



# Chapter 3

## Knowledge Management Solutions

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# Chapter Objectives

- Understand the concept of knowledge management
- Examine knowledge management solutions
- Describe four levels of knowledge management solutions:
  - ◆ KM processes
  - ◆ KM systems
  - ◆ KM mechanisms and technologies
  - ◆ KM infrastructure



# Knowledge Management

- Recall:
  - ♦ *management* = doing what is needed to get the most out of some resource (examples of resources: assets, supply chains, customer relationships, human resources, ...)
  - ♦ *knowledge management* = doing what is needed to get the most out of knowledge resources
- Generally, “get the most” implies:
  - ♦ *knowledge management* = acting so as to maximize the return from knowledge resources (implies cost/benefit analysis!)
- Specifically, “doing what is needed” implies:
  - ♦ *knowledge management* = performing the activities involved in discovering, capturing, sharing, and applying knowledge so as to enhance, in a cost-effective fashion, the impact of knowledge on the unit’s goal achievement.



# Knowledge Resources

- In general, the term *knowledge resources* may refer to:
  - ◆ the knowledge currently possessed by an individual
  - ◆ the knowledge currently possessed by an organization:
    - corporation
    - firm
    - field office of a firm
    - department within a corporation or firm
    - ...
  - ◆ the knowledge that *can potentially be obtained* (at some cost if necessary) from other individuals or organizations



# Knowledge Management Solutions

- Knowledge management *solutions* refer to the variety of ways in which KM can be facilitated:
  - ◆ KM processes
  - ◆ KM systems
  - ◆ KM mechanisms and technologies
  - ◆ KM infrastructure
- Thinking about KM *solutions* takes the broadest view – overlooking all aspects of KM.

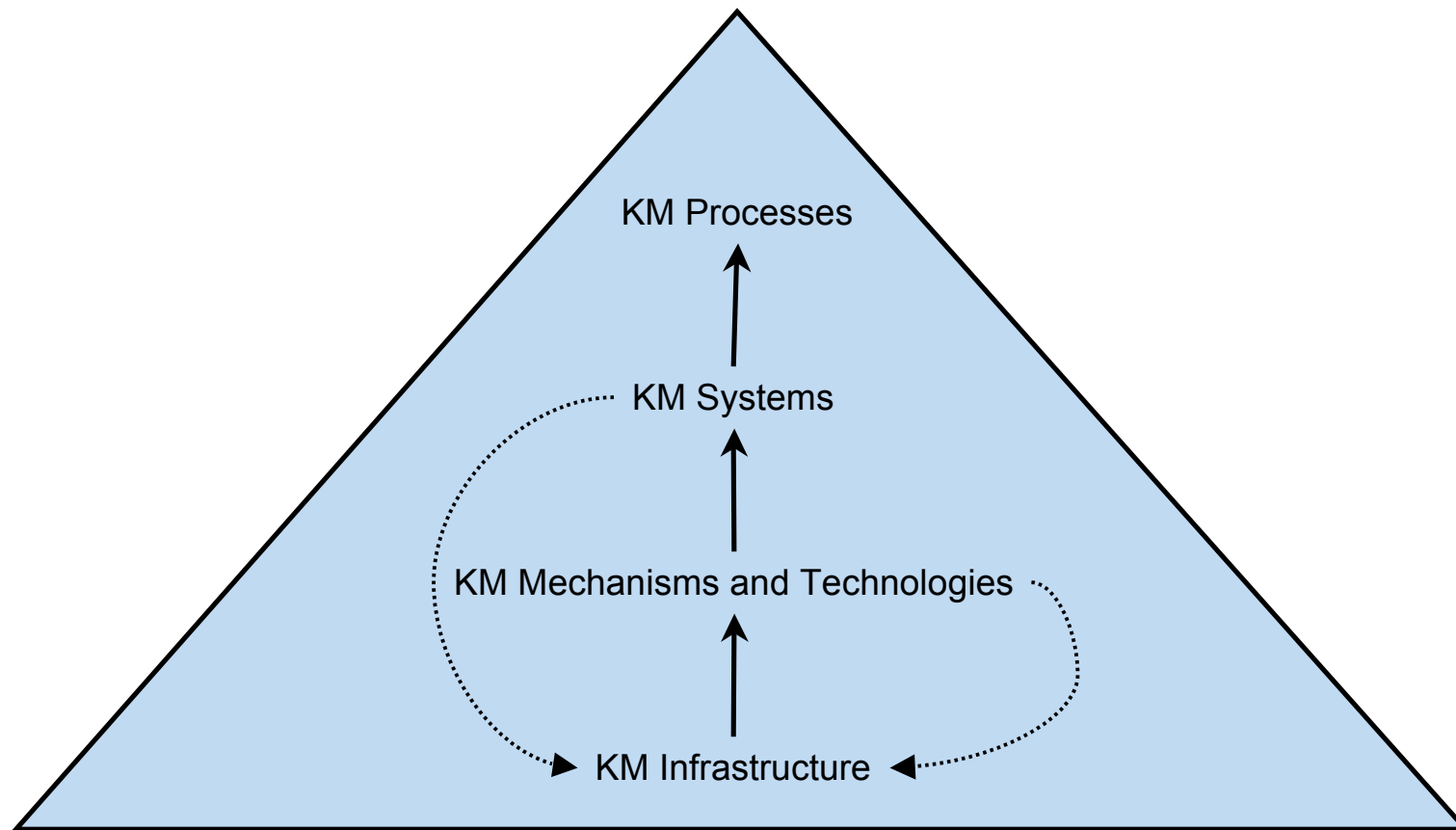


# Knowledge Management Systems

- Knowledge management *systems* are the integration of *technologies and mechanisms* that are developed to support the four KM *processes*.
- (We'll consider KM systems in detail in the third part of this course.)



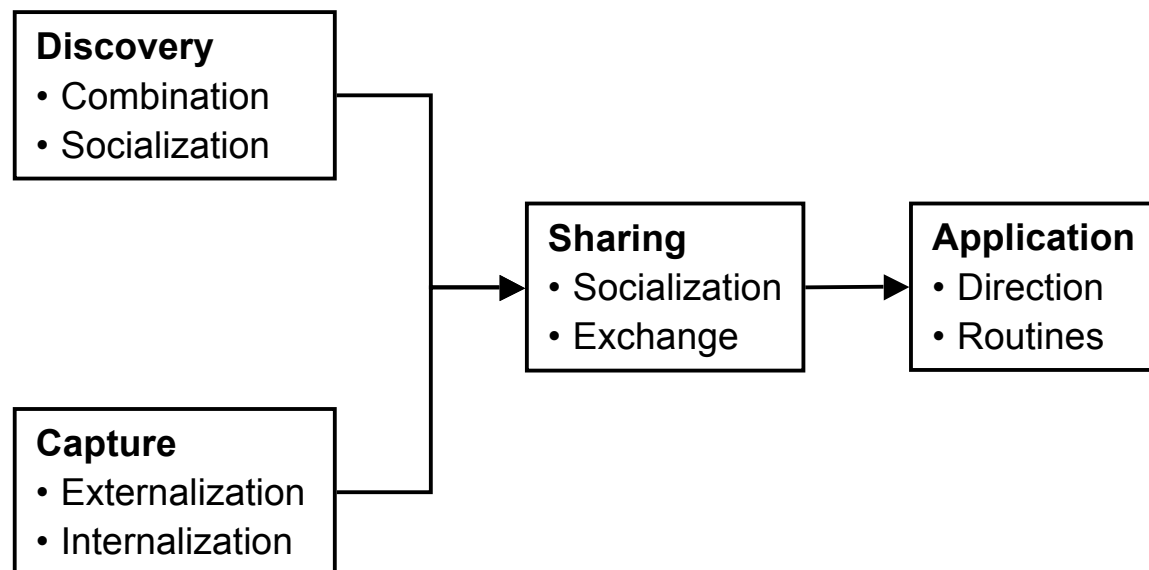
# An Overview of Knowledge Management Solutions





# Knowledge Management Processes

- What are the *processes* that knowledge undergoes in an organization?







# KM Processes: Knowledge Discovery

- *Knowledge discovery* may be defined as the development of new tacit or explicit knowledge from data and information or from the synthesis of prior knowledge
  - ◆ *Combination*
  - ◆ *Socialization*



# Knowledge Discovery Subprocesses: Combination

- *Combination*: multiple bodies of explicit knowledge (+ information + data) are synthesized to create new, more complex sets of explicit knowledge.
  - ◆ Happens via communication, integration, and systemization of multiple streams of explicit knowledge.
  - ◆ Existing explicit knowledge, information, and data are reconfigured, recategorized, and recontextualized.
- **Examples:**
  - ◆ To create a new proposal to a client, the explicit data, information, and knowledge embedded in prior proposals and planning documents may be combined and/or reused.
  - ◆ Data mining techniques may be used to uncover new relationships among explicit data, to produce predictive or categorization models that create new knowledge.



# Knowledge Discovery

## Subprocesses: Socialization

- *Socialization*: synthesis of tacit knowledge across individuals
  - ◆ Usually happens through joint activities instead of written or verbal instructions.
- Examples:
  - ◆ By transferring ideas and images, apprenticeships or internships help newcomers to see how others think.
  - ◆ Conversations at the watercooler helped knowledge sharing among groups at IBM [Davenport & Prusak 1998].



# KM Processes: Knowledge Capture

- *Knowledge capture* is defined as the process of retrieving either explicit or tacit knowledge that resides within people, artifacts, or organizational entities.
- Examples:
  - ◆ Knowledge might reside within an individual's mind, without that individual having the ability to recognize it and share it with others. (tacit knowledge)
  - ◆ Knowledge might reside in an explicit form in a manual, but few people might be aware of it. (explicit knowledge)
  - ◆ In both cases, it is important to obtain the knowledge such that it can be shared with others.
- Knowledge captured might reside outside the organizational boundaries, including consultants, competitors, customers, suppliers, and prior employers of the organization's new employees



# Knowledge Capture Subprocesses: Externalization

- *Externalization* involves converting tacit knowledge into explicit forms such as:
  - ◆ words
  - ◆ concepts
  - ◆ visuals
  - ◆ figurative language (metaphors, analogies, narratives, etc.)
- Difficult process – tacit knowledge is often difficult to articulate.
- Examples:
  - ◆ Use of metaphor: understanding and experiencing one kind of thing in terms of another [Nonaka 1994]
  - ◆ A consultant team writing a document that describes the lessons the team has learned by observing a client organization, executives, and approaches



# Knowledge Capture

## Subprocesses: Internalization

- *Internalization* is the conversion of explicit knowledge into tacit knowledge.
- Represents the traditional notion of “learning”.
- Explicit knowledge may be embodied in action and practice...
  - ◆ so that the individual can re-experience what others have gone through.
- Or, individuals can acquire tacit knowledge in virtual situations, either:
  - ◆ *vicariously* by reading manuals or other’s stories
  - ◆ *experientially* through simulations or experiments [Nonaka & Takeuchi 1995]
- Example:
  - ◆ New software consultant reads a book on innovative software development, and learns from it.



# KM Processes: Knowledge Sharing

- *Knowledge sharing* is the process through which explicit or tacit knowledge is communicated to other individuals
- Must result in *effective transfer*
  - ◆ Recipient must understand it well enough to act on it
- Must be the *knowledge* itself that is shared
  - ◆ Not just recommendations based on knowledge (which is just *utilization* rather than *sharing* of knowledge; we call this *direction* as discussed shortly)
- May take place across individuals, groups, departments or organizations



# Knowledge Sharing Subprocesses: Exchange

Recall:

- *Socialization*: synthesis of tacit knowledge across individuals
  - ◆ Usually happens through joint activities instead of written or verbal instructions.
  - ◆ Also used for knowledge sharing – in addition to capture.
- *Exchange*: communication or transfer of explicit knowledge between individuals, groups, and organizations
  - ◆ Process of exchange of explicit knowledge does *not* differ from process of exchange of information (only the content differs).
  - ◆ Example: a product design manual transferred by one employee to another, who can then use the explicit knowledge contained.





# KM Processes: Knowledge Application

- *Knowledge application* is the process through which explicit or tacit knowledge is utilized to guide decisions and actions
- Depends on the process of knowledge discovery, capture, and storage
  - ◆ The better/worse the processes of discovery, capture, and storage, the better/worse the likelihood that knowledge needed for effective decision making is available
- In knowledge application, the party that makes use of the knowledge does not necessarily need to comprehend it!
  - ◆ As long as the knowledge is somehow used to guide the decisions or actions – directly or indirectly
  - ◆ Knowledge application is possible even in the absence of actual exchange or transfer of knowledge...



# Knowledge Application Subprocesses: Direction

- *Direction* refers to the process through which individuals possessing the knowledge direct the action of another individual without transferring to that person the knowledge underlying the direction
- Pros:
  - ◆ Preserves the advantages of employee specialization
  - ◆ Avoids the difficulties inherent in the transfer of tacit knowledge
- Example:
  - ◆ Production worker calls experts to ask how to solve a particular problem with a machine, and then solves the problem based on instructions given by the experts
  - ◆ Note that the production worker has not acquired and internalized the expert's knowledge (unlike socialization or exchange)
- Cons:
  - ◆ If a similar problem reoccurs in the future, the production worker still could not identify and solve it without calling an expert



# Knowledge Application Subprocesses: Routines

- *Routines* involve the utilization of knowledge embedded in procedures, rules, and norms that guide future behavior
- Pros:
  - ◆ Economizes on communication more than directions, because they are embedded in “mechanical” procedures:
    - bureaucratic processes
    - automated technologies
- Example:
  - ◆ An inventory management system utilizes considerable knowledge about the relationship between demand and supply – but neither the knowledge nor the directions are communicated through individuals
- Cons:
  - ◆ Takes time to develop, relying on constant repetition
  - ◆ Those utilizing the knowledge often have no understanding of the reasons underlying the procedures and rules – cannot adapt to new or unexpected cases



# Knowledge Management Mechanisms

- KM mechanisms are organizational or structural means used to promote KM
- KM mechanisms may or may not utilize electronic technology
- KM mechanisms involve some kind of
  - ◆ organizational arrangement, or
  - ◆ social means, or
  - ◆ structural means of facilitating KM
- Examples:
  - ◆ Near-term: learning by doing, on-the-job training, learning by observation, face-to-face meetings, ...
  - ◆ Long-term: hiring a Chief Knowledge Officer, cooperative projects across departments, traditional hierarchical relationships, organizational policies, standards, initiation process for new employees, employee rotation across departments, ...
- Recall our simulation exercise (on group formation)



# Knowledge Management Technologies

- Technologies that support KM include:
  - ◆ artificial intelligence (AI) technologies encompassing:
    - those used for knowledge acquisition
    - case-based reasoning systems
    - expert systems
    - ... and many others
  - ◆ electronic discussion groups
  - ◆ computer-based simulations
  - ◆ databases
  - ◆ decision support systems
  - ◆ enterprise resource planning systems
  - ◆ management information systems
  - ◆ expertise locator systems
  - ◆ videoconferencing
  - ◆ information repositories encompassing best practices databases and lessons learned systems
- Many of these technologies are now being “rebranded” as *Web 2.0*



# Knowledge Management Technologies

- Examples:
  - ◆ World Bank: uses a combination of video interviews and hyperlinks to documents and reports to systematically record the knowledge of employees who are close to retirement [Lesser & Prusak 2001]
  - ◆ British Petroleum (BP): desktop videoconferencing has improved communication and enabled many problems at offshore oil fields to be solved without extensive traveling [Skyrme 2000]



# Knowledge Management Systems

- *KM systems* utilize combinations of a variety of KM mechanisms and technologies, in order to support the KM processes:
  - ◆ Knowledge Management Discovery Systems
  - ◆ Knowledge Management Capture Systems
  - ◆ Knowledge Management Sharing Systems
  - ◆ Knowledge Application Systems
- Typical KM systems focus primarily on supporting one KM process.
  - ◆ In reality, a more sophisticated KM system may actually be designed to support more than one of the KM processes simultaneously.



# Knowledge Discovery Systems

- *Knowledge discovery systems* support the process of developing new tacit or explicit knowledge from data and information or from the synthesis of prior knowledge
- Support two KM sub-processes
  - ◆ combination, enabling the discovery of new explicit knowledge
  - ◆ socialization, enabling the discovery of new tacit knowledge





# Knowledge Discovery Systems: Mechanisms for Combination

- Mechanisms that facilitate *combination*:
  - ◆ Collaborative problem solving
  - ◆ Joint decision making
  - ◆ Collaborative creation of documents
- Example:
  - ◆ At senior management level, new explicit knowledge is created by sharing documents and information related to midrange concepts (eg, product concepts) augmented with grand concepts (eg, corporate vision) to produce new knowledge about both areas.
  - ◆ This newly created knowledge might be a better understanding of products and a corporate vision [Nonaka & Takeuchi 1995].



# Knowledge Discovery Systems: Mechanisms for Socialization

- Mechanisms that facilitate *socialization*:
  - ◆ Apprenticeships
  - ◆ Employee rotation across areas
  - ◆ Conferences
  - ◆ Brainstorming retreats
  - ◆ Cooperative projects across departments
  - ◆ Initiation process for new employees
- Example:
  - ◆ Honda “sets up brainstorming camps (*tama dashi kai*) – informal meetings for detailed discussions to solve difficult problems in development projects” [Nonaka & Takeuchi 1995]



# Knowledge Discovery Systems: Technologies for Combination

- Technologies that facilitate *combination*:
  - ◆ Knowledge discovery systems
  - ◆ Databases
  - ◆ Web-based access to data
- “Reconfiguration of existing information through sorting, adding, combining, and categorizing of explicit knowledge (as conducted in computer databases) can lead to new knowledge” [Nonaka & Takeuchi 1995].



# Knowledge Discovery Systems: Technologies for Socialization

- Technologies that facilitate *socialization*:
  - ◆ Instant messaging
  - ◆ Social chat groups
  - ◆ VOIP
  - ◆ Video-conferencing
  - ◆ Electronic support for *communities of practice* (COPs)
  - ◆ Wikis
  - ◆ Forums, BBS systems, newsgroups
  - ◆ Blogs, especially those that allow comments and discussions
- This area has gotten off to a later start than other technologies, but is undergoing accelerated development today (often under the buzzword “Web 2.0”), enabled by:
  - ◆ increased penetration of networking and wireless technologies
  - ◆ maturation of first-generation web technologies
  - ◆ younger generation’s ease/comfort/familiarity with new paradigms



# Knowledge Capture Systems

- *Knowledge capture systems* support the process of retrieving either explicit or tacit knowledge that resides within people, artifacts, or organizational entities
- Technologies can also support knowledge capture systems by facilitating externalization and internalization



# Knowledge Capture Systems: Mechanisms for Externalization

- Examples of mechanisms that facilitate *externalization*, from the consulting company Viant [Stewart 2000]:
  - ♦ Before every project, consultants are required to complete a “quicksheet” describing:
    - the knowledge they need
    - what aspects of knowledge can be leveraged from prior projects
    - what they need to create
    - the lessons they hope to learn that they can share with others later
  - ♦ After every project, the team is required to meet to produce a *sunset review* to document what worked and what did not work well.
- Forgetting these reports is hard for several reasons:
  - ♦ “Almost every document ends up on Viant’s internal website, hot-linked every which way.”
  - ♦ “Sunset reviews are done with a facilitator who wasn’t on the team, which helps keep them honest.”
  - ♦ “Every six weeks [the] knowledge-management group prepares, posts, and pushes a summary of what’s been learned.”



# Knowledge Capture Systems: Mechanisms for Internalization

- Mechanisms that facilitate *internalization*:
  - ◆ Learning by doing
  - ◆ On-the-job training
  - ◆ Learning by observation
  - ◆ Face-to-face meetings
- Example:
  - ◆ At one firm “the product divisions also frequently send their new-product development people to the Answer Center to chat with the telephone operators or the 12 specialists, thereby ‘re-experiencing’ their experiences” [Nonaka & Takeuchi 1995].



# Knowledge Capture Systems: Technologies

- Technologies that facilitate *externalization*:
  - ◆ Knowledge elicitation is needed for implementation of intelligent technologies such as:
    - expert systems
    - case-based reasoning systems
- Technologies that facilitate *internalization*:
  - ◆ Computer-based training technologies
  - ◆ Communication technologies
    - eg, an individual can internalize knowledge from a message sent by another expert, an AI-based knowledge capture system, computer-based simulations, ...





# Knowledge Sharing Systems

- *Knowledge sharing systems* support the process through which explicit or implicit knowledge is communicated to other individuals
- Knowledge sharing systems operate by supporting socialization (which promotes sharing of tacit knowledge) and exchange (ie, sharing of explicit knowledge) subprocesses



## Knowledge Sharing Systems: Mechanisms & Technologies for Socialization

- Mechanisms and technologies facilitating *socialization*: many play an equally important role for knowledge sharing as in knowledge discovery
- Typically focused *discussion groups* (or technology-enabled *chat groups*) facilitate knowledge sharing by enabling individuals to explain their knowledge to the rest of the group



# Knowledge Sharing Systems: Mechanisms & Technologies for Exchange

- Mechanisms facilitating *exchange*:
  - ◆ memos & letters
  - ◆ manuals
  - ◆ progress reports
  - ◆ presentations
- Technologies facilitating *exchange*:
  - ◆ Web 2.0, groupware & other team collaboration mechanisms
  - ◆ web-based access to data & databases
  - ◆ repositories of information, including best practice databases, lessons learned systems, and expertise locator systems



# Knowledge Application Systems

- *Knowledge application systems* support the process through which some individuals utilize knowledge possessed by other individuals without actually acquiring, or learning, that knowledge
- Mechanisms and technologies support knowledge application systems by facilitating routines and direction.



# Knowledge Application Systems: KM Mechanisms

- Mechanisms facilitating *direction* include:
  - ◆ traditional hierarchical relationships in organizations
  - ◆ help desks
  - ◆ support centers
- Mechanisms supporting *routines* include:
  - ◆ organizational policies
  - ◆ work practices
  - ◆ standards
- For both direction and routines, these mechanisms can be implemented either:
  - ◆ within an organization (eg, organizational hierarchies)
  - ◆ across organizations (eg, software support help desks)



# Knowledge Application Systems: KM Technologies

- Technologies supporting *direction* include:
  - ◆ experts' knowledge embedded in expert systems and decision support systems
  - ◆ troubleshooting systems based on the use of technologies like case-based reasoning
- Technologies that facilitate *routines* include:
  - ◆ expert systems
  - ◆ enterprise resource planning systems
  - ◆ traditional management information systems
- Again, for both direction and routines, these technologies can be implemented either:
  - ◆ within an organization
  - ◆ across organizations



# Illustrative Summary: KM Processes, Mechanisms, and Technologies

KM Processes	KM Systems	KM Sub-Processes	Illustrative KM Mechanisms	Illustrative KM Technologies
Knowledge Discovery	Knowledge Discovery Systems	Combination	Meetings, telephone conversations, and documents, collaborative creation of documents	Databases, web-based access to data, data mining, repositories of information, Web portals, best practices and lessons learned
		Socialization	Employee rotation across departments, conferences, brainstorming retreats, cooperative projects, initiation	Video-conferencing, electronic discussion groups, e-mail
Knowledge Capture	Knowledge Capture Systems	Externalization	Models, prototypes, best practices, lessons learned	Expert systems, chat groups, best practices, and lessons learned databases.
		Internalization	Learning by doing, on-the-job training, learning by observation, and face-to-face meetings	Computer-based communication, AI-based knowledge acquisition, computer-based simulations
Knowledge Sharing	Knowledge Sharing Systems	Socialization	See above	See above
		Exchange	Memos, manuals, letters, presentations	Team collaboration tools, web-based access to data, databases, and repositories of information, best practices databases, lessons learned systems, and expertise locator systems
Knowledge Application	Knowledge Application Systems	Direction	Traditional hierarchical relationships in organizations, help desks, and support centers	Capture and transfer of experts' knowledge, troubleshooting systems, and case-based reasoning systems; decision support systems
		Routines	Organizational policies, work practices, and standards	Expert systems, enterprise resource planning systems, management information systems



# Knowledge Management Infrastructure

- 5 main components:
  - ◆ Organizational Culture
  - ◆ Organizational Structure
  - ◆ Communities of Practice
  - ◆ Information Technology Infrastructure
  - ◆ Common Knowledge





# KM Infrastructure: Organizational Culture

- *Organizational culture* reflects the norms and beliefs that guide the behavior of the organization's members
- Attributes of a KM-enabling organizational culture include:
  - ◆ Understanding of the value and benefits of KM practices
  - ◆ Management support for KM at all levels, including allocation of time and adequate funding resources
  - ◆ Incentives that reward knowledge sharing, and encouragement of interaction for the creation and sharing of knowledge
  - ◆ Willingness to tackle the inability to directly measure the financial benefits from KM



# KM Infrastructure: Organizational Culture Obstacles

- Typically, the most important challenges in KM are nontechnical in nature – and have to do with lack of the above organizational culture characteristics [Dyer and McDonough 2001].
- Less than 10% of companies trying to implement KM have succeeded in making it part of their culture [estimate by Carla O'Dell, as reported by Koudsi 2000].



# KM Infrastructure: Organizational Structure (1)

- *Hierarchical structure* of the organization affects the people with whom individuals frequently interact, and to or from whom they are consequently likely to transfer knowledge
  - ◆ Traditional reporting relationships influence:
    - the flow of data and information
    - the groups who make decisions together
    - and thus, the sharing and creation of knowledge
  - ◆ By decentralizing or flattening the organizational structure, companies often seek to eliminate organizational layers, so as to:
    - place more responsibility with each individual
    - increase the size of groups reporting to each individual
    - and thus, increase likelihood of knowledge sharing across a larger group of individuals



# KM Infrastructure: Organizational Structure (2a)

- Organizational structures can facilitate KM through *communities of practice*
- A *community of practice* (COP) is an organic and self-organized group of individuals who are dispersed geographically or organizationally but communicate regularly to discuss issues of mutual interest [Lave & Wenger 1991].
- Examples:
  - ◆ A tech club at DaimlerChrysler includes a group of engineers who do not work in the same unit but meet regularly, on their own initiative, to discuss problems related to their area of expertise
  - ◆ At Xerox, a strategic community of IT professionals, involving frequent informal interactions among them, promotes knowledge sharing [Storck & Hill 2000]



# KM Infrastructure: Organizational Structure (2b)

- COPs are usually not part of a company's formal organization
- COPs provide access to a larger group of individuals than is possible within traditional departmental boundaries
  - ◆ So there are more potential helpers, increasing the probability that at least one can provide useful knowledge in any given situation
- COPs provide access to external knowledge sources
  - ◆ An organization's *external* stakeholders (eg, customers, suppliers, partners) provide a far greater knowledge reservoir than just its own [Choo 1998].
  - ◆ Example: relationships with university researchers can help new biotechnology firms to maintain their innovativeness.
- How executives can facilitate COPs:
  - ◆ Legitimize COPs by supporting participation
  - ◆ Enhance perceived value of participation by seeking advice from COPs
  - ◆ Provide resources, either financial or via connections to external experts



# KM Infrastructure: Organizational Structure (3)

- Organization structures can facilitate KM through *specialized structures* and *roles* that specifically support KM
- Examples:
  - ◆ Appoint a Chief Knowledge Officer
  - ◆ Establish a separate department for KM
  - ◆ R&D department supports KM about the latest or future developments
  - ◆ Corporate library supports business units by serving as a repository of historical information



# KM Infrastructure: IT Infrastructure

- The information technology infrastructure includes data processing, storage, and communication technologies and systems
- One way of systematically viewing the IT infrastructure is to consider the capabilities it provides in four important aspects [Daft & Lengel 1986; Evans & Wurster 1999]:
  - ◆ Reach
  - ◆ Depth
  - ◆ Richness
  - ◆ Aggregation



# KM Infrastructure: IT Infrastructure (Reach)

- *Reach* pertains to access and connection, and the efficiency of such access
- Network:
  - ◆ reach reflects the number and geographic locations of the nodes that can be efficiently accessed
  - ◆ Internet has greatly enhanced inexpensive reach
- Standardization of cross-firm communication standards (eg, meta-languages like XML) make it easier for firms to communicate with a wider array of trading partners
  - ◆ including those with whom they do *not* have long-term relationships





# KM Infrastructure: IT Infrastructure (Depth)

- *Depth* focuses on the detail and amount of information that can be effectively communicated over a medium
- Closely corresponds to the aspects of bandwidth and customization in Evans & Wurster's [1999] characterization of *richness*
  - ◆ Communicating deep and detailed information requires high bandwidth, which is now cheap
  - ◆ Again, advances in cross-firm communication standards greatly enhance the possible depth



# KM Infrastructure: IT Infrastructure (Richness)

- Communication channels can be arranged along a continuum representing their “relative richness” [Carlson & Zmud 1999]
- *Richness* of a medium is based on its ability to:
  - ◆ Provide multiple cues simultaneously, eg:
    - body language
    - facial expression
    - tone of voice
  - ◆ Provide quick feedback
  - ◆ Personalize messages
  - ◆ Use natural language to convey subtleties [Daft & Lengel 1984]
- Traditionally, IT has been viewed as a lean communication medium
  - ◆ But this is rapidly changing with today’s technology! Consider YouTube, Skype Video, etc...



# KM Infrastructure: IT Infrastructure (Aggregation)

- Rapid advances in IT have greatly enhanced the ability to store and quickly process information
- Enables the *aggregation* of large volumes of information drawn from multiple sources
- Examples:
  - ◆ Data mining and data warehousing together enable the synthesis of diverse information from multiple sources, potentially to produce new insights
  - ◆ Enterprise resource planning (ERP) systems present a natural platform for aggregating knowledge across different parts of an organization



# KM Infrastructure: Common Knowledge (1)

- *Common knowledge* refers to the organization's cumulative experiences in comprehending a category of knowledge and activities, and the organizing principles that support communication and coordination [Zander & Kogut 1995]
- Provides unity to the organization:
  - ◆ Common language and vocabulary
  - ◆ Recognition of individual knowledge domains
  - ◆ Common cognitive schema
  - ◆ Shared norms
  - ◆ Elements of specialized knowledge that are common across individuals sharing knowledge



## KM Infrastructure: Common Knowledge (2)

- Common knowledge helps enhance the value of an individual expert's knowledge by integrating it with the knowledge of others
- Common knowledge is common only to the particular organization
  - ◆ Increases value in that particular organization
  - ◆ Does *not* transfer to its competitors
  - ◆ Thus... common knowledge supports knowledge transfer within the organization, but *impedes* transfer (or leakage) of knowledge outside the organization [Argote & Ingram 2000]



# KM Infrastructure: Physical Environment (1)

- *Physical environment* includes:
  - ◆ the design of buildings and the separation between them
  - ◆ the location, size, and type of offices
  - ◆ the type, number, and nature of meeting rooms
  - ◆ ...
- A study found that most employees reported they gained most of their knowledge related to work from informal conversations around water coolers or over meals instead of formal training or manuals [Wensley 1998]



# KM Infrastructure: Physical Environment (2)

- Examples:
  - ◆ London Business School created an attractive space between two major departments, which were earlier isolated, to enhance knowledge sharing between them
  - ◆ Reuters News Service installed kitchens on each floor to foster discussions
  - ◆ A medium-sized firm in the US focused on careful management of office locations to facilitate knowledge sharing, developing open-plan offices with subtle arrangements to encourage *knowledge accidents* [Stewart 2000]
    - Locations were arranged so as to maximize the chances of face-to-face interactions among people who might be able to help each other
    - eg, snack areas and vending machines were carefully positioned
- Exercise: consider HKUST
  - ◆ Café / Coffeeshop?
  - ◆ Student Union?
  - ◆ Faculty offices versus laboratories?
  - ◆ University Center?



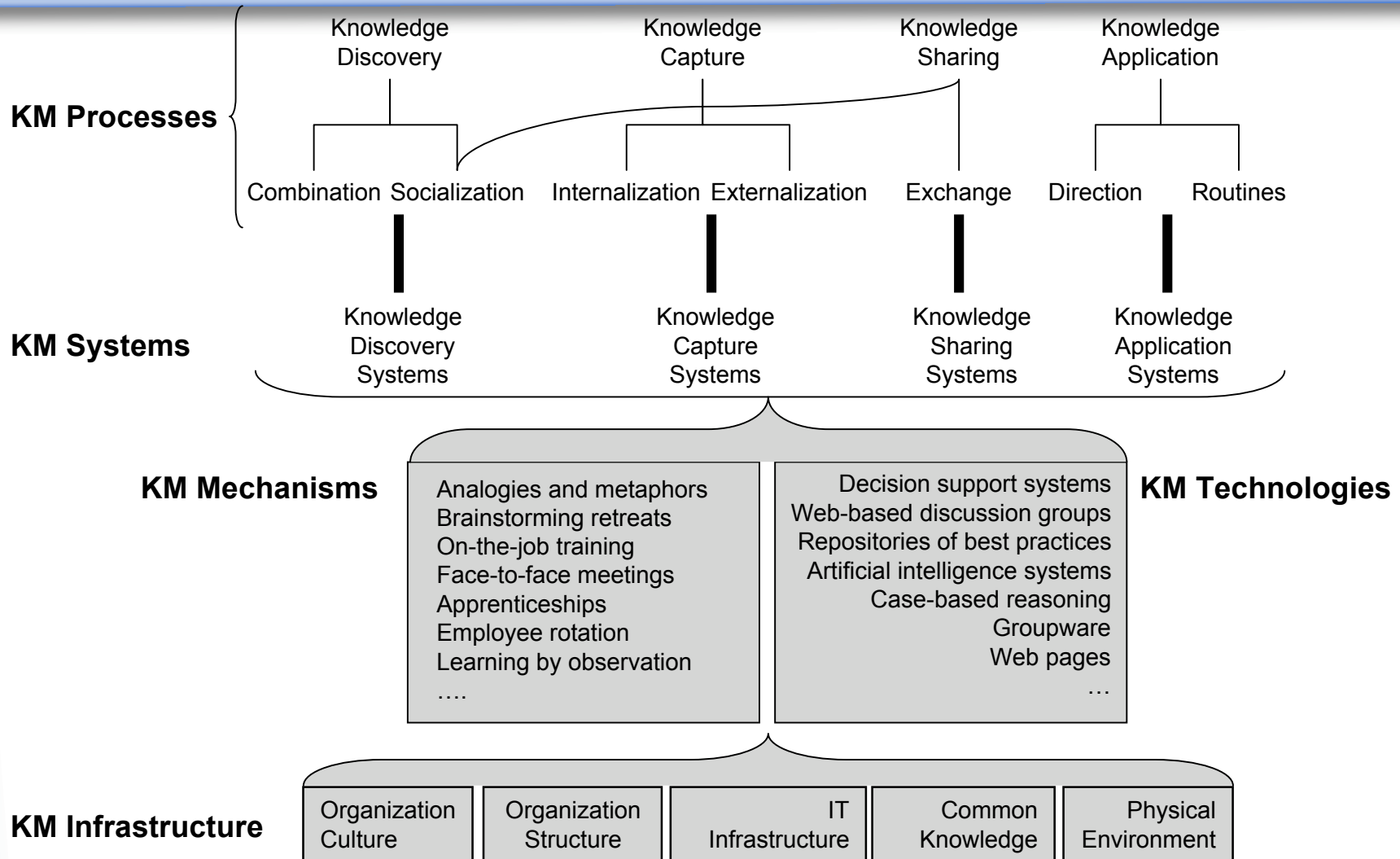
# Knowledge Management Infrastructure

Dimensions of KM Infrastructure	Related Attributes
Organization Culture	<ul style="list-style-type: none"> <li>Understanding of the value of KM practices</li> <li>Management support for KM at all levels</li> <li>Incentives that reward knowledge sharing</li> <li>Encouragement of interaction for the creation and sharing of knowledge</li> </ul>
Organization Structure	<ul style="list-style-type: none"> <li>Hierarchical structure of the organization (decentralization, matrix structures, emphasis on "leadership" rather than "management")</li> <li>Communities of practice</li> <li>Specialized structures and roles (Chief Knowledge Officer, KM department, traditional KM units)</li> </ul>
Information Technology Infrastructure	<ul style="list-style-type: none"> <li>Reach</li> <li>Depth</li> <li>Richness</li> <li>Aggregation</li> </ul>
Common Knowledge	<ul style="list-style-type: none"> <li>Common language and vocabulary</li> <li>Recognition of individual knowledge domains</li> <li>Common cognitive schema</li> <li>Shared norms</li> <li>Elements of specialized knowledge that are common across individuals</li> </ul>
Physical Environment	<ul style="list-style-type: none"> <li>Design of buildings (offices, meeting rooms, hallways)</li> <li>Spaces specifically designed to facilitate informal knowledge sharing (coffee rooms, cafeterias, water coolers)</li> </ul>





# Overview of Knowledge Management Solutions





# Conclusions

- Described the key aspects of knowledge management
- Provided a working definition of knowledge management
- Examined knowledge management solutions at four levels
  - ◆ KM processes
  - ◆ KM systems
  - ◆ KM mechanisms and technologies
  - ◆ KM infrastructure



# A3: Individual Assignment

## (Due at beginning of class Jun 11)

- 1. KM processes in your organization:** Observe and describe at least one (preferably more) examples of knowledge discovery, knowledge capture, knowledge sharing, and knowledge application in your organization. Identify strengths and weaknesses of your organization's KM, with respect to the mechanisms and technologies as well as the infrastructure.
  - ◆ Note: you may wish to extend/refine work you did in Assignment 1.
- 2. Suggest reasons** why a knowledge sharing system could be established between rival organizations (eg, Mastercard and Visa) for the mutual benefit of both organizations.
- 3. Critique the following statement:** "We have implemented several IT solutions: expert systems, chat group, and best practices and lessons learned databases. These powerful solutions can surely get our employees to internalize knowledge."



# Chapter 3

## Knowledge Management Solutions

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