Managing Knowledge and Collaboration

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LEARNING OBJECTIVES

• Assess the role of knowledge management and knowledge management programs in business.

• Describe the types of systems used for enterprise-wide knowledge management and demonstrate how they provide value for organizations.

• Describe the major types of knowledge work systems and assess how they provide value for firms.

• Evaluate the business benefits of using intelligent techniques for knowledge management.
What is Knowledge?

Refer to extra notes
• **Important dimensions of knowledge**
  
  • **Knowledge is a firm asset**
    - Intangible
    - Creation of knowledge from data, information, requires organizational resources
    - As it is shared, experiences network effects
  
  • **Knowledge has different forms**
    - May be explicit (documented) or tacit (residing in minds)
    - Know-how, craft, skill
    - How to follow procedure
    - Knowing why things happen (causality)
Important dimensions of knowledge (cont.)

Knowledge has a location
- Cognitive event
- Both social and individual
- “Sticky” (hard to move), situated (enmeshed in firm’s culture), contextual (works only in certain situations)

Knowledge is situational
- Conditional: Knowing when to apply procedure
- Contextual: Knowing circumstances to use certain tool
To transform information into knowledge, firm must expend additional resources to discover patterns, rules, and contexts where knowledge works.

**Wisdom:** Collective and individual experience of applying knowledge to solve problems

- Involves where, when, and how to apply knowledge

Knowing how to do things effectively and efficiently in ways other organizations cannot duplicate is primary source of profit and competitive advantage that cannot be purchased easily by competitors

- E.g., Having a unique build-to-order production system
• Organizational learning
  • Process in which organizations learn
    • Gain experience through collection of data, measurement, trial and error, and feedback

HOW DO ORGANIZATIONS LEARN?

Refer to extra notes
Knowledge management: Set of business processes developed in an organization to create, store, transfer, and apply knowledge

Knowledge management value chain:
- Each stage adds value to raw data and information as they are transformed into usable knowledge
- Knowledge acquisition
- Knowledge storage
- Knowledge dissemination
- Knowledge application
• Knowledge management value chain
  • Knowledge acquisition
    • Documenting tacit and explicit knowledge
      • Storing documents, reports, presentations, best practices
      • Unstructured documents (e.g., e-mails)
      • Developing online expert networks
    • Creating knowledge
    • Tracking data from TPS and external sources
Knowledge management value chain:

- Knowledge storage
  - Databases
  - Document management systems
  - Role of management:
    - Support development of planned knowledge storage systems
    - Encourage development of corporate-wide schemas for indexing documents
    - Reward employees for taking time to update and store documents properly
• Knowledge management value chain:
  • Knowledge dissemination
    • Portals
    • Push e-mail reports
    • Search engines
    • Collaboration tools
    • A deluge of information?
      • Training programs, informal networks, and shared management experience help managers focus attention on important information
• Knowledge management value chain:
  • Knowledge application
    • To provide return on investment, organizational knowledge must become systematic part of management decision making and become situated in decision-support systems
      • New business practices
      • New products and services
      • New markets
Knowledge management today involves both information systems activities and a host of enabling management and organizational activities.
• New organizational roles and responsibilities
  • Chief knowledge officer executives
  • Dedicated staff / knowledge managers
  • Communities of practice (COPs)
    • Informal social networks of professionals and employees within and outside firm who have similar work-related activities and interests
    • Activities include education, online newsletters, sharing experiences and techniques
    • Facilitate reuse of knowledge, discussion
    • Reduce learning curves of new employees
• Three major types of knowledge management systems:
  • Enterprise-wide knowledge management systems
    • General-purpose firm-wide efforts to collect, store, distribute, and apply digital content and knowledge
  • Knowledge work systems (KWS)
    • Specialized systems built for engineers, scientists, other knowledge workers charged with discovering and creating new knowledge
  • Intelligent techniques
    • Diverse group of techniques such as data mining used for various goals: discovering knowledge, distilling knowledge, discovering optimal solutions
Major Types of Knowledge Management Systems

There are three major categories of knowledge management systems, and each can be broken down further into more specialized types of knowledge management systems.

**Enterprise-Wide Knowledge Management Systems**
- General purpose, integrated, firm-wide efforts to collect, store, disseminate, and use digital content and knowledge
- Structured knowledge systems
- Semistructured knowledge systems
- Knowledge network systems

**Knowledge Work Systems**
- Specialized workstations and systems that enable scientists, engineers, and other knowledge workers to create and discover new knowledge
- Computer-aided design (CAD)
- 3D visualization
- Virtual reality
- Investment workstations

**Intelligent Techniques**
- Tools for discovering patterns and applying knowledge to discrete decisions and knowledge domains
- Data mining
- Neural networks
- Expert systems
- Case-based reasoning
- Fuzzy logic
- Genetic algorithms
- Intelligent agents

**Figure 11-3**
Three major types of knowledge in enterprise

- Structured documents
  - Reports, presentations
  - Formal rules
- Semistructured documents
  - E-mails, videos
  - Unstructured, tacit knowledge
- 80% of an organization’s business content is semistructured or unstructured
• Enterprise-wide content management systems
  • Help capture, store, retrieve, distribute, preserve
    • Documents, reports, best practices
    • Semistructured knowledge (e-mails)
  • Bring in external sources
    • News feeds, research
  • Tools for communication and collaboration
• Knowledge network systems
  • Provide online directory of corporate experts in well-defined knowledge domains
  • Use communication technologies to make it easy for employees to find appropriate expert in a company
  • May systematize solutions developed by experts and store them in knowledge database
    • Best-practices
    • Frequently asked questions (FAQ) repository
Learning management systems

- Provide tools for management, delivery, tracking, and assessment of various types of employee learning and training
- Support multiple modes of learning
  - CD-ROM, Web-based classes, online forums, live instruction, etc.
- Automates selection and administration of courses
- Assembles and delivers learning content
- Measures learning effectiveness
Discovering Knowledge from Data
• **Case-based reasoning (CBR)**
  
  • Descriptions of past experiences of human specialists, represented as cases, stored in knowledge base
  
  • System searches for stored cases with problem characteristics similar to new one, finds closest fit, and applies solutions of old case to new case
  
  • Successful and unsuccessful applications are grouped with case
  
  • Stores organizational intelligence: Knowledge base is continuously expanded and refined by users
  
  • CBR found in
    • Medical diagnostic systems
    • Customer support
Figure 11-9

Case-based reasoning represents knowledge as a database of past cases and their solutions. The system uses a six-step process to generate solutions to new problems encountered by the user.

1. User describes the problem
2. System searches database for similar cases
3. System asks user additional questions to narrow search
4. System finds closest fit and retrieves solution
5. System modifies the solution to better fit the problem
6. System stores problem and successful solution in the database
• Neural networks
  • Find patterns and relationships in massive amounts of data that are too complicated for human to analyze
  • “Learn” patterns by searching for relationships, building models, and correcting over and over again model’s own mistakes
  • Humans “train” network by feeding it data inputs for which outputs are known, to help neural network learn solution by example
  • Used in medicine, science, and business for problems in pattern classification, prediction, financial analysis, and control and optimization
• Machine learning: Related AI technology allowing computers to learn by extracting information using computation and statistical methods
A neural network uses rules it “learns” from patterns in data to construct a hidden layer of logic. The hidden layer then processes inputs, classifying them based on the experience of the model. In this example, the neural network has been trained to distinguish between valid and fraudulent credit card purchases.

Figure 11-11
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