Knowledge Retention

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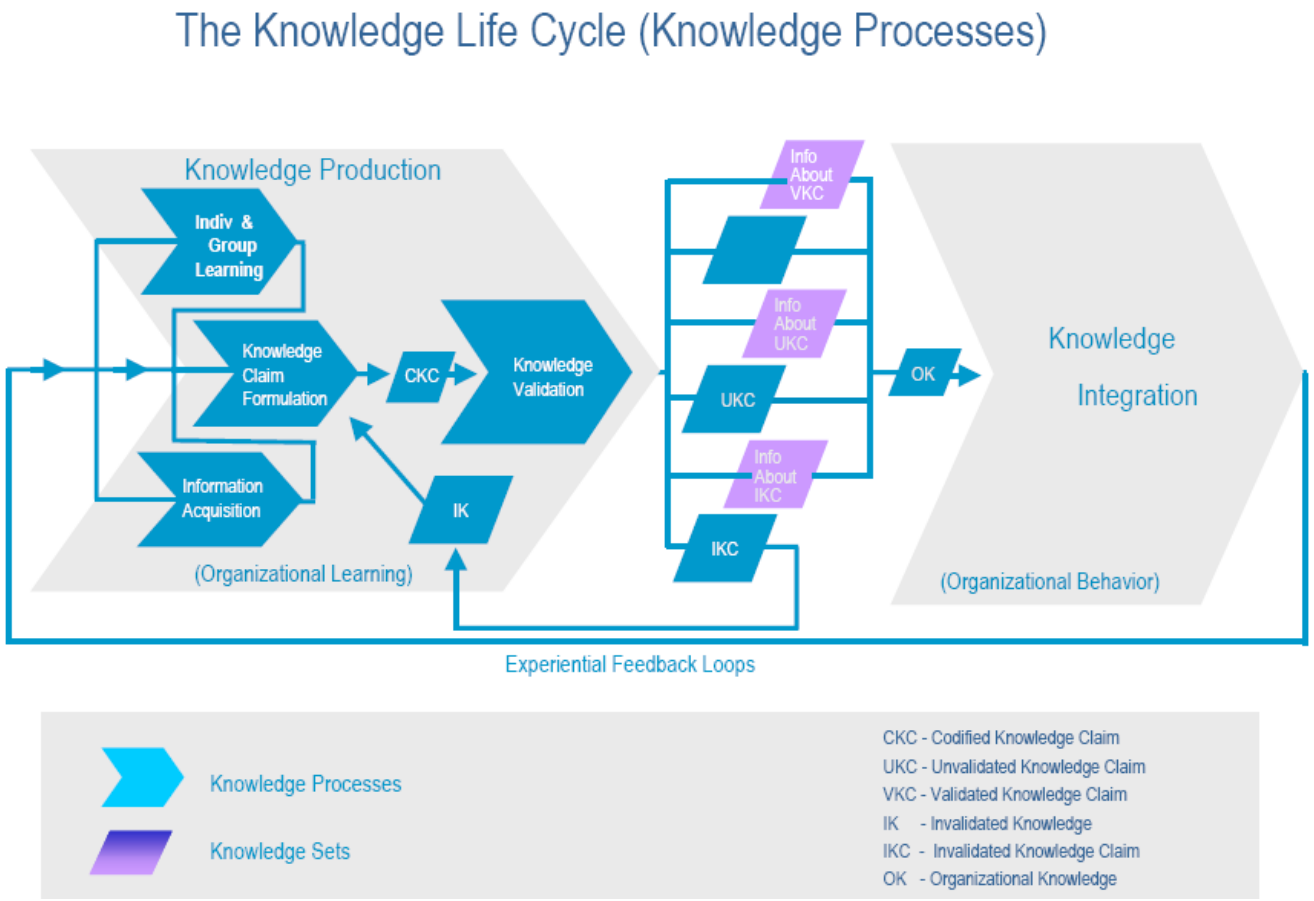
Lifecycle of Knowledge

- Capture
- Presentation
- Retention

Knowledge Life Cycle, Another View



Mark W. McElroy, ICM Conference on Knowledge Management, April 1999
http://www.macroinnovation.com/images/KnlgLifeCycle.pdf

Why Knowledge Retention is Needed

- Aging Workforce
- Increasing attrition rates
- “Baby Boomers”
  - Born from 1946 to 1964; 43 to 61 years old
  - About 76 million employees
  - One third of workforce eligible to retire by end of decade
- Loss of knowledge will require new generations to relearn or rediscover old knowledge

http://www.forbes.com/careers/2005/09/28/career-babyboomer-work-cx_sr_0929bizbasics.html

Retirement Rates, OPM Projections, Government Workforce

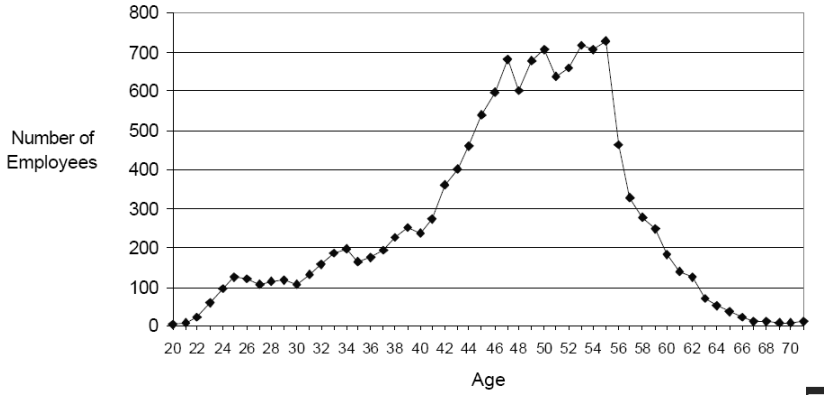
Retirement Rates by Selected Occupations		
Occupation	Fiscal Year 2000-2004 Actual	Fiscal Year 2006-2010 Projection
Information Technology	13.0%	16.9%
Scientist/Engineer	11.2%	14.6%
Financial Management	14.4%	17.9%
Acquisition	15.0%	17.6%
Law Enforcement	11.2%	13.4%

- http://www.opm.gov/feddata/retire/rs2004.pdf

Attrition Rates

- TVA: Estimated 30% to 40% of employee will retire in the next 5 years

- U.S. workforce growth
  - 1970's: 30%
  - 1990's – Now: 12%
  - Now – 2010: 3% (projected)



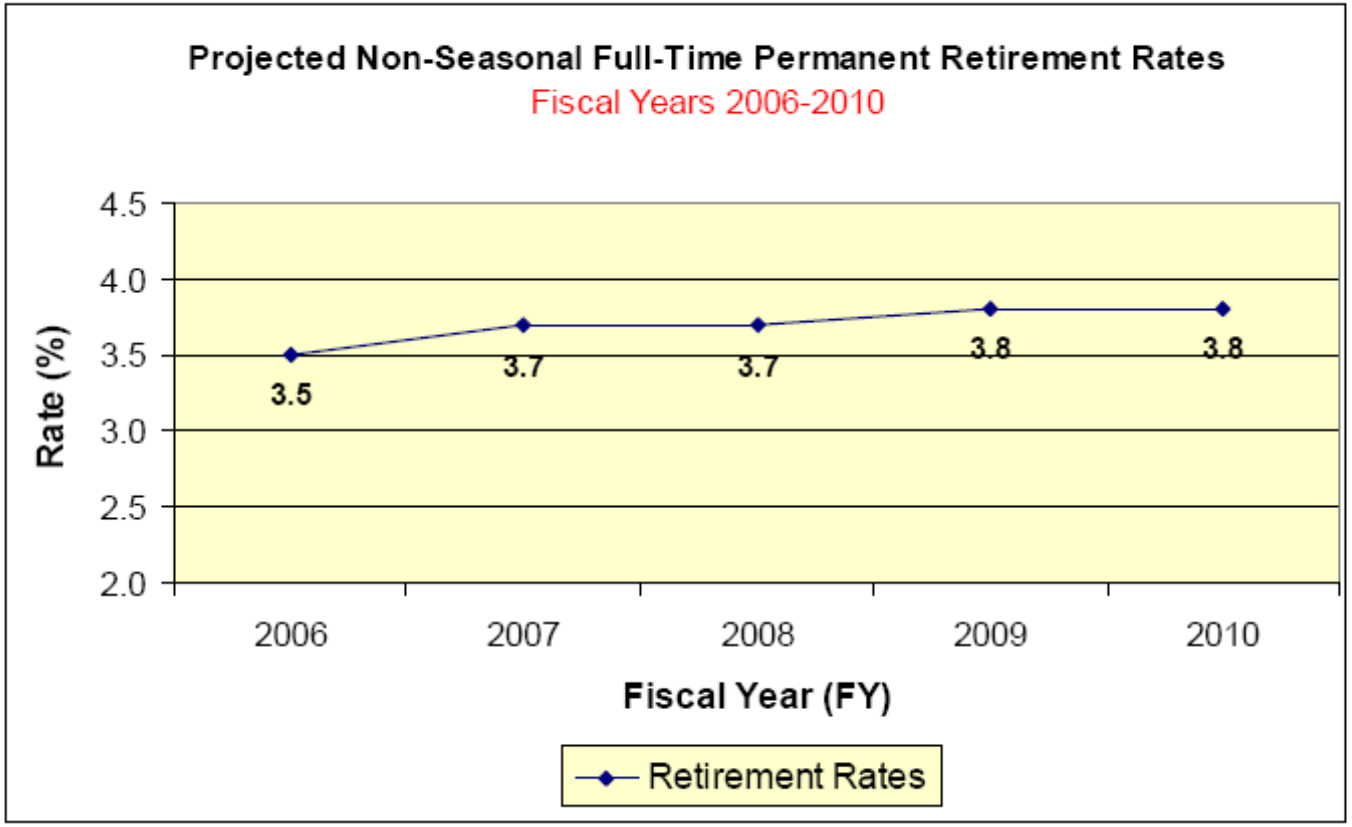
http://www.tva.gov/knowledgeretention/
http://www.tva.gov/knowledgeretention/pdf/briefing.pdf

www.forbes.com/careers/2005/09/28/career-babyboomer-work-cx_sr_0929bizbasics.html

Critical Skills

- Knowledge retention is especially important in critical skills areas
- Replacing manual labor positions is simpler than replacing critical skills positions
- Even if critical skills are transferred to another employee, the ability to perform will deteriorate if the skill is not used

Retirement Rates, OPM Projections

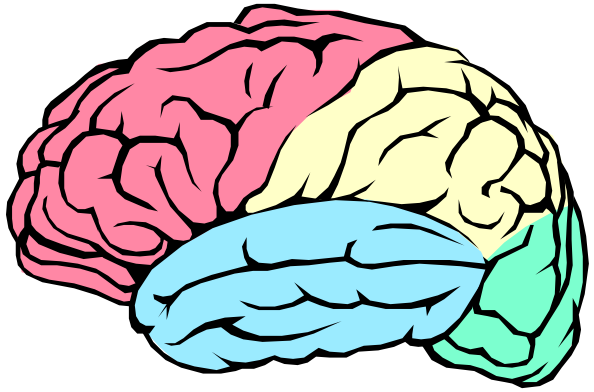


Retirement	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Rate	3.5	3.7	3.7	3.8	3.8
Number	55,508	57,472	58,607	59,071	58,971

- http://www.opm.gov/feddata/retire/rs2004.pdf

Explicit Knowledge

- Estimates suggest that the human brain can hold between one to ten terabytes (1024 gigabytes) of data

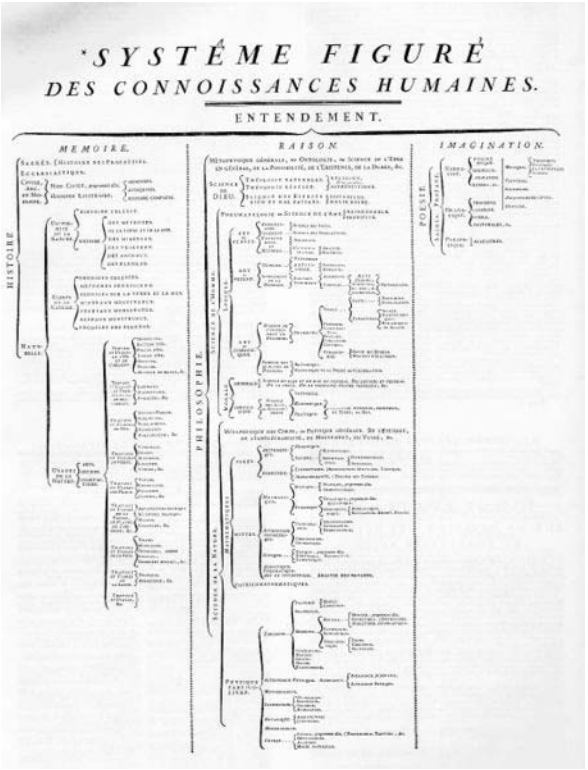


- Tacit knowledge can not be transferred from a brain to a computer

- http://www.sizes.com/people/brain.htm

Figurative System of Human Knowledge

- Jean le Rond d'Alembert and Denis Diderot
- Three branches
  - Memory
  - Reason
  - Imagination
- How can tacit knowledge such as "reason" and "imagination" be retained?



Cost of Lost Knowledge

- Risk Analysis needed to determine the value of knowledge potentially lost (using conventional risk analysis techniques)
- Can a dollar amount be put on the lost knowledge?
- Are the savings from outsourcing / contracting worth the cost of lost knowledge?
- How long will it take to regain the lost knowledge?
- Can new employees take internal / external training classes to acquire the lost knowledge?

Risk of Lost Knowledge

- Low Risk: Losing employees who only have knowledge of obsolete or non-critical processes
- High Risk: Losing employees who are experts on mission critical processes
- Mitigate the loss from losing knowledge
- Prioritize knowledge that should be retained

http://www.tva.gov/knowledgeretention/pdf/briefing.pdf

How long should knowledge assets be retained?

- Based on directives or government schedules
- How can you determine if information/knowledge is no longer needed
- When there is no possible benefit of the knowledge

Where to Store Knowledge

- Information Systems
- Records Centers
- Libraries
- National Archives, NARA
  - Over 40 locations in 20 states
  - The records center in Atlanta stores records for the Southeast, including Tennessee
  - For permanent records

- http://www.archives.gov

What knowledge should be retained?

- Attempting to retain too much knowledge could be problematic; Focus on retaining knowledge of value
- Avoid attempts to retain all knowledge
  - “Infoglut”
  - “Information Overload”
- Avoid gathering redundant knowledge

Knowledge Management Tools

- Ontopia
  - Topic Map Engine
  - Omnigator
  - Vizigator
  - Ontopoly
- Knowledge Bases
  - Knowledge Engineers working with Subject Matter Experts
  - Inference Engine
- Prolog
  - Logic programming language
  - Rulebase / Queries

http://www.swi-prolog.org/

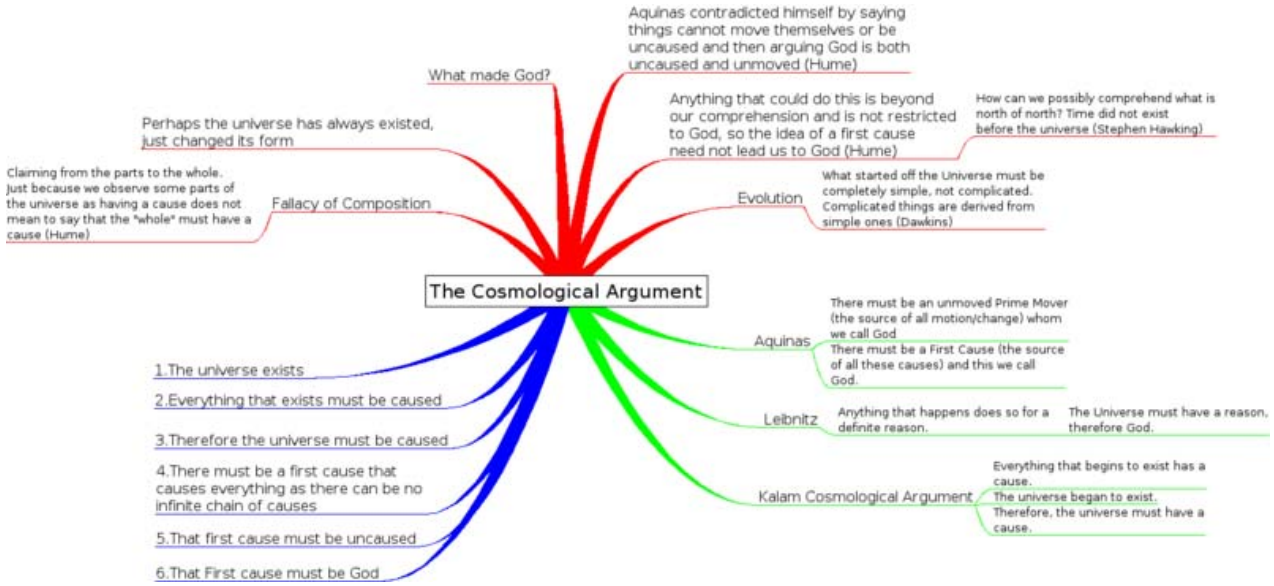
Knowledge Management Tools

- Kaon Workbench
- NewzCrawler
- RetrievalWare
- Inspiration
- Omea Reader
- Kaon
- Omnigator
- MindManager Pro
- Intelligent Topic Manager
- Mind Raider
- SWOOP
- CmapTools
- ConceptDraw V
- HypViewer

http://www.csc.calpoly.edu/~fkurfess/Courses/581/S07/Assignments/KM-Tools-Overview/KM-Tools-S05/

Mind Maps

- No software required
- Software aids
  - FreeMind
  - DeepaMehta
  - Kdissert
  - Labyrinth
  - MindRaider
  - Pimki
  - PlanFacile
  - View Your Mind
  - WikkaWiki
- Useful for recording ideas when brainstorming



http://en.wikipedia.org/wiki/List_of_Mind_Mapping_software

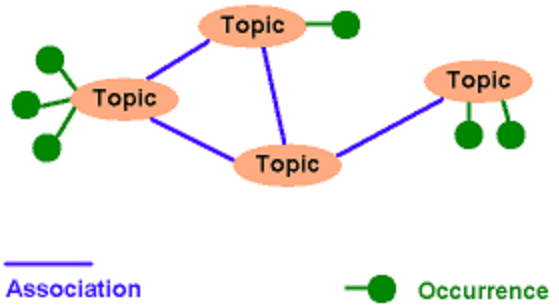
Mind Map Guidelines

- Start in the center with main concept
- Branch from center with key topics
- Branch out further with subtopics
- Use colors to categorize branches or distinguish groups
- Develop your own style for mind mapping; Each mind map style is unique
- Use of words, symbols, and images is encouraged

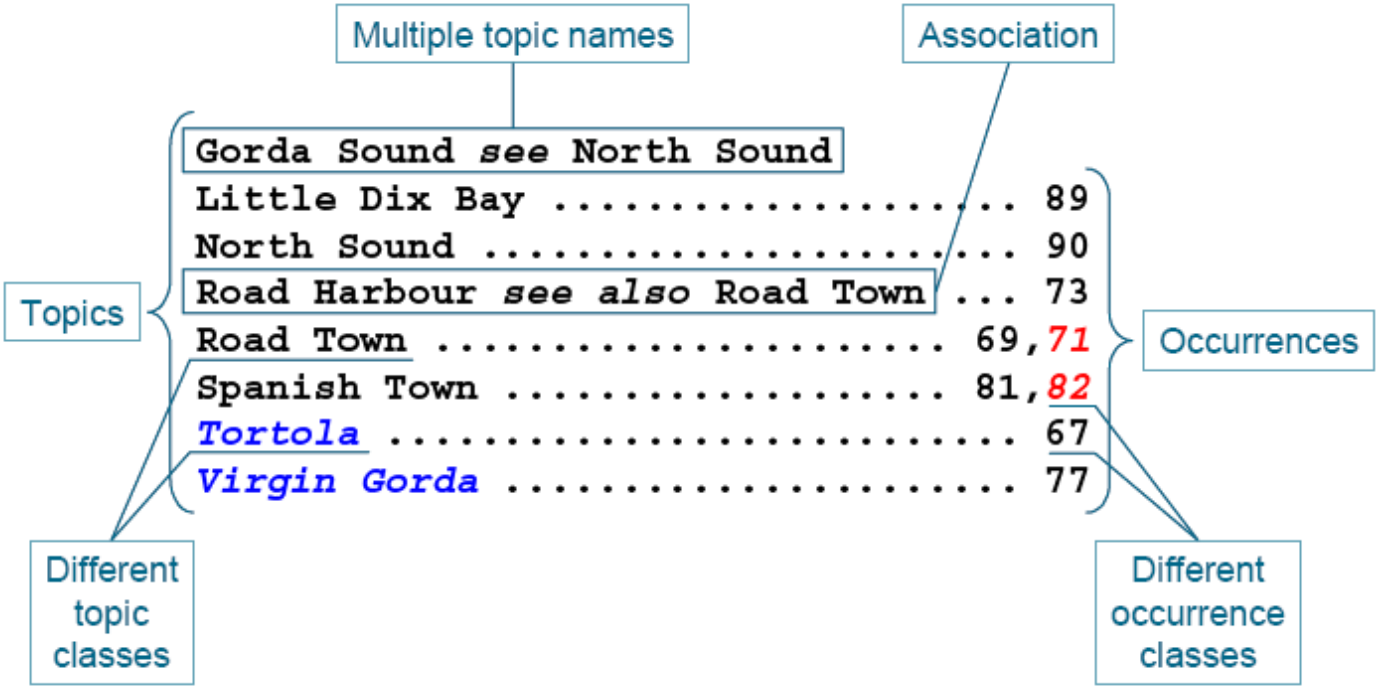
http://en.wikipedia.org/wiki/Mind_Mapping

Topic Maps

- ISO Standard
- Features
  - Topics
  - Associations
  - Occurrences
- Focus on compatibility with XML
- Ontology – concepts and the relationship between them



Topic Map Example



http://www.empolis.com/downloads/empolis_TopicMaps_Whitepaper20030206.pdf

Obstacles in Knowledge Retention

- Documenting how something is built is not as fun as actually building it
- Some employees are protective of knowledge, for job security or other reasons
- Management resistance; No effective way to measure the knowledge retained

Knowledge Protection

- Ensure that employees do not take knowledge to a competitor
- Patents, Trade Secrets, and copyrights
- Non-disclosure agreements

When should knowledge retention occur?

- Knowledge retention should be continuous
- When knowledge is created
- Needs to be a part of the corporate culture

- In most cases, knowledge retention probably doesn't occur until an employee is about to leave the company
  - Exit Interviews
  - Ensure that the employee's knowledge assets are transferred
    - Documentation
    - E-mails
    - Reports

Sharing of Knowledge

- Mentoring
- Job Rotation
- Lessons Learned
- Videotaping
- Internet: Websites, Portals, Wikis, Collaboration Technologies, Q&A Forum
- Intelligent Agents
- Team Meetings

Effective Mentoring Programs

- Assign an experienced employee to a newly hired employee
- Train mentor on the mentoring process
- Ensure that mentor is accessible to protégé
- Protégé should feel free to ask mentor questions and voice concerns
- Plan mentoring activities
- Set schedule and milestones for the mentoring program to verify that progress is being made

Job Rotation

- Advantages
  - All knowledge is not held with one employee
  - Employee is exposed to many processes throughout the organization
- Disadvantages
  - Usually only used to prepare future managers
  - If an employee is performing well in their current position, management will probably be unwilling to move the employee from that position
  - Should everyone really know how to do every job?
  - Employee apathy towards learning other jobs (Theory X vs. Theory Y)

Lessons Learned

- System for recording negative events
- Attempts to prevent event from occurring again in the future
- Must be accessible to employees
- How to promote use of a lessons learned system?

http://call.army.mil/links/lessons.asp

Videotaping

- Advantages
  - Capture knowledge directly from the employee
  - Video can be shared with many employees
  - Can be duplicated and accessed on demand
- Disadvantages
  - Storage space
  - Non-interactive
  - Can not quickly find needed information
  - Lifetime of storage media
  - Watching videos is boring

Internet Technologies

- Websites
  - For posting information
  - Static
- Wikis
  - Website that everyone can update
  - Can rollback to a previous state
  - Useful for linking content
- Collaboration Technologies
  - Microsoft Sharepoint
  - Knowledge Asset Storage
  - Versioning
  - Requires structured process for adding assets
- Portals
  - Pulling various knowledge applications together
  - Centralized location
- Q&A Forum
  - Keep employees updated
  - Employee / Management communication tool

Intelligent Agents

- Software or robot that interacts with the environment
- Types of Agents
  - Physical Agents
    - Sensors
    - Actuators
  - Temporal Agents
    - Behavior is based on time-based or human-based inputs
- Classes
  - Simple reflex agents
  - Model-based reflex agents
  - Goal-based agents
  - Utility-based agents
  - Learning agents
- Intelligent Agents for Knowledge Retention
  - Intelligent Agents don't retire, die, or leave the company
  - Intelligent Agents do require maintenance
    - Software errors or "bugs"
    - Robots breakdown
  - Intelligent Agents become obsolete

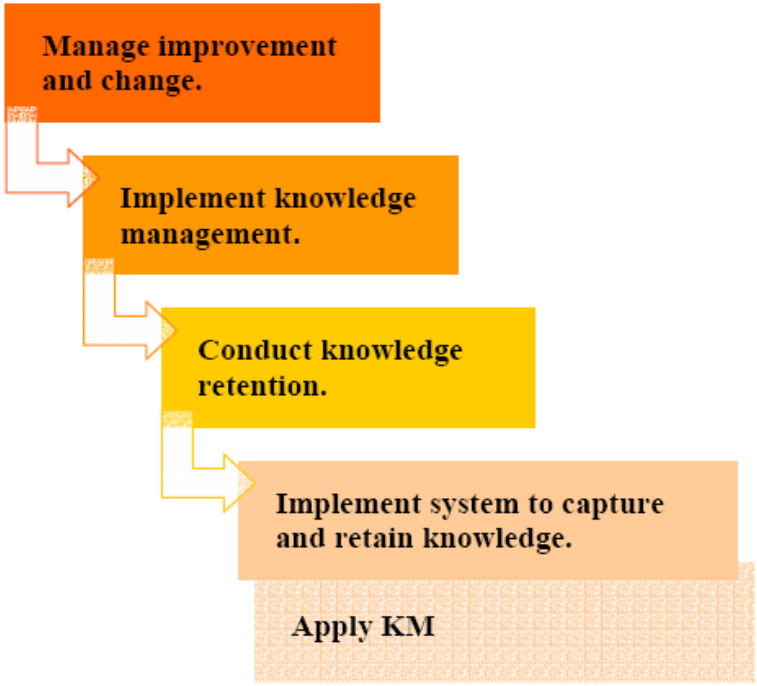
http://en.wikipedia.org/wiki/Intelligent_agent

Team Meetings

- Assign Note Taker / Scribe
- Distribute meeting minutes to team members and management
- Status Reports
- Technical Exchange

Knowledge Harvesting

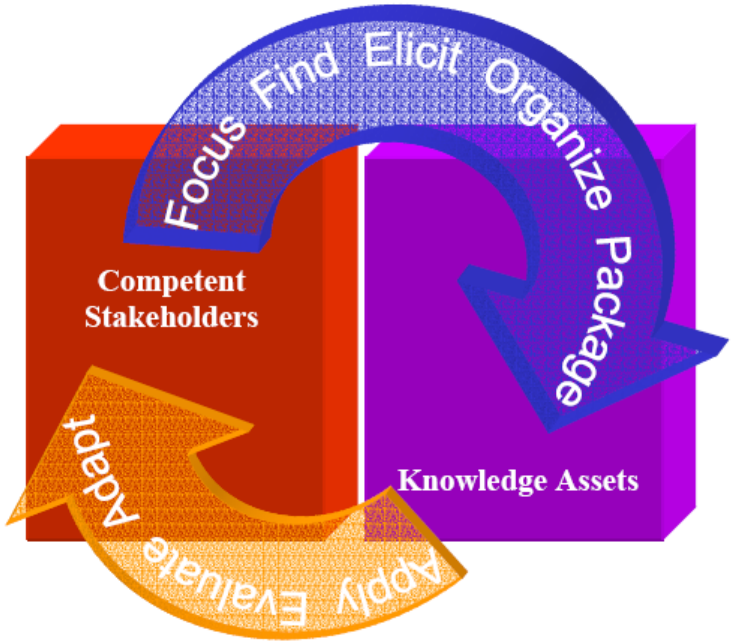
- Convert knowledge expertise into knowledge assets



http://www.amplifi.com/KMcourse/Knowledge%20Harvesting.pdf

Knowledge Harvesting Framework

- 8 Steps
  - Focus
  - Find
  - Elicit
  - Organize
  - Package
  - Apply
  - Evaluate
  - Adapt



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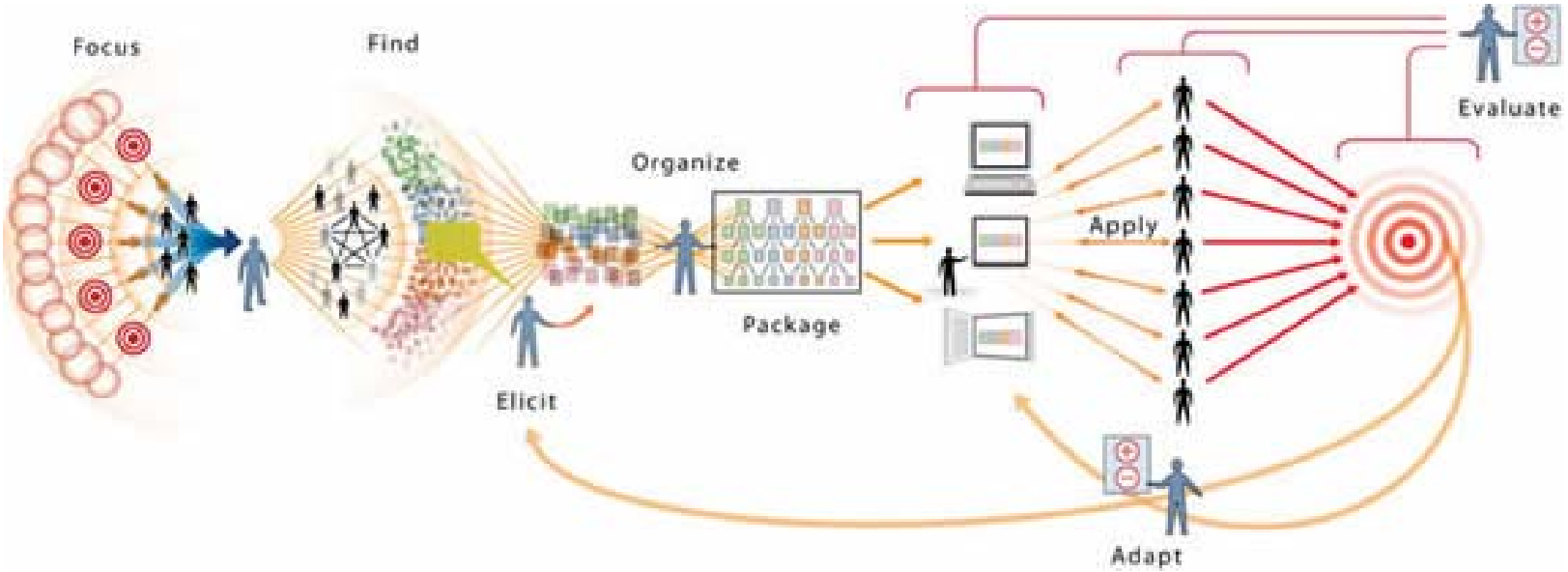
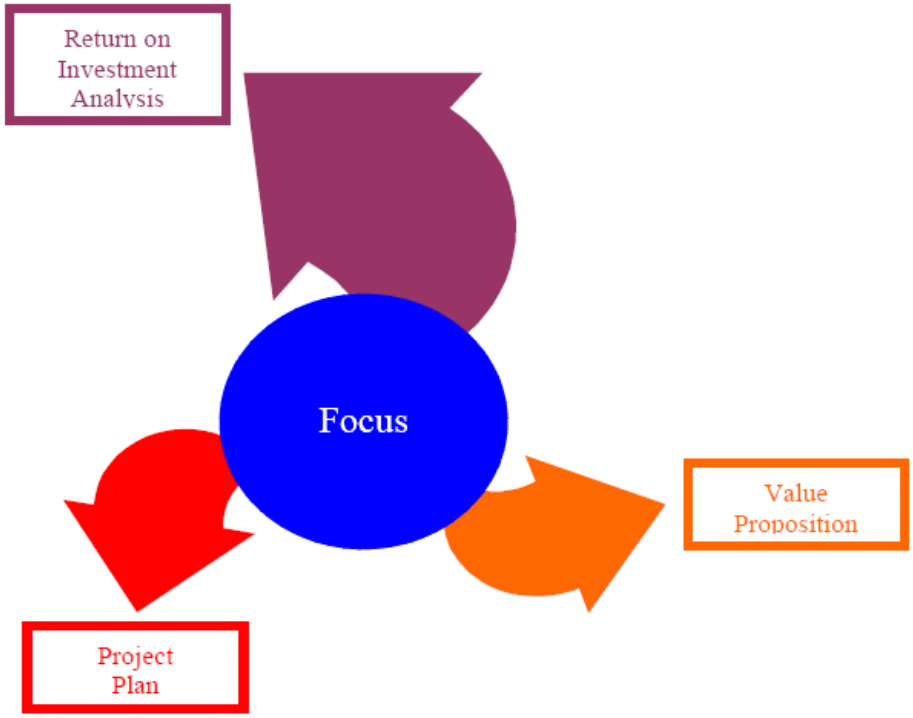
Knowledge Harvesting Framework



Knowledge Harvesting

- Project Plans
  - Milestone schedule
  - Project-costing information
  - Responsibility lists
  - Specifies how ROI is determined



http://www.amplifi.com/KMcourse/Knowledge%20Harvesting.pdf

Applications of Knowledge Harvesting

- Credit Management
  - Loss of senior manager
  - Expert in delinquency and bad debt management
  - Gathered knowledge for 6 weeks
  - Follow-up interviews
  - Delivered tool to provide decisions to respond to delinquent and debt events
  - Estimated benefits: $334,000 (over a three year period)
  - Cost of project: $33,000

http://www.amplifi.com/KMcourse/Knowledge%20Harvesting.pdf

Applications of Knowledge Harvesting

- Call Center
  - Only one technical expert
  - Unable to scale call center
  - Captured knowledge, developed eGain tool
  - Knowledge retention efficiency-oriented project
  - Benefit: $89,000 (over three years) Cost: $12,000

http://www.amplifi.com/KMcourse/Knowledge%20Harvesting.pdf

Applications of Knowledge Harvesting

- Data Reference Library
  - Two technical experts
  - Developed tool called Focus
  - Benefit: $207,000 (over three years) Cost: $13,000

http://www.amplifi.com/KMcourse/Knowledge%20Harvesting.pdf

Applications of Knowledge Harvesting

- Troubleshooting
  - Shop personnel
  - Thermoforming process
  - Productivity orientation scenario
    - Same amount of effort yields more work results
  - Delivered system based on eGain
  - Train facility employees on knowledge harvesting
  - Benefit: $734,000 (over three years) Cost: $64,000

http://www.amplifi.com/KMcourse/Knowledge%20Harvesting.pdf

Corporations Using Knowledge Harvesting Techniques

- Abbott Laboratories
- American Society for Quality
- American Society of Mechanical Engineers
- Arthur Andersen
- BP Amoco
- Buckman Laboratories
- Centre Européen pour le Développement de la Formation Professionnelle
- CheckFree Corporation
- Chevron Corporation
- Clarica Life Insurance Company
- F. Hoffman La Roche
- Florida Department of Education
- Georgia-Pacific Corporation
- Halliburton Energy Services
- INSEAD Centre for Advanced Learning Technologies
- Institute for Electronics & Electrical Engineers
- Intel Corporation
- Lyondell Chemical Company
- Pennzoil-Quaker State Company
- PhaseOne Corporation
- Potomac Institute for Policy Studies
- PricewaterhouseCoopers
- Ramius Corporation
- SAIC Strategies Group
- S.C. Johnson & Son, Inc.
- Steelcase Inc.
- The Dow Chemical Company
- University of Alabama at Birmingham

http://www.knowledgeharvesting.com/Clients.html

Knowledge Harvesting Inc Services

- Top-Performer Knowledge Capture
- Retiree Knowledge Capture
- Executive Succession / Transition
- Review / Audit Knowledge Assets
- Knowledge Retention Strategy
- Assessment of Readiness
- Work Profiling System Installation
- Design, Development – Knowledge Retention System
- eLearning and Performance-Support Applications
- Knowledge Harvesting Workshops

Quote

- “There is no knowledge that is not power”

- Ralph Waldo Emerson

Society and Solitude

Discussion Questions

- What is the best method for retaining knowledge? Is a combination of the methods the best approach?

- Is the aging workforce really a problem?

Discussion Questions

- Do you believe Knowledge Harvesting is real, or is it just buzzwords and hype?
- What is the future of knowledge retention?