Definition of Knowledge

Western epistemology defines Knowledge as

“Justified True Belief”

Nonaka* extension of the definition

“A meaningful set of information that constitutes justified true belief and/or embodied technical skill”

Knowledge creation:

“dynamic human process of justifying personal belief towards the truth and/or embodied technical skill”

Dimensions of Knowledge

Knowledge
- General
- Specific

Knowledge
- Explicit
- Tacit

Knowledge Processes
- Knowledge Creation
- Knowledge Transfer
Assumptions Underlying KM

- Knowledge is worth managing
- Organizations benefit from managing knowledge
- Knowledge can be managed
- Minimal risk associated with managing knowledge
The Nature of Man*

Resourceful, Evaluative, Maximizing Model (REMM)

Every individual cares; he or she is an evaluator
Each individual's wants are unlimited
Each individual is a maximizer
The individual is resourceful

Economic
(money maximizing)

Sociological
(social victim)

Psychological
(hierarchy of needs)

Political
(perfect agent)

Why do Firms Exist?

• Firms exist to minimize transaction costs
  • Contract Costs
  • Knowledge Costs (Transfer, Production)
  • Principle Agent Problem (Monitoring, Bonding, Residual Costs)

• Resource Based Theory
  • Deconstruct the “production function” black box

• Knowledge Based Theory
Managers Role

- Accumulate and Protect Valuable Knowledge
  - Organize and Exploit
  - Hierarchy

VS

- Generate new Knowledge
  - Hyperarchy
Problems and Solutions

• Simple  →  • Decomposable

• Complicated

• Complex  →  • Nearly decomposable

• Wicked  →  • Non decomposable
**Issues in Knowledge Management**

*King et.al, The Most Important Issues in Knowledge Management, Communications of the ACM, September, 2002*
“Technologists never evangelize without a disclaimer: "Technology is just an enabler." True enough -- and the disclaimer discloses part of the problem: Enabling what? One flaw in knowledge management is that it often neglects to ask what knowledge to manage and toward what end. Knowledge management activities are all over the map: Building databases, measuring intellectual capital, establishing corporate libraries, building intranets, sharing best practices, installing groupware, leading training programs, leading cultural change, fostering collaboration, creating virtual organizations -- all of these are knowledge management, and every functional and staff leader can lay claim to it. But no one claims the big question: Why?”

Tom Stewart in The Case Against Knowledge Management, Business 2.0, February 2002
Codification Versus Personalization

**Codification**
- Provide reliable high quality and fast IS implementation by reusing codified knowledge
- REUSE ECONOMICS: Invest once in a knowledge asset and reuse many times
- Use large teams with high ratio of associates to partners
- Focus on generating large overall revenue
- PEOPLE-TO-DOCUMENTS: Develop an electronic document system that codifies, stores, disseminates and allows reuse of knowledge
- Invest heavily in IT
- Hire new college graduates who are well suited to the reuse of knowledge and the implementation of solutions
- Train people in groups
- Rewards people for using and contributing to document databases
- Andersen Consulting

**Personalization**
- Provide creative analytically rigorous advice on high level strategic problems by channeling individual experience.
- EXPERT ECONOMICS: Charge high fees for highly customized solutions to unique problems
- Use small teams with low ratio of associates to partners
- Focus on maintaining high profit margins
- PERSON-TO-PERSON: Develop a network for connecting people so that tacit knowledge can be shared
- Invest moderately in IT
- Hire MBA’s who like problem solving and can tolerate ambiguity
- Train people through mentoring
- Rewards people for directly sharing their knowledge with others
- McKinsey & Company

Health Care

• Reuse Model – Access Health
  • Clinical decision architecture (algorithms of the symptoms of 500 illnesses)
  • First 300 used an average of 8000 times a year

• Personalization Strategy – Sloan Kettering
  • 17 disease specific teams
  • Team members located in the same area
  • HR policy aligned with KM strategy
    • Junior staff hired from top residency programs and use an “up or out” pyramid system
    • Nationally recognized clinicians
Knowledge Creation

“The goal of Knowledge Creation is to enhance the pace of innovation and reduce timespan to commercial success in market” – Ikujiro Nonaka

• 5 Step Process
  • Create Collective Tacit Knowledge
  • Make Collective Knowledge Explicit (develop concepts)
  • Scrutinize concepts
  • Prototype product/service
  • Integrate newly created knowledge into the organization
SECI Framework*

I: Individual  G: Group  O: Organization  E: Environment

Organization Learning*


<table>
<thead>
<tr>
<th>Epistemological Dimension</th>
<th>Ontological Level of Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explicit Knowledge</td>
<td>Individual</td>
</tr>
<tr>
<td>Tacit Knowledge</td>
<td>Group</td>
</tr>
<tr>
<td></td>
<td>Organization</td>
</tr>
<tr>
<td></td>
<td>Inter-organization</td>
</tr>
</tbody>
</table>

- Socialization
- Externalization
- Combination
- Internalization

- Organization Intent
- Individual and Group Autonomy
- Fluctuation/ Creative Chaos
- Information Redundancy
- Requisite Variety
## Knowledge Creation

### Table: Knowledge Creation

<table>
<thead>
<tr>
<th>Individual</th>
<th>Collective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Originating Ba</td>
<td>Distinguishing Ba</td>
</tr>
<tr>
<td>Exercising Ba</td>
<td>Systemizing Ba</td>
</tr>
</tbody>
</table>

### Diagram: SECI Model

- **BA (Building and Applying):**
  - Experiential KA
  - Conceptual KA
  - Routine KA
  - Systemic KA

- **SECI (Sharing, Exchanging, Creating, Integrating):**
  - Moderate
  - In
  - Out

- **Knowledge Assets:**
  - Develop and redefine KA
  - Knowledge Vision

- **Lead SECI:**
  - Synchronize
  - Justify
  - Define

- **Process:**
  - Build and Energize
  - Exercising BA
  - Systemizing BA

*ESD.61J / 16.852J: Integrating the Lean Enterprise © JK, Debbie Nightingale 2005 Massachusetts Institute of Technology*
Seven-Eleven Japan

Weekly meeting for all field counselors
Review buying + feedback to create hypotheses
Test Nationally

Manuals for store operations, employee training, Franchise recruiting

Ordering by personnel is based on customer buying behavior, items on shelf, advice from counselors

ESD.61J / 16.852J: Integrating the Lean Enterprise © JK, Debbie Nightingale 2005 Massachusetts Institute of Technology
Knowledge Transfer

1. People have to be aware of the opportunity to exchange knowledge
2. Parties involved, expect the knowledge transfer to be worthwhile to both parties
3. Parties must be motivated to pursue knowledge transfer
“In a knowledge economy, a key source of competitive advantage and superior profitability within an industry is how a company creates and shares knowledge”

Knowledge Domain (KD)

Knowledge Workshop
- Shared Vocabulary & Terminology
- Initiation of a “Community of Practice” (CoP)
- Identification of Knowledge Gaps

CoP
- Relevant data and information
- Articulated knowledge (Handbooks, Manuals, Presentations)
- List of Key People

Knowledge Domain
- Increase depth of knowledge
- Increase scope of knowledge

define

custodians
Communities of Practice

- Core group of participants of the workshop (10-12)
- Custodians of the knowledge domain
  - sharing and creation of knowledge and practices to achieve organization and personal objectives
- A senior business stakeholder $\rightarrow$ champions the CoP
  - Delivery to business targets
  - Visibility of CoP’s impact and effort
- Portfolio of CoP’s and KD’s is determined by
  - Importance to effectiveness of business operations
  - Tacitness of knowledge
Knowledge Strategy*

“Employment of Knowledge processes to an existing or a new knowledge domain in order to achieve strategic goals”

<table>
<thead>
<tr>
<th>Knowledge Domain</th>
<th>Knowledge Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing</td>
<td>Transfer</td>
</tr>
<tr>
<td></td>
<td>Leveraging Strategy</td>
</tr>
<tr>
<td></td>
<td>Expanding Strategy</td>
</tr>
<tr>
<td>New</td>
<td>Creation</td>
</tr>
<tr>
<td></td>
<td>Appropriating Strategy</td>
</tr>
<tr>
<td></td>
<td>Probing Strategy</td>
</tr>
</tbody>
</table>

Leveraging Strategy

- Internal knowledge sharing
- Improves the innovation process
- Share knowledge to reduce risk of overtaxing resources
- Share knowledge of competitors and regulatory environment

Unilever reduced time for designing planning and commissioning of a new plant by 50%

Microbiological Design Approval (MiDAS): frees up experts to innovate
Expanding Strategy

Unilever uses a common flavor language as a means of communication independent of regional and cultural differences, background/experience of user.

- Better Understanding of Key Processes
- Creating new process and product innovations based on existing products
- Developing KD’s to reduce risk of overtaxing resources and exposure to deterioration
- Share knowledge of competitors and regulatory environment

Incremental product innovation based on existing products

Knowledge Process

<table>
<thead>
<tr>
<th>Transfer</th>
<th>Creation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leveraging Strategy</td>
<td>Expanding Strategy</td>
</tr>
</tbody>
</table>

Knowledge Domain

- Existing
- New

Appropriating

Probing
Appropriating Strategy

- Transfer new knowledge from partners
- Transfer knowledge from partners for innovation
- Transfer knowledge from partners to reduce risk of overtaxing resources and exposure to deterioration
- Transfer new knowledge of competitors and regulatory environment

Unilever in partnership with WWF established the Marine Stewardship Council to ensure sustainable fishery.

Unilever set up alliances with AOL, Microsoft, NetGrocer to ensure development and exploit an understanding of how to interact with consumers through online channels.
Probing Strategy

- Create new knowledge that can improve business process
- Create new knowledge for radical process and product innovation and better adaptation
- Reducing exposure of risk of existing knowledge domain deterioration

Unilever market researchers and marketers are immersed in the lifestyle, habits and attitudes of the consumer.
Knowledge Measurement is Hard!

- Lack of standardized system for measuring and valuing training metrics
- Accounting practices don’t include human capital
# Impact of Culture*

<table>
<thead>
<tr>
<th>Japanese Organization</th>
<th>Western Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Group-based</td>
<td>• Individual-based</td>
</tr>
<tr>
<td>• Tacit Knowledge Oriented</td>
<td>• Explicit Knowledge Oriented</td>
</tr>
<tr>
<td>• Strong on Socialization and Internalization</td>
<td>• Strong on Externalization and Combination</td>
</tr>
<tr>
<td>• Emphasis on Experience</td>
<td>• Emphasis on Analysis</td>
</tr>
<tr>
<td>• Dangers of “Group-Think” and “over-adaptation to past success”</td>
<td>• Dangers of “Paralysis by Analysis”</td>
</tr>
<tr>
<td>• Ambiguous organization intent</td>
<td>• Clear organization intent</td>
</tr>
<tr>
<td>• Group Autonomy</td>
<td>• Individual Autonomy</td>
</tr>
<tr>
<td>• Creative Chaos through overlapping tasks</td>
<td>• Creative Chaos through individual differences</td>
</tr>
<tr>
<td>• Frequent Fluctuation from top management</td>
<td>• Less Fluctuation from top management</td>
</tr>
<tr>
<td>• Redundancy of Information</td>
<td>• Less Redundancy of Information</td>
</tr>
<tr>
<td>• Requisite Variety through cross-functional teams</td>
<td>• Requisite Variety through individual differences</td>
</tr>
</tbody>
</table>

Impact of Culture*

Japanese Organization
• Group-based
• Tacit Knowledge Oriented
• Strong on Socialization and Internalization
• Emphasis on Experience
• Dangers of “Group-Think” and “over-adaptation to past success”
• Ambiguous organization intent
• Group Autonomy
• Creative Chaos through overlapping tasks
• Frequent fluctuation from top management
• Redundancy of Information
• Requisite Variety through cross-functional teams

Western Organization
• Individual-based
• Explicit Knowledge Oriented
• Strong on Combination and Externalization
• Emphasis on Analysis
• Dangers of “Paralysis by Analysis”
• Clear organization intent
• Individual Autonomy
• Creative Chaos through individual differences
• Less fluctuation from top management
• Less redundancy of information
• Requisite Variety through individual differences

Knowledge Measurement
Frameworks

• Skandia Navigator
• Intangible Assets Monitor
• IC Index Model / HVA Model (Holistic Value Approach)
• Technology Broker Model
Measuring Knowledge

• Domain knowledge
  • Formal education, post-secondary education and formal training
  \[ K = \frac{c}{r} \left( \frac{(1+r)^n - 1}{(1+r)^n} \right) \]

Where:
  \[ K = \text{Value of knowledge} \]
  \[ c = \text{standard cost of acquiring knowledge in each time period} \]
  \[ r = \text{a long-run rate of return on investment} \]
  \[ n = \text{number of years of education} \]

For a formal education, using \( c = 9,230 \), \( r = 5.34\% \), \( n = 12 \), \( K = 149,840 \)

• Handle obsolescence by using depreciation

Measuring Knowledge

• Tacit Knowledge
  • How much time is spent sharing knowledge?
  • 12.5% (assumed in the absence of records)

$60,000 per employee $7,500 cost of tacit knowledge per employee

Given that the average period of employment is 47 years, using the same rate as that for Domain knowledge, present value of a working lifetimes’s tacit knowledge is estimated at 128,270.
Overview

• Evolving definition of knowledge
• Critical Issues in knowledge management
• Knowledge Management Frameworks
• Measuring Knowledge
• Human side of knowledge management
• Generic Approach to KM
Organization

- Perform a knowledge-based SWOT analysis
- Create a vision for KM initiative and provide a leader
- Align KM with the business strategy
- Plan and design the KM project
- Manage the organization culture and manage change
- Include stakeholders, competitors, environment
- Create and manage organization learning
People

• Manage people as individuals

• Encourage sharing and use of knowledge

• Encourage individual learning and innovating thinking

• Implement reward plans and promote
Infrastructure and Process

- Manage technology
- Manage process