

# Технологічні Можливості Інформаційного Сервера Hyperwave

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## Technological Possibilities of Hyperwave Information Server

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*Анотація*— У статті розглядаються рішення для Інтранету як глобально операційної обробки інформації компанії. Наводиться розвиток системи управління знаннями, що стосується посилань на інформаційну систему на основі інформаційного сервера Hyperwave. Представлені певні рішення від загальної моделі Hyperwave у вигляді окремих модулів. Наведені комплексні висновки. Розглядаються можливості розширення і вдосконалення моделі Hyperwave.

*Abstract*— In the article an intranet solution for a globally operating information processing company is considered. The development of the knowledge management system is concerned especially with the reference to the Hyperwave information system based on the Hyperwave Information Server. Two partial solutions from the general model are then presented as separate modules (metadata records and news application). Then the complex conclusions are drawn. The expansion and improvement possibilities of the model are also presented.

*Ключові слова*— створення оцінки; управління знаннями; інформаційна система; обробка інформації компанії; Інтранет; інформаційний сервер Hyperwave; інформаційна система Hyperwave.

*Keywords*— value creation; knowledge management; information system; information processing company; intranet; Hyperwave Information Server; Hyperwave information system.

### I. INTRODUCTION

The biggest challenge in today's working world: Information – namely, too much of it. Without functioning

document management, it is hard to work efficiently. As well as creating and editing documents, what is important is the ability to access documents regardless of location and device, and an efficient repository and administration that allow you to find any document you are looking for quickly. The Hyperwave solution guarantees all this [1, 5].

Whether we're talking about digital or paper documents – the primary function of any document management system is to allow the publication of any type of content. Only then can content be edited and assigned attributes, or be automatically distributed or archived.

Hyperwave has made these editing options so simple and intuitive that the user can create and publish documents without any help from administrators. At the same time, we guarantee that the appropriate company processes and access rights regulations are complied with. The easy and at the same time secure handling ensures productive operation from the first day – and frees up your IT people to deal with other projects [4, 7].

The fact that knowledge is the most important source of value creation in modern organizations is nowadays recognized worldwide. The rapid growth and the increasing sharing of knowledge, as well as the virtualization of enterprises and the new possibilities of the information technology compels conglomerates to establish a systematic and active knowledge management. This is usually achieved by the means of the complex mechanisms which carry out both the modeling of the functional and structural

characteristics of the company as well as map them on the information system [3].

## II. THE CHALLENGES OF THE KNOWLEDGE-BASED INFORMATION SYSTEM DEVELOPMENT

The appropriate technology should be efficient in the performing the above mentioned tasks. Further challenges in the design of the knowledge-based information systems for information processing companies include [2]:

1. Geographically distributed information as well as administration. Distributed systems do not only require appropriate technical solutions, which assure the functionality and stability of the entire information system, but also demand an elaborate strategy for the knowledge units management.
2. Diverse profiles of users that provide them with a personalized demand-oriented information system view. A company-wide, consistent user management over the highly distributed system architecture should harmonize with an effective document management.
3. Global distribution of databases that can restrict or obstruct 'fast' data transfer for large or time-critical documents. Not only the technical aspects of replication mechanisms but also the strategic decision-making criteria play a crucial part.
4. The urgent need for the development of updating and synchronization mechanism which will optimize consistency, error tolerance and performance of the storage system.

Preference should be granted to the established model approaches that offer a viable and standardized solution. The employment of standards in the information system implementation provides both a lasting and flexible, thus more cost-efficient way to expand or improve the system [6].

## III. SELECTION OF THE SUITABLE TECHNOLOGY

The above analysis allows to assume that an intranet concept is a solution that represents some of the immensely important aspects that can facilitate the knowledge-based information system in the information processing company.

Intranet supports the alignment, retrieval and exchange of information within a company, therefore the knowledge base behind it is invisible and inaccessible to unauthorized users. An intranet is based on the same technologies and services as the Internet and represents the Internet at the enterprise level [2, 9].

Intranet is considered here as a tool for information management and not only as a collector of documents. That is, the focus or idea behind the use of the Intranet technology should be foremost motivated by the goals set and are not by the documents. The reason for this is obvious: people use information units to accomplish specific tasks.

Information technology companies strive to find a solution for their information system while their business processes are handled efficiently and profitably. Modern knowledge-based information systems should therefore be able to provide the

right information at the right time in the right place available [8].

The technological possibilities of the Hyperwave Information Server (version 5.5 SP2) allow to establish the core architecture of the information system. Therefore the intranet environment will be implemented on the Hyperwave Information Server [11].

## IV. HYPERWAVE INFORMATION SERVER

Developed in the Graz University of Technology in Austria in the early 1990s Hyperwave was first introduced in 1997 as the first commercial version of the Hyper-G technology. The application, which underlies the entire Hyperwave content management infrastructure, now goes by the name of Hyperwave IS/6.

Hyperwave is an information system focused on the document storage and service. By 'document' means any chunk of data that coexists with object record. It contains the metadata of the document – the list of attributes, open to the enhancement by user. Some of the attributes are always set by Hyperwave Server, some of them are modifiable [1, 11].

Attribute refers to the pair name/value presented as name=value. Complete object record contains the amount of pairs necessary for the user. The attribute name does not require to be equal, that is the title can appear several times throughout the object record. It makes sense in case of title specification in different languages. There is an alignment for that case – the title is preceded by a two-letter abbreviation of the language, for example: 'en: Title in English' or 'ge: Titel in deutsch'. Other attributes – description or keywords – are potential candidates. Hyperwave allows to replace language abbreviation by any other string separated from the rest of the attribute by a column [5, 13].

Each object entry has its own string representation where each name/value pair is separated by newline characters; Hyperwave extension also provides another representation – an associative array with an attribute name for a key. Multilingual entries form another associative array with a language abbreviation key.

Apart from document all its hyperlinks are stored as object records. Document hyperlinks are deleted and saved in separate objects when the document is inserted into the database. Hyperlink object record contains the information about its beginning and its end. To get the document user needs to request hyperlink-free document and insert the hyperlinks with the appropriate commands. The advantages of document-links separation are evident: if the name of linked document is modified, the link is easily changed. The link-contained document is not affected in the process at all. The link can be added to the document without modifying the last [12].

The Web-based Hyperwave infrastructure offers an integrated and configurable product family for knowledge management and eLearning, which includes several technical solution areas, including document management, content management, archiving with configuration management, special search function, extensible metadata described above,

knowledge portals, automatic link management, workflow, team workspaces, and other. The operation of the Hyperwave Information Server is versatile and comprehensive in its applicability [14].

## V. TECHNICAL IMPLEMENTATION OF THE INFORMATION SYSTEM

The complex locational, functional and structural constraints within the information processing company result in the following list of the critical aspects required for consideration while introducing a knowledge-based information system [6, 13]:

### 1. Technology choice and the information system architecture

The technical implementation of the information system is to take place with the help of technology from the Hyperwave Information Server.

### 2. Availability and life cycle of data sets

Carried out in the process of knowledge development within a large and distributed system the analysis of the document nature relating to the life cycle of the company's intellectual capital allows to regard documents as explicit knowledge, therefore life cycle of documents exists.

The life cycle model for documents within a centralized information system identifies five different stages in the life cycle of a document:

- creation;
- publishing;
- organization;
- access;
- destruction.

The examination of the document lifecycle within the Information System, that is the habitat of the document, plays a crucial role.

### 3. Semantic enrichment of databases by metadata.

The semantic information processing by defining metadata for the individual units of the digitally captured intellectual capital proves to be very beneficial as it increases the content analysis quality and simplifies the meaning extraction from the document content.

### 4. Multilingual functionality of the system

Of particular importance in the management of multilingual data is the representation of the semantically identical information units. Such information units are, on the one hand, 'physically close' (e. g. via their shared storage in special container structures), and, on the other hand, managed 'virtually close' (e. g. by clustering mechanisms or Topic Maps).

### 5. Information units retrieval and presentation

The basic issue is the logical and technical separation of layout and contents of the dataset. In order to ensure the transparent presentation layout and behavior of interfaces follow a predefined scheme. The presentation of the scheme is set in the framework of the CI (corporate identity), the content can be adapted to correspond with portal structure. Overall six different frames are defined:

- header frame;

- navigation frame;
- search frame;
- quick links frame;
- code frame;
- content frame;

each of which displays portal specific information.

### 6. Company-specific role concept

A thoroughly elaborated role concept is essential for the information system of the information processing company, since it represents the general user and department administration, and therefore, exerts a direct influence on all access rights dependent operations.

### 7. Dynamism and modularity of the system

The term 'dynamic structures' refers to all mechanisms or modules that can be adapted to both specific strategic or operational changes regardless of the change duration (that is short, medium or long). The aspects of dynamics and modularity are considered on the all technical levels in order to overcome any future system modifications.

### 8. Conceptual structures creation and use

With a globally defined conceptual structure the relevancy and accuracy criteria of the knowledge access is solved on the systematic level. With the merger of companies – which are specialized for example in various fields – the structures with different duration can provide the ability to generate various departmental perspectives on the knowledge units of the system structure.

### 9. Increase collaboration and communication

Such demand is usually driven by the urge to improve the knowledge division. This aspect has a particularly high priority in the knowledge management and is implemented by customized solutions of the information system. It fulfills the requirement to increase collaboration and communication through the tools that provide centralized and controlled knowledge sharing. Solutions of this type are shown, for example, by the following components: eLearning platforms, discussion forums, chat systems, email applications, video conferencing, etc.

### 10. Specific archiving and data management criteria

Under this aspect, decisions taken determine the possible use of database or file systems (or a combination of both). Hyperwave ensures the efficient and effective data management by the combination of the following mechanisms: assigning access rights on specific object attributes, upload mechanism for all types of multimedia objects, configurable version control for document objects, editing HTML files directly to the Server (without obligatory download), specialized container objects (Cluster, Sequence, Collection, Document Classes, Search Query Object) etc..

The information system provides users with global or partial views of the dataset depending on the current role status (usually a member of a group), the activity mode (read, write, etc.) and of the – under Hyperwave – adjustable 'User Preferences' [9].

All points described so far provide an overview of the structure and functionality of the knowledge-based information system for an information processing corporation

[14]. The technical implementation of the requirements for such a system was presented based on the Hyperwave Information Server.

Not least, the Hyperwave solution doesn't care what device you use to access the document. You can access all data, without any time or location restrictions and outside of the company boundaries, edit your document and share it with colleagues or external partners

It is often referred to as the 'knowledge of power'. But no matter what you call it – the very specific knowledge that exists in your company is more or less dead capital, unless you draw on its full potential. Only then will it become a decisive factor in production. That is why it is no longer enough to simply gather and archive information and data; the pieces of information all have to be linked to each other and you have to be able to access them as quickly as possible. Hyperwave can also help your company to benefit from this kind of knowledge management [10].

Hyperwave saves all documents and related meta data in a relational database. The Hyperwave Team Workspace is the solution for web-based team working. It offers a working environment for internal and external project groups, that is both easy to set up and intuitive to use. Any user with appropriate access rights can set up a Hyperwave Team Workspace in about two minutes. And it also offers you all the document management functions you might require – with no previous knowledge you can publish, edit and replace documents easily. This allows you to start your project quickly, and also lets you bring in new employees at any stage of the project, without the need for extra training.

Using only web-based technologies, the Hyperwave Team Workspace can be deployed anywhere and immediately, without a major rollout. All internal and external project members and partners can work online or offline, regardless of their timezone or location.

An overview page lets you see any changes in one quick glance. Long drawn-out searches for modified project documents are a thing of the past. A shared calendar and task lists that can be accessed by all participants over the Web help to plan and coordinate tasks [4].

Our daily business is ruled by documents and unstructured data such as contracts, reports, calculations, presentations, design drawings and photos. Having quick and easy access to the correct and most up-to-date documents gives you a distinct competitive advantage.

A Hyperwave document management solution will guarantee that you find the documents you are looking for fast, and that you are always accessing the latest version of a document. The confidentiality of documents is assured using role-specific display of content. In this way, you are guaranteed that company employees have access to the information they require, while confidential content is protected [8].

With Hyperwave, e-mail problems, finding the correct files, and data and versioning chaos are all things of the past.

## VI. CONCLUSION

The knowledge resource in large and geographically distributed information processing companies is now either explicitly or implicitly embedded in its processes. The basic objective of such corporations in this context is to generate knowledge and to increase productive and efficient use of the computer-aided knowledge systems. Therefore, the company's corporate memory requires an organized and orderly administration.

The discussed in this article model is based on the technology and architecture of the Hyperwave Information Server. The implemented knowledge-based information system provided the necessary tools for an efficient and effective solution. The technological advantages of the Hyperwave Information Server have been widely exploited for the technical implementation and provided an optimal solution for the problem at each stage of the analysis.

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