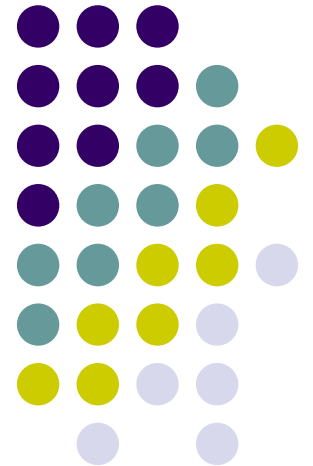
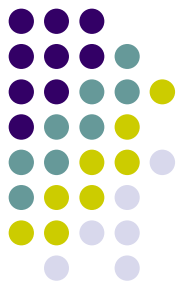

Knowledge Sharing Systems: Systems that Organize and Distribute Knowledge



Outline



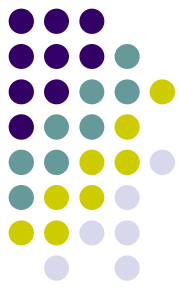
- To explain how knowledge sharing systems help users share their knowledge, both tacit and explicit:
 - For tacit knowledge – systems utilized by *communities of practice*, particularly those that meet virtually
 - For explicit knowledge - *knowledge repositories*
- To present the different types of 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



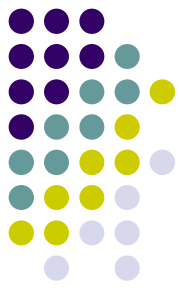
- KSS help to organise and distribute the CM of an organisation to be accessed
- Standard communication medium on which KM applications are based is the Web,
- Platform independence; pervasive and can interface with different computer platforms through a common user interface

What are Knowledge Sharing Systems

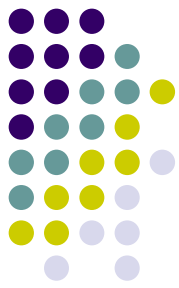


- Systems that enable members of an organization to acquire tacit and explicit knowledge from each other.
- **Knowledge markets** that must attract a critical volume of **knowledge seekers** and **knowledge owners** in order to be effective.

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 K
- 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:

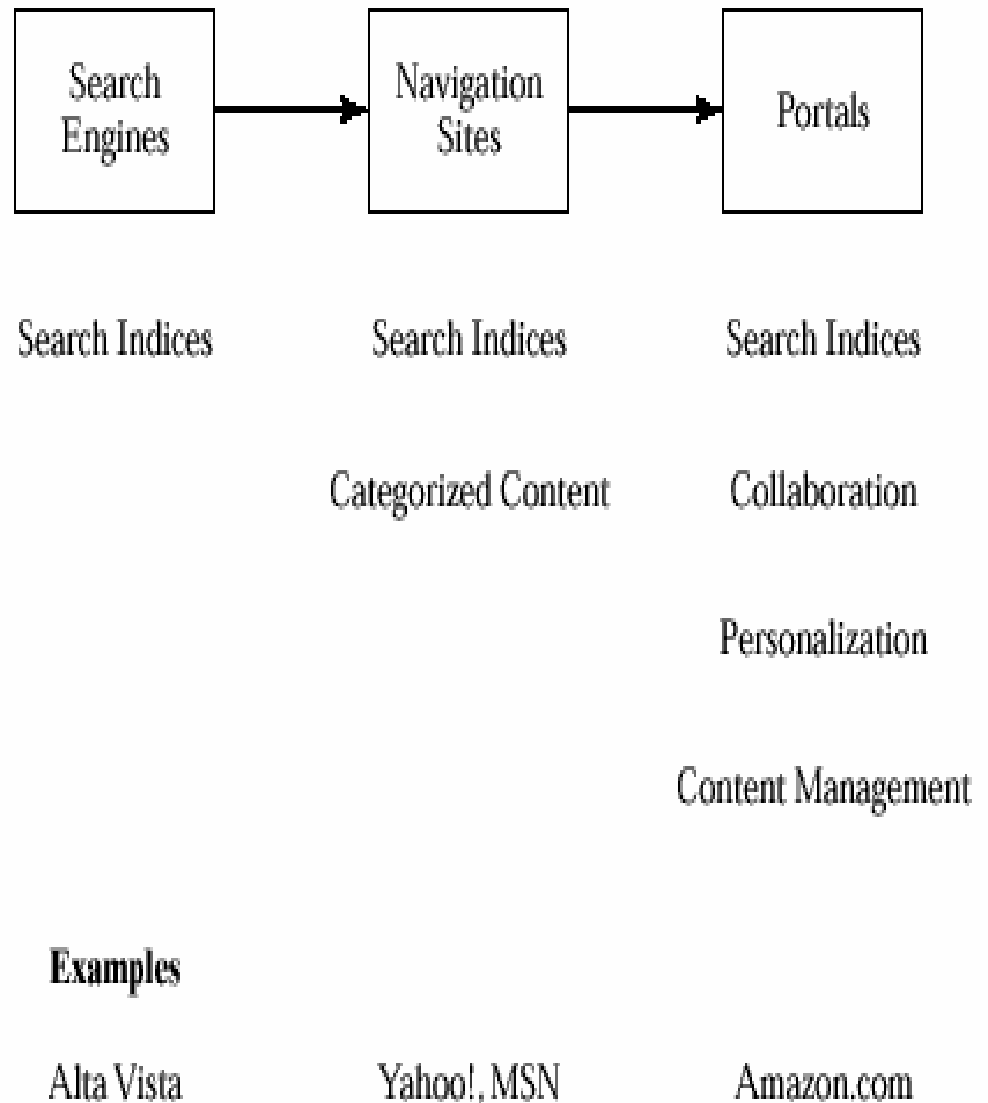
- Simplify access to data stored in various application systems
- Facilitate collaboration among employees
- Assist the company in reaching its customers

Knowledge portals provide two kinds of interfaces:

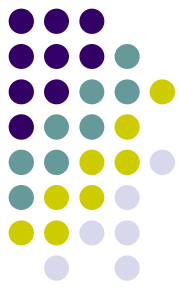
- The knowledge producer interface
- The knowledge consumer interface

Portals

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

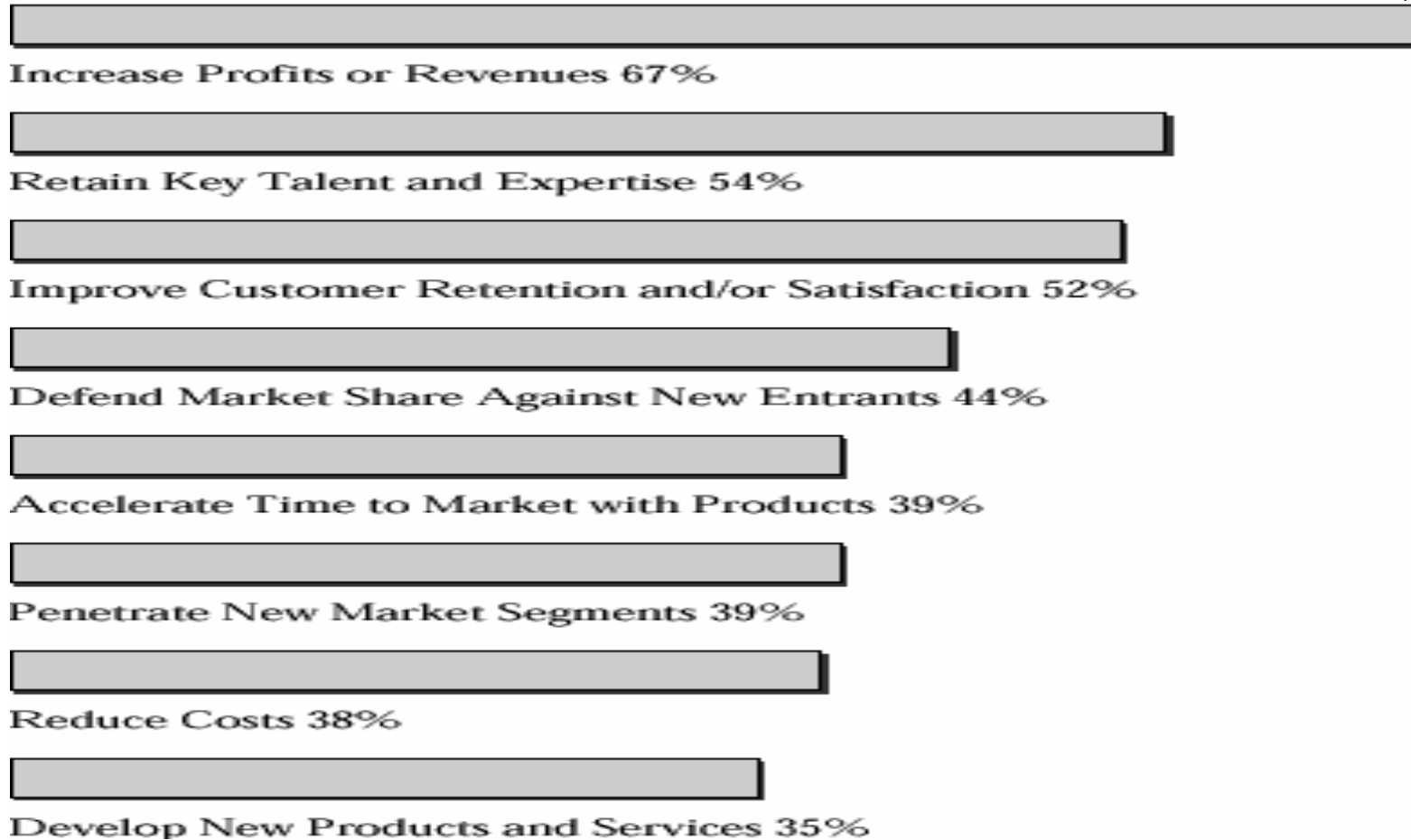


Portals and business transformation

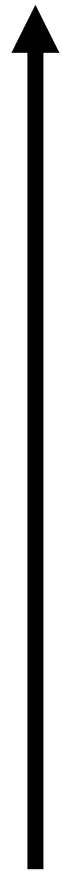
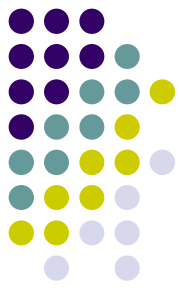


- Explosion of key business information captured in electronic documents
- Speed by which the quantity and kinds of content is growing
- Challenges:
 - Shorter time to market
 - Knowledge worker turnover
 - More demanding customers and investors

Why organisations use KS



The Benefits of Knowledge Portals

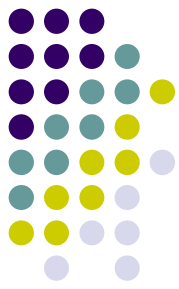


Productivity
Locating Documents
Collaboration
Better Decisions
Quality of Data
Sharing Knowledge
Identifying Experts



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



Common Features

Business Benefits

Search

Quick access to hidden information to **facilitate business processes**

Categorization

Ability to organize information assets by business process, group, or job category thus **promoting access to relevant information**

Query, Reporting,
and Analysis

Better decision support as well as information dissemination and sharing

Integration of Information
and Applications

Ability to access through a single interface, all applications and information required for **increased job throughput**

Publish and Subscribe

Maturation of business processes by collaborating with others, sharing information, and **improving business performance**

Personalization

Arranging the interface to meet an individual's needs and desires for **increased job productivity**



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**

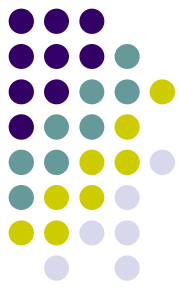
- *Advantages:* same as electronic mailing lists except requires slightly faster Internet connection
- *Disadvantages:* cultural resistance

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



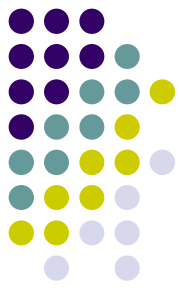
1. Collection and systematic organization of information from various sources.
2. Minimization of up-front knowledge engineering.
3. Exploiting user feedback for maintenance and evolution.

Requirements



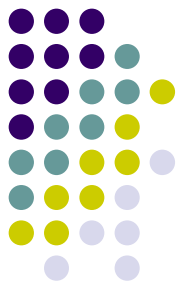
1. Integration into existing environment.
 - Humans tend to avoid efforts to formalize knowledge
 - If effort to formalise is too high, keep it informal, not explicit
2. Active presentation of relevant information
 - These systems are envisioned to become intelligent assistants, automatically eliciting and providing knowledge that may be useful in solving the current task

Barriers to the use of Knowledge Sharing Systems

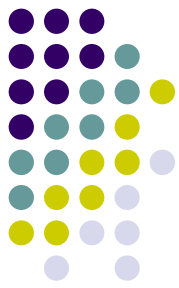


- Many organizations, specifically science and engineering-oriented firms, are characterized by a culture known as the '***not-invented-here syndrome***'.
- Organizations suffering from this syndrome tend to essentially reward employees for '**inventing**' new solutions, rather than re-using solutions 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/> 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).



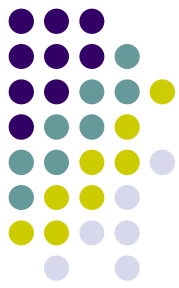
Differences between KSS

- **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?

Types of Knowledge Repositories



Knowledge Sharing System	Originates from experiences?	Describes a complete process?	Describes failures?	Describes successes?	Orientation
Incident Reports	Yes	No	Yes	No	Organization
Alerts	Yes	No	Yes	No	Industry
Lessons Learned System	Yes	No	Yes	Yes	Organization
Best Practices Databases	Possibly	Yes	No	Yes	Industry

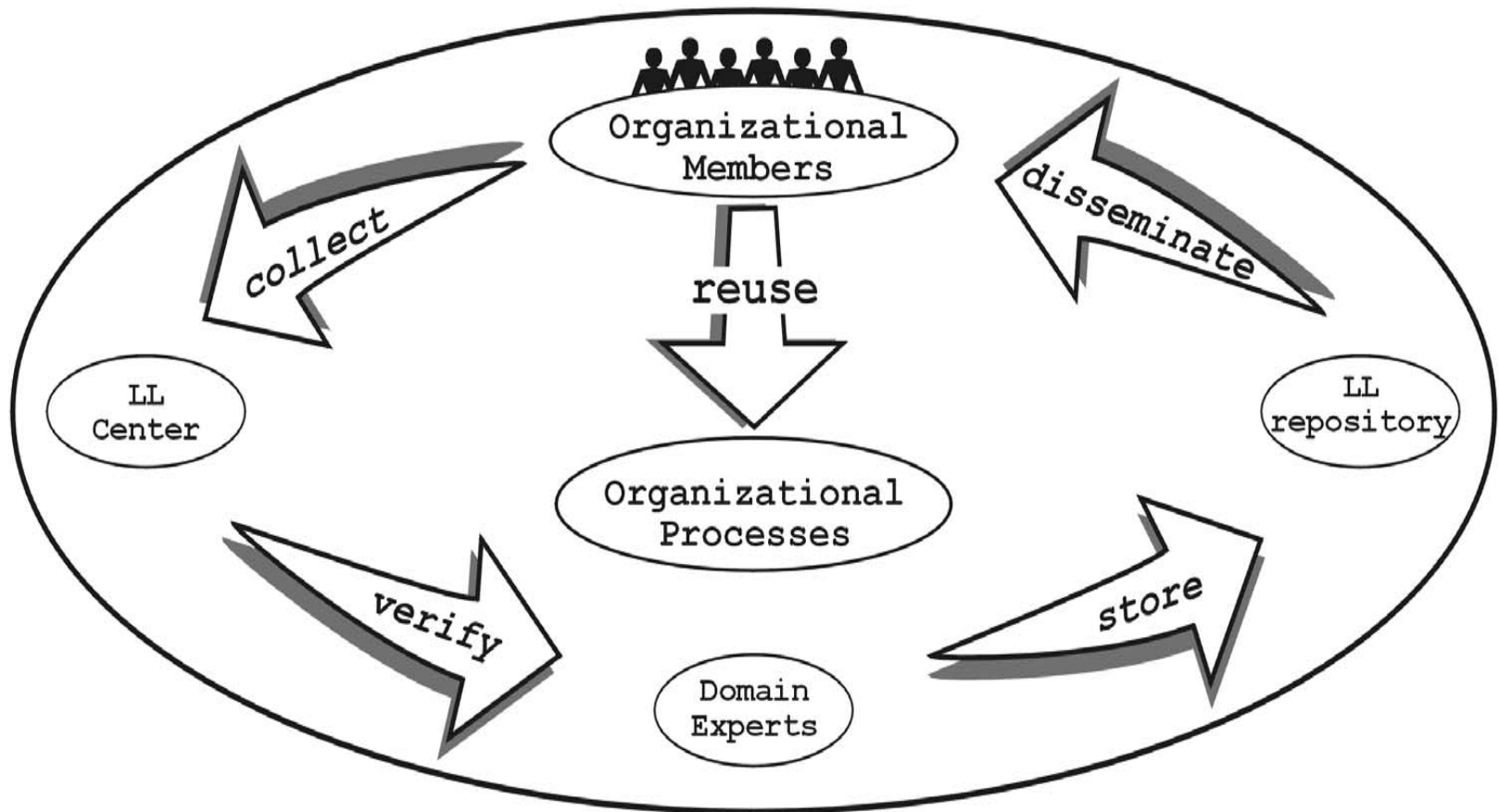
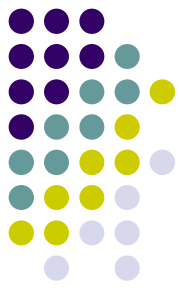


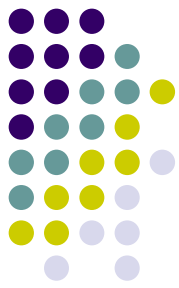
Lesson learned systems

- 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

Weber et al. (2001) Intelligent Lessons Learned Systems. International Journal of Expert Systems Research & Applications, 20(1), 17-34.

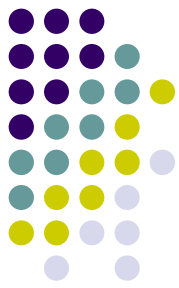
Lesson Learned Process



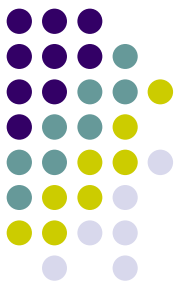


Lessons Learned

- **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 an 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.



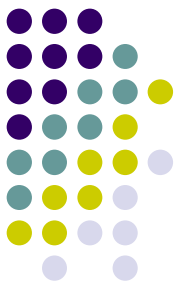
Verify the lessons

- 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.



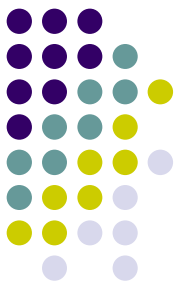
Disseminate the Lesson

- 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



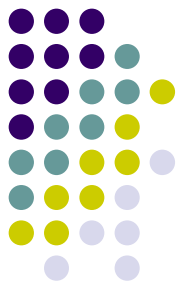
- Goal: to catalog knowledge competencies, including information not typically captured by human resources systems, in a way that could later be queried across the organization to help locate intellectual capital.
- Significant challenge in the development of ELS, knowledge repositories, and digital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