Additional questions to answer on your Questionnaire

1. What university did you do your undergraduate work?
2. Where did you grow up?
3. Does your career goal lean toward management or engineering?
4. In the MSc-IT program so far, would you have liked more or less (1) technical CS material, (2) business/management IT material?
5. What is the biggest piece of software you have ever written?
6. If you're not working for a company, do you belong to any organizations?
7. Do you blog? If so, what software or site do you use? How did you choose it?
8. Do you enjoy programming? Do you hate it?
9. Are you a night person or a morning person?

Chapter 1

Introducing Knowledge Management

Chapter Objectives

- Describe what KM is and what the forces are that drive KM.

- Discuss organizational issues related to KM.

- Explain knowledge management systems (KMS) and their role in the organization.

- Discuss the relevance of KM in today's dynamic environments augmented with increasing technological complexity.

- Present the benefits and considerations about KM, including an overview of the nature of the KM projects currently in progress at public and private organizations around the world, and the important role that IT plays in KM

Knowledge Management - Motivation

- "*The 20th anniversary of the landing of an American on the surface of the Moon occasioned many bittersweet reflections. Sweet was the celebration of the historic event itself... Bitter, for those same enthusiasts, was the knowledge that during the twenty intervening years much of the national consensus that launched this country on its first lunar adventure had evaporated... a generation of men and women who had defined their lives to a large extent in terms of this nation's epochal departure from Earth's surface was taking its leave of the program they had built*" [Fries, 1992].

Need for Knowledge Management

- "*Knowledge has become the key resource, for a nation's military strength as well as for its economic strength… is fundamentally different from the traditional key resources of the economist – land, labor, and even capital…we need systematic work on the quality of knowledge and the productivity of knowledge… the performance capacity, if not the survival, of any organization in the knowledge society will come increasingly to depend on those two factors*" [Drucker,1994]

What is Knowledge Management?

- Knowledge management (KM) may simply be defined as *doing what is needed to get the most out of knowledge resources*.

- In general, KM focuses on organizing and making available important knowledge, wherever and whenever it is needed.

- KM is also related to the concept of intellectual capital.

Most vital resource of today's enterprise = Knowledge

- Collective knowledge residing in the minds of the organization's employees, customers, and vendors

- Many benefits to learning how to effectively manage organizational knowledge
  - ◆ Leveraging core business competencies
  - ◆ Accelerating innovation and time to market
  - ◆ Improving cycle times and decision making
  - ◆ Strengthening organizational commitment
  - ◆ Building sustainable competitive advantage
    [Davenport & Prusak 1998]

Valuation of Intellectual Capital

- Consider the widening gap between *corporate balance sheets* versus *investors' estimates of corporate worth*

- Globally, knowledge-intensive companies are valued at <u>3x</u> to <u>8x</u> their financial capital

- Case: Microsoft
  - ◆ valued at US$284B (July 2003)
  - ◆ much more than worth of its buildings, computers, physical assets
  - ◆ also represents estimate of its <u>intellectual assets</u>

Intellectual Capital: Human vs. Structural Capital

- **Human capital**
  - The body of knowledge the company possesses
  - Knowledge in the minds of Microsoft's software developers, researchers, academic collaborators, business managers, …
  - Also, knowledge in the minds of vendors and customers

- **Structural capital**
  - Everything that remains after the employees go home
  - Copyrights, customer files, business process software, databases, software manuals, trademarks, organizational structures, …
  - In other words, organizational capability

- **Intellectual capital is ubiquitous – but there are still no standard tools to manage it as an asset!**

Forces Driving Knowledge Management

1. **Increasing Domain Complexity**

2. **Accelerating Market Volatility**

3. **Intensified Speed of Responsiveness**

4. **Diminishing Individual Experience**

Increasing Domain Complexity

- Complexity of the underlying knowledge domains is increasing.
- Thus, complexity of the knowledge required to complete a specific business process task has increased as well.
- Intricacy of internal and external processes, increased competition, and the rapid advancement of technology all contribute to increasing domain complexity.
- Example: New product development now typically requires…
  - *not only* brainstorming sessions by freethinking product designers
  - *but also* partnership of interorganizational teams representing many various functional subunits (finance, marketing, engineering, …)
- Professional recruiters increasingly emphasize not just excellent educational and professional qualifications, but also have outstanding communication and team collaboration skills…
  - … enabling them to share their knowledge for the benefit of the organization.

Accelerating Market Volatility

- The pace of change, or volatility, within each market domain has increased rapidly in the past decade.
- Market and environmental influences can result in overnight changes in an organization.
- Corporate announcements of a missed financial quarterly target could send a company's capitalization into a downward spiral.
  - Along with their entire industry, sometimes!
- Stock prices have become increasingly volatile in recent years
  - A result of "day trading" phenomenon (sharp increase in nonfinancial professionals who are making a living from exploiting steep market fluctuations).

Intensified Speed of Responsiveness

- The time required to take action based upon subtle changes within and across domains is decreasing.
- Rapid advances in technology is continually changing the decision-making landscape.
  - Decisions must be made and implemented quickly – otherwise the window of opportunity closes.
- Example: hotel booking business
  - Yesterday… low-tech…
    - customer makes a request
    - individual sales representatives return to the office
    - discuss the opportunity with their manager
    - draft a proposal
    - mail the proposal to the client
    - client accepts or rejects the offer
  - Today… with online auctioning/bidding markets…
    - hotel manager: "should I book a $200 room for the bid offer of $80 and fill the room, or risk not accepting the bid hoping to get a walk-in customer that will pay the $200?"
    - manager only has minutes after a bid offer to make the decision!

Diminishing Individual Experience

- High employee turnover rates have resulted in individuals with decision-making authority having less tenure within their organizations than ever before.

- Example: Fortune 300 CEOs
  - Proportion below age 50:
    - 1998: 5%
    - 2000: 15%
  - Median tenure in office:
    - 1998: 7 years
    - 2000: 5 years

Diminishing Individual Experience (cont'd)

- Because trends change so rapidly, a decision-maker's experience may not be relevant to the decision that needs to be made (even when the individual has been with the organization for years).

- Damages mission-critical decision making:

  - Immature intuition – the decision maker is less likely to understand the nuances of domain inputs, due to the complexity in specific domains and their own tenure within an organization.

  - Pressure for faster responsiveness – when facing external pressures, the need to respond is more urgent due to competitive pressures such as shortening product development cycles.

  - Higher risk of wrong or unclear decision responses – the need for swiftness in implementing an action after a decision has been made allows little market tolerance for wrong or unclear decision responses.

Summary: Forces Driving Knowledge Management

1. **Increasing Domain Complexity:** Intricacy of internal and external processes, increased competition, and the rapid advancement of technology all contribute to increasing domain complexity.

2. **Accelerating Market Volatility:** The pace of change, or volatility, within each market domain has increased rapidly in the past decade.

3. **Intensified Speed of Responsiveness:** The time required to take action based upon subtle changes within and across domains is decreasing.

4. **Diminishing Individual Experience:** High employee turnover rates have resulted in individuals with decision-making authority having less tenure within their organizations than ever before.

So, what does this mean?

- Faced with increased complexity, market volatility and accelerated responsiveness, today's younger manager feels less adequate to make the difficult decisions faced each day.

- KM is important for organizations that continually face downsizing or a high turnover percentage due to the nature of the industry.

Case: Corporate Downsizing Trend followed by Growth again

- Need for KM became even more evident in the "reengineering" era of recent times.
- Dominant driver of downsizing in most organizations: rapidly reduce costs to survive against competitors.
- Obvious negative side effect: dissipation of the knowledge resources of the organization.
- Results in a devitalized organization:
  - decreased morale
  - reduced commitment
  - inferior quality
  - lack of teamwork
  - lower productivity
  - loss of innovative ability [Eisenberg 1997]
- Fact: many laid-off individuals performed significant tasks and had acquired considerable and valuable skills over the years.
- Many companies are typically not prepared for downsizing
  - Few take steps to prevent the escape of knowledge
  - Should first identify what skills and information resources are needed to meet mission-critical objectives
- Now, with growth again, how and by whom can new employees be trained?
- Effective methodologies, including tools and techniques to capture vital knowledge, are essential for an organization to maintain its competitive edge.

Vignette 1-1 Is Knowledge Management for Everybody?

- KM is important for all organizations
- Today's decision maker faces the pressure to make better and faster decisions in an environment characterized by a high domain complexity and market volatility, even in light of
  - ◆ lack of experience typically from the decision-maker
  - ◆ outcome of those decisions could have such a considerable impact on the organization

Knowledge Management Systems

- Information technology facilitates sharing as well as accelerated growth of knowledge.

- Information technology allows the movement of information at increasing speeds and efficiencies.

- *"Today, knowledge is accumulating at an ever increasing rate. It is estimated that knowledge is currently doubling every 18 months and, of course, the pace is increasing... Technology facilitates the speed at which knowledge and ideas proliferate"* Bradley [1996]

Knowledge Management Systems

- Knowledge management mechanisms are organizational or structural means used to promote knowledge management.

- The use of leading-edge information technologies (e.g., Web-based conferencing) to support KM mechanisms enables dramatic improvement in KM.

- *knowledge management systems* (KMS): the synergy between latest technologies and social/structural mechanisms

Latest Technology **+** Social/Structural Mechanisms **=** Knowledge Management Systems

Knowledge Management Systems

- **KM systems classification** based on observations on the KM systems implementations:

    - *Knowledge Discovery Systems (Chapter 13)*
    - *Knowledge Capture Systems (Chapter 14)*
    - *Knowledge Sharing Systems (Chapter 15)*
    - *Knowledge Application Systems (Chapter 16)*

Knowledge Management Systems

- **Artificial intelligence and machine learning technologies** (Chapters 7-12) play an important role in the KM processes, enabling the development of KMS

- **Experience management:** basically experience develops over time, to coalesce into more general experience, which then combines into general knowledge

Issues in Knowledge Management

- *"Effective KM is not about making a choice between "software vs. wetware, classroom vs. hands-on, formal vs. informal, technical vs. social…uses all the options available to motivated employees to put knowledge to work …[and] depends on recognizing that all of these options basically need each other*" [Stewart, 2002].

- One of the primary differences between traditional information systems and KM systems is the active role that users of KM systems play on building the content of such systems.

Effective Knowledge Management

- 80% - Organizational culture & human factors

- 20% - Technology

  To effectively apply Artificial Intelligence, we must understand Human Intelligence and Human-Computer Interaction…

Essence of KM

1. Knowledge is first created in the people's minds. KM practices must first identify ways to encourage and stimulate the ability of employees to develop new knowledge.

2. KM methodologies and technologies must enable effective ways to elicit, represent, organize, re-use, and renew this knowledge.

3. KM should not distance itself from the knowledge owners, but instead celebrate and recognize their position as experts in the organization.

Text Overview

- **17 chapters** divided into **4 parts**
  - *Part I - Principles of Knowledge Management*
  - *Part II: Technologies for Knowledge Management*
  - *Part III: Knowledge Management Systems*
  - *IV: The Future of KM*

Conclusions

In this Chapter, we…

- Described KM ranging from the system to the organizational perspective.

- Explained the relevance of KM in today's dynamic environments augmented with increasing technological complexity

- Explained the benefits and considerations about KM, including an overview of the nature of the KM projects currently in progress at public and private organizations around the world.

- Described that information technology plays an important role in KM. The enabling role of IT is discussed, but the old adage of "KM is 80% organizational, and 20% about IT" still holds today.

Individual Assignment
(Due in class Jun 12)

- Do one (or both) of the following:
  - ◆ Identify an example of a KM initiative that has been undertaken in your organization. Has the initiative been successful? What are some of the issues, both technical and nontechnical, that were faced during its implementation?
  - ◆ How would you go about designing a knowledge management initiative to support your business needs? What nontechnical issues will you face during its implementation?
- Give an example of each of the four forces driving KM described in this chapter (from your own experience if possible).

Chapter 1

Introducing Knowledge Management