

The DMS Guide

An up to date Insight
into Document Management
and Archiving



Dear Reader,

In the past, Document Management Systems could only be found in a few organisations and in fact only in large-scale organisations – due to the high investment costs, a lack of acceptability or simply because people were not aware of how they could be used.

Meanwhile, thanks to an innovative software technology, we notice a new trend is setting in. These systems are much easier to handle, are available at much lower prices and result in much lower operating costs. As a result, Document Management has, for the first time, become affordable for the one-man business, any small or medium-sized company or large corporations.

Only very few companies have all their documents available in electronic form. More than 75 % administer their information on paper and approximately 12 % utilise photographic processes such as microfiche. Depending on how the company's processes are structured, employees spend between 50 and 80 % of their working time searching for information. Furthermore, certain information is distributed in departments and even throughout companies. As a result, information that is only available in paper form has to be copied



several times and is then passed on. Administering several versions of such a document therefore becomes equally as impossible as monitoring the status of the work in progress. In addition, paper-based workflow has a considerably higher processing time than electronically administered documents.

Due to the problems this poses, companies are seeking solutions. The use of electronic Document Management Systems reduces the problems outlined here. In addition to lower costs, this also results in improved data security, a more efficient filing system with fast accessibility as well as an improved utilisation of space.

This DMS Guide is intended to offer you an easy introduction to the DMS world and to provide you with an understandable overview of the DMS functions and technologies.

***A.I.S. hopes you gain
an interesting insight!***

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The software industry world-wide has been busy creating initial solutions and software products in the DMS sector for more than one decade. Unfortunately, a standard definition of the term Document Management has never been established and the term has remained rather vague up until now. Moreover, the general definition of the term is distinctly affected by the fact that every provider in the market tries to use the special characteristics of his product to interpret the term Document Management.

In the widest sense, Document Management therefore encompasses various product categories: document imaging, 'classic' document management, electronic archiving

on optical media, groupware, workflow, electronic administration of forms and much more. What all these systems have in common is that they handle and process different electronic documents such as scanned paper documents, incoming faxes, office application files, multimedia objects, etc. Each of these categories cover only a partial area of what is generally understood as Document Management.

windream has now expressed its own new principles of Document Management and these differ from those of all other providers:

- DMS must be simple to use
- DMS must be flexible for the future.

DMS ?

These two requirements can only lead to one result: DMS now becomes a basis technology, a basis technology like the Windows operating system. This new, revolutionary aspect of Document Management means that no additional DMS program is required

“DMS now becomes a basic technology: DMS like Windows”

any longer, but rather that the DMS functionality itself is integrated

directly in the operating system. Handling a DMS is now as simple as working with Windows.

The Document Management is available centrally from the operating system, just like file management in Windows, which is centrally available to all application programs from the operating system. As a result of the fact that DMS is now integrated in the operating system, it therefore becomes the basis for all components, e.g. groupware and workflow applications, which are based on it. This also ensures flexibility in the future.

Changeable, dynamic information is handled flexibly by a Document Management System (DMS). The following seven points describe the possibilities and functions: processing, retaining, preventing, providing, altering, administering, and deleting. – Information is created, is archived and must be protected from unauthorised access. The information has to be found again, can be edited or updated, it must be managed and administered and is then deleted at a predefined point in time.

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Document Management Systems have been available since data processing became accessible to the market at large. The electronic administration of information of all kinds is common to them all. The simplest and most pronounced feature of a DMS is the file system of an operating system.

differ from a file system?

Through the file system which is embedded in the operating system, the management of information is central and therefore easier for the application programs. Most applications, irrespective of whether they are standard applications like Microsoft Office or special CAD applications, create or process information with the help of the file system. Once this information has been saved as a file, the application program transfers the responsibility for the file to the operating system. The user recognises this transfer when executing a 'Save' command for example in Microsoft Word.

After selecting a target drive that can either be a local or a network drive, it is necessary to define the path name and to enter the file name. This function "Save as ..." is initiated by the application program in conjunction with the operating system. The file is transferred to the operating system following the Save command for administration. The user can then 'manage'

it within a file management program in the operating system (e.g. the Windows Explorer) and the file can be moved, retrieved, and renamed irrespective of the application program.

Although a file system represents a basis functionality within the operating system and relieves the application programs from managing information, it restricts the user's natural thought and work processes. For the

"The file system offers too few indices"

file system only offers the option of four search indices to identify the information: namely the file name, path, file type and the date of modification. Although the information can clearly be identified in this way, the freedom of the indexing options is restricted permanently.

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How does a DMS

This disadvantage is especially important if you work in networks where you want to mark information for other co-users. As a result, the user is forced to lodge major search characteristics within a classification system that is restricted to the four fixed indexing requirements. This can mean e.g. that the user creates a folder named "Exhibitions" and a sub-folder named "CeBIT" and calls the document "Sub-Exhibitor Registration Form". So that other people can find this document, they would have to define general rules for filing the information. This may still be possible in smaller companies or departments. However, a knowledge management beyond the department level much less throughout the entire company is impossible under these circumstances.

**"File Management
becomes
Document Management"**

Now, a time-intensive search becomes necessary, if a file is needed of which neither the precise filing structure nor the file name is known. The loss of time is due to the fact that the indices are not administered centrally in a database, but are saved within the file structure itself (on the local drive or on servers in the network). Repeated access to the individual storage media is required. Furthermore, the file system allows neither the administration of several versions of the same document nor the possibility of tracing the life cycle of a document.

differ from a file system?

DM systems that provide the user with the missing administrative functions (such as indexing of your choice, concepts of access rights, administration of versions and many more) were created as a result of such restrictions in the file system. Consequently, the use of almost unlimited search characteristics is possible and the user can identify the file using a wide range of possibilities. A product description could for example simultaneously be identified by its product name, product group, product colour or the name of the product manager. The document can be identified by every index in itself or a combination of all of them. As a result, File Management becomes Document Management for the User.

"File + variable indexing = document"

Through using a database in which the index information is saved it is only necessary to access the database in order to find a document. The database supplies the DMS with the document identification with which the document can be retrieved from its place of storage and made available directly to the user. Special dialog boxes assist the user when indexing documents or when entering an index criterion in order to find a document again later. The disadvantages resulting from the file system restrictions outlined above no longer apply as a result of this.

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Let us differentiate between two types of software: firstly the DM systems, which work as a separate application that have the same right to administer documents and work alongside the program that is processing the documents; this type of DMS is referred to herein as non-integrated DMS, program-linked DMS or as a conventional system, and secondly those whose Document Management functionality is integrated in the operating system.

In the first type of DMS, the management of files and documents is much less user-oriented than with a file system. While the information is saved directly from any application program and can also be retrieved in the file system, access to documents is only possible here if the DMS has already been launched before. The administration of documents therefore is not managed over the file system, but rather via a separate DMS program. So that the DMS program can communicate with all the application programs, they have been previously connected to the DMS through individual programming.

Both technical and financial disadvantages arise with such a program-linked DMS. The number of programs with which the DMS can work is restricted from the onset because, from a financial point of view, not every common application on the market can be integrated in the DMS. The suppliers of such DM systems generally only supply a few application programs from the Microsoft product range (Word, Excel etc.). Additional costs arise, if new versions of implemented programs appear on the market. The DMS must then be adapted, which naturally also takes some time. Very quickly, the DMS will become no longer cost-effective for many companies as a result of both the restricted usability for a few applications as well as the high investment costs.

DMS exist?

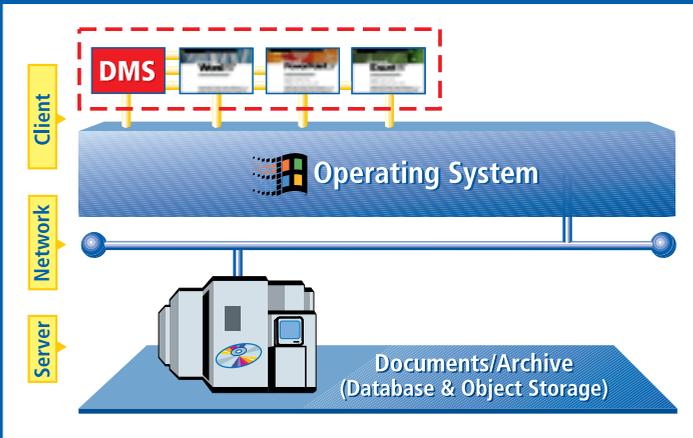


Figure 1: Conventional DMS technology

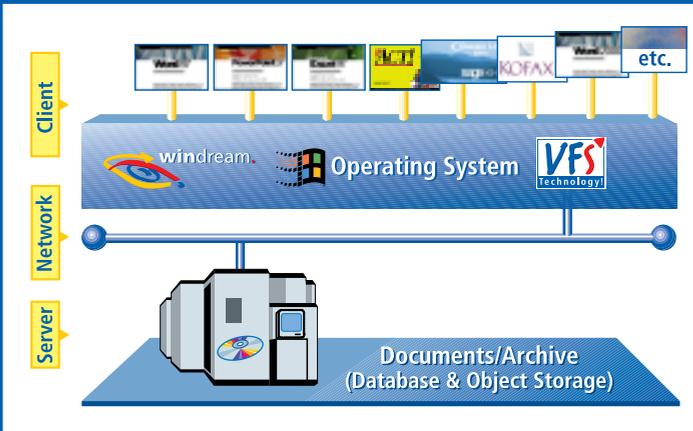


Figure 2: Modern DMS using VFS technology

In addition, all actions that the user performs in conjunction with the operating system only apply for the temporary file structure. For example, Business Plan: if a Word file containing an Excel sheet is to be linked, then the target Word file is linked

with the Excel source file. This file connection is known as a so-called OLE link (Object Linking and Embedding). If a few of the numbers in the source file have been changed, then these changes will automatically be taken over by the target file,

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What kinds of

as soon as it is called. An OLE link cannot be identified by a conventional DMS. The operating system attempts to find the Excel document on the basis of the link information that is stored in the Word document. However, since the source document is no longer located in the temporary path, but in the document's place of storage (to which the operating system has no access), the target document can no longer be updated. As a result, there is a breach in the required data consistency in the storage media.

The logical consequence of this is to expand the file system: in the second DMS type, the familiar file management functionality of the operating system is extended by the DMS functionality. Microsoft has created the technical prerequisites for this through the open system architecture of its Windows operating system. At system level, various components can be addressed by the operating system via standard interfaces and drivers to enable the handling of various types of graphics cards, network cards and especially file systems.

Microsoft has revealed all of these interfaces due to compatibility reasons so that every manufacturer can add his own driver functionalities. The Document Management functionalities are integrated into the operating system by using a special file system

"The DMS is integrated within the operating system"

driver that behaves exactly like a normal file system towards Windows but is logi-

cally based on the DMS. Similar to technologies like NFS (Network File System) from Microsoft, this is named as "VFS technology" (Virtual File System).

An autonomous DMS application installed above the operating system and which has the task of indexing and administering documents along with previously described disadvantages is no longer required. Instead, a virtual file system driver is installed via an IFS interface. This behaves exactly like a normal file system driver towards the operating system and therefore also represents another drive. However, this is only a virtual drive – it behaves like a normal drive, but is also equipped with special enhancements.

DMS exist?

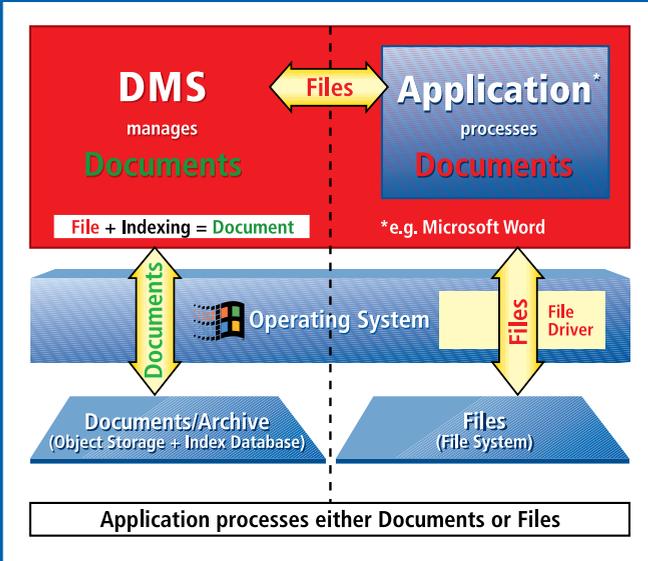


Figure 3: Conventional document processing

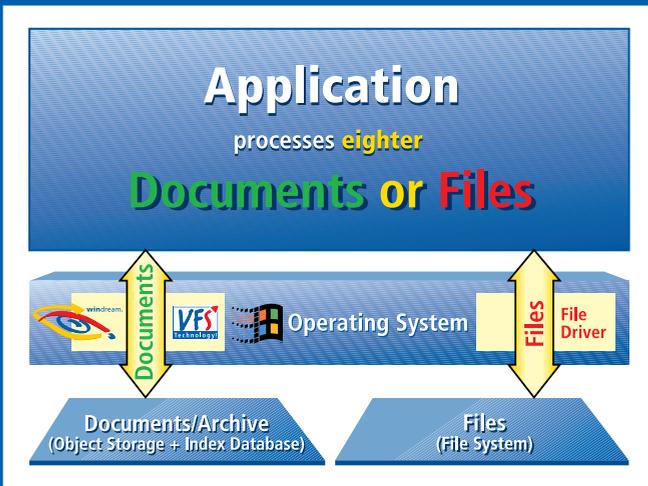


Figure 4: Modern document processing

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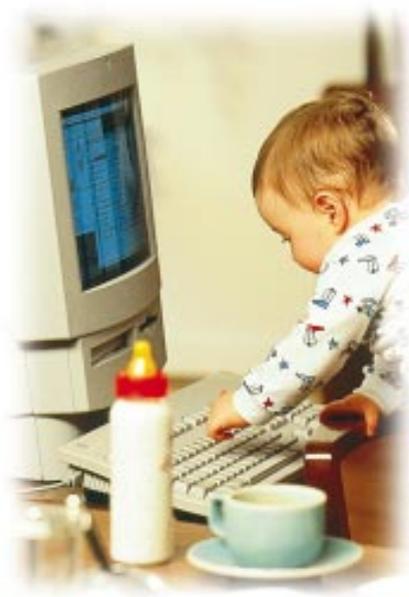
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The demands made on a modern Document Management System are generally well known in the industry, but they have not been implemented adequately yet.

The fundamental requirement for an "ideal DMS" is that it supports all application programs without any restrictions. This is not the case with normal Document Management Systems where an own DMS program contains the entire logics for administration tasks and controlling the application programs whose documents are to be administered. As a result, neither the operating system nor the application is able to access documents that have been filed directly within the DMS. In addition, only a few application programs, typically Word and Excel, can be started from the DMS. Even this has required costly modifications, which resulted in high integration costs. And, for example, if a file has to be edited from an 'exotic' application, then the detour via the file system is always necessary.

different from yesterday's?

Integrating the Document Management function in the operating system means that costly modifications are no longer necessary. For the first time, this approach with VFS technology has been implemented in the Windream DM System. With Windream, the user can open documents via the "File Open" dialog from the DMS or to save them

"All application programs are supposed to work with the DMS"

within the DMS via the "File Save" dialog

without any additional work. Access is not restricted to just a few application programs, but is available to all Windows-programs. The user handling is equal to that of Windows, but with some decisive enhancements:

If the user wants to pass a document on to the DMS, he then chooses the "Save as" command in the corresponding application program as he is used to. After having selected the virtual Windream drive, which is presented like a normal network drive, the user names the document as usual. Once he has enabled the "Save" command, the DMS automatically opens an index mask. This is where the corresponding document type is selected and the specific indices are assigned, which make the subsequent retrieval of the document possible.



Figure 5: You can select the document type after saving the document

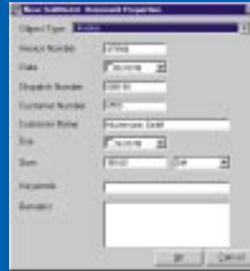


Figure 6: The indices can be entered after having selected the document type

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How is today's DMS

Finding an archived document is similar to Windows. The user simply selects the Windream Search by activating the "Find" command in the Start menu. The DMS starts

"All Windows functions will be supported"

the dialog box "Search for Documents" automatically using various search options on

corresponding tab controls, based on the Windows search for directories and files. Various search options are available to the user here: the index search, the search over document types, and the full text search.

The index search makes it possible to retrieve a document by using one or more indices of a document which were assigned at the time it was acquired or which were automatically extracted from the document. The individual search terms can be interconnected to a search profile through so-called operators like "and" or "or". Selecting a specific document type allows the user to narrow down the number of index fields to those belonging to this document type.

During the document type search, the indices of each document type can be interconnected into a search profile with "and". Only documents with the selected document type are displayed in the result list. Once a search profile has been generated, it can be

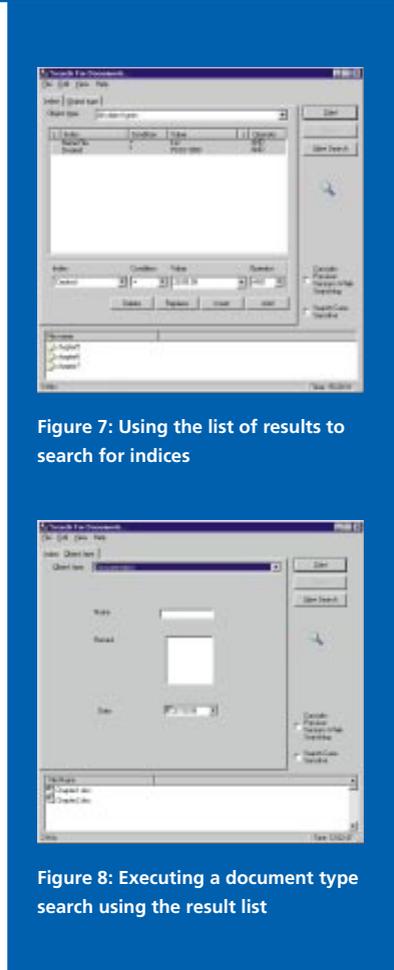


Figure 7: Using the list of results to search for indices

Figure 8: Executing a document type search using the result list

saved and placed on the Desktop. As a result, this is always available to the user for search routines of the same structure – all he needs to do is to double click it.

How is today's DMS

The lacking operating system integration in normal DM systems unfortunately leads to a loss of basic functionalities. This condition restricts the user's normal methods of work and is therefore frequently kept silent by the manufacturers. As a result, normal systems cannot utilise the View option in Windows. Instead, a separate viewer must be integrated, which results in additional expenses for modifications. Or else, and in addition to the original, the documents are converted into a standard format (such as TIFF or PDF for example), which means maintaining duplicate data storage.

Also, conventional technologies were not able to recognise OLE links between two files in the past and they were not able to place the link to a document on the Desktop (for direct access without research), as the documents were only temporarily available on the client. These restrictions no longer apply for integrated systems. Windream retains existing OLE links between two documents. If changes are made in the source document, then these are automatically updated when the linked target document is retrieved.

Import and export in Windream is also handled in the way we are familiar with. Whether files are imported into the DMS or exported from the DMS, this never involves more than copying files in the Windows Explorer. The original operating system functions are even retained, such as moving documents using Drag & Drop. Previous DM systems did not support anything like this.

Users want to be surrounded by familiar working environments. Conventional DM systems provided their functionalities over an own interface on their own. To do this, the user interface from the file system and

**"All documents
can be structured and indexed
using enhanced possibilities"**

its possible functions had to be simulated in the DMS. The numerous new menus and masks required the user to re-think how he worked and necessitated intensive training with regard to the new DMS environment. The time and cost involved with this was underestimated by the users and frequently played down by the providers.

Since the Document Management functions have been integrated into the operating system in Windream, there is no need for expensive user training. A DMS is now as easy to handle as Windows – the user moves around in an environment he

different from yesterday's?

is completely familiar with. The DMS is displayed like a normal drive in the Windows Explorer, but has the additional, enhanced index features. As a result, the DMS automatically uses the Explorer as the Desktop.

Unrestricted flow of information within a company requires general availability of information. The heavily discussed subject of "Knowledge Management" is inconceivable without the possibility of managing and distributing information. The possibilities of identifying and retrieving information provided by the operating system is restricted to a minimum. The structuring of documents using expanded options such as by invoice or booking number for an invoice is completely and totally impossible.

In Windream, it is possible to define document types such as an invoice, proposal or order individually. A document type editor provides extensive design tools for the index masks for individual types of documents. The user can use these to classify his documents.

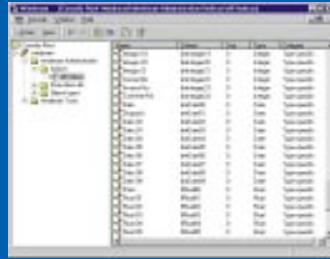


Figure 10: Administering document types with the Windream Management Console

DM systems that are able to structure documents by their expanded options are generally designed strictly as DMS solutions and treat long-term archiving as a fully separate matter. Long-term archiving guarantees the availability of documents beyond their actual time of use. At the same time, it ensures compliance with legal requirements with regard to retaining business documents. This applies particularly for applications that have their origins as pure archiving solutions. These only fulfill the minimum with regard to subjects such as document management and workflow – as an alibi function, as it were. An integrated search using the documents within the DMS and the archive is not possible.

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How is today's DMS

For the user, this means that he must know where the document he is seeking is stored in addition to the actual features. Users however demand integrated solutions that allow clear identification and searches using structured criteria irrespective of the

“The filing of documents becomes transparent for the user”

through the interconnection to the long-term archive from A.I.S. When conducting a search, all document resources are checked, in other words, both the documents filed in the DMS as well as those in the archive. This allows fast and comfortable access to archived objects irrespective of their physical file location.

A leading company of Auditors has confirmed the revision security of the archive. Support for varying storage technologies (such as the addressing of CD or WORM jukeboxes and RAID technology) ensures that all documents can be accessed and researched at any time, irrespective of where they are stored via the Windream drive.

where the file is kept. This is guaranteed in Windream

“High security aspects, such as expanded access protection, will be guaranteed”

Certain documents that are administered with a Document Management System must only be accessible to a specific circle of people due to legal or company-specific requirements. This includes confidential personnel records, the handling of which is subject to Data Protection legislation or sensitive financial data that has to remain confidential for the good of the company.

To fulfill such requirements from a DMS, Windream utilises expanded access rights, which surpass the Windows settings. Therefore it is possible that the author of a document will only permit access to authorised people or groups. The Windream access rights concept is based on the group and

user concept of Windows NT. The group association of the users is defined by the NT administration. As a result, there is no additional cost for the user administration in Windream.

According to this structure, each group is given corresponding rights on folders or individual documents. A differentiation is necessary here between read-only permission, creation permission and the right to grant permission. If a group has read-only permission, then every user in that group

different from yesterday's?

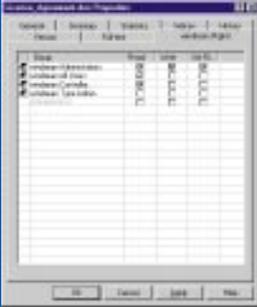


Figure 11: Issuing permissions in the Properties Menu

can open the document in its read-only condition without being able to make any changes in it. If the group has to make changes to the document, then "write" permission must be allocated. If a group has neither the permission to "read" nor "write", the corresponding directories and documents will not be displayed in the search result list or in the Explorer.

The history allows the user to have a detailed summary about the complete life cycle of a document. All actions (such as the creation, any changes in contents, changes in indices or permissions as well as deleting and restoring) are recorded and show the date, time and the name of user who performed the action.

User-defined entries that are reserved only for users with 'write' permission for the document can also be made under History. A look at the history of a document is available via the file properties, as a tab control named "history" is added to the normally existing tab pages in Windows. The use of History is recommended particularly for documents that undergo frequent modifications: for example, contracts that constantly need to be adapted as a result of on-going negotiations.

The administration of versions allows the creation of documents based on previously existing files without changing the original document's form or contents. To create a new version, the user selects the source document from the list of search results or from the file manager and activates the

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How is today's DMS



Figure 12: History in the Properties Menu



Figure 13: Administration of versions in the Properties Menu

function "Create new version" in the context menu. The system automatically creates a new version of the document whose contents, indices and permissions correspond to

"The DMS will encompass a history of changes and the administration of versions"

those of the original document and whose History shows the version number of the predecessor version.

Administration of versions is used for documents that are constantly being revised or whose development status has to be recorded at certain times. The different versions can also be used for development in other directions. Appropriate areas of implementation would be, for example, design drawings for the construction industry or for batch administration in the chemical industry.

The Check in and Check out procedure makes it possible to edit documents outside of the Windream installation (e.g. in a Notebook) and guarantees that the documents will always be updated. The Check out process is noted in the database and therefore blocks the document for any further editing; 'read-only' access is only possible then. If the user attempts to alter, delete or

different from yesterday's?

'check out' a document that is already 'checked out', then a message with the name of the person currently working on the document appears. The restriction is only lifted once the document has been checked back in using the provided "check in" procedure. Only the system administrator has the right to remove the 'block' for a document that is checked out, but that process is also noted in the document's history.

As a result of modern n-layer architecture, some DMS manufacturers have shifted parts of the application logic from the DMS client to a central server. The objective was to create local resources for the use of additional applications, such as workflow systems, for example. Unfortunately, this was achieved without taking modern interface technologies like DCOM or Corba into consideration, so although the client's resources were less overburdened, they did not necessarily gain flexibility.

"The DMS architecture must be open and flexible"

VFS technology is pursuing a completely new approach. A complex distributed DMS environment using 3-layer architecture lies behind the VFS drive, where all familiar file system operations work normally. To make the integration as a DMS-supported file system perfect, all DMS components were integrated as independent, modular enhancements in the client's operating system. These stand-alone client components are only loaded if the user actually needs them.

The individual modules have been developed as ActiveX-Controls, and can therefore also be used for Internet applications or individual solutions. All modules work with objects that have been exported from the DMS kernel using DCOM and do not access the database directly. As a result, the possibility of displaying the functionality directly via the standard interface of the DMS kernel exists, without having to bypass the system. Here, all programming environments can be used that support DCOM, starting from simple Windows scripts or macros in Visual Basic for Applications (VBA) to complex applications in Visual Basic or Visual C++.

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How is today's DMS

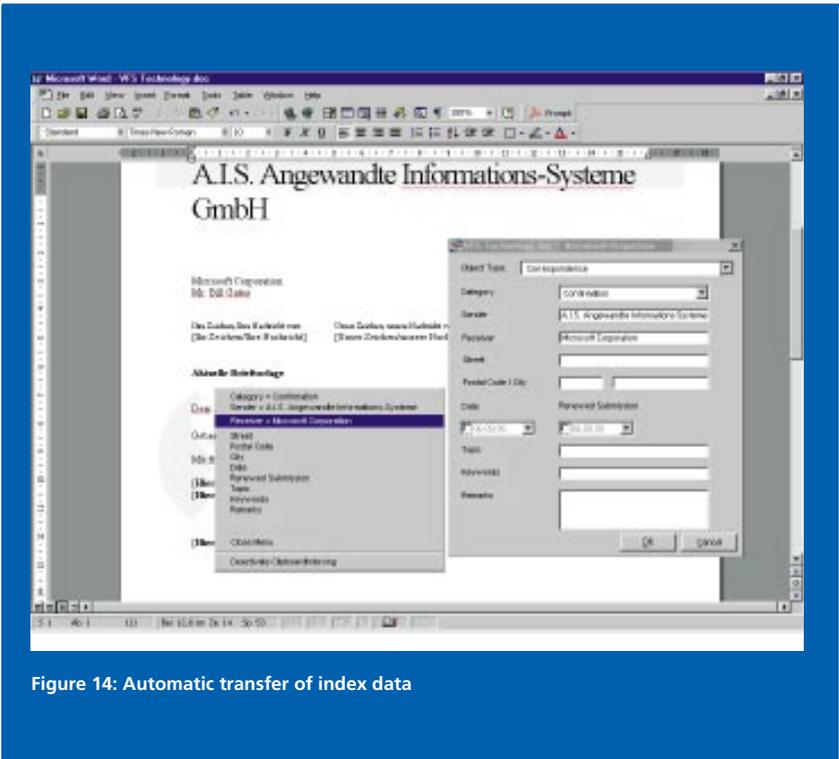


Figure 14: Automatic transfer of index data

Support for Windows scripts allows the cost-effective simple implementation of specific requirements. Thus, for example, a script can be kept in the Layout Editor for every index field or button for certain document types, which will be executed every

time you leave, enter, or activate the field. Within this script, you can access any attribute in the document and all functions of the DMS kernel. A series of actions can be automated as a result of this:

different from yesterday's?

- Automatic transferral of index data from a document
- Cross-searches in the database of a third party system, to verify entries in index fields or to update other index fields automatically with the data that is found
- Adhoc workflow through the triggering of specific activities, such as the passing on of a document to a certain recipient once an index field has been modified.

The open system architecture also makes it possible to achieve special document imaging requirements (e.g. scanning), the automatic transfer of mass quantity printing data and the linking of standard business management applications like SAP. As a result, simple scripts can be used to link high performance

“The open architecture system allows specific requirements to be implemented”

scanning runs with a throughput of several hundred documents per minute, while automatic allocation and indexing takes place in addition to automatic recognition.

The complementary use of COLD (Computer Output on Laser Disk) is also possible for companies with high quantities of mass printing files, that would otherwise have to be filed as paper documents. Large volumes of data can be automatically recorded, indexed and archived in order to be saved revision-secure.

The link to SAP makes it possible to use Windream to retrieve documents that have been archived in SAP. The SAP indices are transferred to the Windream database for this purpose. As a result, it is possible to retrieve receipts archived in SAP from non-SAP workstations. Even the opposite, researching documents filed in SAP using Windream, is conceivable.

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The competitive advantages a DMS offers primarily depend on whether it is only used in specific cases, or throughout the entire department – or if the introduction of the DMS is even related to the redesigning of the corporate processes. Wherever a DMS is used extensively, fast and safe decisions can be made as a result of the accelerated, transparent flow of information. This makes it possible to work more effectively.

vantages does a DMS offer?

In addition, the DMS ensures safe control of data and guarantees that all information is complete and up-to-date in that area where you need it. The constant

“Documents can be found quickly and customer inquiries can be dealt with immediately”

availability of information

avoids any time-intensive search. You will be able to find a certain document quickly so that you can, for example, respond to a customer’s inquiry immediately. The financial effect gained through improved customer service should not be underestimated in such a case.

The so-called media break between analogue and digital systems can be avoided. All information is available in digital form and is searched for within a single medium – the computer. As a result, you also save

“Reaction times become shorter, there is an improvement in work productivity and business processes”

time which was formerly needed for searching and working on business processes. You can reuse all documents that have been created or just individual components. The

redundant saving of more than one copy of the same document (due to duplication) no longer applies.

All of these factors contribute towards the fact that the throughput and reaction times can be shortened, work productivity and business processes can be improved and that the satisfaction level of your customers will also rise. In addition, organisational adaptations can be achieved more quickly, thereby enabling flexible reaction to different framework conditions. This leads to considerable improvements in the company’s ability to be competitive.

The introduction of a DMS also increases the measurable business advantage. Thus, many companies consider the implementation of such a system as a starting point to reduce their costs, optimise space or improve the use of staff.

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The double figure growth in the DMS market and the expectations for further upward movement in the market has brought a number of providers into this area. In Germany alone, there are currently more than 200 companies providing DMS solutions. The choice of a suitable system becomes increasingly difficult for the user, because not all software products fulfill the requirements of the user to the same extent.

As a result, extensive questionnaires and specifications are written in order to make a targeted choice and find suitable software. In addition to the functional scope and technical specifications, special emphasis is also placed on being able to show large-scale reference installations. Large-scale installations in this conjunction mean systems that are accessed by several thousand users who administer several million documents.

windream and a group of approximately 20 other providers have established themselves in the German-speaking area. All of these companies are able to meet these requirements. Only these companies fulfill the extensive requirements, which include reference sites in several countries, universal and branch unrelated implementation of the application and the integration possibility within existing structures.

However this poses the question of whether proof of a large-scale installation is that decisive for a small or medium-sized company. Other factors such as comprehensive functionality, simplicity of handling or integration into the operating system are much more important.

the right one?

As a project becomes more structured, the question of costs must be considered by the potential user, irrespective of the company size. In times when IT budgets are tight, the question of the "Total Cost of Ownership" (TCO) becomes a subject of many heated debates.

The question here is, how companies can obtain a picture in

"Up to 90 % of the costs of conventional DM systems can be saved"

advance on the costs that will be incurred and how these can be maintained within the framework of a budget.

The latest investigations have shown that only 20% of the entire IT expenses are due to acquisition costs (studies by the Gartner-Group to calculate TCO). These are expenses for hardware and software. The remaining 80 % are incurred for follow-up costs like maintenance and support, user training and administrators as well as for costs for downtimes. There is a huge potential for savings here:

a reduction in the follow-up costs could be the most imminent solution if users could do without training or if administrators did not require backups. The main disadvantage here would be that the user would not be able to utilise the full scope of the system in that case. Even doing without administrative measures would not reduce the follow-up costs, but would only move them to a later point of time.

The more effective possibility for savings on the other hand consists of reducing the complexity of the system. A system without its own desktop, whose functionality is integrated in existing applications, can be operated intuitively by the user. This minimizes the need for training.

The administration is based on operating system standards and uses its resources, e.g. its user administration. This not only increases the level of acceptability on behalf of the staff, but also lowers the operating costs.

Windream therefore offers two approaches to reduce the TCO: on the one hand, as a result of the low licensing fees, the acquisition costs are low enough that document management can easily be afforded even by small or medium-sized companies. On the other hand, the follow-up costs are extremely low and also easy to calculate. As a result, you can save up to 90 % of the costs of a conventional Document Management System.

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No expert can make a safe prediction – too many parameters and variables on the quotation and demand side influence further developments.

The following is safe to say: functional changes will depend on new technologies. The onward development of new technologies is connected with immense expenditures that can only be made by large organisations. Thus, the commercial and market political interests of the quasi-monopolistic technology owners (COM/DCOM vs. CORBA, Java vs. proprietary programming platforms, etc.) will also influence technologies. Companies like Microsoft, IBM, Oracle, Sun etc. certainly belong to these quasi-monopolistic providers.

On a more global basis, one could say that information is managed in three ways: it is saved, it is transported and it is processed. While in the early days of data processing, storage and transportation of information was supported by the processing applications, standardised software components have increasingly taken over these tasks.

These standardized modules then increasingly became the components of the operating system: file management has been part of the operating system for decades, transporting information, e.g. available via the TCP/IP communication protocol formerly an additional component in the UNIX world is now also available in most operating systems. Only the applications processing the information retain their individual characters and are installed based on the operating system, because it is impossible to standardize all possible application models.

visible in the DMS market?

Document Management and archiving certainly belong to the information storage category. As file management is within the operating system, one could conclude that even Document Management could become a component of the operating system. Recent operating systems, such as BeOS, have integrated a database in the operating system from the first day on. Here, index filing is made possible directly within the operating system.

What must always be taken into consideration in all developments is that one should largely retain the compatibility with older technologies. Just like Microsoft always had to take the compatibility of the file system of the predecessor versions (MS-DOS) into consideration when it worked on new developments of the Windows operating system, the compatibility to file management will need to be retained when transferring from file management to Document Management.

It would probably be easy for the providers of operating systems to implement a new and more powerful approach to saving information than within the file system. Such a new operating system, which would not be compatible with the earlier way of storing information, would not be accepted by the market, since one of the major production factors inside companies would be lost if the technology were changed – the existing base of information.

Workflow, currently still the controlling component of saving data, transporting and processing information, will also become a component of the operating system. However, there is one restriction here – at the beginning only fundamental and general processes for handling processes will be available, as specialised sequences are very closely linked to the type of application, and, as we know, the number of various applications is almost never-ending.

Until now, specialised features within Document Management Systems, such as Imaging, COLD, implementation of fax message solutions or press clippings, are still undergoing further application-specific refinement. Depending on the market demand, fewer or more providers with functional performance advances will be able to establish themselves here.

The archiving component that includes the task of providing revision-secure documents will play a role within the document system of the refined information storage hierarchy of the operating system. Just like the classic types of media such as tapes, disk devices and CD-ROMs are interconnected via the operating system, in the future jukeboxes will also find a place in the digital information storage hierarchy within an operating system.

“Workflow will also become a component of the operating system”

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Glossary

- Access rights:** access rights are assigned to every document that requires archiving. There is a difference between Read and Write rights. Users with Read-only rights can look at a document, but cannot modify it, while users with Write permission can actually make changes in a document.
- ActiveX:** technology based on the Component Object Model (→ COM) from Microsoft that makes it possible for software components to communicate within one another in a networked environment irrespective of the programming language they were developed in.
- ActiveX Controls:** (ActiveX-Control Elements) reusable standard elements on a user desktop based on ActiveX technology; these are used to integrate specific functions, thereby making it possible to create forms and dialog fields quickly.
- ADO:** (ActiveX Data Objects) a concept as well as an object oriented interface for access to various sources of data (e.g. databases, file systems).
- API:** (Application Programming Interface) a programming interface for communication between an application and a service.
- Archive:** used for the long-term, orderly and statistical retention and administration of documents. A search can be carried out within an archive for any document that is filed there. Under normal circumstances, archived documents are only accessed in a 'read only' state and cannot be changed.
- Archiving systems:** are generally used for final filing and are used for revision-secure, unchangeable storage of information. Electronic archiving systems are closely based on a similar approach as classic Document Management Systems. Here, individual documents and containers are administered using a database. Archiving systems also have the possibility of administering large quantities of information in → Jukeboxes.
- Attribute:** the identifying or descriptive property of a document.
- BLOB:** (Binary Large Object) a data object that can be retained but cannot be interpreted by the archiving system.
- BLOB ID:** the internal identification number for the data object (BLOB).
- Boolean operators:** or even logical operators such as "and", "or", "not" allow a linking of search criteria into complex search inquiries.
- Branching:** the parallel existence of several current versions of a document.
- CAD:** (Computer Aided Design) overall concept for the use of computers in the designing of products.
- CD:** (Compact Disc) industrially manufactured read-only storage media. Originally developed by Philips and Sony as an audio-CD.
- CD-R:** (Compact Disc – Recordable) optical storage medium that enables the user to record the media once.
- CD-ROM:** (Compact Disc – Read Only Memory) industrially manufactured optical storage medium that is 5 1/4 inches in size – can only be used as 'Read-only' by the user. CD-ROMs have a capacity 650 MB.
- Check in, Check out:** a function of → DMS for the documented export or import of data out of and into the DMS, which also allows the external handling outside of the system.
- Client:** a system in a network environment that cannot provide a service itself, but requires the services of a Server.
- Client-Server architecture:** describes the interaction between the sources of a workstation with the special resources of a central entity from the Client's aspect. A Server in turn can become a Client if it uses other services. Typical Client functions include user desktop support or local Document Management. Server functions are characterised through central database administration or communication management.
- COLD:** (Computer Output on Laser Disk) procedure used for the archiving of mass data on digital optical storage units. COLD systems accept several files, extract index data and save the information. Data can then be displayed in its original format with the use of overlays or background layouts.
- Collection List:** an enhancement of the list of results. The documents selected in the list of results can be copied into the collection list and edited with the functions available here.
- COM:** 1. (Computer Output to Microform) direct filming of coded processor information on microform media. 2. (Component Object Model) a specification that describes the development of software components. It is the basis for specifications → ActiveX and → OLE. COM objects can above all be integrated or used by all programming languages. Also see DCOM.
- Compound Document:** document made up of various objects such as text, image, table, audio, video, etc.
- Compulsory indexing:** a name for indices that are assigned by the user. These are needed for the archiving of a document. If an index was not entered properly or is missing, then the system will indicate this and the incorrect or missing entry will need to be entered.
- DCOM:** (Distributed Component Object Model) the version of the Component-Object-Model-Specification that defines how individual components will communicate with one another within the network. Results in DCOM being able to distribute various components of an application to several network computers. Also see COM.
- DDE:** (Dynamic Data Exchange) Microsoft-Standard for the exchange of data between application programs.
- Desktop Program:** electronic desktop that simulates a normal, object oriented office workstation on the screen.
- DMA:** → Document Management Alliance.
- DMA-Model:** specifies fundamental operations and mutual elements of all DMA-conforming Document Management Systems. Access to a DMA system is provided via access points and service points. DMA Middleware handles the distribution of the access. For the Client, DMA offers a uniform view of all documents, irrespective of their location, their creation, etc.

Glossary

DMS: → Document Management System.

Document: applies not only for earlier paper documents, but can also contain any other digital type of information that is linked together into a document. A document can consist of one (e.g. an image or a set of data) or several individual objects (e.g. several images, a file with integrated images, text and tables, a mixture of content from several sources).

Document ID (Doc-ID): a unique document number that serves to identify this document. The ID number is consecutive and is automatically issued by the recording system.

Document Imaging: computer-supported detection, storage, search, modification and output of images.

Document Management: acquisition, processing, administration and storage of documents while ensuring accuracy, performance, safety and reliability irrespective of who saved the documents or what format they were saved in.

Document Management Alliance (DMA): a cooperation of more than 100 companies with the objective of providing standards and products that will facilitate the interoperability of Document Management applications.

Document Management System (DMS): total system consisting of hardware and software with which all information existing within an organisation can be recorded, administered or handled. This information can be available in paper or electronic form. Paper documents are transferred to digital format prior to be recorded. The document that is to be recorded must be indexed and can then be subjected to a targeted search and retrieved later. Furthermore, referring to the contents of a document allows a full text search (→ full text) to be carried out.

Document Management System (DMS) in the narrower sense: makes it possible to administer files on networks. These systems are document oriented, i.e. they are accessed, administered and displayed based on the document characteristics.

Document Management System (DMS) in the wider sense: overall term for the increasingly mixed DMS system categories in the narrower sense, → Document Imaging, → Groupware, → Workflow, electronic archiving systems with digital optical storage, E-Forms and more.

Document type: describes documents with similar characteristics. specific document types are assigned to documents to classify these. The document types are defined according to their use and can be set up accordingly. Such document types are for example notices, proposals, and orders.

Drag & Drop: an action carried out with the use of the mouse during which the object (e.g. files) is moved within a graphic user desktop.

DVD: (Digital Versatile Disk) a storage medium in the format of a Compact Disk, but with a higher storage capacity.

EDI properties: (Electronic Data Interchange) overall concept for system concepts that make it possible to transmit data to a DP system and to directly process these further electronically.

EDMS: 1. (Electronic Document Management System)

→ DMS. 2. (Engineering Document Management System) A DMS for preferential use in a technical environment for the integration of production planning or CAD systems. 3. (Enterprise Document Management System) Document Management System used throughout an organisation or corporation.

E-Mail: electronic mail that can be mailed individually or according to distributor lists on networks. An exchange of data of any kind is possible between users.

Enabling: interlinking/enhancing of existing applications for and involving DMS functionality.

Facsimile: copy of an original. Information (e.g. text, graphics), that is available as a screen image. With facsimiles, this involves unencoded information that cannot be processed any further directly by the processor.

File structure: a hierarchical classification system for documents. With the help of the file structure, the user defines where, i.e. in which column, the document to be archived is to be filed.

Filing area: used for keeping and administering documents on the short or medium term for the purpose of fast and simple access; should be considered as the dynamic and changeable part of a → DMS. Can be compared with a classic Document Management System in the narrow sense.

Folder: is considered an index; it is not mandatory to provide this when documents are recorded. Represents a filing element to which documents can be assigned if necessary, that can be retrieved during an index search, according to its assignment.

Form: prepared form, can also be an electronic form, which allows the input and output of formatted and standard information.

Full text: text information for a CI file (e.g. the text of a Word file). It is not subject to any uniform structure and cannot be saved effectively on a → RDBMS or used for search purposes.

Full text database: a database in which the complete text is indexed and therefore allows a content-related search.

Full Text Retrieval System: a system for searching and retrieving documents, document groups or document sections while referring to the full text.

Full text search: search method in which direct reference is made to the contents of a document. Reference to chains of characters or word usage is also possible.

Function rights: authorisation of a user to use a certain function in an application.

Groupware: starts out with office communication modules, links individual components with its own intelligence and provides task-oriented tools to allow all groups to work together.

Hierarchical search: a search function that searches through document categories for saved documents.

History: functionality of a DMS that provides the user with an overview of the entire life cycle of a document. All actions such as creating, editing or changing are documented and can be examined by the user.

Glossary

- Hitlist:** results of a Search request in which the user can see what documents fulfill the indicated search criteria. List of Results, Hitlist.
- ICR:** (Intelligent Character Recognition) method for recognising text in a NCI document. In addition to OCR methods (→ OCR), other sources of information are taken into consideration during the conversion, which improves the recognition rate over standard OCR technologies.
- IFS:** (Installable file system) an architecture component of the file system, which is responsible for handling the access of various components of the file system.
- Index:** search criteria; the amount of defined search information for the → retrieval and access. The index is comprised of descriptive and identifying attributes.
- Index database:** the integrated reference database of the DMS that contains the index information about the filed or archived documents.
- Indexing:** normally a database supported process to create unique access information for fast retrieval of saved documents, document groups or individual document components.
- Java:** programming environment for the World Wide Web by Sun Microsystems, licensed by Netscape and Microsoft; for the development of interactive documents and to link programs to websites.
- Jukebox:** automatic drive changer for optical storage media. Jukeboxes today allow access to almost unlimited quantities of data.
- LAN:** (Local Area Network).
- MAPI:** (Messaging API → API) Middleware-Messaging-Standard from Microsoft.
- Microfilm:** analog medium for the storage of non-coded information (NCI).
- Migration:** possibility or necessity of transferring access information and documents from one system to another.
- NCI documents:** (Non Coded Information) non-coded information such as pictures, speech, sound, video, etc. that are not recognised by the computer and cannot be processed directly. A typical NCI application is the recording of documents using scanners and their handling as a facsimile.
- Network file system:** a Network file system that allows users access to files and directors far away or on local elements.
- NFS:** (→ Network file system).
- NLS-Support:** (National Language Support) describes the display of the user desktop, the outputting of error messages and help texts in the language selected by the user.
- NT:** abbreviation for Windows NT, a Microsoft operating system in the upper performance range.
- OCR:** (Optical Character Recognition) method to convert texts into grid format (→ NCI documents) in an encoded sequence of characters that the processor can process (CI → Coded Information).
- ODA (ISO 9613):** (Open Document Architecture) ISO standard to describe structure and content of complex electronic documents.
- ODBC:** (Open Database Connectivity) standard for database access that is not manufacturer dependent.
- ODMA:** (Open Document Management API → API) standardised high level interface between Desktop applications (→ Desktop programs) and the Document Management Systems (Client interface).
- Office communication:** a software package consisting of individual modules such as text processing, table calculation, graphic application, database, calendar or E-mail. The modules that are in the background such as the mail or database components are often differentiated as being the "Back-Office" while on the other side, applications that are directly executable on the screen such as text processing, table calculations or graphic applications are considered to be the "Front-Office".
- OLE:** (Object Linking and Embedding) Windows procedure for the linking of objects. OLE offers two options: 1. Linking: Linking of a document with other files (text, tables, graphics, etc.) that do not become part of the original document but remain independent objects. 2. Embedding: The objects become part of the document that they have been embedded into.
- OLE-DB:** a strategic programming interface at system level developed by Microsoft for universal company-wide data access – has been introduced as the successor of ODBC. OLE-DB is not restricted to data sources from relational databases like ODBC, but allows access to all data types, irrespective of their format or how they were saved. As a result, access is also possible to Excel data, text files, E-Mail data, etc. OLE-DB provides COM interfaces for programming.
- Online:** direct, providing and processing information based on current inputting requirements.
- Online archive:** documents in the online archive have direct Read and Write access; this means the affected storage area is located on a drive (single or jukebox drive).
- Online database:** database with direct access, which outputs the results immediately after inputting; normally, central information databases, that can be consulted via telecommunication lines by external users.
- Operators:** search operators such as "and", "or", "not" or "follows" are used to link together search concepts.
- Path:** a type of description of the storage area for a file starting from the highest level of the tree structure of a drive.
- PDF:** (Portable Document Format) was developed by Adobe and is suitable for use throughout the system. All data that has been converted into PDF format can be viewed with an external Viewer program (Acrobat Reader); this is available for a large number of operating system platforms.
- Pool:** pools contain → BLOBs, which should be handled equally. For example, these BLOBs can have the same storage period. Several BLOB containers can be contained within one pool. BLOBs can belong to more than one pool.
- Principles of electronic archiving:** electronic archiving system requirements in order that these can be accepted as being revision secure, consistent and recoverable (revision secure archiving).

Glossary

- Process Control:** → Workflow- or system supported, automated, and standardised handling of a process from a workstation.
- Process Control:** originally a synonym for → Workflow (→ Workflow-System), but only contains the link between individual modules and predefined dialog sequences.
- RAID:** (Redundant Array of Independent Disks) a data storage process in which the data is stored with error correction codes in at least two or more hard disk drives to increase performance and data security.
- RDBMS:** (Relational Database Management System) database system with relational architecture. Is suitable for the administration of large quantities of structured data and its selective evaluation. The information can be linked together in multi-dimensional relationships and can be queried using various interconnected criteria. The data must clearly be structured if it is to be used in a relational database. Subsequent search criteria must have been defined precisely from the onset.
- Result list:** results of a search from which the user can see what documents fulfill the required search criteria.
- Retrieval:** the retrieving of documents or document groups using firmly defined index criteria.
- Revision secure archiving:** long-term storage of unchanging documents according to the legal requirements.
- SBE:** (→ Small Business Edition).
- SBX:** (→ Small Business Extension).
- Scalability:** expansion of a DMS, where the old and new components (in comparison with cascaded) represent a local unit (for example a further jukebox on an existing jukebox server, which is administered by the same → IRS). This involves the expansion of the memory area, the system performance, etc.
- Scanner:** device for the digitalisation of paper or microfilm documents, comparable to a copier.
- SDK:** (→ Software Development Kit).
- Search history:** the results of a full text search are displayed in the list field for the Search History group. The list contains the number of the search runs issued by the program, the number of the document that were found and the search definitions. A search term can be selected in the Search History.
- Self-contained Object:** objects, which encompass their administrative information (for example references, processing rules, etc.).
- Server:** an instance (hardware or application) that provides a specific service that can be used by the workstations connected to the network. The Server is event-controlled, i. e. it "waits" for Client requests (→ Clients). The corresponding actions are carried out once a request is received and the responses are sent back to the Client via the network. Typical server services are mutually used devices (Shared Devices) and quantities of data, external communication, printing serving, LAN communication and management or Server applications.
- Service:** a service that provides various Clients to a Server, for example, a printing service.
- SGML (ISO 8879):** (Standard Generalized Markup Language) ISO standard for the software and hardware independent description of the structure and content of documents and document categories.
- Small Business Edition:** product version of Windream having restricted scope, especially designed for smaller companies.
- Small Business Extension:** a functional enhancement of the Small Business Edition.
- Software Developer's Kit (SDK):** a collection of routines (normally in one or more libraries), which simplifies the writing of programs for an operating system or a user desktop. The object model is described in the Windream Software Developer's Kit – it also contains descriptions of programming with Windream by using the methods, results and properties that are available. This also includes program examples.
- SQL:** (Structured Query Language) a database language for querying, updating, administering data in relational database systems.
- SQL (ISO 9075):** (Structured Query Language) structured standard interrogation language for defining, updating, administering and querying relational databases.
- SQL Server:** database system from Microsoft.
- Stack feeder:** is used for scanning masses of receipts (paper-based documents) in one batch run or one after the other in a stack. These documents are inserted into the feeder and are pulled into the scanner page by page. The procedure is only completed after the last page has been pulled in.
- Structured search:** a search for documents using the indices. Items such as the document type, author or date of creation are considered as indices.
- TCP/IP:** (Transmission Control Protocol/Internet Protocol) standard network protocol for the Internet and elsewhere.
- Thesaurus:** connects and sorts related terms and synonyms and shows hierarchical or other relationships between the descriptive features of the documents.
- Thumbnail:** small preview of a picture.
- TIFF:** (Tagged Image File Format) standard file format for images – allows various conversions – various versions are available for TIFFs. TIFFs can be generated and processed onwards by most image and text processing programs.
- TWAIN-Interface:** the standard for image processing products with which files can be scanned in graphic format from any TWAIN-compatible peripheral device.
- VBA:** (Visual Basic for Applications) a macro language based on Visual Basic, used to program a wide range of Windows applications – already contained in various applications.
- Versioning:** a process in which a → DMS administers various versions of the same document or of documents that are based on one in parallel.
- Version management:** management and consistent storage of various versions of documents, programs, etc. (→ Document Management System in the narrower sense).

Glossary

VFS: (→ Virtual file system).

Viewer: program to view a specific or several file formats. The Viewer cannot be used to edit a document.

Virtual file system: a technology that adds a virtual drive to the drive system, which offers the user all properties of an actual existing drive.

Visual Basic: a development platform for visual programming that was developed by Microsoft for the creation of Windows applications.

Visual C++: a Microsoft application development system for the C++ programming language that uses MS-DOS and Windows.

WAN: (Wide Area Network) association of geographically widespread independent processors for the purpose of exchanging data within a logical network.

Wildcards: well-known from DOS inputting – characters that are not defined, that keep a partial content of a search string open, i.e. can be random.

Workflow: computer-supported automation of business processes or procedures (also termed → Process Control).

Workflow Management Coalition (WfMC): international group of more than 100 Workflow pro-

viders, users and advisers, primary standardisation bodies within the Workflow area.

Workflow Reference Model: describes general characteristics, functions and interfaces of Workflow systems.

Workflow system: also Workflow Management System; a system that defines, controls and executes workflow while considering resources, deadlines and costs with the help of software. A Workflow System consists mainly of two components: the Buildtime component to define the process or Workflow and the Runtime component to execute the Workflow.

World Wide Web (WWW): standards which describe the exchange and the display of documents in one common, platform-independent format.

WORM: (Write Once, Read Many) 5 1/4 inch storage media that can be recorded once and read as often as you wish. WORMs have various capacities between 1.3 GB and 10 GB. There is a differential between "Soft" WORMs (identification of the media with a code, data can theoretically be changed) and "True" WORMs (non-alterable recording of information through the physical modification of the surface – an appropriate storage media for revision secure long-time archiving).



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