

Study „Content Management in Practice – the Use of Content Management Systems for Intranets in American and German companies“

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Although Content Management Systems (CMS) are used to support the creation, administration and maintenance of websites for several years, studies on their utilization and their benefits can rarely be found. This report summarizes the survey results of twenty large American and German companies, ten companies per survey. Within an intranet context, the IT environment was explored in order to develop different types of configuration. The focus was on the organizational rules of utilization as well as the extent of use and the attained benefits. This report restrains from appraisals on individual solutions, referring to show practical options. By this means, other companies receive information in order to find a suitable position within the frame of solutions. Differences between the American and the German companies, in so far as they could be detected, are mentioned. In addition to the overall results, distinctive or typical examples will be depicted.

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1 Motivation and Design of the Investigation

Since approx. 1997 Content Management Systems (CMS) have been used to support the operation of complex Internet, Intranet or Extranet websites. The main idea is to separate the content of each web page from its layout - shape and structure. By this means, the users are able to publish independently on the web and without html programming.

The tasks of content management as well as the CMS operations and their potentials are described adequately, see for example [Büchner et al. 2002] and [Stein 2000]. But studies on the utilization and the benefits of CMS in practice are rare. This was the author's intention in executing a corresponding investigation from April to August 2002. The questions were addressed personally to managers responsible for intranet and content management in large companies - first to representatives of ten large American companies during a research visit to the Pfeiffer University, Charlotte, NC, then to ten more companies with their headquarters located in Germany.

The investigation was directed towards large companies because it is assumed that the challenge of extensive websites is encountered here in particular. All interviewed companies already use at least one CMS for their intranet. With regard to the types of companies there were no restrictions made. Intranet and content management are relevant for all branches. Within the wide scope of branches, financial services, automobile manufacturers, insurance companies, chemicals companies and energy companies were represented more than once.

Usually the intranet of a large company covers several plants, branches, firms, centers, units, divisions, dealerships, offices, operations, departments, agencies and / or subsidiaries. Except for two companies, all participants have more than one location. Twelve companies have locations in different countries, so the designation 'Global Intranet' was repeatedly found.

Two companies had merged shortly before the investigation. This indicates that a substantial change of intranet extension can occur even on short term bases.

Due to the number of interviewed companies the investigation can not be regarded as representative in a statistical manner. However, the companies involved have nearly one million employees – with an overall average of more than 45.000 people, 43.000 within the American and 47.000 in the German companies. Therefore the investigation includes an economically relevant number of employees.

The same catalogue of questions were used in all interviews, downloadable via <http://www.prof-stein.de>.

Apart from the categorizing and delimiting passages in the following chapter, the investigation is restricted to the CMS utilization for intranets. If the deviations are sufficient, differences between the American and the German companies are indicated according to the individual aspects of the investigation. As far as similarities occur regarding to the results of a study carried out by the Institute of Business Information Systems, University of St. Gallen, Switzerland, from 2001 [Büren et al. 2001 und Büren et al. 2002], a reference will be made.

2 IT Environment for Content Management Systems (CMS) in Practice

In the light of the results of the categorizing and delimiting questions it is possible to classify the integration of CMS into the environment of Document Management Systems (DMS), web-based applications and Enterprise Portals. The following table differentiates five configuration types by means of essential configuration features.

Configuration Type	Number of American Companies	Number of German Companies	Features
I) CMS Diversification	6	2	Several CMS in use, Intranet CMS ≠ CMS for internet presence, Several DMS in use in most cases, Unified CMS desired / announced, No intranet portal at this time.
II) Extended CMS	1	4	First CMS generation (-s) is / are replaced, CMS for internet presence transferred to the intranet, DMS only for restricted purposes, e.g. Archiving of incoming mail only, No intranet portal at this time.
III) CMS-DMS-Combination	1	1	Comparatively small companies, First CMS generation in use, Procedure in company a: content copy archived by a separate server, Procedure in company b: content administration and archiving via DMS, access via CMS, No intranet portal at this time.
IV) Intranet Information Portal	2	-	One and the same CMS used for intranet and internet presence, DMS only for restricted purposes according to legally required archiving duties, Portal functions realized by a separate tool, Business applications not integrated into the portal yet.
V) Application Portal	-	3	First CMS generation (-s) is / are replaced, Portal functions realized by a separate tool, Intranet portal as a platform for application integration, CMS and DMS are examples for these applications.

Table 1: Categories of CMS Configuration Environments

By means of the chosen terms for the configuration types a brief description of the situation is stated. But the features show that the configuration types are not free from overlaps. Notwithstanding, the sequence of configuration types can be seen as a development path which is marked by increasing complexity and also increasing systems integration. According to this, six out of the ten American companies are on a level which is indicated in particular by a parallel utilization of more than one CMS. This already follows as a consequence of supporting the internet presence by a separate CMS. In most cases the internet CMS was implemented before the intranet CMS. In addition, some departments or business units of the companies in this category use their own (self developed) CMS for individual intranet pages, so that a kind of sub-intranet exists.

Looking at the organizational structure, only five companies have a centralized and hierarchical structure. All other companies have a decentralized structure with an extended degree of independence of the individual branches or business units. Nevertheless, 13 out of the 20 companies have a clearly centralized IT structure. This means that the IT department as a cross-sectional division operates for all decentralized business units. In order to set standards for the whole company, the remaining seven companies assigned the intranet to a central de-

partment as well. Within these companies, the departments of “Corporate Communication” or “Public Relations” were responsible for the intranet or at least for the latest CMS project.

As far as the eight companies of category I are concerned, the centralized competence has not had resulted in a unified CMS. But a broad utilization of only one CMS is desired by all companies of category I.

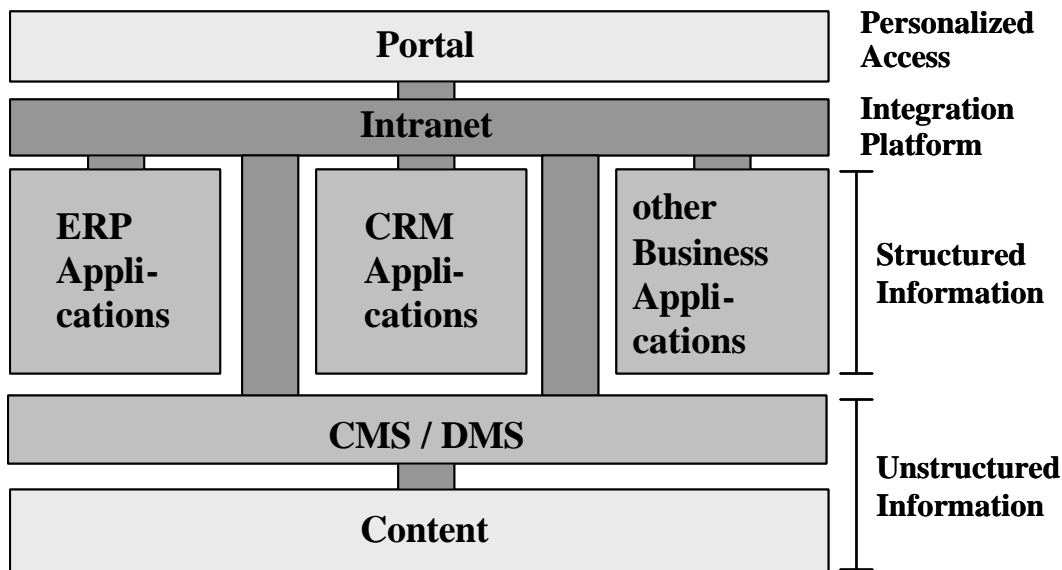
Meanwhile within the five companies of category II a second or third CMS generation is in use. But a portal - in the sense of dynamically generated intranet pages, which could be personalized corresponding to the individual requirements and authorizations of an identified and named user [Bauer 2001, p.34ff.] – is not the planning of these companies yet.

The boundaries between CMS and Document Management Systems (DMS) were not evident in most cases. Within twelve companies the DMS access was in part possible via intranet – usually via link from the browser. Two companies are listed as category III in tab.1 because they represent single examples for the fusion of CMS and DMS.

Five companies have implemented (among other CMS) a self developed system, followed by four companies using the product “Teamsite” from Interwoven. Other CMS products have been found only once or twice. Except for the self developed solutions, the results correspond to the results of [Büren et al. 2002, p.86], which have indicated no dominant manufacturer of content management software.

Of the two companies which have a realized Information Portal (category IV) it was seen that a separate tool had been set up for the personalization of intranet pages. The functions of personalization or complementary modules of the CMS supplier had not been used in these cases.

The three companies which have integrated the CMS as one among many applications into an Application Portal, are particularly large enterprises. On the bases of the intranet an Application Portal converges the personalized user access to the required information as well as to the applications. Thereby the gap between structured information out of business applications on the one hand and the comparatively unstructured information within the intranet on the other hand [Königer et al. 1998, p.65] begins to close. The three companies of category V are already at the beginning of a development path as seen in the model sketched in fig.1.



CRM = Customer Relationship Management
 ERP = Enterprise Resource Planning

Fig.1: Configuration blueprint for an integrated Information and Application Portal

In practice it can not be expected that all implemented applications will be subsequently completed as web based applications. But at least for newly purchased or developed applications the model from fig.1 serves as a guideline.

3 Organizational Rules for CMS Operation

3.1 Organization of the Publishing Process

The questions concerning the organization of the publishing process focus on the authors of the content and the extent of their responsibility. Firstly, whether an editor verifies the author's contents and releases them for publication. Tab.2 summarizes the detected organizational regulations by means of the resulting numbers of publishing steps.

Process Steps	Single-staged (Author = Editor)	Partly double-staged (Author + Editor)	Double-staged with fixed roles	Double-staged with flexible roles	Triple-staged
Number of American Companies	3	3	2	-	2
Number of German Companies	3	2	2	2	1

Tab.2: Steps of the publishing process

Within a single-staged publishing process there is no editor supervising the author, so each author is fully responsible for his own content. The author creates and verifies his contents as well as releasing them for publication within the intranet. Content updates and complements are his responsibility as to whether they are put in and taken out. This category also includes two companies where the authors discuss and agree on the contents together with the responsible head of department or respectively with a so called Knowledge Keeper. Also the division of tasks within a German chemicals company is not listed as a separate process step, where the actual content creation is executed by an assistant or a secretary in accordance to

particular content guidelines from the author. Spot checks from the overall responsible intranet manager are not treated as a part of the publishing process within this evaluation.

Five of the 20 interviewed companies integrate editors into the publishing process only from time to time, depending on the importance and the sensitivity of the content. The other nine companies constantly integrate an editor as a supervising and releasing instance within the publishing process. In contrast to this, the study of [Büren et al. 2001, p.28] came to the conclusion that in most cases no release instance exists within the 19 questioned companies within the intranet sphere.

Among the companies with a double-staged publishing process two types of role assignments must be distinguished. On the one hand, five companies were talking about firmly implemented roles, i.e. one person is either an author or an editor. Thereby authors and editors belong to one and the same section of the company, e.g. a department. In only one case the editors were located outside the respective area, namely at the IT department. On the other hand two of the German companies had a flexible role assignment: some of the authors are also editors. One of these companies keeps up the “principle of four eyes” even if an editor – in most cases the head of department – functions as an author. A fellow worker verifies the text in this case. At the other company of this category, an editor’s authorship requires no further check.

Within the companies with an triple-staged publishing process the final content release is carried out by a third party. In case of a German financial services company a content quality manager executes the final review after the previous operations from the authors and editors. Additionally, the quality manager decides in which area of the intranet the respective content will be published. Up until now there have been three content quality managers, all belonging to the central department of corporate communications. Moreover, it is planned that the key words for the description of the contents will be determined by the quality managers.

In comparison, an American financial services company has implemented a rather decentralized way of a triple-staged publishing process. Each of the participating departments has its own ‘Authoring Community’, consisting of authors, editors and release supervisors. For publishing within the intranet these three persons involved are connected via a workflow. Inside the ‘Authoring Community’ the roles are assigned in a flexible manner depending on the genus of content.

14 out of 20 interviewed companies were able to state the number of authors. Related to the overall number of employees, figures can be calculated between 1:2500 from an American food company to 1:17 from an American steel company. Without weighting, at the average there is one author assigned to 609 employees in the American companies and one assigned to 250 employees in the German companies. However, these figures can not be unconditionally compared to each other. For example, in some companies not all of the employees have access to the intranet. Moreover, sometimes there are external authors. Disregarding these figures, it was stated that most authors are chosen for their expertise. On the contrary, the study from [Büren et al. 2001, p.28] came to the conclusion every employee can publish something on the intranet in most cases. Looking to the further extension of the CMS resp. its utilization, five companies stated that the number of intranet authors will increase. The aimed figures are between 1:150 and 1:5.

A Content is described by metadata. Common metadata are the title, the name of the author, the validity date as well as keywords concerning the topics of the content [Stein 2000, p.314]. 13 companies assigned the responsibility for metadata to the author. Within three companies the editor is in charge of the metadata – in one of these cases, only if the editor is integrated into the respective publishing process (partly double-staged process, see tab.2). Comparable with a similar paragraph from [Koop et al. 2001, p.68], a German chemicals company explicitly combines the responsibility of the editors with the expectation that the co-

ordination of metadata is insured by this. Homogenous terms, categories and catchphrases should be accomplished more easily.

Within two companies an organizational vacuum was recognizable in the light of the question about metadata because the responsibility had not been organized up until then. In another case, metadata were restricted to automatically generated indications as the date of creation, the author of the document and the related department. One company is not currently using the metadata at all.

Irrespective of the responsibility question, in five companies it became evident that there was a lack of discipline to constantly deposit metadata. Against this background additional technical support beyond automatically generated metadata was discovered within the interviewed companies. For example, contents can not be released without an entry into obligatory metadata fields. Default values reduce the efforts of entry. Within a German insurance company the responsible authors are supported by non-revisable drop-down-boxes for several metadata.

Without an exact differentiation, the study of [Büren et al. 2001, p.17] came to the conclusion that 75% of the companies have fixed publishing workflows. During the investigation presented, here the question of implemented workflow functions was relevant only for the 14 companies having more than a one step stage of publishing (partly double-staged or more). Six German and three American companies have realized their publishing process as a workflow. Within an American company with a double-staged publishing process, the author transfers a draft of his content to the editor via e-mail. Two more American companies hold out the prospect of a workflow-supported publishing process. Within a German automobile manufacturing company with a partly double-staged publishing process, the author decides whether the content should be checked by the editor or not. Either way, the editor receives an automatically generated e-mail as to whether a content has been set up or modified.

In 14 out of the 20 companies, published contents are available for all employees who have intranet access. In this context two of the questioned industrial companies conceded that the blue collar workers have few access possibilities as yet. In contrast to that, four companies emphasized that also the employees for production and assembly lines have intranet access via information terminals near their workplaces, cf. also [COM/ONFOUR 2001]. Four German and two American companies have provided some of the contents with an access protection in order to reduce the range of receivers. As far as quantified information was made available, between three and 15% of the contents were restricted.

In only two cases beginnings of complementing content calls (pull) by push functions could be found. Within an American financial services company occasionally the author sends an e-mail containing a publishing hint to a limited group of people. A German financial services company gives their users the opportunity to receive hints on recently published contents on their individual personalized intranet homepage.

Non of the interviewed companies have direct incentives for the authors in order to publish contents. However, 13 companies were talking about indirect incentives because information publishing is seen as a part of the job and the CMS supports this task especially by saving time in comparison to other methods of communication and distribution. Authors as well as editors reach a higher rate of publishing productivity. In future, content awards are planned in one German industrial company. A German insurance company reflected on the idea to offer the responsible information manager a bonus as part of the target agreement.

3.2 Content Organization

In addition to the publishing process, the investigation was interested in the organizational regulations concerning content administration. So it was of interest to examine which criteria is being used for logical content arrangement. For intranet users the logical content arrange-

ment is recognizable by the navigation tree on the website. Tab.3 gives the results of the survey on the discovered solutions.

Segmentation Criteria	Organizational Units	Topics	Blend of Organizational Units and Topics	Intranet Products	Variable through Choice
Examples of Expression	Areas, Departments, Subsidiaries	News, Service, Knowledge, Who is Who	Departments, Areas of Knowledge	Booklets, Forms, Handbooks, Photos	Organizational Units, Topics and User Roles
Number of American Companies	6	2	1	-	1
Number of German Companies	3	3	2	1	1

Tab.3: Criteria for the logical arrangement of contents

Some of the companies with a classification similar to the organizational structure have an additional section for contents with relevance for several parts of the company. Regarding the cases of variable criteria, the users can choose among a content structure corresponding to organizational units or topics. An American financial services company offers a third sorting option according to user roles. Each of these views is departmentalized in a suitable way. All contents are linked to each kind of structure by their metadata. Irrespective of the arrangements shown in tab.3 there are connections between individual contents by links.

By means of the stencil for format and structure (template), the layout of a web page as well as the alignment of content elements such as headline, abstract and text body is determined. The CMS manages the relations between templates and web pages, users and / or output formats. Most of the interviewed companies used between two and 20 different templates. At the end of the range there is an American company with approx. 100 templates - one for each content category – and a German company with an individual template for each of the about 100 business units. Within three companies templates are not in use or not used for all contents currently.

Occasionally the templates were connected with special CMS functions. For example, in an American industrial company there is only one template. The individual logo of each subsidiary is inserted automatically referring to a corresponding information about the content source within the metadata. A German financial services company use partly different metadata for the twelve existing templates, e.g. for the content category ‘booklets’ there is a metadata item for the respective order address. A German automobile manufacturing company gives their business units the opportunity to create individual template versions on the base of 5 to 10 standards. Instead of automatically assigned templates a German energy company offers 90 different layout components, each concordant to the corporate identity. Among them, the authors choose suitable structure and layout elements.

Within all interviewed companies the output format for web pages is HTML. Also universally, nearly all companies provide pdf documents and documents of the different Microsoft Office formats via intranet. Moreover, four companies mentioned individual picture, audio, video or flash documents. WML content has not been provided by any of the 20 companies yet, cf. also [Büren et al. 2001, p.15f.].

With regard to the frequently criticized information overflow [Gryza et al. 2000, p.12] the companies were asked whether there is a necessity check for intranet contents. Six companies gave a definite no without any further explanation. Eight companies regard it as the task of the author to decide on the necessity of content. Corresponding to tab.2 there were 14 com-

panies that have a double or triple staged publishing process with an at least an occasional content review carried out by an editor. But only within one German and three American companies the editors also check the necessity of the content before publishing. In one German and one American company it is up to the central IT administration or the central information manager respectively to supervise the content necessity with the help of logfile evaluations. While doing this, the information manager mentioned above, sometimes induces a notice in the newsletter or on the intranet homepage, if an important content is called up rarely. A German automobile manufacturing company, with no necessity check, outlined that there will be logfile protocols about content ordering available for the authors in the future. An analytical procedure, for instance in reference to the business processes of the company and the content necessity inferable out of them [Stein 2000, p.313f.] was not expressed.

Among the twelve companies with locations in different countries, four American and seven German companies have sites with different languages. But none of the four American and only four out of the seven German companies have identical content in different languages. Moreover, in only one case the different versions due to language are connected to each other within the CMS. In another case there was an indirect connection because all intranet web pages from the navigation levels one to three are 'mirrored', i.e. provided in German and English. Within the companies having identical content in different languages the translations are organized partly by a central department, partly by the author or his department.

In addition to links to external web pages, nine German and five American companies integrate content from outside the company. The examples extend from weather reports, travel information and stock prices via business news and press reports to market research results and sports news from a team sponsored by the company. A German automobile manufacturing company is intended to purchase webcam pictures from critical traffic knots around the headquarter. The responsibility of external content is assigned to the individual authors, the respective heads of departments or to an IT administrator.

Legal aspects taken into consideration by the interviewed companies only on few occasions. In two cases the copyrights for pictures were mentioned. Two American companies are obligated to store all versions of intranet based documents for several years in order to reconstruct the state of information at a specific point in time if necessary.

3.3 Content Maintenance

The questions concerning the maintenance of intranet contents highlight the regulations and procedures after publishing. First of all it was to determine whether an employee portal is existing so that the content users are able to influence their intranet homepage by personalization. Thereby solutions with only minor customizing opportunities – for example weather report yes / no – were not regarded as a portal, cf. also the characteristics of portals from [Bauer 2001, p.34ff.]. Three American and five German companies already have an intranet portal. But in three cases they have to be considered as pilot solutions within the implementation phase of a running project, so that they are not mentioned in tab.1. The three German companies with an already realized intranet portal regard their solutions as an application portal with the CMS as one of the integrated applications, cf. also tab.1. Therefore the result comes close to the study of [Büren et al. 2001, p.30], according to which personalization has not progressed in many companies yet. Within six of the interviewed companies an intranet portal is planned for the near future.

At a closer view, there are four role-based and two user-based personalization solutions. Thereby the roles follow the example of the organizational structure, i.e. the role definition is similar to the delimitation of the departments. In two cases there is a combined solution, that means role-based preadjustments for the displayed intranet contents supplemented by a content push according to the individual user interests.

Regarding updates and corrections of published content, the investigation showed several different ways of organizing. Fig.2 structures the different regulations.

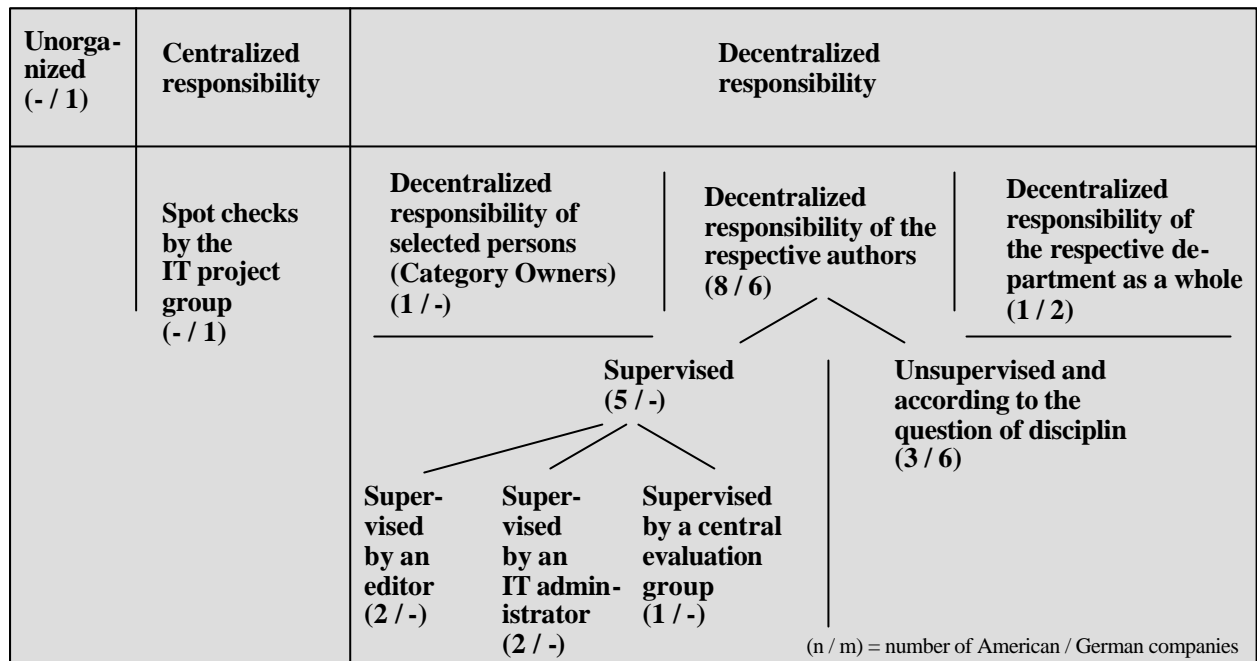


Fig.2: Solutions for the organization of content maintenance

Within the companies with a decentralized responsibility of the departments as a whole, each department is allowed to organize the manner of content maintenance, independently.

Occasionally the content maintenance is supported by suitable CMS functions. For instance, a list of potentially obsolete contents is created, aided by automatic metadata reports. Some CMS accomplish an automatic content resubmission to the author after an adjustable period of time (so called best-before date).

Requesting the number of intranet content objects, it became evident that some of the investigated companies have not integrated all existing contents into their CMS by a large margin. Thereby the term content objects designates all text documents, computer graphics, photos, videos and sound files managed by the CMS. Six companies had a large number of outstanding contents, on an average only 17% of the contents were taken over within these six companies. To take over a content into the CMS entails for a conventional HTML web page to separate and extract layout commands from portions of text and other content objects. A German insurance company estimated the relation between intranet web pages and content objects at 1:5. However, it is a wrong assumption that all outstanding contents will be prepared and taken over. An American energy company and a German automobile manufacturing company expressed that not more than 50% respectively 60 to 70% of the existing contents would be integrated into the regarded CMS.

In addition to the uncompleted transfer of existing contents there is an rapid growth of new content expected in most cases. Therefore the current number of contents can be only a current estimation. The respective statements are within a span of 1.200 to 250.000 content objects.

14 companies had quantified the current number of authors. In these cases the average number of content per author can be determined. The number of contents extend from 17 to approx. 500 objects with a percentile of 130 objects. An individual evaluation of this ratio must occur with regard to the required content maintenance and under consideration of the planned number of authors and the expected number of content objects.

4 Expected and Realized Benefits

In order to get a picture of the different perspectives, the benefits from the CMS were highlighted by a different set of questions. With regard to the motivation of the latest CMS project the question was asked as to which trigger the investment had had from the point of view of the manager responsible for intranet and content management. The extent of initial motivation can be structured roughly into strategic and operative reasons. Five American and five German companies listed strategic oriented motives:

- improvement of internal communication,
- extension of employee participation in the internal information pool,
- CMS as a part of the new technological alignment of IT,
- CMS as a part of a cost cutting process,
- CMS as an integrated contribution to business development.

Within the study of [Büren et al. 2001, p.19] the first two motives can be found as strategic intranet objectives too. In contrast to this, the residual strategic objectives of Büren et al. called „knowledge transfer and storage“ and „accomplishment of information overflow“ can not be confirmed here.

All in all, the area of operative motivation includes 30 different aspects. The following ones were mentioned several times:

- standardization of intranet pages,
- standardization of intranet tools,
- integration of tools at the base of the intranet,
- reorganization of intranet publishing process,
- acceleration of publishing process,
- elimination of narrow passages of publishing by decentralized content creation,
- reduced cost of publication,
- simplified content maintenance.

A cost-benefit analysis before the CMS investment decision was undertaken by four American and four German companies. Two more German companies executed a comparison of costs, while all other ten companies had not undertaken any kind of cost-benefit investigation. This was explained by a “strategic investment decision” which needs no explicit and detailed reflection on operative efficiency. In two cases the interviewed companies expressed that they were forced to act so that the CMS investment was done without any cost-benefit analysis.

With regard to the costs of procurement and implementation most companies were reluctant to give price information. In seven cases the information was confidential. Ten companies quantified the costs only partly, for example the expenditures for licenses and external support or the years of payroll costs for internal programming operations. Therefore the answers are incomparable. [Büren et al. 2001, p.31] estimate a wide span of implementation costs, emphasizing a lacking in comparability of the different projects too.

The question about the expected benefits of utilizing a CMS was connected to the question as to which of these expectations had actually occurred. Expecting to get only the essential benefits, the investigation was done advisedly without a prepared list of potential benefits. Tab.4 summarizes and structures the expressed benefits. Occasionally the interviewed companies perceived their CMS as too young, so the question of realized benefits was not answered in all cases.

Benefit	Number of American companies	Therefrom with realized expectations	Number of German companies	Therefrom with realized expectations
Intranet Organization				
Standardization of intranet pages	3	2 1 still possible	3	2 1 still possible
Improved intranet usage control	2	1 1 partly	-	-
Increased intranet security	1	1 still possible	-	-
Information supply				
Improved information exchange	2	1 1 partly	3	2 1 still possible
Improved information access	-	-	3	1 1 partly 1 still possible
Publishing Process				
Increased content quality	2	1 still possible 1 mostly	3	2 1 still possible
Simplified publishing	2	1 still possible 1 partly	2	2
Accelerated publishing	1	1 still possible	3	3
Simplified maintenance of intranet pages	1	1	1	1
Disburden intranet administrators	-	-	2	1 1 partly
Additional automation	1	1 still possible	-	-
Less content redundancy	1	1 still possible	-	-
Transparent processes of publishing and maintenance	-	-	1	1
Cost-cutting				
Reduced IT costs	-	-	3	3
Reduced publishing costs	-	-	1	1
Content reuse	-	-	1	1

Tab.4: Expected benefits from CMS and their realization

Proceeds out of content syndication in the sense of a paid transference of information usage rights [Hess 2001, p.83] were given in none of the 20 interviewed companies. Only one American company had taken a first step in this direction.

Resistance against the CMS project was expressed by the discussion partners from six American and nine German companies. Tab.5 structures resistance according to different groups of people. The figures in brackets indicate the number of American / German companies which mentioned their respective resistance.

Resistance from top management	Resistance from certain departments	Resistance from IT administration	Resistance from occasional users
<ul style="list-style-type: none"> - Amount of costs (1/1) - Underestimation of project weightiness (-/2) - Reservations about deployment of new media (-/1) 	<ul style="list-style-type: none"> - holding on to former CMS customs (-/4) - Department does not accept intranet publishing as one of his tasks (-/1) 	<ul style="list-style-type: none"> - Reservations about the new CMS (1/1) - Project management not performed by the IT department (-/1) 	<ul style="list-style-type: none"> - Limited flexibility for content creation (1/2) - General fear of innovations (-/2) - Replacement of a running system (-/1) - Regulated publishing process (1/-) - Large quantity of assigned content (1/-) - Unrecognized content usefulness for other people (-/1)

Tab.5: Resistance towards the CMS project

In addition, the question was asked as to whether problems occurred during the CMS project. Overall, there was a diversity of specific challenges, for instance a difficult procedure towards an agreement on necessary metadata and a discussion of publishing workflows which was perceived as much too intensive. Mentioned twice or more time were

- technical problems (six cases),
- functional lacks (two cases) and
- an extended procedure to find the features of Corporate Identity (CI) for the intranet (two cases).

With regard to the verification of project success 15 out of 20 companies executed a type of intranet traffic analysis or logfile analysis. Two more companies have planned this for the near future. In addition to the respective CMS functions there are separate tools frequently in use. In most cases the degree of utilization is observed by recording and evaluating the number of page viewings. In an American construction company the weeks top ten pages are named and linked on the intranet homepage at the beginning of each working week. The occasionally mentioned utilization of visitor quantities for the verification of content necessity was already pointed out in chapter 3.2. An extensive type of logfile evaluation [Hippner et al. 2002, p.108] was expressed only by a German insurance company.

To answer the question concerning the most frequented content, ten companies named intranet pages from the department of human resource management – designated for example as an employee handbook or employee kiosk. In particular, these pages contained e.g. the internal job market, an overview on residual vacation days and key data of employment. Furthermore, internal news, the phone directory and the canteen menu were mentioned more than once.

The reflection on project results finished with the question on an overall estimation of project success. The discussion partners were requested for a separate statement, from both a top management and an IT management point of view. In four cases the CMS project seemed to be not adequately advanced, so that there was no answer to this question. Within four American and seven German companies both sides regarded the CMS project as a success. Rationales from the top management which occurred more than once were the improved corporate communication, the request for a further extension of the system resp. its range of application as well as the nearly smooth project procedure. From the IT management side, the high acceptance of the system incl. the intensive intranet utilization, was emphasized frequently in connection with the overall success estimation.

Within three American and one German company only the IT management regarded the CMS project as a success. In four of these cases the reason was that the CMS implementation was not recognized on a top management level. Furthermore, the example of a German automobile manufacturing company is worth mentioning: the position of the IT department as an IT service provider for the overall company was reinforced by the successful CMS project. Finally, in one company the CMS also wasn't a topic for the top management, while the IT management did not speak of success because the implemented CMS was suitable only as an interim solution.

5 Perspectives

First of all, the investigation section concerning a view towards the further development contains a general question on the potential extension of the CMS. Next, questions to the point of individual development directions were supplemented, in order to find the attitudes towards these approaches.

The question on already planned enlargements of the CMS and / or its usage indicated that the full extension regarding authors and content, as well as the desired degree of integration, has not been achieved yet. Tab.6 structures the expressed aims of extension by the interviewees under the following headings:

Planned Extension	Number of American companies	Number of German companies
Enlargement of usage extent		
Increasing number of authors	4	-
Increasing number of business areas and subsidiaries using the CMS	2	3
Increasing number of contents taken over from other systems	1	1
Increasing number of published contents	1	1
Making the top management use the intranet for internal communication	-	1
(Worldwide) Connecting of several intranets	-	2
Enlargement of functionality		
Additional CMS functions	1	2
Implementing personalization functions	-	3
Exchange of the CMS		
To another unified CMS for the overall company	2	1
To another CMS product	1	1
CMS integration		
Integration of individual intranet service applications (e.g. booking of company cars)	1	2
Improve the integration of CMS, DMS und groupware	-	2
CMS integration into an application portal	-	1
Other activities		
Selling the self developed CMS to other companies	-	1

Tab.6: Existing plans to extend the CMS or its usage

Examples for planned enlargements of CMS functionality were concerned with search functions, statistical analysis, workflow functions, templates for a dynamic adaptation of navigation trees as well as a chat room and an international team room.

In the light of the results from tab.6 it becomes evident that the further development within the American companies will have a different main focus than that of the German companies. The American companies will primary increase the extend of usage, for instance by additional

authors. In contrast to this, the German companies have two more center points of development: functional enlargement and systems integration.

The question of the general need for a further integration of CMS and other business applications goes beyond the already existing plans of one American and five German companies already listed in tab.6. Thus there were only four American and two German companies which do not see the need for integration as yet. While doing this, a German insurance company refers to a strict architectonic separation of conventional versus web based applications. A German automobile manufacturing company negated the general need, with reference to approx. 800 existing applications. Among the companies supporting the general need, three interviewees mentioned a long term strategy of integrating all applications on the basis of the intranet. The other agreeing companies expressed individual examples of application integration at which the applications from SAP were named repeatedly. According to the need of integration, an American financial services company refers to the number of users utilizing the respective application. Even existing web based applications do not get access via intranet if there is only a small group of users.

Two companies combined the need for further application integration with the comment that this should happen with the aid of XML.

The role of XML in connection with the CMS was also the object of another question of perspective. Three American and one German company responded that no use for XML had been considered yet. Another American company regards XML as a general option for all coming intranet solutions. Within the remaining 15 cases, concrete employment was mentioned and occasionally already in practice. Fig.3 structures the answers by means of an input-output-diagram.

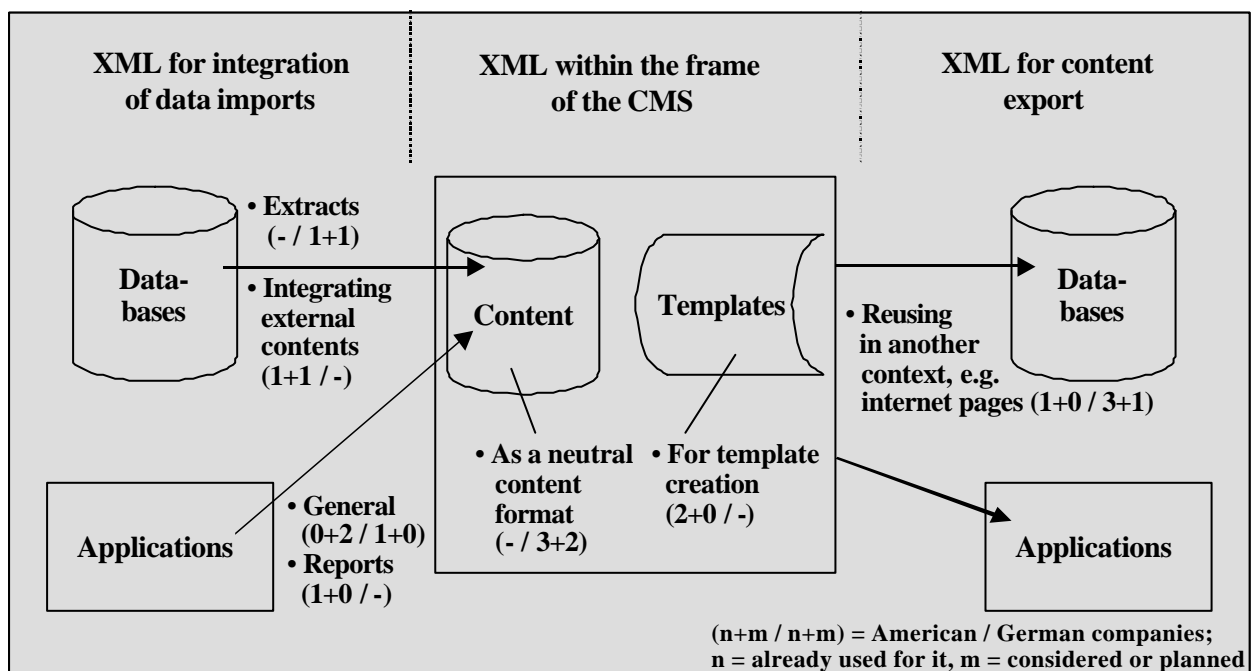


Fig.3: Utilization of XML in connection with the CMS

For using XML as a neutral content format, the CMS manages XML files. Just in the moment of request, the respective XML file is transferred into HTML and distributed together with the template for layout and structure.

By means of the question as to whether intranet content management can take over a role for business processes and / or knowledge management, connections between CMS and these intensely discussed areas of business practice were investigated. Regarding business processes, six companies saw no connection to CMS, at least not at the present time. In these

cases, business processes are executed without an appreciable utilization of the intranet. The interviewees of two companies pointed out explicitly that modeling and direct support of business processes represents a different level of IT configuration within the company. However, three out of these six companies intended an integration of both intranet and business processes.

All other 14 companies could already imagine a connection at the present time. Among them, five American companies and one German company were talking about supporting, accelerating and improving the business processes in a general manner. Within the residual cases concrete connections were named, mostly concerned with the provision of information for business processes, e.g. for quality management and sales control. A German industrial company mentioned also an information flow in the opposite direction, meaning data takeover out of business applications for intranet publishing.

Noteworthy is also the example of a German insurance company which has connected Intranet and business processes by means of an extranet utilization: for financial services companies, acting as sales partners and offering insurance policies to their customers, there is access to product information available on the intranet of the insurance company.

With regard to knowledge management, the study from [Büren et al. 2002, p.83] came to the conclusion that assistance via intranet has not been realized yet. This is confirmed by six American and three German companies which saw no connection resp. only an indistinct or still far off connection between CMS and knowledge management at this point in time. In contrast to this, the remaining eleven companies expressed a general or concrete connection. Within two cases intranet and CMS were understood as a (basic) instrument for knowledge management. Two other companies saw the connection for the moment when the outstanding integration of separate knowledge management platforms with the intranet and the CMS is realized. Six companies explicitly pointed out individual knowledge contents available on the intranet. Essentially, there are project analysis, best practice reports, interactive trainings and also a knowledge forum for failure avoidance. Finally, an American financial services company expressed that knowledge management is the ultimate goal for the utilization of the CMS.

The perspective on the coming development includes also the future of CMS itself. The respective question asked for the assessment whether the CMS will remain an independent application or receive a different outline by fusion with other applications. Within seven companies the CMS was seen as an independent application also in the future. On the opposite side, it is expected in eight cases that in the future it will not be possible to distinguish CMS and DMS any longer. The results of tab.1 according to the demarcation between CMS and DMS within the interviewed companies have shown that the fusion is already taking place on occasion. Moreover, three kinds of systems were named which could be enhanced by CMS functions in the future – web server applications and in two cases, office applications. For three interviewees it is imaginable that content management functions will be an integrated part of coming operating systems.

6 Summary

In the light of the results of positioning CMS within the examined companies five different types of configuration could be defined. The respective sequence can be seen as a stairway of configuration development. Thereafter, the investigation in hand, documents a range of practicable solutions for the organizational tasks of CMS implementation. Special attention is given to the options of role distribution and the concepts of content publishing steps connected with these options. In addition, considerable solution distinctions were asserted according to content management and maintenance.

Referring to the companies investigated here, German companies are a small step ahead as far as the overall intensity of CMS utilization for intranets could be indicated. This becomes obvious by the entire survey of the current utilization as well as through the existing plans for CMS extension resp. the extent of CMS utilization. In addition, the idea of integration was expressed more intensively by the German companies, for example with regard to employee portals and / or application portals including CMS.

A widespread need for activities was identified concerning necessity checks on contents as well as maintenance for contents already available. And the pressure to act will increase in time to come. Over and above the commonly expected growth of new contents, many companies still have far to go because a large amount of existing content objects have not been transferred into the CMS yet.

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