Knowledge Sharing Systems:
Systems that Organize and Distribute Knowledge
Outline

- To explain how knowledge sharing systems help users share their knowledge, both tacit and explicit:
  - For tacit knowledge – systems utilized by *communities of practice*, particularly those that meet virtually
  - For explicit knowledge - *knowledge repositories*
- To present the different types of knowledge repositories
- To demonstrate how sharing systems serve to organize and distribute organizational and individual knowledge
Corporate Memory

- Corporate Memory (also known as an organizational memory) is made up of the aggregate intellectual assets of an organization.
- It is the combination of both explicit and tacit knowledge.
- KM develops applications that prevent the loss of CM.
- The loss of Corporate Memory often results from a lack of appropriate technologies for the organization and exchange of documents.
- Loss of explicit organisational knowledge
Corporate Memory and KSS

- KSS help to organise and distribute the CM of an organisation to be accessed
- Standard communication medium on which KM applications are based is the Web,
- Platform independence; pervasive and can interface with different computer platforms through a common user interface
What are Knowledge Sharing Systems

- Systems that enable members of an organization to acquire tacit and explicit knowledge from each other.
- Knowledge markets that must attract a critical volume of knowledge seekers and knowledge owners in order to be effective.
KSS

- Knowledge owners may:
  - Want to share their K with a trusted and controllable group
  - Decide when to share and the conditions of sharing
  - Seek a fair exchange, reward for sharing K

- Knowledge seekers may:
  - Not be aware of all possibilities for sharing, so knowledge repository helps them searching / ranking
  - Want to decide on the conditions of knowledge acquisition
A KSS defines a learning organisation, supporting the sharing and reuse of organisational knowledge.

IT tools supporting: document management systems, groupware, e-mail, databases, workflow management systems are now integrated in KSS.

Benefits known if used independently but their Integration greatly enhances KSS.
Document management systems

- Repository is at the core with multiple access points
- Repository can be either centralised or distributed
- DM adds to the repository by adding classification and organisation of documents over a platform independent system
- DM increases sharing of documentation across the organisation; documents are indexed using a classification taxonomy (index catalog)
Portals

- Portal technologies used to build a common entry into multiple distributed repositories
- Portals provide a common user interface which can be customised to the user’s preferences

Portals are considered to be virtual workplaces that:
- Promote knowledge sharing among different categories of end users
- Provide access to stored structured data
- Organize unstructured data
Portals

Portals can:

● Simplify access to data stored in various application systems
● Facilitate collaboration among employees
● Assist the company in reaching its customers

Knowledge portals provide two kinds of interfaces:

● The knowledge producer interface
● The knowledge consumer interface
Portals

- Search engines
- Navigation sites
- Portals evolved to include advanced search capabilities and taxonomies
Portals and business transformation

- Explosion of key business information captured in electronic documents
- Speed by which the quantity and kinds of content is growing
- Challenges:
  - Shorter time to market
  - Knowledge worker turnover
  - More demanding customers and investors
Why organisations use KS

- Increase Profits or Revenues 67%
- Retain Key Talent and Expertise 54%
- Improve Customer Retention and/or Satisfaction 52%
- Defend Market Share Against New Entrants 44%
- Accelerate Time to Market with Products 39%
- Penetrate New Market Segments 39%
- Reduce Costs 38%
- Develop New Products and Services 35%
The Benefits of Knowledge Portals

- Productivity
- Locating Documents
- Collaboration
- Better Decisions
- Quality of Data
- Sharing Knowledge
- Identifying Experts

- E-mail Traffic
- Bandwidth Use
- Time in Meetings
- Phone Calls
- Response Times
- Redundant Efforts
- Operating Costs
- Time to market
Knowledge Portal Technologies

- Gathering
- Categorization
- Distribution
- Collaboration
- Publish
- Personalization
- Search/navigate
# Portal Features and Benefits

<table>
<thead>
<tr>
<th>Common Features</th>
<th>Business Benefits</th>
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<tbody>
<tr>
<td>Search</td>
<td>Quick access to hidden information to <strong>facilitate business processes</strong></td>
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<tr>
<td>Categorization</td>
<td>Ability to organize information assets by business process, group, or job category thus <strong>promoting access to relevant information</strong></td>
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<tr>
<td>Query, Reporting, and Analysis</td>
<td><strong>Better decision support</strong> as well as information dissemination and sharing</td>
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<tr>
<td>Integration of Information and Applications</td>
<td>Ability to access through a single interface, all applications and information required for <strong>increased job throughput</strong></td>
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<tr>
<td>Publish and Subscribe</td>
<td>Maturation of business processes by collaborating with others, sharing information, and <strong>improving business performance</strong></td>
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<tr>
<td>Personalization</td>
<td>Arranging the interface to meet an Individual’s needs and desires for <strong>increased job productivity</strong></td>
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Types of collaborations

- Asynchronous collaboration is human-to-human interactions via computer sub-systems having no time or space constraints. Queries, responses, or access occur anytime and anyplace.

- Synchronous collaboration is computer-based, human-to-human interaction that occurs immediately (within 5 seconds). It can use audio, video, or data technologies.
Synchronous and Asynchronous collaboration

**Synchronous collaboration**
- **Teleconferencing**
  - *Advantages:* personal, immediate feedback
  - *Disadvantages:* expensive, often does not work well across time zones
- **Computer Video/Teleconferencing**
  - Computer-based teleconferencing and videoconferencing is a rapidly evolving technology that has tremendous potential for distributed organizations.

**Asynchronous collaboration**
- **Electronic Mailing Lists**
  - *Advantages:* cheap
  - *Disadvantages:* limited communication medium
- **Web-Based Discussion Forums**
  - *Advantages:* same as electronic mailing lists except requires slightly faster Internet connection
  - *Disadvantages:* cultural resistance
Requirements for Successful Collaboration Tools

- Comfortable e-mail systems
- A Web browser
- Simple search functionalities
- Collaboration services with a multipurpose database
- Web services
- Indexing services for full-text search of documents
- Well-organized central storage locations
Requirements for the Success of a Knowledge Sharing System

1. Collection and systematic organization of information from various sources.
2. Minimization of up-front knowledge engineering.
3. Exploiting user feedback for maintenance and evolution.
Requirements

1. Integration into existing environment.
   - Humans tend to avoid efforts to formalize knowledge
   - If effort to formalise is too high, keep it informal, not explicit

2. Active presentation of relevant information
   - These systems are envisioned to become intelligent assistants, automatically eliciting and providing knowledge that may be useful in solving the current task
Barriers to the use of Knowledge Sharing Systems

- Many organizations, specifically science and engineering-oriented firms, are characterized by a culture known as the ‘not-invented-here syndrome’.
- Organizations suffering from this syndrome tend to essentially reward employees for ‘inventing’ new solutions, rather than re-using solutions developed within and outside the organization.
Specific Types of Knowledge Sharing Systems

- Knowledge sharing systems are classified according to their attributes
  1. **Incident report databases**
     - used to disseminate information related to incidents or malfunctions
     - Incident reports describe the incident together with explanations of the incident, although they may not suggest any recommendations.
Types of KSS (2)

- *Alert systems*: were originally intended to disseminate information about a negative experience that has occurred or is expected to occur. However, recent applications also include increasing exposure to positive experiences.

- Alert scientists about an interesting topic, funding opportunities
Types of KSS (3)

- **Best practices databases**: describe successful efforts, typically from the reengineering of business processes that could be applicable to organizational processes.

- Best practices differ from *lessons learned* in that they capture only successful events, which may not be derived from experience.

- [http://msdn.microsoft.com/library/](http://msdn.microsoft.com/library/) provides tips for different products etc.
Types of KSS (4)

- **Lessons learned systems (LLS):** the goal of LLS is “to capture and provide lessons that can benefit employees who encounter situations that closely resemble a previous experience in a similar situation. LLS could be pure repositories of lessons or sometimes intermixed with other sources of information (e.g., reports).
Differences between KSS

- **Content origin**: does the content originate from experience or from industry standards?
- **Application**: do they describe a complete process, or a task, decision?
- **Results**: do they describe failures or successes?
- **Orientation**: do they support an organisation or a whole industry?
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<tbody>
<tr>
<td>Incident Reports</td>
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<tr>
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<td>Industry</td>
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<tr>
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<td>Yes</td>
<td>Yes</td>
<td>Organization</td>
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<tr>
<td>Best Practices Databases</td>
<td>Possibly</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Industry</td>
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Lesson learned systems

- LLs are common in organisations.
- A LL is knowledge or understanding gained by experience. The experience may be positive, [...] or negative. Successes are also considered sources of lessons learned. A lesson must be significant in that it has a real or assumed impact on operations; valid in that it is factually and technically correct.

Lesson Learned Process

Organizational Members

- collect
- verify
- store
- disseminate

Organizational Processes

Domain Experts

LL Center

LL repository
Lessons Learned

- Collect the lessons
  - a) Passive - the most common form of collection. Contributors submit lessons through a paper or Web-based form.
  - b) Reactive - where contributors are interviewed by a third party for lessons. The third party will submit the lesson on behalf of the contributor.
  - c) After-action collection - where lessons are collected during a mission debriefing, as for example, in military organizations.
d) Proactive collection - where lessons are automatically collected by an expert system, which may suggest that a lesson exists based on analysis of a specific content.

e) Active collection - where a computer-based system may scan documents to identify lessons in the presence of specific keywords or phrases,

f) Interactive collection – where a computer-based system collaborates with the lesson’s author to generate clear and relevant lessons.
Verify the lessons

- A team of domain experts performs this task
  - requires the verification of lessons for correctness, redundancy, consistency, and relevance.

- The verification task is critically important, but sometimes introduces a significant bottleneck in the inclusion of lessons into the LLS, since it’s a time-consuming process.
Store the lesson

- This task relates to the representation of the lessons in a computer-based system.
- Typical steps in this task include the indexing of lessons, formatting, and incorporating into the repository.
- Technology required to support this task, LLS could be based on structured relational or object-oriented databases, case libraries (case-based reasoning).
- LLS can also incorporate relevant multimedia such as audio and video, which may help illustrate important lessons.
Disseminate the Lesson

- This task relates to how the information is shared to promote its reuse

  a) Passive dissemination
  b) Active casting
  c) Broadcasting
Disseminate the lesson

- Active dissemination –
- Proactive dissemination
- Reactive dissemination

Apply the Lesson: This task relates to whether the user has the ability to decide how to reuse the lesson.
Expertise-Locator Knowledge Sharing Systems

- Goal: to catalog knowledge competencies, including information not typically captured by human resources systems, in a way that could later be queried across the organization to help locate intellectual capital.
- Significant challenge in the development of ELS, knowledge repositories, and digital libraries, deals with the accurate development of knowledge taxonomies.
Taxonomies

- Taxonomies, also called classification or categorization schemes, are considered to be knowledge organization systems that serve to group objects together based on a particular characteristic.

- In the case of ELS, the knowledge taxonomy is used to describe the organization’s critical knowledge areas used to index people's knowledge.
KM Systems to Share Tacit Knowledge

- To create a cultural environment that encourages the sharing of knowledge, some organizations are creating knowledge communities.

- A community of practice is an organic and self-organized group of individuals who are dispersed geographically or organizationally but communicate regularly to discuss issues of mutual.
Conclusions

- What are knowledge sharing systems
- Design considerations for knowledge sharing systems
- Specific types of such systems: lessons learned systems, knowledge repositories, and expertise locator systems
- Communities of practice are important to share tacit knowledge.