. To meet the challenges in knowledge management, we need flexible content management and open communication culture at the same time. All the information that exists on different servers and databases serving separate business processes should also be available for other parts of the company to enrich the information and its reuse.

It is very important for a successful company to create new knowledge.

Knowledge is an essential part of any business process and it has always its own creation, possession and utilisation processes. The common features for knowledge creation, knowledge management and knowledge utilisation should always be taken into account despite the fact that they are owned by one business process.

Information is a strategic and important, intangible asset of any company today. That is why it is very important to manage information, to produce information and to distribute information. Information gets more valuable always when it is moving. The right information at the right time for the right persons is a perfect goal for good information management. Information format must be reusable, trusted, safe, flexible and easy to utilise. With all that you can achieve effectiveness, reduce costs and secure your investments.

1.2 Objectives and Scope of the Study

The goal of this study is to find out what the business benefits to be achieved are when you use a content management system in an enterprise. The main points in this thesis are:

- to find out what kind of benefits different companies are looking for in their content management projects and
- to find out what kind of business benefits there exists for enterprise content management according to the contemporary literature and research.

1.3 Structure and Execution of the Study

The thesis is divided into seven chapters where the first chapter is the introduction as shown in Figure 1.1. The second chapter describes the background of content management as a part of knowledge management and its history with different trends. The third chapter describes the role of content management in various business processes. The fourth chapter concentrates on content management systems. The fifth part clarifies systematic analysis of business impacts of technological projects, and the sixth part describes the questionnaire with its outcome. The last chapter summarises the theoretical part with the questionnaire outcome.

This study is based on the latest articles, publications and literature of content management, knowledge management and management of e-business with the

interviews of experts of four Finnish companies. The experts' comments are based on a questionnaire, which was sent to four large companies that have taken or are taking a content management system into use. The point was to find out what kind of business goals companies had when they started to implement a content management system, and what the results turned out to be after the implementation phase in every day use. The results of the interviews are compared to the existing ideas of contemporary articles, researches and literature in conclusions.

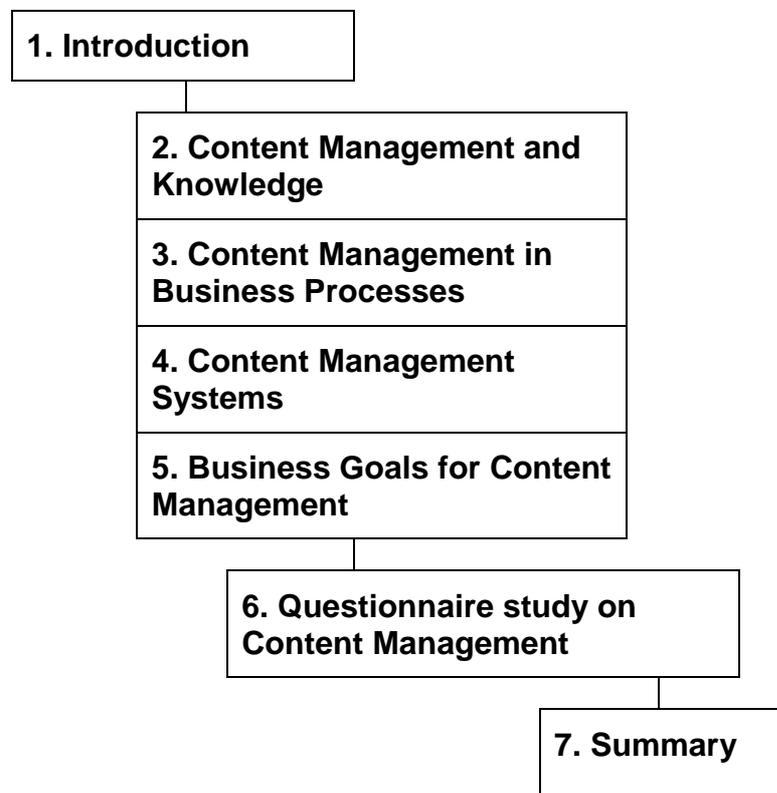


Figure 1.1 Structure of the study

1.4 Presentation of TietoEnator Technology Oy

With a staff of 10.000 employees in 12 countries and an annual turnover exceeding 1.2 billion Euros, TietoEnator is one of the leading providers of high-value-added IT services in Europe. TietoEnator Technology companies, with a staff of 160 employees in all Scandinavian countries, are focused on design, delivery and implementation of content management solutions, thus being the Content Management Competence Center in TietoEnator. Within the content lifecycle management area TietoEnator Technology has chosen the leading content management product Documentum as a base for their content management solutions. TietoEnator Technology has been the Scandinavian distributor and implementation partner for Documentum since 1996. Combined with the organisation of Documentum, they are able to deliver global services for global customers. They all work with solutions in all types of organisations within eBusiness Solutions, Content and Document Management, Database and Information Management and other Services as seen in Figure 1.2.

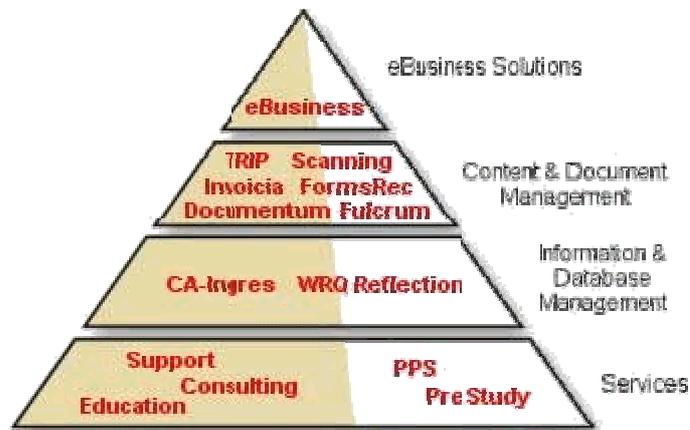


Figure 1.2 Solution areas of TietoEnator Technology Oy

(<http://www.tietoanator.com/>)

As a partner to their customers, TietoEnator delivers design, development, integration, implementation, management and maintenance of information systems as well as business related strategic consulting. TietoEnator has in-depth

knowledge of the businesses of its customers in areas such as banking and finance, forest industry, public sector, media and telecommunications. For example TietoEnator's Documentum customers are Nokia, Sonera, Nordea and Bank of Finland and for addition to that, the examples of solutions are Customer Extranet for Sulzer Pumps, Veppi, customer intranet for Orion Pharma and several applications for Nokia.

Learning and knowledge transfer is one of the key processes within TietoEnator Technology in order to ensure customer benefit and to keep content management competencies in the front line. Every professional or expert is required to reserve time monthly to learn and develop personal skills and competencies. TietoEnator Technology has also an in-house laboratory environment for evaluating and getting familiar with the latest technology.

TietoEnator Technology expects this study to enhance its knowledge of customer value expectations and clarify the classification of investment drivers for content management and knowledge management. Better proposal fit will shorten sales cycles and profitability of sales.

2 CONTENT MANAGEMENT AND KNOWLEDGE

Organisational knowledge is embedded in documents, organisational routines, processes, practices and norms (Davenport, T. H. & Prusak, L. 1998) and it is based on tacit knowledge of individuals.

Content management has an essential role in managing organisational knowledge today. Philosophy of content management should be adapted to all available information management systems of business processes. For instance, systems like Document Management, Product Data Management, Enterprise Resource Planning, Digital Assets Management, Business Intelligence, Data Mining, and Web Site Publishing systems should be implemented with content management philosophy. Along with these more general systems, there can be systems for risk management and knowledge management or specialised application tools like knowledge repositories, expertise access tools, e-learning applications, discussion and chat technologies and synchronous interaction tools, which also should utilise content management. All the above-mentioned tools can support knowledge management of tacit knowledge in a company with the help of content management across different business processes.

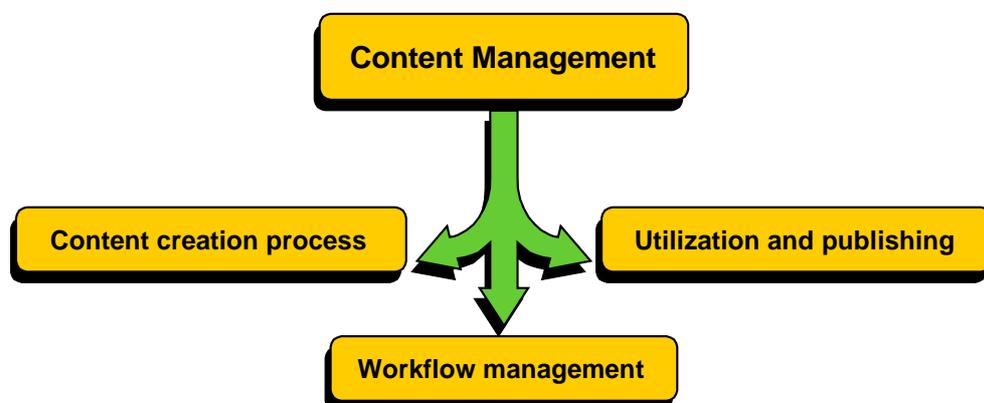


Figure 2.1 Content management areas

The idea of content management includes three parts. Figure 2.1 shows that content management consists of areas such as content creation, workflow management and content publishing and utilisation (Verkasalo, M. 1997). Content management can be utilised on business process level, on enterprise level and on operative level.

Table 2.1 shows examples of content management areas on different organisational levels. Web Content Management is an example of operative level usage, an integrated enterprise content management system is an example of enterprise level usage, and on a business level there are various operative systems which include business process related information e.g. Customer Relationship Management systems or Enterprise Resource Management systems.

Table 2.1 Examples of content management areas on different levels

Area	Content creation	Workflow management	Content publishing and utilisation
Level			
Enterprise level	Content is produced all around in the company by processes, management, partnerships, user groups, customers and individuals.	Information across the functions is controlled and reliable and user groups are well defined.	Supports knowledge management in the company.
Business process level	Content is produced in various operative systems according to business process.	Approvals and versions are managed for process purposes.	Supports reuse of business process information
Operative level	Content is produced for one operative purpose as for public delivery.	E.g. publishing and withdrawal dates can be managed on each piece of information.	Supports multichannel distribution and easy conversions of information.

Content can be any type of digital information. It can be text, images, graphics, video, sound etc. or anything that can be published on an Internet, intranet and extranet or with any other media such as paper, TV or mobile phone.

Content is produced and it is managed and delivered to those who need that information. Those three phases of content management can support good knowledge management in a company together with servers, channels and information management systems of IT technology. Knowledge is a people and process issue whereas content is a people, process and technology issue. Hierarchy for data, information, content and knowledge is defined in Figure 2.2. Knowledge is also often confused with information or data but neither information nor data is knowledge. It only becomes knowledge when it is used and given a meaning. Knowledge management has to involve processes, otherwise it does not have any value.

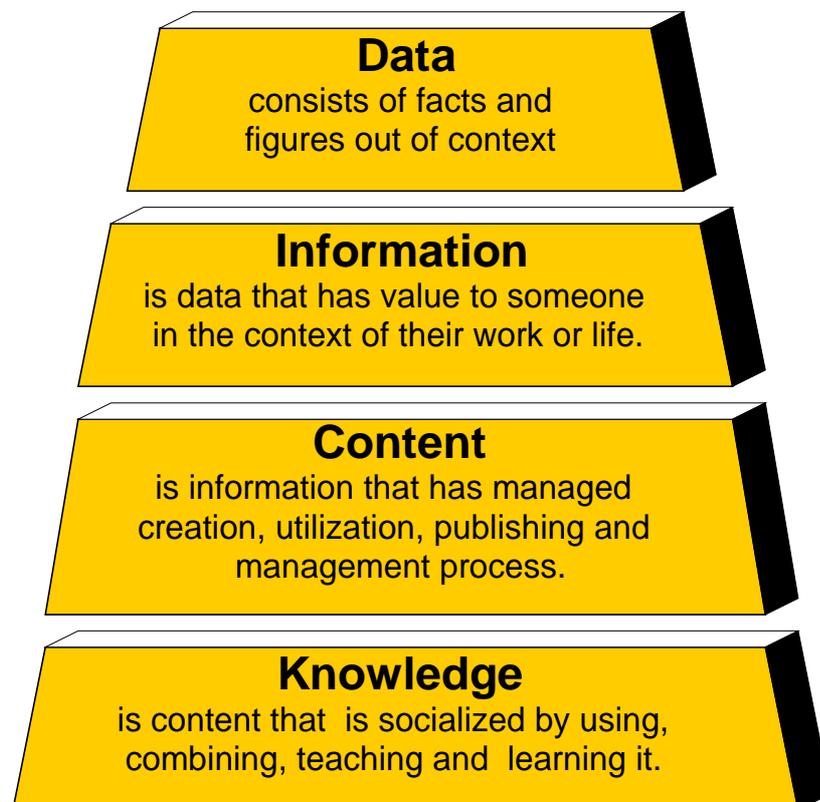


Figure 2.2 Hierarchy from data to knowledge management

Content refers to any piece of information that exists within an organisation.

Content is divided into the following four categories:

- **Controlled:**
Content and relationships are under revision control. Controlled content may be structured or unstructured.
- **Uncontrolled:**
Content that is not under revision control. It may exist in any information storage system.
- **Structured:**
Usually considered as data stored in databases, but may also include spreadsheets and other forms of structured storage.
- **Unstructured:**
Usually refers to documents and other electronic or physical media containing the information.

Where is content produced? How to share it? How to use it? How to find it? How to convert it? How to maintain it? How to reuse it? These are the core questions around content management and there are many ways to solve these questions depending on the needs of business processes. Content management can give one answer to these questions.

Where is content produced?

If the content creation process is innovative and takes place in a dynamic environment it can produce new knowledge and can be called a knowledge creation process. In mechanistic environments content creation and update process is for effectiveness, repeatability and traceability and not for new knowledge creation. (See Figure 2.3.) Typical content created and used in a mechanistic environment is content for quality systems and manuals. In an organic environment knowledge arises from dialogues and from joint discussions. Content can also be born in a business process as a result of an operative chain e.g. financial calculations. It can be written down from any available information by combining or recalling or it can be produced based on a dialogue. In a dynamic

environment content management supports new knowledge creation and in a mechanistic environment it supports information processing.

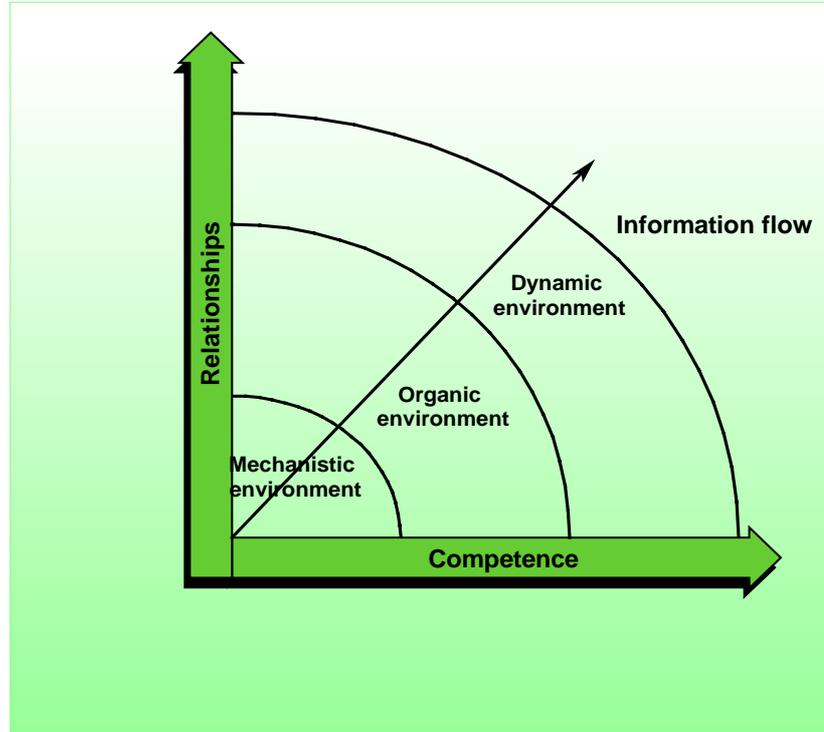


Figure 2.3 Knowledge management environments (Stähle, P. 2000).

How to share content?

User groups for sharing content should be based on the organisational needs to support business processes. Sharing can be done among employees, departments, business processes and partners. User groups such as peers, managers, personnel, teams can share content, or groups can be based on an organisation such as, for instance, marketing, sales, R&D, administration, support, production and finance. The sharing groups are not necessarily the same as creation groups. The roles of users and business needs of a company together build up the basis for user groups. An ideal way to define user groups would be a dynamic predicting way to define who is the right person this time for this type of content, but that is still a goal to be reached in the future.

How to use, reuse and find content?

Content is often reusable. To be able to reuse content it must be easy to find and update. Reusability requires standardised formats and effective search engines together with classified content with reasonable attributes. Metadata usage enables better search results and reuse possibilities.

How to convert content?

Conversion is needed when there is a need to use multichannel publishing. To publish on-line on various media is a challenge for tools, formats and publishers. Conversions need rendering tools, predefined filters and style sheets for different purposes.

How to maintain content?

Maintenance is a process for updating, archiving or deleting content. A big help for maintenance is an automatic life cycle management in the content management systems. If the rules are well defined in advance, archiving and deleting is simple.

2.1 Knowledge Management

Knowledge management is the process through which organisations generate value from their intellectual and knowledge-based assets. Generating value from such assets means sharing them among employees, departments, business processes and partners. An excellent supporting tool for this is a content management system.

According to K-E. Sveiby (2001) knowledge can be seen as an object or as a process as presented in Figure 2.4. If knowledge is considered an object, knowledge management is often facilitated by IT based information management systems, but technology by itself is not knowledge management. Explicit knowledge should be managed with content management whenever it is possible

while it supports the process-based areas of knowledge management with features like combining, sharing and publishing of content. Although technology can support knowledge management, it is not the starting point of a knowledge management program. Knowledge management decisions should be based on who (people), what (knowledge) and why (business objectives) and the how (technology) comes in the end of the project (Santosus, M. & Surmacz, J. 2001).

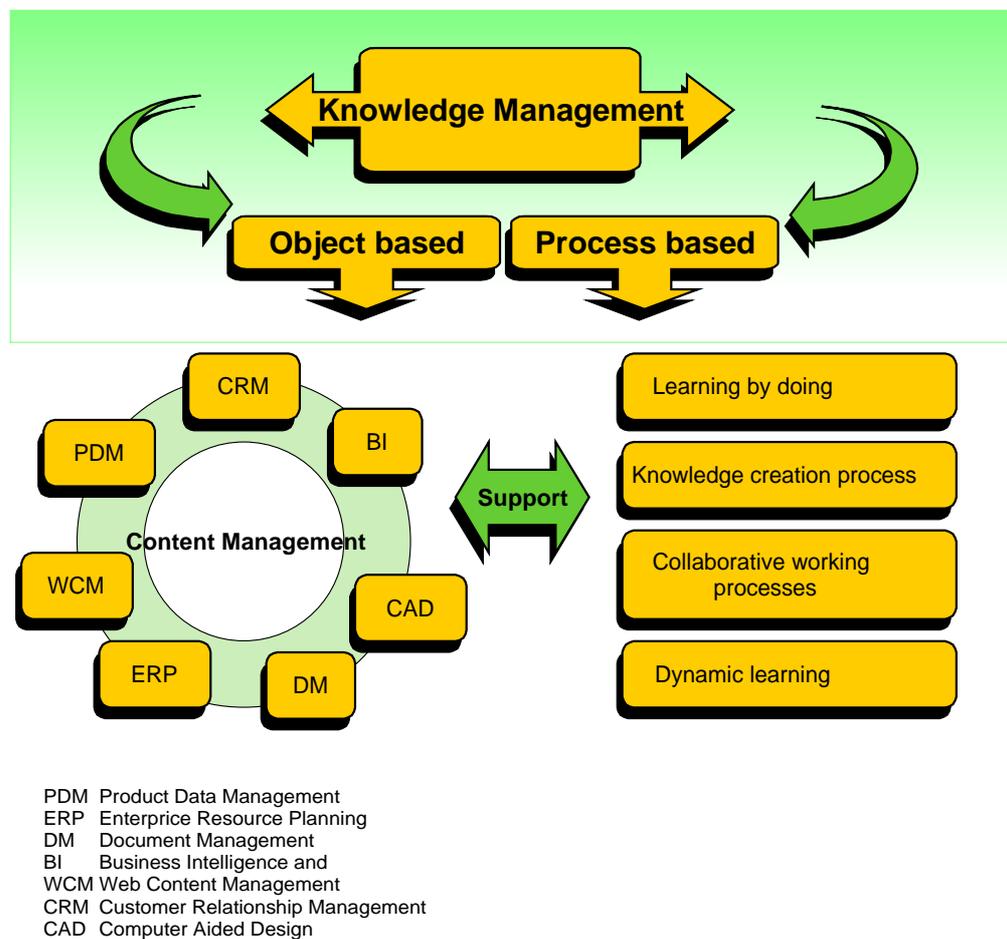


Figure 2.4 Knowledge management areas with examples

Knowledge management is said to be a key factor in future organisational development and growth. Along with the people in the organisation, knowledge is one of its most valuable assets, regardless of the task of the organisation. Organisations are beginning to realise the real value of organisational information,

which is at the same time intangible and often invisible and hard to manage or shape in the conventional ways.

Successful management and implementation of knowledge management means deep understanding of theories and models of process-based knowledge management e.g. organisational learning, group processes, teamwork, behaviour, change and creativity together with a well defined object based enterprise-wide content management system.

2.2 Knowledge Creation Process

In process-based knowledge management the goal is to find, learn, bring up and innovate new knowledge with the rules of knowledge creation process.

While documents are produced from content and content is produced from information or knowledge, it is interesting to find out also the creation process for knowledge. One of the challenges in managing intangible knowledge is transferring it from individuals to others in a usable form. Knowledge that exists within an individual or organisation but has not been recorded or exchanged is called tacit knowledge. Information that has been recorded or exchanged for others to use is called explicit knowledge. (Päivärinta, T. 2001.)

Knowledge is created through interaction between tacit and explicit knowledge. Figure 2.5 shows the four modes of knowledge and their content combined with the knowledge spiral. The modes of knowledge conversion are socialisation from tacit knowledge to tacit knowledge, externalisation from tacit knowledge to explicit knowledge, combination from explicit knowledge to explicit knowledge and internalisation from explicit knowledge to tacit knowledge. The content of knowledge in these four conversion modes are sympathised, conceptual, systemic and operational knowledge. The knowledge spiral works through interaction methods such as dialogue, linking of explicit knowledge, learning by doing and field building. (Nonaka, I. & Takeuchi, H. 1995.)

The grey areas in Figure 2.5 show those knowledge contents that can be managed with content management systems. Content management is mainly used for the

combination, where you combine different systemic, explicit knowledge sources for targeted publications. Content management can also be used for externalisation of conceptual knowledge, when you convert tacit knowledge to explicit knowledge, e.g. if managers want to make company values work in every day life they can externalise managements vision of values to explicit content. Internalisation, which means the use of operational knowledge, is usually managed with the content management systems from the creation process through management process to distribution. Socialisation concerns sympathised knowledge and cannot be managed with any management system while it is individual and informal. However, with an advanced content management it is also possible to support the socialisation mode in the Nonaka's whole spiral of knowledge creation by making the information easy to share, easy to find and use and easy to convert.

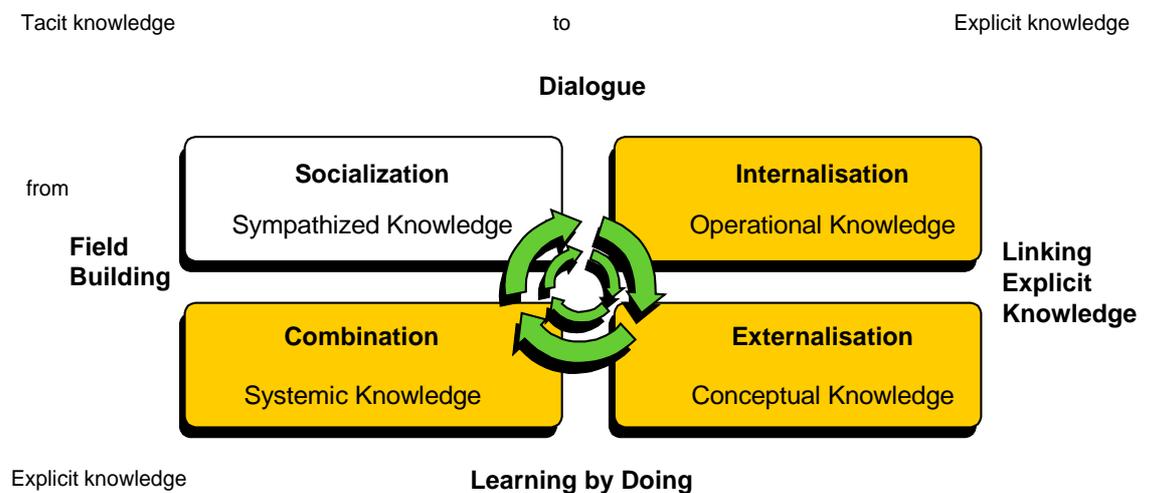


Figure 2.5. Contents of knowledge, knowledge spiral and four modes of knowledge conversion (Nonaka, I. & Takeuchi, H. 1995).

Knowledge management means discovery and synthesis, when the core of content management is collection and distribution. The knowledge that you discover and synthesise you must also collect and distribute. If you distribute knowledge in

personalised Web pages you need a content management system for portal creation. (Boiko,B. 2002.)

2.3 Information Management Systems for Content

There are various systems for managing content today. In Table 2.2 different management systems are compared.

Enterprise content management is an integrated application to manage documents, Web content, and digital assets. Enterprise content consists of unstructured data types such as Web pages, documents, spreadsheets, and multimedia files. To manage these diverse content types, firms rely on separate management systems such as document management systems, Web content management systems and digital asset management systems (Wilkoff, N. et al. 2001). As a term enterprise content management is barely a year old. And enterprise content management is said to be the next big digital revolution. Enterprise content management is focused on all the content that is in the enterprise and out with partners somewhere (Longwell, J. 2002).

Content management means effective capture, management and distribution of any kind of content in targeted publications. Content can be defined as business information that is formatted for personalised users. From knowledge and information you can bring up many different contents, and from content you can produce many different documents. CMS is a tool that enables a variety of centralised technical and (de-centralised) non technical staff to create, edit, manage and finally publish a variety of content (such as text, graphics, video etc), whilst being constrained by a centralised set of rules, process and workflows that ensure a coherent, validated Web site appearance (Anon. 2002. Content. Management Benefits).

Web content management is used to manage and publish Web content for intranet, extranet, and Internet sites. In addition to management features such as library services and administration, Web content management tools specialise in content authoring, template design, and Web publishing workflows, as well as

they interface with application servers for personalisation, scalability, and delivery. (Wilkoff, N. et al. 2001.)

Document management includes document life cycle management, which means creation, editing, approval and review, publishing, search and view, archiving and deleting of a document. (Anttila, J. 2001.)

Digital asset management is used when sites contain large amounts of rich media. Digital asset management is specialised in supporting the aggregation, storage, and indexing of rich media, as well as editing features like storyboards and audio/video clipping (Wilkoff, N. et al. 2001).

Table 2.2 Comparison between different information management systems

System	Creation and capture	Management	Distribution or utilisation
Document Management	Object is a document	Life-cycle management of object.	Separate publishing channels.
Content Management	Object can be any piece of content in any format. Taxonomy rules, templates, layout and content are not together, dynamic content configuration management.	Life-cycle management of object, fast update.	Multichannel publishing.
Web Content Management	Object can be any piece of content. Taxonomy rules, templates, layout and content are not together, dynamic content configuration management.	Life-cycle management of object, fast update, global.	Multichannel publishing. Personalised user interfaces for dynamic Web pages.
Enterprise Content Management	Integrated to all information systems and information can be captured from any other system, dynamic content configuration management.	Life-cycle management of object, fast update, global.	Multichannel publishing. Personalised user interfaces for dynamic Web pages.
Digital Asset Management	Object is a piece of rich media, text, graphics, animation, sound, video, etc.	Storage and index for various rich media formats by using metadata.	Specific user groups organise, manipulate and share rich media for their own use.

2.4 Different Trends and Drivers of Content Management

Business automation started in the 1970's and 1980's and the automation of the creation, storage and delivery processes of information started during the last decade. In the beginning, the idea of integrated information sources was unusual, but the idea has been developing towards enterprise-wide content management for some years. If content management is in favour today it used to be document management in the late 1980's and early 1990's.

As a result of the ever-increasing amount of information that companies were producing in the late 1980's, companies began to realise that there was a growing need to internally organise, rationalise and digitalise documentation such as Word files, spreadsheets, PowerPoint presentations etc. This need resulted in the creation of Document Management Systems (DMS).

By the end of the 1990's the Content Management Systems (CMS) arrived. Since a document may contain one or more units of digital information, a document is comprised of content. As both CMS and DMS enable information to be managed according to rules, processes and workflows, the main differentiation between the two products is the granularity of management of the digital information. CMS offers this whereas DMS does not. Content may be any piece of information but a document is a document.

DMS is concerned with a document and less interested in what the document contains. CMS manages on a micro level the individual units of info that forms a document, Web page or multimedia presentation. The Internet has begun to redefine the way organisations create and publish information and documents. More and more intranets, Internets and extranets are replacing the document storage of information with online, up-to-date content-based information. The Internet has led the companies to be more interested in managing information on the content level rather than on the document level.

Global companies

One of the most visible information systems trends of the nineties has been the fast implementation of intranet applications in organisations. The significance of effective knowledge sharing has been growing in global organisations. They have to share their information and knowledge resources, ideas and experiences globally to support both individuals and teams in co-operation. To be able to share information effectively communication infrastructure and business processes must together support it. Intranet technology is considered to provide a capable platform for effective information sharing globally. (Wachter, R. M. & Gupta, J. N. D. 1997.)

Structured and unstructured information

Brett MC Intyre vice president of content management for IBM has said that “There is a shift going on from data-centric applications to management of unstructured data.” While document management vendors try to make applications for the Web and embrace XML and Java standards, Web content management vendors are enhancing software to manage content locked within CRM document management and ERP repositories. Enterprise content management is more of a strategy than a single application. Content management is dependent on connecting with other systems. (Longwell, J. 2002.)

Content management deals with the creation, collection, storage, approval and reuse of structured content and media assets in a managed collaborative environment. It enables assembly, analysis, processing and reuse of structured content.

The main difference between content management systems and document management systems is in the use of XML-related standards, which can enhance the value of the content. Currently available content management systems manage documents and their workflow and besides that the systems are able to manipulate content with the help of XML. Content manipulation on a content level, not only on a document level, enables personalisation, and also enhances the user

experience. The value of content can then be much higher due to more effective use. The XML-related standards help to create a true content management system.

Figure 2.6 shows how document management has developed towards enterprise content management during the last three years. The Meta Group forecasts that content management will be a \$10 billion market by 2004.

“The age of information systems is coming to an end, and the age of shared services is dawning,” wrote John Hagel III and John Seely Brown in their article in Harvard business review last October (2001). There is a good reason to take the first step towards pure Internet-based IT architecture and it saves money. (Hagel, J., Brown, J. S. 2001.)

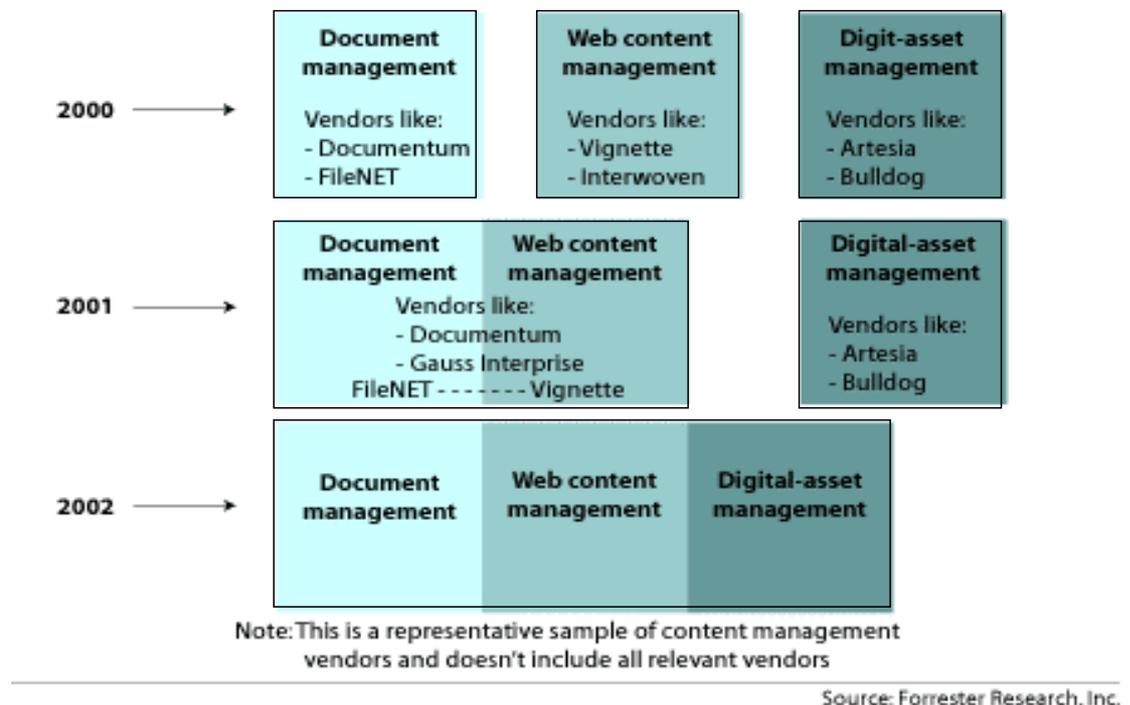


Figure 2.6 Development from document management to enterprise content management.

Cultural environment

Content management systems require cultural and technical features. If the cultural features do not exist, the technical features do not have their value. Open communication is the feature number one in a company that is implementing content management system. The second important feature is the understanding of the need for content management. The idea of content management with its metadata, workflows, taxonomy rules and style sheets must be accepted before taking any tools into use.

Technical environment

Technical features of a content management tool that improve content creation, management and distribution processes are the following:

- Automated, audited workflow
- Templates and style sheets separated from content
- XML support
- Role-based security management
- Scheduled launch and archiving
- Integration with other information management systems
- Scalability

With a content management system you can write, edit and publish updates in a matter of minutes without suffering from "Web master Bottleneck". Content management system maintains the structure of the site, content and visual presentation in separate layers, content and its structure can be managed with a few visual templates. Similarly, you can restructure a site, merging and splitting areas, without manual work, as this layer is also maintained separately.

3 CONTENT MANAGEMENT IN BUSINESS PROCESSES

3.1 Benefits of Content Management in Business Processes

Enterprise Content Management is a technology to create, capture, deliver, customise and manage content across the enterprise in support of business processes. (Mancini, J. 2001) Enterprise Content Management is much more than the management of Web content or document management because ECM is directly linked to effectiveness of organisational processes.

Before implementing any Enterprise Content Management System it is important to know strategic goals for the project. Content management can link the customer interface with the business applications to be an effective information sharing application. (Luomala, J & al, 2001.)

The issues that must be defined are the amount of content, different types of content, ownership of the content, lifecycle of the content and the need of reuse of the content. All the content management strategies across business processes should include the same vision of information sharing.

Integration, organisation, search ability, and traceability are the key words for enterprise wide content management. Enterprise content consists of a variety of unstructured data types such as Web pages, documents, spreadsheets, and multimedia files. Instead of having multiple applications to manage their content, with separate access right administration, search engines and separate meta data usage, firms could implement enterprise content management idea to manage and deliver available information.

Effective content management demands that the content is well-structured and organised before it is put into any software tools. Disorganised content that is automated will simply give you disorganised content faster. You need to

understand the content, its variability, its creation, and its archive cycles. (Sharpe A. P. & Ashenden A. 2001.)

3.2 Common Requirements for Various Information Systems in Business Processes

Different business processes in a company have various information management systems in use. There is a possibility to have content management built inside the various systems. To gain benefits with content management, companies should implement the following features in every business process:

Standardised user administration. Firms should implement LDAP directories and use common classifications for user groups and roles across information management systems. This will make it easier for the administrators to create and delete users, define access control, and assign publishing rights.

Standardised search capability. Companies should choose a search tool and integrate it with their diverse content repositories. This will allow users to search for content across repositories from a central location.

Standardised metadata. Enforcing standard metadata classifications gives users a common language to describe and find content.

Figure 3.1 gives examples of information management systems and it shows how content management can be built in various business processes. The most important benefit to gain with this kind of integrated enterprise wide content management is transparency. With transparent object-based knowledge management you can support process based knowledge management processes, if the meta data definitions, search capability and access administration are common across business processes. Enterprises must recognise business data as a valuable asset that needs to be integrated and reused across different systems. Enterprise content management gives business a return on information and investment. The value of information is the ability to use it. With content management it is possible to make business processes easier and quicker, but also more traceable

and controlled. Information flows is the starting point for content management rather than corporate hierarchy.

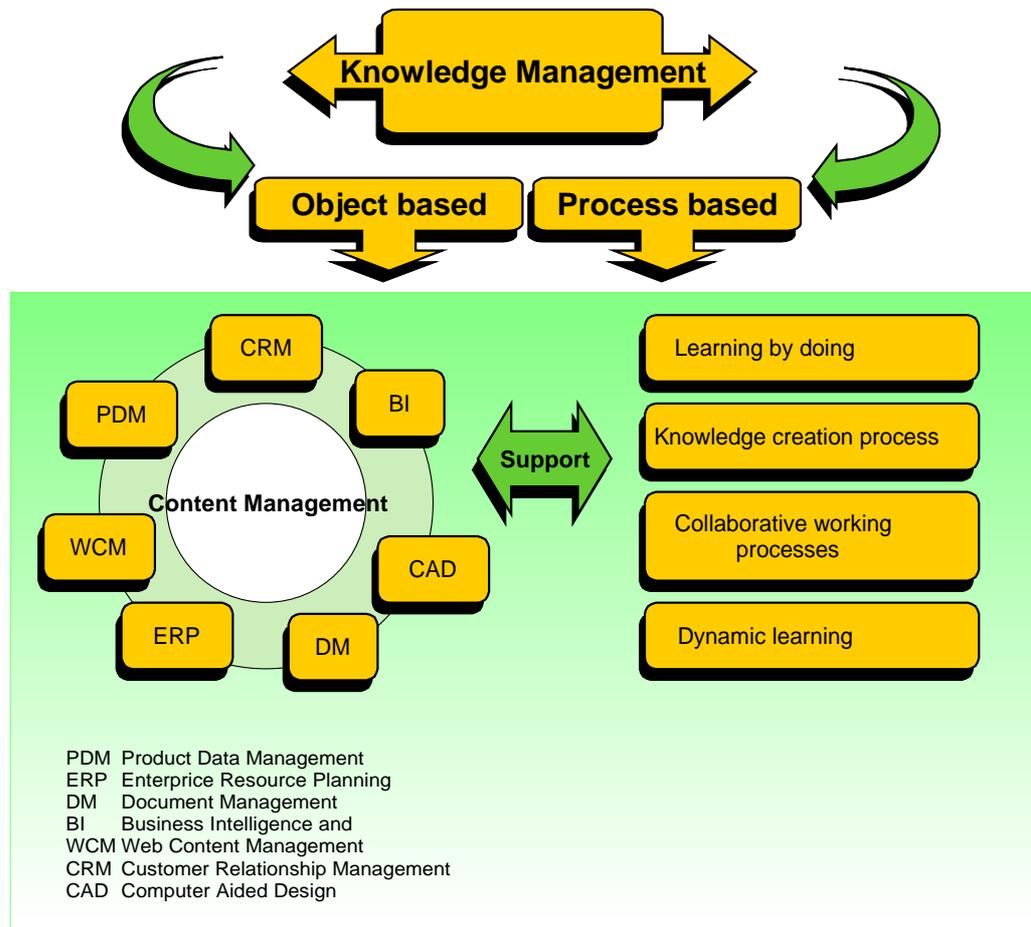


Figure 3.1 Knowledge management areas and content management in business processes.

When implementing content management there is a difference whether you need to implement a content management system or just the idea of content management.

Enterprise content management system provides a unified view of information on various repositories so that users can access all relevant content independent of where it is stored or which system they have access to.

Enterprise content management system makes information utilisation easier by one common interface, common rules for contributing and tagging content and following approval processes concerning information to be delivered. ECM enables good business practice throughout the enterprise. It improves quality by routing key business documents through the appropriate review and approval processes and it improves productivity by enabling users to access and reuse critical information stored in documents across business processes. With ECM system you can really support process-based knowledge management while it increases operational efficiency and collaboration among all users, including remote employees and external suppliers and partners.

A content management system can provide access to information that many people, internally and externally, have never had before. It allows more people to be heard and it gives wider and more immediate way to collaborate. This means that many parts of business will need to think carefully about how they implement content management. It is a strategic issue. You will need to look closely at your business process to understand how content is currently produced. It is quite obvious that the process of content creation within your business process must be adapted to the content management solution. Implementing workflow, which is an integral part of content management will change the way people work. There can also be changes in formal authorisation processes and some cultural issues.

4 CONTENT MANAGEMENT SYSTEMS

Content management system must enable users to collaborate and interact on the creation and management of trusted content through the portal and allow users to import or create new content and edit existing content or properties. The required features must be in line with business goals to be reached with the help of content management. Features are categorised to three content management areas; creation, management and publishing and presentation. At the end of this chapter some general requirements for contract and business goals are also listed. (Robertson, J. 2002.)

4.1 Features for Content Creation

Authors using a content management system for creating content require functions that support the authoring process. Authors should be provided with a powerful, efficient, and easy-to-use authoring environment for which required features include:

- Integrated authoring environment.
- Separation of content and presentation for publishing to multiple formats.
- Multiuser authoring.
- Single-sourcing and content reuse.
- Metadata creation is needed for capturing metadata. Metadata should include at least creator, subject, keywords, etc when managing a large content repository.
- Powerful linking.
- Non-technical authoring.
- Ease of use and efficiency.
- Import and export of XML data.

4.2 Features for Content Management

The core of most content management systems is a central repository, supported by a range of tools for manipulating and managing the content. Key requirements include:

- Version control & archiving.
- Workflow management.
- Security for adequate security levels and audit trails to protect the integrity of the content.
- Integration with external systems.
- Reporting.

4.3 Features for Publishing

The publishing engine takes the content stored in the repository, and generates the final format for different media. Required features include:

- Style sheets for final appearance.
- Page templates for overall page layout.
- Extensibility for simple integration of additional publishing functionality.
- Support for multiple formats, such as: HTML (Web), printed, PDF, hand-held (WAP), and more.
- Personalisation is based on either user profiles, or metadata in the source content.
- Usage statistics of most popular pages, daily usage, and search engine usage.

4.4 Features for Utilisation

From the customers or users viewpoint, the published pages must meet certain standards and it is also important to specify these features that include:

- Usability
- Accessibility
- Browser support
- Client-side functionality and technology e.g. Java or JavaScript, etc.
- Speed for publishing and viewing
- Valid HTML features
- Effective navigation
- Metadata for effective indexing and searching

4.5 Features for Contract and Business Goals

Project management and business requirements must be satisfied in a content management project and that is why these features must be included in the system requirements.

- Training
- Documentation
- Warranty
- Maintenance agreements
- Resources required
- Skills required
- Cost
- Scalability
- IT constraints
- Reference sites

4.6 Content Management System Providers

For many companies content management is an unknown term and the whole area of knowledge can be new. Therefore it is important to find out what kinds of options there are by familiarising with the available systems. Table 4.1 presents the leading content management system vendors in Europe today.

Table 4.1 Content management system vendors in Europe

(<http://www.contentmanager.eu.com/providers.htm>)

CMS Vendor Internet address	Description of their product's main areas
Interwoven, USA http://www.interwoven.com/	Interwoven's flagship product, TeamSite, manages the development and deployment of business-critical Web sites.
Vignette, USA http://www.vignette.com/	Vignette's products enable Internet businesses to communicate, collaborate and comprehend its relationships with business, trade, and consumer customers, wherever they may be.
Reddot Solutions, Germany http://www.reddotsolutions.co.uk/	RedDot Solution's products are online editorial solutions (content management systems) for the fast and easy creation, administration and maintenance of online content.
Mediasurface, U.K www.mediasurface.com .	Mediasurface's product offer customers a scalable, application-based solution for managing changes over information within business. Software helps customers to rapidly publish and effectively manage content across their organisation for both internal and external use.
Documentum, USA www.documentum.com .	Documentum drives content management through e-businesses with an open, flexible, Internet-scale platform that enables customers to create, deliver, publish, and personalise content in all formats across all e-business applications.

The most important activity is to identify your business goals and requirements. When you have identified the features and requirements for content management you can choose the vendor. Evaluate the vendors in a systemic way. Request

detailed descriptions of how each of your requirements will be met by their system. Ask for demonstrations to see how the product will meet your business needs. Selecting an enterprise-wide content management system is often a multimillion-value exercise. It is, therefore, critical that the new system meets your current needs. Spending time on these phases reduces the business risks and the project is also likely to be more successful.

4.7 Enterprise-Wide Content Management Architecture

The goal of enterprise-wide content management is to define an overall environment that will support common infrastructure functionality such as: security, single sign on, Web browser interface etc., but not to present a single architecture which all applications must comply with.

Content refers to any piece of information that exists within an organisation. Content can be controlled, uncontrolled, structured or unstructured. Controlled content may be structured or unstructured but it must be under revision control. Uncontrolled content is not under revision control. It may exist on the LAN Drive or in other storage systems. Structured content is usually considered as data stored in databases, but may also include spreadsheets and other forms of structured storage. Unstructured content usually refers to documents or other digital media containing the information.

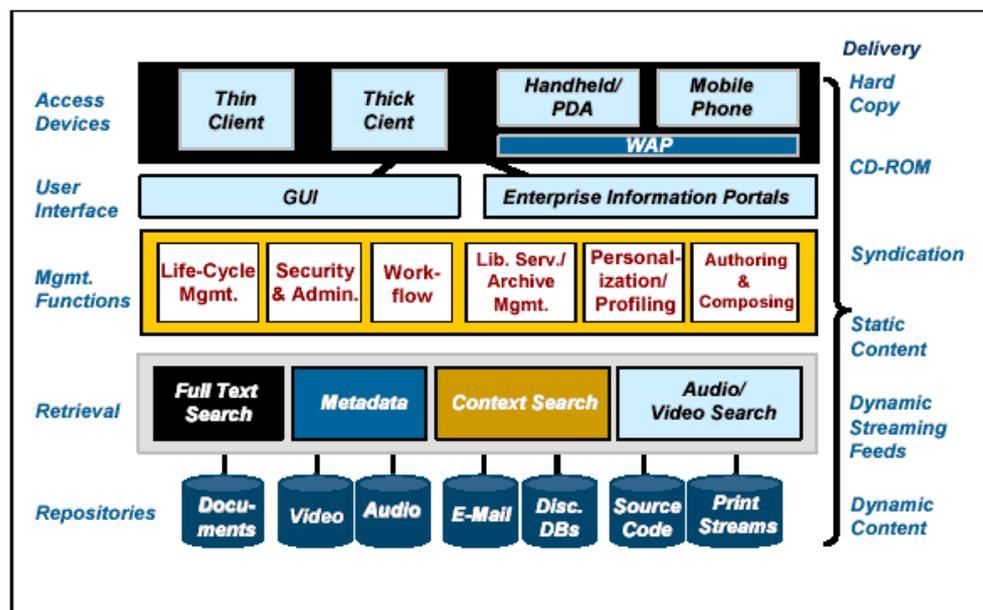
Relationships describe how one piece of information is associated with another. This relationship information must also be managed appropriately. For that you can use a modelling methodology such as the Unified Modelling Language (UML). In practice, relationships are managed in several information management systems such as ERP, PDM, DM and other database applications. One of the challenges of any architecture is how to support the relationships of information that are not stored in the same system.

Enterprise content management system should provide access to all the pieces of information regardless of how and where it is stored. Enterprise content management system has its own data model that describes product, project, and

document information. Some of this information can also exist in other systems such as ERP. There will never be one system in an organisation that will contain all the information and its relationships. Therefore, it is important that the reference architecture supports:

- Searching for information in multiple information systems.
- Viewing of information stored in multiple information systems.
- Synchronisation of replicated information.

Figure 4.1 shows Enterprise Content Management Architecture with its five layers.



Source: Giga Information Group

Figure 4.1 Enterprise content management architecture (Moore, C. & Markham, R. 2002).

The five layers of Enterprise Content Management Architecture are as follows: access devices, user interface, management functions, retrieval and repositories. Access devices include thin client, thick client, handheld PDA (Personal Digital Assistant), mobile phone and WAP (Wireless Application Protocol). User interface include GUI (Graphic User Interface) and enterprise information portal.

Transactional interfaces must exist to access data and/ documents that exist within the knowledge repository. Management functions consist of life-cycle management, security and administration, workflows, library services and archive management, personalisation and profiling and authoring and composing with such tools as office tools, CAD tools and scanning tools. Retrieval includes full text search, meta data, context search, and audio and video search. Repositories include documents, video, audio, e-mail, databases, source code and print streams. Repositories of operational or information systems support business processes. They would typically include ERP, Project Management, Collaboration, E-Mail, Public Folders, EDM/PDM or Data Warehouse. (Anon. 2002. Enterprise Content Management.)

5 BUSINESS GOALS FOR CONTENT MANAGEMENT

5.1 Reasons to get Interested in Content Management

Businesses generate huge volumes of information that must be available for those who need it. Company that is planning to start a content management project must find out in the beginning what information the business processes need and what the business goals to be achieved are. After that it is possible to ask what technology should be used to manage the information.

Previously one man could build Web sites and publishing a few Web pages was a relatively easy and simple process. There was also a belief that the Web is not a tool to publish an electronic book or brochure and simultaneously there was the ever-increasing demand that intranets, Internets and extranets should publish all the internal and external information of the organisation. Traditional tools and methods of building Web pages are inefficient and extremely costly. For example, changing a single word in a piece of text on a Web page with traditional methods has to be done by someone who understands HTML. This process forces all creation of information and content go through centralised Web maintenance departments and publishing process gets slow and complicated.

The desire to increase the amount of information being contained on Web pages and the need to include more groups into the Web publishing process has led to the situation, where Web management teams are no longer able to handle the growing demand in their resources. Web applications are meant for general public, including partners, knowledge workers and clients. That is why you need new flows of information and new requirements to be met. Previously the sites were departmental with limited and static content. Now there are sites of thousands of pages with both static and dynamic content from diverse sources, intended for different audiences.

The revolution that was caused by the word processing system in the 1960's is similar to the revolution that occurs as more and more companies realise the benefits of using CMS. If one company has out-of-date Web sites when the other has Web sites containing information that changes regularly, there is no question about which one is serving its customers and users better.

There are several reasons to get interested in content management. Here is a list of some of the reasons in the following:

- Explosive growth in both the amount and types of unstructured content published on public Web sites.
- An increased focus on internal knowledge sharing and reuse of unstructured content throughout the organisation.
- Demand for unstructured content to support e-business commerce and collaboration.
- Significant growth in customer relationship management, which requires access to content about customers, products and services.
- Increased awareness of the ability to access multiple content types through portals.
- Desires of organisations to reduce the number of vendors required to manage content throughout the enterprise and implement integrated content solutions.
- The need to integrate content into enterprise applications.
- Changes in corporate structures due to mergers, acquisitions and increased globalisation.

(Moore, C. & Markham, R. 2002.)

5.2 Reasons for Not to Get Interested in Content Management

Naturally there are processes and companies, which do not need content management at all. The main factor is the size of the company. If the organisation is small and Web publishing is in-house and everybody involved with publishing can communicate well with content creation, there is obviously no need for any

content management system. If the Web site is small and need not to be updated frequently in content or structure, the maintenance and updates of the content can be carried out manually.

Moreover you do not need a content management system, if there is no business need such as; better online customer services, more up-to-date and fast communication ways with retail outlets, call centres, email newsletters or other business-related channels.

If you have decided not to have a content management system you must have someone who has detailed knowledge of the entire site and its content, due to the fact that if you have Web sites, they must be up-to-date in any case.

5.3 How to Define the Scope of Business Potential Assessment

Technology projects in general enable impacts in business linkages, business potential, competitiveness and finally in profits of the company as shown in the Figure 5.1.

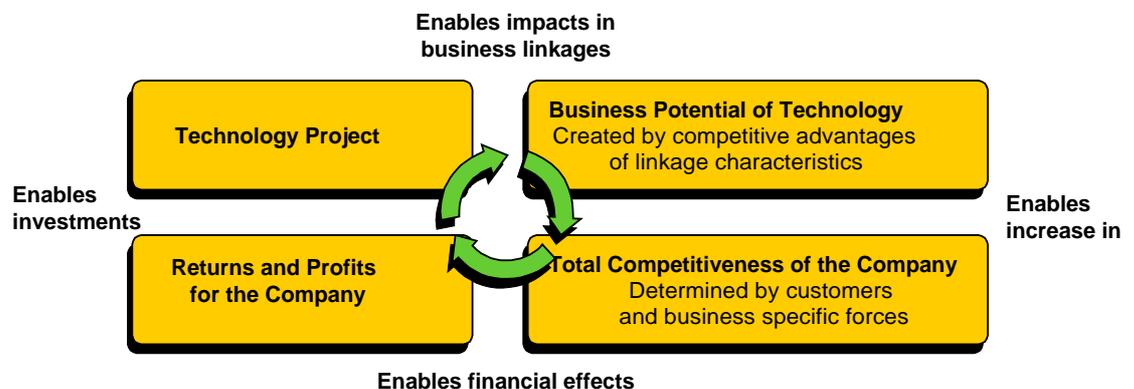


Figure 5.1 Defining the scope of business potential assessment (Kärkkäinen & al. 1999).

When defining the scope of business potential assessment in content management projects you have to define the business linkages e.g. e-commerce, e-business or the value of intangible assets.

After recognising the business linkages you can characterise the competitive advantages. Customers define the final competitiveness of the markets. The possibilities in reducing costs in labour, better quality, and effective processes can mean better profits for the company.

5.3.1 The Phases of the Assessment Process

The following is a more detailed list of the phases, which must be included when defining the scope of business potential assessment:

- Identification of customer needs and business linkages between customers and competitive suppliers.
- Assessment of the present competitive situation.
- Mapping and identification of the business impacts of assessed technology.
- Assessment of the significance of technology impacts for the customer in every important business linkage.
- Assessment and forecasting of potential increase in total competitiveness by the assessed technology.
- Evaluation of the permanence of potential increase in competitiveness.
- Forecast of future returns and profits and follow-up of the results of the assessment process. (Kärkkäinen et al. 1999.)

5.3.2 Content Management as a Technology Project

A content management system project is divided into three equal parts: technology, content and processes. Selecting and implementing a content management system is one of the largest IT projects in many companies during the next years. The evaluation process is critical and needs to be carefully defined in advance. Before a company can identify any specific requirements, it must determine the business goal that will be achieved by implementing a content management system. The requirements are unique for each organisation and that

is why it is not possible to have a list of requirements that could suit every content management system purchase. Without a business goal, success is impossible to measure. There is no other way to calculate a return on investment (ROI) than measuring the success of the business goals by using goals as metrics.

5.3.3 Business Potential of Content Management

Business potential of technology in content management enables increase in total competitiveness of the company, which means up-to-date Web sites, fast publishing processes to be first on the market, and competitive knowledge creation process to bring up innovations. Customer needs for fast services and up-to-date information are easier to fulfil with content management system than by one Web master.

To realise business benefits of content management investment is not easy. To identify the benefits you need to know the business requirements for information management in the company. Ability for information sharing and knowledge leverage is a competitive asset for a company, but in addition to that you have to take care of user training, the business goal, user guidelines and perhaps appoint a content manager. (Breu, K. et al. 2000.)

As already mentioned, information is anything that can be digitised, i.e. books, databases, music, movies, magazines and Web pages are information goods. To produce information is costly, but to reproduce information is cheap. Information has high fixed costs but low marginal costs. When managing intellectual property in general, your goal should be to maximise the value of your intellectual property, not to maximise the protection. The value of the Web lies in its capacity to provide immediate access to information. Using the Web, information suppliers can distribute up-to-date information dynamically from databases and other repositories. Improved information infrastructure has increased the ability to store, retrieve, sort, filter and distribute information, which has enhanced the value of information. (Shapiro, C. & Varian, H. R. 1999.)

On the other hand, you can try to form a network with your customers while Metcalfe's law says that the value of a network goes up to the square of the number of users. That is why popularity adds value in a networking industry. Content management helps you to add value to your network services and, at the same time, you will deepen your relationship with your customer. (Shapiro, C. & Varian, H. R. 1999.)

The other challenges in making new revenue with the help of content management in the information age could be:

- Reduced distribution costs help to advertise your product by making it cheap to give away samples.
- Adding value to on-line information by differentiating it from hard copy.
- Adding value with user interface, timeliness and flexibility.
- Differentiating by personalising the information and price. (Shapiro, C. & Varian, H. R. 1999.)

E-business or e-commerce needs for better customer satisfaction are quick downloads, an easy-to-use navigator together with an effective writing process. E-business winners use content management to lower their overall content production costs and increase the amount of relevant content available online, leading to higher site utilisation.

Every company with an e-commerce Web site tries to find out what the customer wants. They try to personalise their Web sites by managing the content on the site to reflect the company's best guess of the preferences, needs and interests of the users. On a small site one Web master can handle the updating of the pages, but on a larger site, more assistants are needed to help change the content. When sites grow to the point where mistakes start to occur, the content gets bottlenecked. (Harrington, A. 2001.)

5.3.4 Competitive Advantages

Increasing revenues and profits through increased sales with the help of content management is possible by linking content into the B2C selling process. A company can deliver personalised, dynamic content that helps to cross-sell products by targeting relevant content at the buyer. Similarly, by linking content to B2B selling processing, a seller can differentiate in public e-marketplaces and increase sales, for example, through private e-marketplaces. (Moore, C. 2002.)

Sharing of out-of-date information is very risky. With the help of a content management system you can keep up with update timelines. There are more competitive advantages of using a content management system, which are listed below.

A content management system enables online information to be fresh, consistent and of high quality by:

- Reducing internal and external customer dissatisfaction with incorrect information.
- Reducing legal accountability, by ensuring that the information given to customers is consistent and accurate.
- Increasing value of the provided information.
- Increasing the interest of the customer to re-visit the site.

A content management system facilitates the reuse of content by:

- Increasing productivity with reuse of content across multiple Web sites or pages.
- Creating new audiences with the reuse of Web output to broadcast over different media such as DTV and mobile phones.
- Making it easier to reuse content from other suppliers.

A content management system ensures enhanced productivity and job satisfaction in a publishing process team by:

- Enabling specialists to focus on technology and areas such as redesign and functionality.
- Renewing of publishing process, which results in lowered production costs.
- Enabling a quick response to changes on both company's own and competitors Web sites.

A content management system enables decentralised content creation by:

- Enabling global contribution of content and information.
- Speeding time to market of changes and new content by avoiding the bottleneck.
- Offering the ownership and responsibility to content creators and editors for the information they provide.

A content management system facilitates centralised workflow, approval processes and rules by:

- Enabling decentralised contribution without loss of controlled centralised process.
- Providing effective audit trail.
- Ensuring a controlled flow of content around internal processes.

A content management system provides either a competitive advantage or eliminates a competitive disadvantage by:

- Increasing the Web site's role as a window that investors use to evaluate a company.
- Creating the impression of a forward thinking company with a dynamic, changing Web site.
- Enabling a fast response to changes in the competitive environment.

(Anon. 2002. Content Management Benefits.)

5.3.5 Profits for the Company

There are many other tangible benefits to be gained by ensuring the quality of content, which can be defined, tracked and measured. Those benefits according to J.Robertson (2002) include:

- Reduced training costs.
- Improved call centre response times.
- Improved help desk efficiency.
- Eliminated printing and distribution costs.
- Improved staff productivity.

Labour costs can be reduced and the problem of getting enough qualified personnel can be avoided, if you manage to work with less personnel. Focusing the work of specialists to develop site architecture and future requirements and to implement upgrades will continuously help the company to improve the usability of content. A Web site should always meet the business requirements.

Implementing a content management system for content creation, review, approval, publishing and delivery can result in reducing maintenance costs, labour costs for content authoring, IT operation costs, the business risk of publishing erroneous or out-of-date content or increasing revenues and profits through increased sales. Reduced labour costs in content authoring through standardisation across the company can be achieved by creating content centrally, replicating it to standardised local Web sites and reusing the content locally. It will save a lot of duplicated effort expended on creating content, graphics and design layout. The number of full-time employees responsible for creating local Web content can be reduced.

Maintaining and enhancing a custom developed Web publishing system is challenging because of the rising user and customer expectations. If business units want to increase the formal review and approval process for publishing content

and to personalise dynamic content in order to increase sales the maintenance, costs will rise without a content management system with automatic workflows.

Reducing Web publishing IT operation costs by changing the Web master's role in the publishing process with the help of a content management system means that the Web master who has served as an appointed person for everyone involved in the authoring process can shift the review and approval process to a workflow-enabled process. For example, content creators and editors can significantly decrease their operation costs if content does not go back and forth between contributor and Web master many times.

Reducing the business risk of publishing erroneous or out-of-date content is possible with a systematic review and approval process to review content before it is published on the Web. This can include review and approval by business managers, legal staff, the marketing department and other responsible parties. It is difficult to calculate the financial benefits from risk avoidance without knowing the specific risks involved, but examples of some of the risks include erroneous prices, erroneous product descriptions, erroneous warranties and erroneous claims. (Moore, C. 2001.)

5.4 Process Demands

Effective content management demands that the content is well structured and organised before it is put into any software tools. Disorganised content that is automated will simply give you disorganised content faster. You need to understand the content, its variability, its creation, and its archive cycles.

The process of creating content must be well understood. Goals can be concrete and measurable. The process of content creation is comparable to standard project management processes, such as design with deliverables and milestones.

In content creation process content management systems can help companies to take steps toward distributed Web page administration so that independent Web authors can publish content apart from the layout. Individual departments can

build more custom targeted content into individual portals, which is owned by departments. The content management application can take the burden of creating HTML pages and updates to text and published content from the programmer to the business person. It should be possible to update Web information at the same time with other media.

Intelligent content management requires five principles:

- Use well defined metadata.
- Know the users and their individual needs.
- Control access to content carefully.
- Support rich searching.
- Keep content timely and automatically updated.
- Support your authors. (Sullivan, D.2001.)

After purchasing there is a project to design, implement and deploy a solution. After the implementation a permanent process must be put in place to ensure the continued accuracy and coverage of your content. This must be given resources, staff and time. CMS must become an everyday part of your business activities. Users will not admire CMS that delivers inaccurate and out-of-date information, however efficiently it does so.

5.5 Experts' Comments on Content Management

Whether delivered as a specialised, packaged software application, a custom developed solution or as a service, content management systems seek to provide both efficiency and predictability to Web publishing, while putting powerful tools in the hands of largely non-technical users. (Howard J. & Crown J. 2002.)

Mike Zimmer, Marketing Manager of IBM has written that more than 85 % of today's business information resides in sources beyond traditional databases. He says that Enterprise Content Management is a key component of an e-business infrastructure. (Zimmer, M. 2001.)

Karen Strong, President of Clarity Inc. says that documents play an important role in Enterprise Content Management. The content of business documents has a relationship with the success of e-business applications. Content sources, document creation and capture can occur at every desktop, in every process, and by every on-line application, but the management of e-business content in electronic document formats is an enterprise issue. (Strong, K. 2001.)

“The content should always be attractive, targeted to knowledge workers or to maintain customer loyalty. It should provide the right information to the right user at the right time. Customers and employees should have seamless access to the company and it requires managing all kinds of content and delivering it in a personalised way. It is the content that is in Web site and it is as important as the site itself” wrote Credit Union Magazine in March 2002.

6 QUESTIONNAIRE STUDY ON BENEFITS OF CONTENT MANAGEMENT

6.1 Background and Execution of the Questionnaire

Questionnaire was sent to eleven experts in eight large companies. Companies represent different business areas, but all of them have more than 3000 employees. The experts have all been in a responsible role in content management projects in their companies.

Four experts from three companies answered the questionnaire, and some of them who did not answer had agreed that they would send only one filled questionnaire from their company.

Questionnaire was quite long; it had 70 questions divided into six different classes. Three main classes are listed in the following; knowledge creation process advantages, management process advantages and utilisation process advantages, and the other three classes were about the achieved goals and learned lessons.

The goal was to find the real reasons a company has when it starts a content management project. The three content management areas; information creation, management and utilisation were covered along with the possible output of their project experiences. The questionnaire included four parts; first part was for validation of their thoughts about what kind of benefits they wanted to achieve in 1) content creation process, 2) management process and 3) utilisation process and moreover 4) what they had achieved and how they would value that achievement. The scale was 0, 1, 2 and 3. Number zero was for the opinion in which the advantage in question had no relevance, whereas if the advantage was the real reason for the content management project the choice should have been number three. Every part gave a possibility to add benefits not mentioned in the questionnaire. In the end of the questionnaire there was room for other goals they had had, and for the lessons to be learned.

6.2 Analysis of the Given Answers

The questionnaire is attached to the end of this thesis. Answers to the given questions are classified here under six business goals, better information accuracy, better customer experience, better knowledge sharing, better publishing process and better technology in use. The requirements for each business goal are picked up from the questionnaire.

The values for the requirements are directly calculated from the given answers so that given 0 got value 0, 1=1, 2=2 and 3=3 and those have been summed up from each answer. Minimum value is then 0 and maximum value is 12 for each question. The lowest given value sum was 2 and the highest was 12. Tacit knowledge capture requirement got only two points. However, the highest points were given for the idea of “create once, publish anywhere” and for personalised Web pages. The average value for each business goal is shown in the end of each table. The written comments of experts are copied to the last sub chapter of this main chapter.

Information accuracy

If the business goal is to improve information accuracy, the requirements for it are presented in the order of favour in Table 6.1.

Table 6.1 Requirements for better information accuracy.

Life cycle management	10
Better version control	10
Classified information	9
To increase quality of knowledge	8
Increased reliability of knowledge	8
Better approval and review process	8
Common templates	7
Controlled information	6
Similar layout for information	6
Traceable publishing process	6
More secure knowledge management	5
Average	7,55

The most favourable requirements for information accuracy seem to be life cycle management and version control. Traceability ability and security did not have equally important features when implementing content management.

Better customer experience

If the business goal is to improve customer experience the requirements for it are presented in the order of favour in Table 6.2.

Table 6.2 Requirements for better customer experience.

Personalised Web portals	12
Increase quality of service	10
To achieve competitive advantage	10
More easy Web publishing	10
Real time publishing	10
To deliver relevant, up-to-date real-time content	10
To increase the use of Web based business services	9
Increase customer/user satisfaction	8
Improve communication	8
Implement e-business	7
To support and unify the image or the Brand of the company	7
Average	9,18

Better customer experience through personalised Web portals is the other of those two requirements that got the maximum value in the questionnaire. In this area of requirements, many others are also considered very significant. This goes to show that better customer experience has been one of the real business goals to be achieved with content management. Neither e-business nor brand support were the most important goals for this area. It is critical to ensure that the managed content required by your partners, users, authors or employees is what they get.

Better knowledge sharing

If the business goal is to improve knowledge sharing for innovation process the requirements are presented in the order of favour in Table 6.3.

Table 6.3 Requirements for better knowledge sharing.

More collaborative way to work	8
To support dynamic nature of knowledge	7
Knowledge and expertise sharing	6
Capturing and reusing best practices	6
To have a change in organisational culture	6
Support organisational learning	6
To form an organisational memory	5
To analyse business knowledge	3
More innovative knowledge creation process	3
To capture tacit knowledge	2
Average	5,2

Knowledge sharing is in the end of the ranking list in general. A more collaborative way of working is one way to support knowledge sharing in a company and it seems to be the most favourable in this case, too. However, capturing tacit knowledge or having an innovative knowledge creation process is not yet included in the contemporary needs.

Better publishing process

If the business goal is to improve publishing process the requirements are presented in the order of favour in Table 6.4.

Better publishing process, with the requirement to be able to create only once but publish anywhere, is the other of those two requirements that got the maximum value. In this area of requirements, many others are also considered very significant. Connecting many content provider sources got the lowest value in this context. Content creators and customers should have an important role in the project development team. If creating content is not easy and efficient, it simply will not happen.

Table 6.4 Requirements for better publishing process.

Create once publish anywhere	12
Shortened time to market	11
Automated workflows	11
To support reuse of knowledge	11
Ease of use and implementation	10
More easy update process for existing knowledge	10
More effective creation process	9
Reduce operating costs	9
To avoid information bottlenecks	8
Flexible reuse	8
Connect many content provider sources	7
Average	9,64

Better technology in use

If the business goal is to improve used technology the requirements are presented in the order of favour in Table 6.5.

Table 6.5 Requirements for better technology in use.

To have integrated solution for business information	11	Format and type independence	7
Multichannel delivery	11	Open standards	6
To create from one source to many medias/channels	11	Take metadata in use	6
To manage the growing volume of information	11	To use various information formats	6
To separate content from layout	11	Create knowledge repository	6
Improve knowledge access	10	Interoperability	5
Better search capability	10	New tools and methods for knowledge creation	5
Structured information	9	External content delivery	5
Scalability	8	To manage links	4
Location and storage independence	7		
		Average	7,84

It seems that the technological goal has not been the most important one when improving business processes with content management. The requirements in this area have both technological and process improvement-related requirements. The process related requirements seem to be those that got very high values. System

integration, multichannel publishing and the growing volume of information have been the business drivers in this area. Focusing on technology can affect content negatively. The old phrase “garbage in, garbage out” applies to many content management solutions where technology has become the centre of the improvement project.

Average values of business goals

Average values of business goals in Figure 6.1 show that the most important improvement areas have been publishing process and customer experience. The improvement area, which did not interest interviewed experts was knowledge sharing. Technology improvement and accuracy of information were both near the median value.

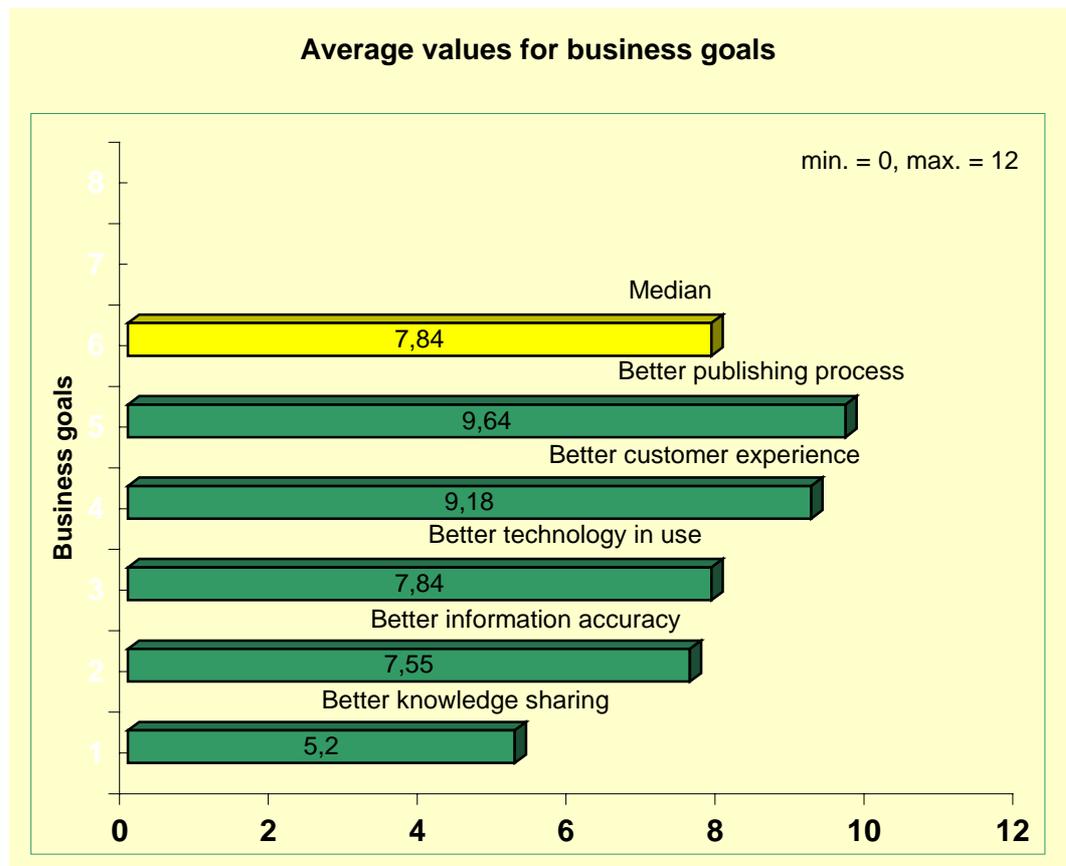


Figure 6.1 Average values of business goals with median.

The Written Comments of Experts

Question number four asked if there were goals that they had already reached. The written comments were:

- “To get a common tool (workflows, methods, terms, roles...) for cross border use instead of different local ones helped to start to work out this tremendous big change.”
- “Our first generation Internet and intranet services have been in production for several years and worked well. So we have achieved most of goals. Second generation of Web services are under development (content management and knowledge management).”
- “Technical base for Web content management. Unified process for publishing”
- “All the major goals mentioned earlier have been achieved, at least in the scope of the current use of our content management solution.

Question number five asked about the goals they had had. The written comments were:

- “Content management decentralisation and user friendly content creation.”
- “To get rid of paper and manual archiving.”

Question number six asked for the lessons they had learned, and the written answers were:

- “It takes time, it is a long journey from local (national) solutions to a common structured content development, but one can reach everything step by step. It is learning by doing, working together.”
- “For time being when data volume is increasing the importance of content management comes more and more important.”
- “One shouldn’t underestimate size of this change process.”

- “The definitions (including the attributes) of the various document/content types must be thoroughly done before advancing into any technical solution.”

6.3 Conclusions

6.3.1 Main Results of the Questionnaire

The results of the questionnaire show that there has been a great interest in developing the publishing process of information with content management system so that the information could be created once and published anywhere. Automated workflows, shortened time-to-market and better reuse of information has also been of great interest of experts in the projects of their companies. The other great goal has been the improvement of the experience that customers, partners and employees get when they visit the company Web sites. To improve customers' experience they want to achieve personalised Web portals, real time publishing and better quality of service in general. With all these improvements they also want to achieve competitive advantage. They said that they have already reached unified processes and a common tool when they have purchased their new content management system, which seems to be quite obvious. I hope that they have managed to make everyone also to use the new tool. The lessons they had learned are related to the implementation of a big change in processes and culture. There is a lot of work and definitions to be done before the goal has been reached.

They did not try to achieve knowledge sharing for innovation processes. The goals had been much more concrete than the creation of new knowledge is.

Technological improvements were not the most important requirements for the experts either. With technological changes they wanted to focus on integrated tools and multichannel publishing to manage the growing volume of information. Better search capability and possibility to separate content from layout are also goals that are depending on the used technology.

6.3.2 Review on Results and Execution of the Questionnaire

The content for the questionnaire was made in the early stage of processing content management related information, and that is why the questionnaire became quite wide. There were some difficulties to analyse results and I had to make up a business goal based classification to find the real issues among 70 answers. Despite the fact that there were only four experts, who answered the questions, I suppose that the trend can be seen from the results. It is a pity that everybody did not answer, but neither did I phone them afterwards. More information would have made the results more reliable. The experts were from the companies where the main business processes are related with direct customer services and their need has been to improve customer experience and to support business processes. If the experts had been from manufacturing business area I am sure that the main business goals would have been slightly different more focused on information accuracy.

6.3.3 Future Actions

I think that there is a synergy between the capabilities of advanced information technologies and human creativity and innovation. Better understanding of the meaning of new knowledge creation and knowledge management can lead to more effective business strategies and better business performance.

Content management is an area, which will keep on growing, while there are so many places to benefit from it. There is a need for applications and integrations for better knowledge sharing in global and local companies. It already looks like the enterprise wide content management is becoming more the issue of today than content management. My opinion is that content management is the core idea, but enterprise is one level where content management can be implemented. Everything depends on the real business goal.

To reach good results with content management in process improvement and knowledge sharing processes, we need to know more about the metadata definitions and information flow analysis in companies.

My interest has grown to find out what kind of benefits content management could bring to different business areas e.g. digital eLearning networks, where the content has such an important role. The issues for further study would be metadata usage and maybe some parts of Semantic Web definitions connected to that.

7 SUMMARY

Companies are global organisations in today's business environment, and they must deliver information quickly throughout the world. Information in all its forms must be supplied when and where customers, business partners, or own employees require it. The amount of content is growing exponentially and it is produced from various sources in many formats. It has to be up to date and immediately available. That is why content management has an essential role in object based knowledge management today. I suppose there is not a great deal of knowledge about all the information that is produced in different systems in the companies in general, while the process ownership and access rights can restrict even the necessary use of available knowledge. There is a large number of redundant www applications and knowledge bases in the companies. The contents of the knowledge sources are not always trusted. There are a lot of content providers when anyone can publish anything almost anywhere. The need for information executives will grow in the future, and business strategies should be rethought together with the design and use of information technology and organisational knowledge processes.

The goal of this study was to find out what the business benefits to be achieved are when you use a content management system in an enterprise. The main points in this thesis were to discover what kind of benefits different companies are looking for in their content management projects and to find out what kind of business benefits exist for enterprise content management according to contemporary literature and research.

The main results of this study start from the recognition of process-based and object-based knowledge management, and what the role of content management is in this context. The second finding clarifies the three areas of content management that must always be covered; creation, management and publishing of content. The main point is the content management usage in various business processes. There are things to be standardised as metadata usage, access administration and

search features. However, the most important requirement is to have a real business goal. The business goal should be related to publishing process improvement and to better customer experience.

Three big companies, which are implementing a content management system in their publishing processes, are focusing on improving both process and customer experience. They want to reduce costs and achieve competitive advantage with better site services. The most important investment drivers seem to be the service of personalised Web pages with relevant and up to date information and process of once created, published anywhere. The focus has been quite narrow which, on one hand, can be the reason for their success in implementation and, on the other hand, is the most important business goal in customer service-oriented business area. Nobody claimed that they had taken too long a step when they took content management system into use. However, they have still the possibility to widen the usage and understanding of content management by integrating the available information sources around the company to their content management system. They seemed to be very satisfied with their improvement project of content management.

I have enjoyed reading dozens of articles and some books about content management. I have been able to organise business goals and possibilities in my mind to a priority order. That was also my goal, but I hope that this thesis gives you possibilities to understand, what the business drivers for content management implementation project are. I also solved the problem of the relationship between knowledge management and content management in a way that I can be very proud of. Knowledge management areas and the role of content management in various information management systems show the possibility to support the creation processes of new knowledge. I have the feeling that I have learned a lot about content management and, moreover, I have learnt how much effort it takes to write a thesis like this. From now on I will appreciate researchers much more than earlier.

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APPENDIX

Questionnaire questions

This questionnaire includes four parts; first you should validate your thoughts about what kind of benefits you wanted to achieve in 1) content creation process, 2) management process and 3) utilisation process and then 4) what did you achieve and how would you value that achievement. The scale is 0, 1, 2 and 3, e.g. if you did not consider at all the advantage in question you should give 0, on the other hand if the advantage was the real reason for the content management project give 3. Every part gives you a possibility to add benefits that I could not imagine. In the end of the questionnaire there is room for other goals you had, and for the lessons to be learned.

I thank you for your support, and I'll mail you the results of the survey in autumn.

With best regards Marja-Liisa Suna

Please start here:

Which business area you are in?

e.g. finance, telecommunication etc.

How many employees you have in your company?

Ps. Please do not care if the questionnaire table breaks the pages, I'll anyway format the results for my thesis in an other table.

Questionnaire

1. What kind of advantages did you want to achieve with content management in knowledge creation process?				
Value of the advantage	0	1	2	3
Better approval and review process				
Common templates				
Connect many content provider sources				
Controlled information				
Ease of use and implementation				
More collaborative way to work				
More easy update process for existing knowledge				
More effective creation process				
More innovative knowledge creation process				
New tools and methods for knowledge creation				
Reduce operating costs				
Shortened time to market				
Similar layout for information				
Structured information				
To capture tacit knowledge				
To classify information				
To separate content from layout				
To support reuse of knowledge				
To reduce time to market				
To increase quality of knowledge				
To reduce costs of content creation				
To create from one source to many medias/channels				
Other advantages to achieve:				

2. What kind of advantages did you want to achieve with content management in knowledge management process?				
Value of the advantage	0	1	2	3
Automated workflows				
Better search capability				
Better version control				
Create knowledge repository				
Format and type independence				
Implement e-business				
Improve knowledge access				
Increased reliability of knowledge				
Interoperability				
Life cycle management				
Location and storage independence				
More easy Web publishing				
More secure knowledge management				
Open standards				
Reduce operating costs				
Scalability				
Take metadata in use				
To have integrated solution for business information				
To manage links				
Traceable publishing process				
To reduce costs of content management				
Other advantages to achieve:				

3. What kind of advantages did you want to achieve with content management in knowledge utilization process?				
Value of the advantage	0	1	2	3
Capturing and reusing best practices				
Create once publish anywhere				
External content delivery				
Flexible reuse				
Improve communication				
Increase customer/user satisfaction				
Increase quality of service				
Knowledge and expertise sharing				
Multichannel delivery				
Personalised Web portals				
Real time publishing				
Reduce operating costs				
Support organizational learning				
To achieve competitive advantage				
To analyse business knowledge				
To avoid information bottlenecks				
To form an organizational memory				
To have a change in organizational culture				
To manage the growing volume of information				
To support dynamic nature of knowledge				
To use various information formats				
To support and unify the image or the Brand of the company				
To deliver relevant, up-to-date real-time content				
To increase the use of Web based business services				
Other advantages to achieve:				

4. Are there goals that you have already reached?				
Value of the advantage	0	1	2	3
List the benefits that you have already achieved? Their value?				

5. What kind of other goals did you have? And how could you value them?				
Value of the advantage	0	1	2	3
List the other goals you had.				

6. Lessons learned				
List the lessons to learn?				