

a CKO provides a focus on the knowledge development strategy within the organization.

A KMS is evolving in an Enterprise Information Portal⁵ which is described in the next section. EIP's are one way of disseminating knowledge through an organization, Internet-based training, and what is now called e-Learning. Many companies combine their portal strategies with their online courses and make courses available through portals. Since 1999, the rise of EIP's (from enterprise home pages) has been a noteworthy trend in knowledge management. EIP's are also called corporate portals, enterprise knowledge portals, and collaborative portals. They give users one-point access to knowledge and application resources through the Web browser.

The outlook for KMS is upbeat, as EIP's provide information outside traditional organizational bounds and collaboration work (via an EIP) calls for higher levels of knowledge sharing. The adoption of EIP's will accelerate the establishment of KMS within organizations. Because of the widespread familiarity with Yahoo! and other consumer portals, more users will expect their corporate intranets to offer similar capabilities (such as search engines and automatic document summaries) across the enterprise-wide collection of structured and unstructured documents. Along the way, this trend will help organizations to transform from unwieldy corporate intranets into KMS.

EIP-ENTERPRISE INFORMATION PORTAL – *INTRA-OFFICE AUTOMATION*

EIP is an info-communication system which applies Web technology (on the intranets and extranets) to create a single place where one could start a search for information and knowledge using a search engine, data mining, On Line Analytical Processing (OLAP), and query and reporting techniques. The model for this type of a system comes from the successful Internet portal such as *Yahoo!* which is used by both consumers and business people.

The architecture of EIP is provided in Figure 4-13. EIP's are now being constructed to help knowledge workers locate, manage, and use all this information/knowledge within the context of their jobs' informed decision making.

Some software companies offer toolkits to help develop this read-only software. For instance, Microsoft has launched a toolkit – Microsoft Nuggets – which is a part of its Digital Dashboard strategy.

For those companies that prefer to have their portals maintained and managed by a third party, outsourcing options are becoming more widely available. For example, CoVia, Epicentric, and Netscape are among the companies that build and host specific company/industry-oriented portals.

Generic portal software packages are available in the market, such as IBM/Lotus' Knowledge Management Suite, Oracle's Portal Framework, Viador's E-Portal Suite, and others.

The adaptation of EIP's will accelerate the penetration of KMS within organizations. Because of the widespread familiarity with Yahoo! and other consumer portals, a great number of users now expect their corporate Intranet to offer similar capabilities. In such a manner, Intranets can be transformed into true Knowledge Management Systems.

The EIP is characterized by the following attributes:

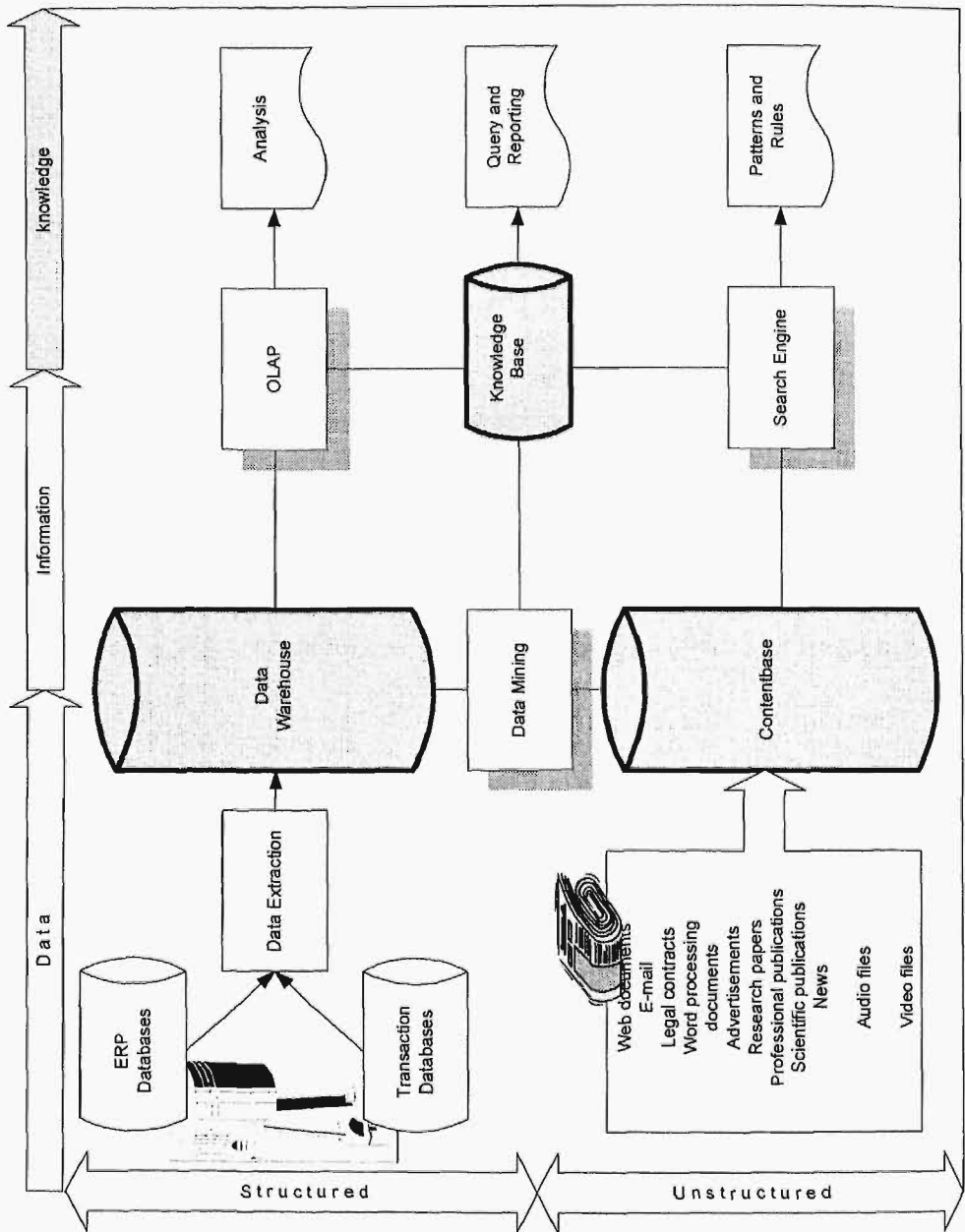
- “Push” and “Pull” technologies are applied to transmit information to users through a Web-based interface with a very user-friendly GUI (Graphic User Interface),
- The interactive ability allows the users to communicate with EIP through e-mail, chat rooms, bulletin boards, etc.,
- Technologies such as Content Management, Business Intelligence (OLAP), Data Warehousing, Data Marting, and Data Mining are integrated into a single system that can handle information from one user browser,
- The ability to access external and internal sources of data, information, and knowledge.

The success of portals leads toward the development of many types of portals that at the present time can be recognized as:

- Enterprise Information Portals (EIP) – displayed on the Internet for visitors and potential customers (“data-centric”),
- Business-to-Employee Portals (BEP) – for internal way of communicating and information handling in inter-office applications (“information-centric”)
 - Filing expenses reports,
 - Selecting training and participating in Web-based classrooms,

- Requesting supplies and computer maintenance,
- Managing medical insurance and retirement funds,
- Other.

Figure 4-13: The Architecture of Enterprise Information Portal (The Targowski Model)



- Application Enterprise Portals (AEP) to integrate different applications via Web technologies in a mode of “process-centric.”
- Vortals – vertically oriented portals oriented toward a given industry/business which contain industry news, articles, white papers, lists of recommended books, advertisements, and even e-commerce,
- Other, such as consumer portals.

In general, one can say that these portals serve as the presentation layer (a single gateway) for business key information, business intelligence, human resources, e-business, CRM, SCM, and other systems and their components.

The EIP provides the following capabilities:

- Text retrieval for relevance with queries;
- Personalization allows users to see information related to their activities;
- Knowledge classification to summarize available scientific data and rules;
- Document management is applied for unstructured and semistructured documents;
- Collaboration tools permit co-creation and sharing of common documents, and discussions in synchronous and asynchronous modes.

DMS-DOCUMENT MANAGEMENT SYSTEM

In the shift from paper-based commerce to e-business, documents do not go away and the new challenge is how to incorporate paper's digital documents into e-enterprise's applications. Here are some examples of document handling challenges (Bruce Silver, www.eBiz.com):

- Customer Relationship Management
 - A customer sends a letter to request a new service from the power or telephone utility and does not have any response in the next few days. Then the customer phones the call center where the agent does not know about the customer's letter and the former is unhappy.

After implementing the integrated document system, the agent knows about the customer's letter and the latter is satisfied.

- Fortune 1000 companies receive many calls from their employees about retirement plans and their statuses; however, the help desks do not know in time about an employee's recent document submission, so the employee is unsatisfied.
- Credit card companies use the call centers to resolve disputes about payments, but if all documents are digitized, then the agent knows how to solve the customer's problem.
- Financial services, utilities, and other organizations can use the call centers to smoothly solve the customers' problems if appropriate documents are in a digital format.
- Human Resources Self-Service
 - Employees can online update and query all personnel files, especially those associated with benefits and expenses, if all appropriate documents are digitized. Many documents require a signature or must be original, like birth certificates or physician statements; in such a case these documents must be stored in an image format.
- E-Bill Presentation and Payment (EBPP)
 - The most common way of communicating with customers is in the form of the bills and statements that the service providers send each month. The EBPP system allows the customer to pay bills and receive the account's status through Web technology via the Internet. Because all documents are in digital format, it ensures that the payees obtain superior customer services, and vice versa; the service providers can exercise marketing technique 1-to-1 and apply data mining to discover the customers' behavioral patterns.
- ERP/Financials
 - Accounts payable is a paper-intensive process that must match received invoices with delivery receipts, purchase orders, and other documents in order to be paid. Timely processing is critical to receive discounts or avoid penalties. With Web access to these digitized documents, the accountants can close transactions quite easily and quickly.

Some enterprises such as hospitals are a huge factory of documents⁶. For example a hospital with 400 beds processes the following volumes of documents:

- 8,000 payors remittances per month,
- 150 physician completing records electronically,
- 6,000 medical records per month,
- 15,000 pages faxed per month automatically,
- 2,000 pages faxed ad hoc,
- 13,500 documents signed with an electronic signature

Other types of documents include (in thousands):

- Outpatient lab results,
- Outpatient radiology results,
- Dictated reports,
- Coding verification worksheets,
- Miscellaneous documents

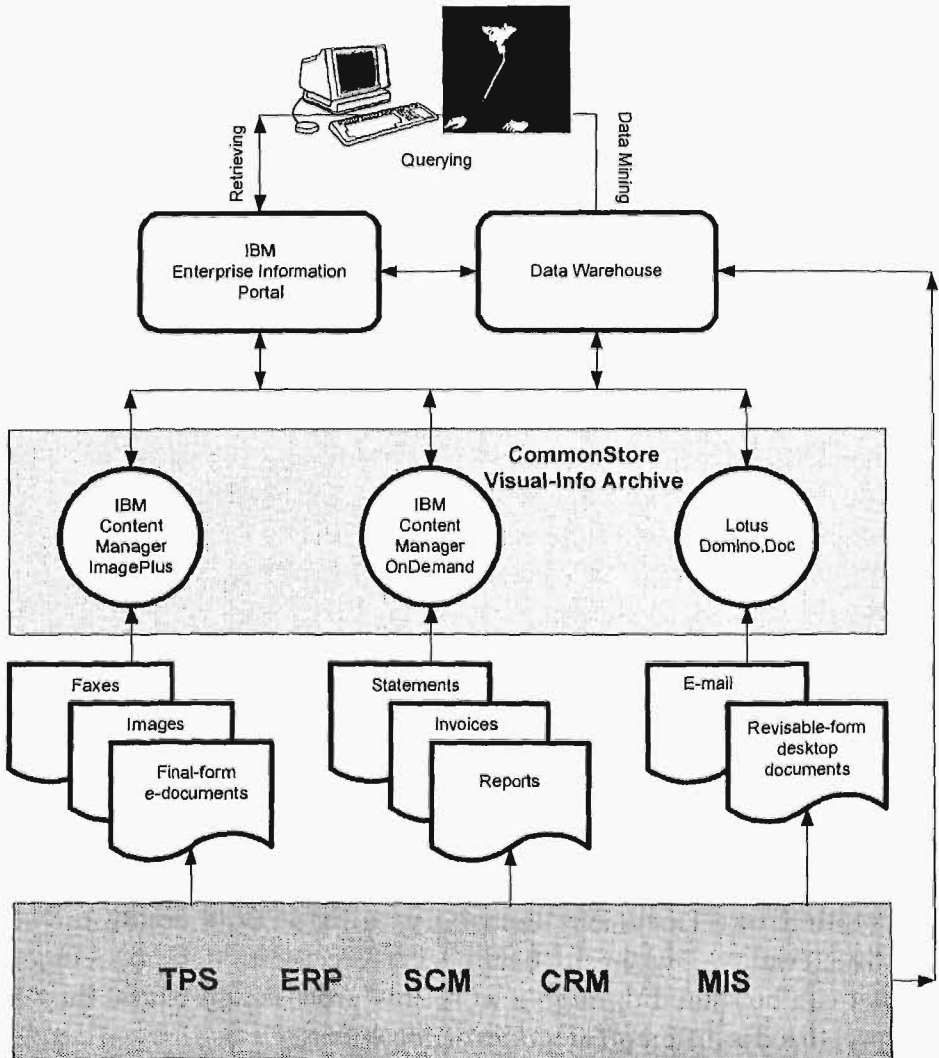
Some financial institutions process even more documents, and in order to do so, an e-Document Management System has to be applied, as is illustrated in Figure 4-14.

For example, IBM's approach for the e-Document Management System has the following stages:

1. Creating the e-Document Repository, called a "CommonStore-Info-Visual Archive," where three subsystems create e-folders of documents that can be routed through a workflow process and where they are specialized in different categories of documents:

- IBM Content Manager subsystem digitizes and stores images, faxes, and final form documents,
- IBM Content Manager OnDemand hosts other systems' outputs, such as statements, invoices, and reports,
- Lotus Domino.Doc stores revisable-form desktop documents and e-mail.

Figure 4-14: The Architecture of e-Document Management System



2. Providing an integrated search and retrieval capability spanning all three e-document repositories through the IBM Enterprise Information Portal. It defines search templates that translate the index fields of each repository into a common vocabulary used in the query screens.
3. Each e-document repository is Web-oriented and can be searched individually or through EIS that is also Web-oriented. In addition, by using a Java servlet on a Web application server such as IBM Webshare, Enterprise Information Portal can provide an “ultra” client that communicates to the Web browser in plain HTML script.
4. Automating business processes that use e-documents through IBM MQSeries Workflow. Workflow makes e-documents accessible and transforms them into key components of e-business transactions.

At Hewitt Associates (12,000 consultants in Human Resources services in 75 locations in 35 countries) all clients’ papers such as birth certificates, benefits election forms, and others are scanned into Content Manager and indexed by the company’s and employee’s Social Security Number. When a client phones the call center and provides the unique PIN, then the agent can access all e-documents and answers the question or solves the problem. Also, the employees can access their own e-documents via the Internet.

The next expected solution in e-Document Management System is the ability to handle audio-visual documents for more comprehensive informing and for knowledge discovery processes. IBM DB2 Universal Database is ready to handle such documents, and IBM Intelligent Miner for text is the first step to support broad searches of all types of documents.

INFORMATION SERVICES

Information services have emerged together with the broader application of the Internet as an external information source. They are delivered free or on pay basis through the Internet. Among such services one can mention the following financial news:

- *Electronic Yellow Pages* - a well organized data collection of business and community services. This is a dynamic database which interactively

can be retrieved by the user. The best known yellow pages are the French Minitel services.

- *Financial News* provided by such companies as Dow Jones, Reuters, Knight-Ridder, Associated press, McGraw-Hill, Financial News network, and market News Service.
- Stock Quotations are provided by Reuters, Holdings PLC, Quatron Systems, and Telerate. They provide information about most stocks, all commodity and financial features, and the market data: bids, offers, last-sale prices, and stock volume information.
- *Value-Added Products* - provided under the form of historical information, research information, and customized information. Companies providing such information are Quatron, Reuters, Bridge Brokerage Systems, Morningstar, and so forth.
- Foreign Exchange Data - this service is provided by Reuters, which launched the Monitor Dealing Service, allowing traders to negotiate transactions over their terminals instead of telephones. Other competing companies are Reuters, Telerate, and AP-Dow Jones.
- U.S. Government Bond Data are provided by Telerate.

Database and information retrieval services offer subscribers the ability to tap into more than 5000 commercial databases covering thousands of subjects provided by hundreds of companies. They are organized into six functional levels:

1. The information originator, a publication like *The Washington Post*, *The Wall Street Journal*, or *The New York Times*.
2. The database maintainer; an agency, company, or private individual in charge of loading and updating a computer-based database system and leasing telecommunication lines to end users.
3. Service vendor; a company or agency that provides marketing and sales of a database to information consumers (e.g., Lockheed, with some hundreds of databases).

4. Packaged analysis creator who provides analysis of raw data.
5. Search services; intermediary information brokers who provide industry-wide searches of all electronic commercial storages and sites.
6. Information consumer.

Among those companies one can recognize the following information service providers: Knowledge Index, Dow Jones news, Datatimes, NEWSNET, BRS/After dark, EASYPNET, and Lexis and Nexis (legal information).

Among consumer information services providers one can mention Internet Portals such Yahoo! and America Online (AOL) with 30+ million users. Their menus are similar. For example, some of AOL's categories are as follows:

Mail	Stock Quotes Area
News & Finance	Top News of the Day
People Connection	Directory of Services
Lifestyles & Interests	What is New Area
Entertainment	Download Manager
Learning & Reference	File Search/Software
Travel & Shopping	Forums
Computing & Software	Members' On-line Support

The most popular service is "Forums," which provides message-based and real-time conference areas for the special-interest groups.

SCM-SUPPLY CHAIN MANAGEMENT – *INTER-OFFICE AUTOMATION*

The supply chain includes all functions involved in filling a customer request. These functions include: suppliers, transportation, distributors, new product development, manufacturing, marketing, finance, accounting, retailers, customers, customer service, etc. For example, when a customer buys online a Dell computer, the supply chain embraces the customer, the Web page that acquires the customer's order, Dell's manufacturing plant, and, going backwards, all of the seller's suppliers and their suppliers and distributors.