Knowledge Management



Jayakanth Srinivasan November 09, 2005



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"

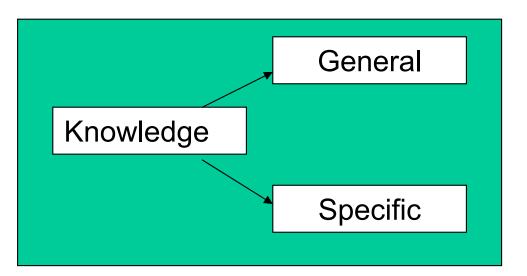
Knowledge creation:

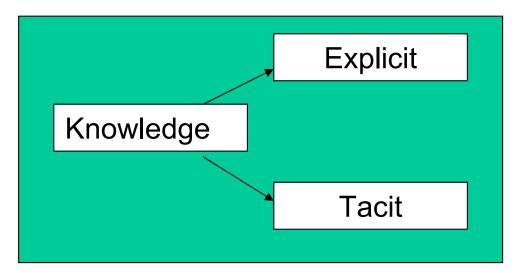
"dynamic human process of justifying personal belief towards the truth and/or embodied technical skill"

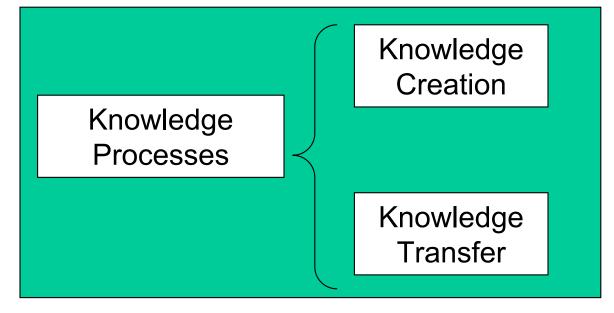
*Nonaka et.al, From Information Processing to Knowledge Creation: A Paradigm Shift in Business Management, Technology in Society, 18(2) pp 203-218, 1996.



Dimensions of Knowledge









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*



(money maximizing)

Sociological

(social victim)

Psychological

(hierarchy of needs)

Political

(perfect agent)

Resourceful, Evaluative, Maximizing Model (REMM)

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

*Jensen, Michael C. and Meckling, William H., "The Nature of Man" . Michael C. Jensen, FOUNDATIONS OF ORGANIZATIONAL STRATEGY, Harvard University Press, 1998, and Journal Of Applied Corporate Finance, 1994 http://ssrn.com/abstract=5471



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*

Executive/Strategy Management

- 1. Providing for strategic advantage
- 2.Top management support
- 4. Motivation to participate
- 9. Sustainability
- 15. Evaluating the CKO
- 16.Creativity and Innovation
- 17. Effect on organization process
- 19. Organization responsibility

Operation Management

- 3. Knowledge Currency
- 5.Identification of organization knowledge
- 7. Verification of Knowledge
- Contribution
- 8.System design
- 11. Methodologies

KM Issues Management Program

Costs, Benefits, Risks

- 6. Financial cost and benefit
- 10.Security
- 13. Non financial cost and benefit
- 18. Investment

Standards

- 12.Development of technical standards
- 14. Operation definition
- 20. Fit with IT infrastructure

^{*}King et.al, The Most Important Issues in Knowledge Management, Communications of the ACM, September, 2002



Critiquing Knowledge Management

"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		Personalization			
Provide reliable high quality and fast IS implementation by reusing codified knowledge	Competitive Strategy	Provide creative analytically rigorous advice on high level strategic problems by channeling individual experience.			
REUSE ECONOMICS		EXPERT ECONOMICS			
Invest once in a knowledge asset and reuse many times		Charge high fees for highly customized solutions to			
Use large teams with high ratio of associates to partners	Economic Model	unique problems Use small teams with low ratio of associates to			
Focus on generating large overall revenue		partners			
PEOPLE-TO-DOCUMENTS		Focus on maintaining high profit margins			
Develop an electronic document system that codifies,	KM Strategy	PERSON-TO-PERSON Develop a network for connecting people so that			
stores, disseminates and allows reuse of knowledge		tacit knowledge can be shared			
Invest heavily in IT	IT	Invest moderately in IT			
		Hire MBA's who like problem solving and can			
Hire new college graduates who are well suited to the	Human	tolerate ambiguity .			
reuse of knowledge and the implementation of solutions	Resources	Train people through mentoring			
Train people in groups	Resources	Rewards people for directly sharing their knowledge with others			
Rewards people for using and contributing to document databases					
Andersen Consulting	Example	McKinsey & Company			

*Hansen et. al, What is your Strategy for Managing Knowledge, Harvard Business Review, Mar-April, pp 106-116, 1999



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



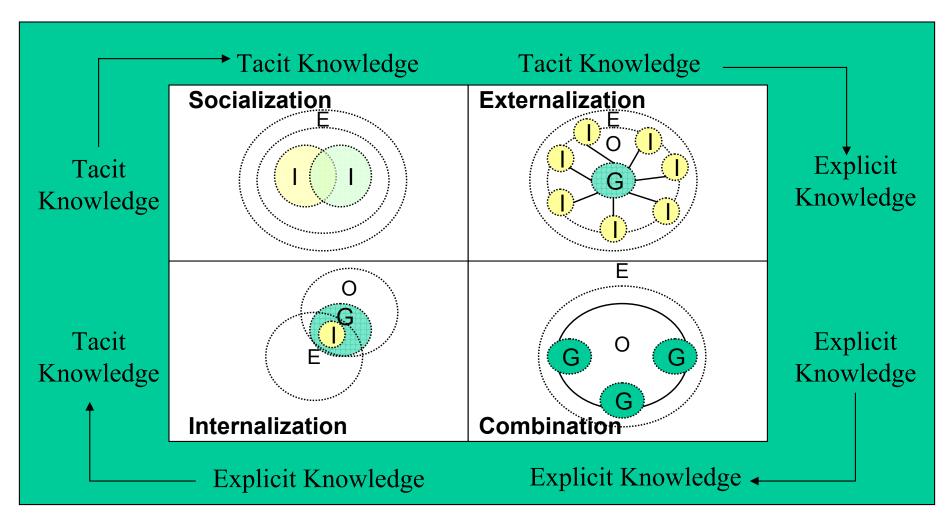
Knowledge Creation

"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

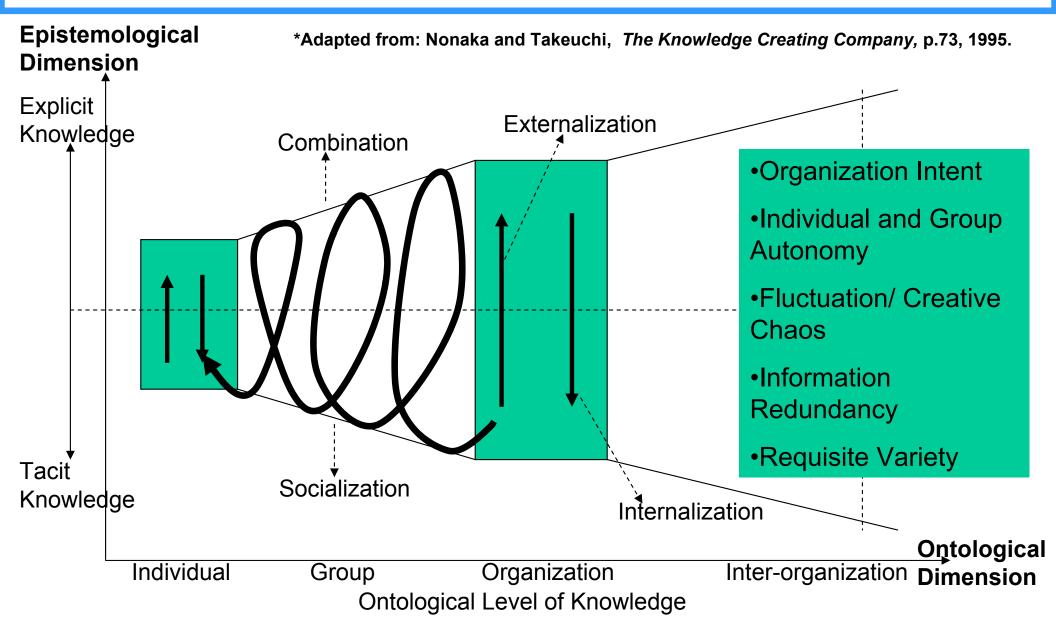
O: Organization

E: Environment

*Nonaka and Takeuchi, The Knowledge Creating Company, p.62, 1995.

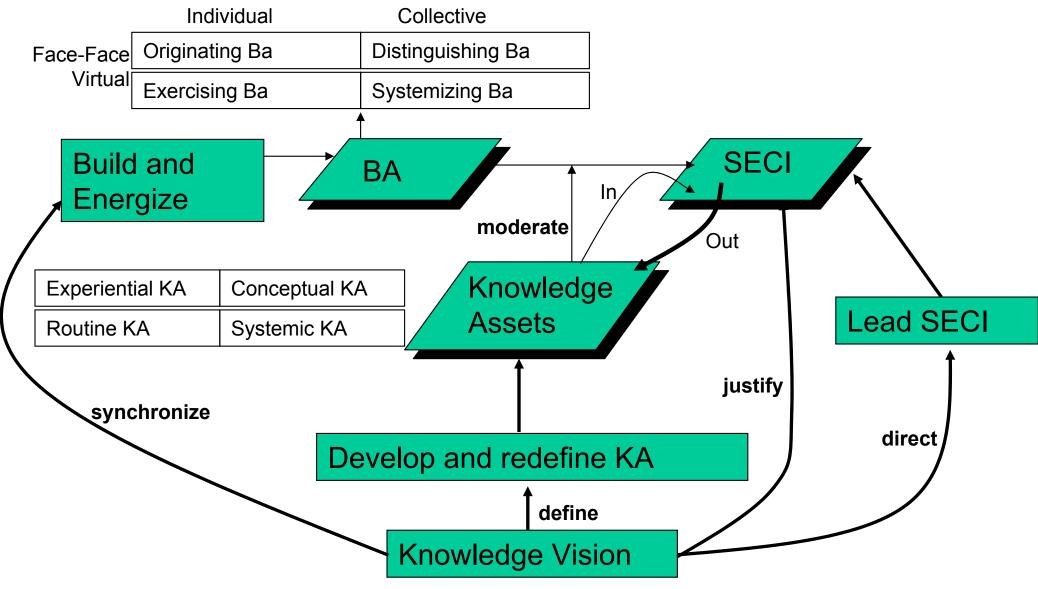


Organization Learning*



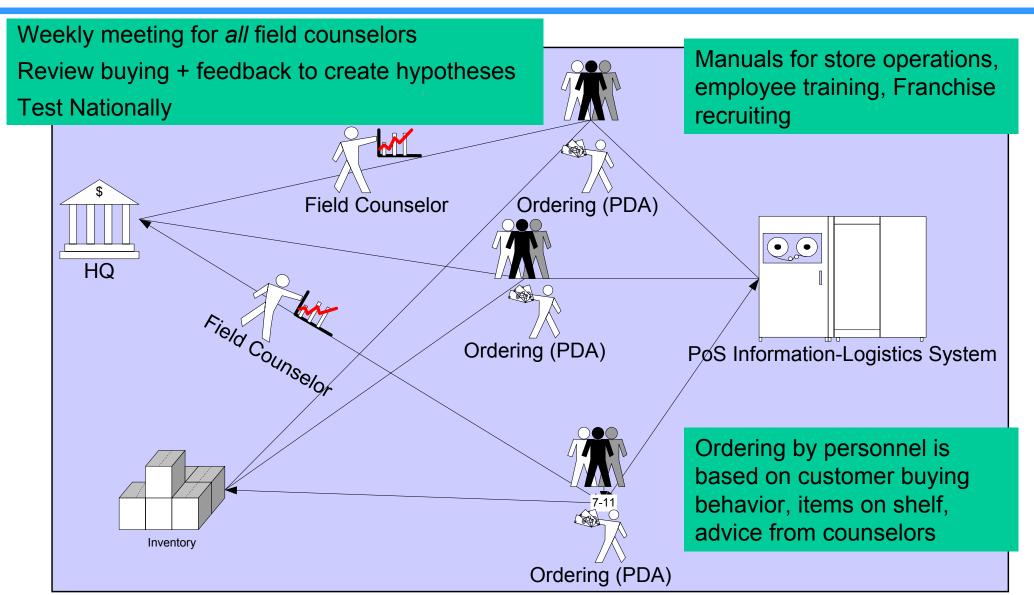


Knowledge Creation



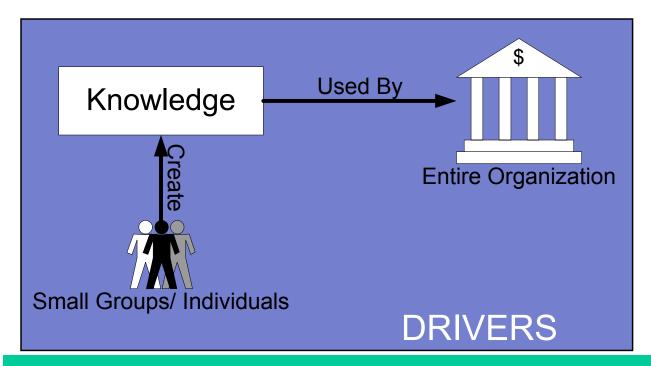


Seven-Eleven Japan

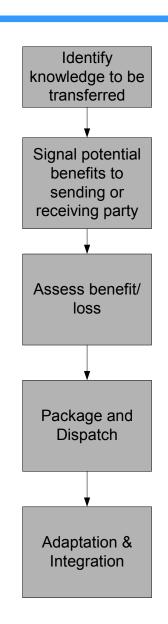




Knowledge Transfer



- 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



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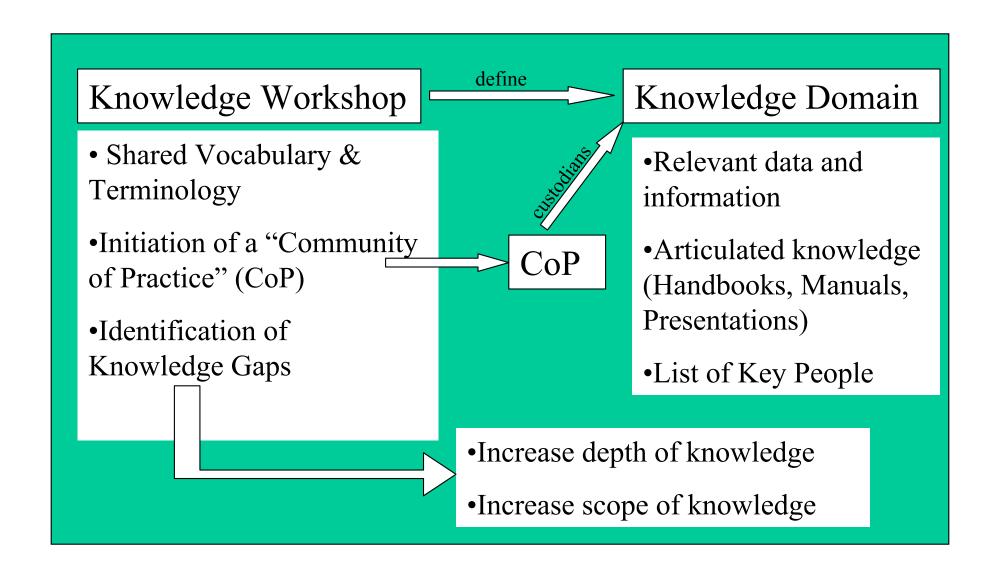
Providing Strategic Advantage

"In a knowledge economy, a key source of competitive advantage and superior profitability within an industry is how a company creates and shares knowledge"

- The New Economy: A Primer, Cambridge Technology partners, 1999.



Knowledge Domain (KD)





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 → 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"

			Knowledge Process		
			Transfer	Creation	
	Knowledge Domain	Existing	Leveraging Strategy	Expanding Strategy	
		New	Appropriating Strategy	Probing Strategy	

*von Krogh et. al, Making the Most of Your Company's Knowledge: A Strategic Framework, Long Range Planning, 34, pp 421-439, 2001...



Leveraging Strategy

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

Microbiological Design Approval (MiDAS): frees up experts to innovate •Improves the innovation process

- •Share knowledge to reduce risk of overtaxing resources
- •Share knowledge of competitors and regulatory environment



Expanding Strategy

Knowledge Process

Transfer Creation

Existing Leveraging Expanding Strategy

New Appropriating Probing St

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

Incremental product innovation based on existing products

- 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



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

Existing aging Expanding egy Strategy

New Appropriating Probing Strategy

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

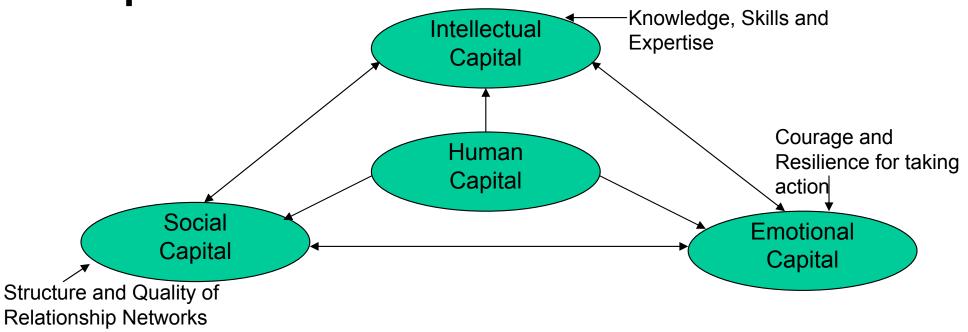
Unilever market researchers and marketers are immersed in the lifestyle, habits and attitudes of the consumer

			Папо		preation
	wledge main	Existing	Leveraging Strategy		xpanding Strategy
	Know Dom	New	Appropriating Strategy		Probing Strategy



Knowledge Measurement is Hard!

- Lack of standardized system for measuring and valuing training metrics
- Accounting practices don't include human capital



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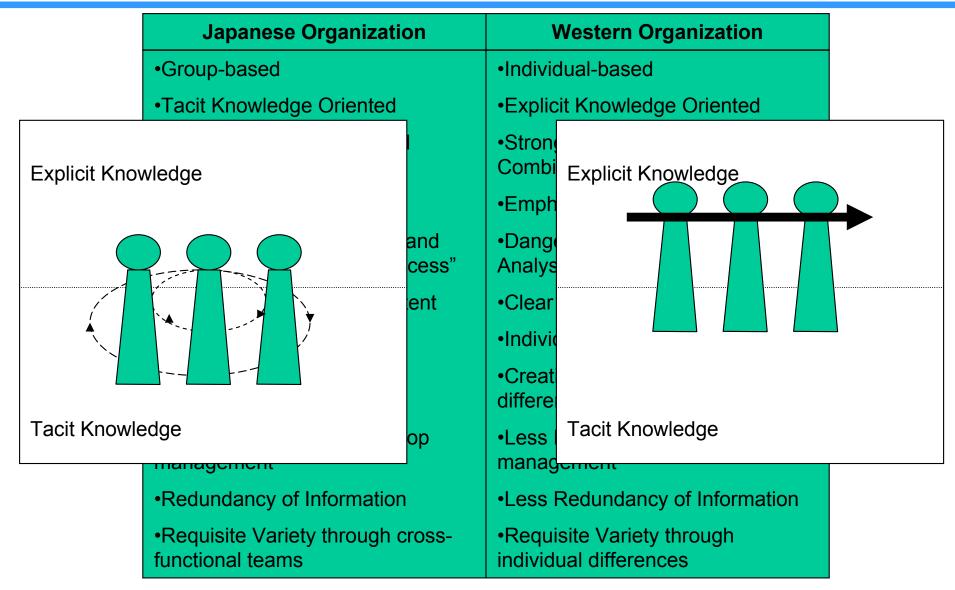
Impact of Culture*

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

^{*}Nonaka and Takeuchi, The Knowledge Creating Company, p.199, 1995.



Impact of Culture*



^{*}Nonaka and Takeuchi, The Knowledge Creating Company, p.199, 1995.



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

$$K = (c/r)((1+r)^n - 1)$$

Where:

K = Value of knowledge

c = standard cost of acquiring knowledge in each time period

r = a long-run rate of return on investment

n = 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

^{*}Turner and Jackson-Cox, If Management Requires Measurement How May We Cope with Knowledge, Singapore Management Review, 24(3), pp 101-111, 2001



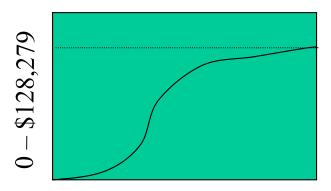
Measuring Knowledge

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