The KMS Road Map

The first phase: evaluation of the infrastructure and aligning KM and business strategy.

The second phase: KM system analysis, design, and development.
- Knowledge audit and analysis.
- Designing the KM team.
- Creating the KM system blueprint.
- Selecting KM technology.
- Developing the KM system.

The third phase: KMS deployment.
The final phase: measuring ROI and performance evaluation.

Amrit Tiwana, 2002

Technology Components of KM

- A balance between “must have” tools and “should have” tools (constrained by time/costs)
- Needs to support both tacit and explicit knowledge processes

Technology is an enabler of KM systems
A KMS Technology Architecture

- User Interface: e.g. browser
- Authentication/Security Layer: includes access identification, firewalls, and user recognition
- Collaborative Intelligence and Filtering: such as intelligent robots to disseminate news, based on agent or AI technology
- Application Layer: includes collaborative work tools, video conferencing, decision support tools, yellow pages, etc.
- Transport Layer: including WWW, TCP/IP, e-mail, document exchange, SMTP (Assumes existence of an appropriate Physical Layer such as cables, physical wires, modems for transmission)
- Middleware and Legacy Applications
  - Repositories: such as data warehouse, databases, documents and other files (Tiwana, 2002)

Supporting technology and functionality

- Local area network (LAN)
- Intranet-based webs
- Should work on multiple types of computer platforms
- E-mail
- On-line publishing
- Application distribution
- On-line search
- Distributed databases
- Multimedia data management
- E-mail archives
- Frequently asked questions
- Minutes of the meetings
- Product information
- Business intelligence
- Project management
- Reports
- News
- Personal homepages
- Videoconferences

Intranet

- An intranet is the main tool for sharing knowledge and allowing staff to tap the organisation’s know how.
- Primary aim
  - Create and distribute up-to-date information
  - Give access to information resources within organisation
  - Give access to historical information
  - Create and maintain organisational memory
  - Link people
- Targets
  - Knowledge repositories
  - Mostly structured information (reports, manuals, and documents)
  - Discussion databases/forums for sharing business information
  - Hyperlink-connected Internet documents;
  - Groupware databases;
  - Thesaurus is essential to most on-line repositories
Portals

- A simple concept: a personalized and customised Web-based interface that consolidates access to information, services, and applications
- Provides an "Information Ecology" for KM
- Facilitates knowledge sharing
- Facilitates knowledge transfer
- Makes organizational processes more transparent
- Is a front end and a major component of KMS

“Work is not where you go, but what you do”

Types of KM Portals

- Information portal provides instant access to personalised content and services.
- Collaboration portal facilitates online real-time communication, brainstorming sessions, and allows selective push for relevant information.
- Team portal monitors efficient workflow-based task management among teams and members, sharing of skill sets.
- Expertise portal connects organisational experts to members who need their help (e.g., yellow pages, profiling, push/pull facilities, interactive sessions with experts).
- Learning portal maintains skill inventory, facilitates skill-upgrading through online learning sessions.

Types of KM Portals (accessed 2001)

Another classification

- Corporate Portals
  - Business Intelligence
  - Business Area
  - Horizontal (collaboration, expertise)
- e-Business (Extranet) Portals
  - Connect right customer to right service
  - Provides secure channel for business transaction
  - Facilitates Customer Relations Management
- Personal Portals
- Public Portals
  - General – Yahoo.com
  - Excite.com
- Industrial – specific audience, Village
- Specific purpose – healthcare portals
Role of Intelligent Technology

- Modeling expertise
  - expert systems approach ("objectified" knowledge "carved" in a computerised form)
- Solving problems by analogy
  - Case Based Reasoning (CBR) approach
- Simulating problem solving
  - neural networks
  - Dealing with ambiguity
  - fuzzy logic
- Evolving solutions
  - genetic algorithms
- Search
  - Intelligent agents

Knowledge Based Systems

- An Expert System is ... "a computer program that emulates the behaviour of human experts who are solving real-world problems associated with a particular domain of knowledge."
  - Pigford and Baur (1990)
- Knowledge Based System is a more general term than Expert Systems
  - there may be no expert for the problem
  - systems may encode policies, rules, regulations which no one person knows completely
  - system may not represent any one individual's method of problem solving
  - systems may be used to support rather than replacement of people

Case-Based Approach

- Case-Based Reasoning (CBR) - reasoning from experience.
- Knowledge about past experience is represented as cases
- CBR is based on psychological theory of human cognition
- Assumes that when solving a new problems we rely on past experience.
  - New Solution = Past Solution(s) from the Case Base + Measure of Similarity
- CBR approach is used in AI to model human memory
Machine Learning

- Many organisations maintain large data bases of past events. These data bases may "hide" relationships between data elements that are significant and unknown to the organisation and its staff.
- Machine learning is one attempt to discover these relationships.
- Once discovered, the rules may be used in rule-based systems for automated action.

Intelligent Agents

- Agents can help in:
  - Knowledge creation (templates, reminders, automatic agenda management);
  - Knowledge classification (intelligent indexing);
  - Knowledge distribution (filtering rules, push technology, profiling);
  - Knowledge retrieving (content and context-based retrieval, automatic query generation, intelligent portals and EIP)

Currently Use of KM Technologies

Source: S. Zyngier, KM Survey in Australian corporate environment
Exploring Technology for KMS

- There are many classifications of KMS. You could see an example of such a classification used to search Monash KM Laboratory products database at http://km-svr.sims.monash.edu.au/.
- There is another one provided within KM TOOLS part of ICASIT’S resource KMCentral (http://www.icasit.org/km/tools/index.htm).
- KMWorld’s “100 Companies that Matter in Knowledge Management 2004” (http://www.kmworld.com/100.cf) is a list worth exploring for up to date information about technological solutions for KM projects.

Can’t live with IT – Can’t live without IT

- IT design is driven by the needs of knowledge workers
- KM strategy has to be aligned with the organisational IT strategy
- The value of IT investment needs to be justifiable

The IT Infrastructure
- What systems are already in place?
- What is the opportunity for integration?
- Buy or build?

Software for Knowledge Management

- Creativity Tools
- Document Management
- Data Warehouses
- Data Mining
- OLAP
- Intra/Internet Standards
- Law Modelling
- Content Management
- Online Cooperation
- CAD/CAM
- Work Coordination
- Text Mining
- Case Based Reasoning
- Search Engines

H. Shauer, 2002
Elements of the Technology Infrastructure

- **Knowledge Repositories**
  - provides organisational knowledge assets, (information resources, knowledge-based products and organisational records) that are identifiable, reliable, authentic and flexible (e.g., Lotus Notes, intranets, Grapevine)
- **Categorizing and Contextualizing Knowledge Assets**
  - based on a common understanding of contexts and terminology explicitly expressed in metadata
- **Performance Management**
  - to manage the work process (e.g., workflow) and model work practices with intelligent technologies
- **Communications**
  - to transform personal knowledge into organisational knowledge

Approaches to KMS

**Codification – product-based approach**
- Create knowledge object
- Create knowledge base/archive/library/repository
- Index and store knowledge object in the knowledge base
- Subject matter expert or information manager acts as a Knowledge Integrator/Broker

**Personalization – people/process-based approach**
- Identify knowledge processes
- Create knowledge flow support facilities
- Integrate knowledge base with the knowledge processes
- Align knowledge objects with knowledge flows
- Requires KM specialist, KM coordinator, support from the CE manager as well as Knowledge Integrator/Broker

**Functional – an intelligent decision support approach**
- KMS provides access to organisational knowledge for intelligent decision support
- Intelligent decision support includes functionality for learning, reasoning, memory and explanation
- Builds on, and combines, the first two approaches

“Pull” principle in KM Infrastructure

- User needs to be actively involved in the search of information/knowledge
- They need to “go and get” what they want when they want it
- Agents and web crawlers/spiders can be set up to help with topic-based search
“Push” Principle in KM Infrastructure

- Identifies what knowledge you need to perform your task and provides it to you at the right time and in a right form (Microsoft Paperclip?);
- Based on knowledge replication;
- Organisational level decision on what is needed;
- Can include setting up training sessions for staff;
- Channels for knowledge transfer have to be clearly defined

(Probst, Rauch and Romhardt, 2000)

Core Knowledge Services

- Knowledge generation services create new knowledge in forms that can be stored in the repository (e.g., data mining, pattern recognition, collaborative creation of documents etc.)
- Knowledge capture services facilitate addition to repositories
- Knowledge organisation services arrange items in repository to facilitate retrieval and use (add or modify indexes, directories)
- Access management services facilitate the control of access to the knowledge repository
- Retrieval services make knowledge available for specific users (include searching, navigation, translation, integration)

(Housel & Bell 2001)

Other Knowledge Services

- Electronic Communication services – e.g., e-mail, chats
- Collaboration services – on-line meetings, discussion groups, groupware
- Translation services – from one file format to another, language to language
- Work management services – built upon collaboration services (define work activity, view the status of tasks, share results etc.)
- Search and Intelligence services – Intranet, extranet, intelligent agents
Issues for the Technology Infrastructure

- Privacy
- Intellectual property
- Confidentiality
- Copyright
- Change of media
- Change of work practices (20%technology-80%culture)

References