

# Knowledge management



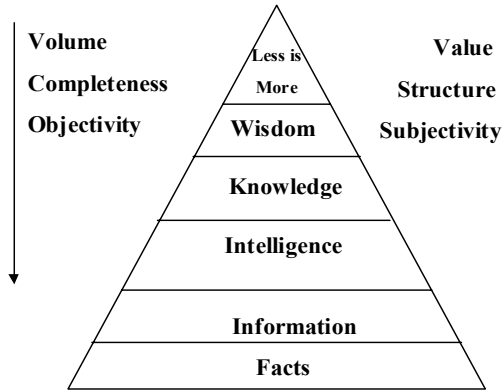
## What Is Knowledge



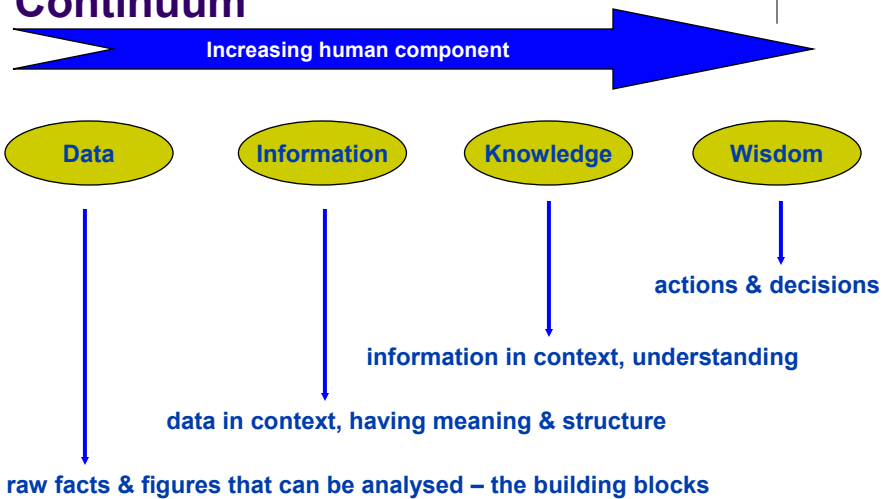
# From Facts to Wisdom

(Haeckel & Nolan, 1993)

one example of the hierarchy



## Data, Information & Knowledge Continuum



# The Difference Between Data, Information and Knowledge



- **Data**
  - Facts, observations, or measures that have been recorded but not put into any meaningful context. A single musical note is data
- **Information**
  - Data that has been arranged in a systemic way to yield order and meaning. A series of notes arranged into a tune is information
- **Knowledge**
  - Is information in the mind, in a context which allows it to be transformed into action. A musician is able to play a tune because of his knowledge
- *Source: Davenport and Prusak, Working Capital*

## Knowledge



- Knowledge is a fluid mix of framed experiences, values, contextual information and expert insight that provide a framework for evaluating and incorporating new experiences and information (*Davenport and Prusak, Working Capital*)
- *Source: On Health Canada web-site*

## Knowledge & information



- Information is data that has been given structure
- Knowledge is information that has been given meaning
- **Knowledge is information that has been interpreted by individuals and given a context**

## So Really What Is It?



- A framework of everything we know put into a meaningful context
- Mixture of information, data, experiences, thoughts, processes, insights, values, etc.

# Knowledge Characteristics



	<i>Know</i>	<i>Don't Know</i>
<i>Don't Know</i>	<i>Tacit Random People Based</i>	<i>External Risk Opportunity High Value</i>
<i>Know</i>	<i>Structured Accessible Codified</i>	<i>Acquirable Repeatable Universal</i>

## Types of Knowledge



- For knowledge management purposes we define knowledge into two categories:
  - Explicit Knowledge - آشکار و واضح
    - consists of anything that can be documented, archived and codified
  - Implicit/Tacit Knowledge- ضمنی و تلویحی
    - the know-how contained in people's heads
    - the challenge inherent with tacit knowledge is figuring out how to recognize, generate, share and manage it

## Explicit Knowledge



- Found in documents, databases and files
- Relatively easy to communicate
- Relatively easy to convert into other explicit knowledge
- Ready for corporate use/benefit if well captured & organised

## Tacit Knowledge



- Found in people's heads
- No benefit/use to organisation unless it can be shared and/or captured and/or transferred
- Effort required to convert into explicit knowledge

# Knowledge management



## KM as a management concept / approach



- management ideas
  - Classical administrative theories 1940's
  - Scientific management (eg Taylor) 1950's
  - Human relations approach
  - ...
  - TQM 1980's
  - BPR 1990's
  - KM !! 2000~
  - ... ??
- Is KM one among many approaches?
  - Shouldn't knowledge be a fundamental concept for understanding and managing organizations?

## Why did KM become “trendy” in the 1990’s and 2000’s?



- Technology companies began looking for new markets and new sources of skill
- Sources of competitive advantages are becoming better understood (M. Porter.....microeconomist)
- Decrease in importance of manufacturing and increasing size of “knowledge” based sectors of economy
- Very quick product changes
- Research on topic by Academics (again, Porter)

## One Perspective of KM



- **“KM [Knowledge Management] involves blending a company’s internal and external information and turning it into actionable knowledge via a technology platform.”**

## Knowledge for Business Success



- **Customer Knowledge**  
developing deep knowledge through customer relationships, and using it to enhance customer success through improved services.
- **Knowledge in Products and Services**  
embedding knowledge in products and surrounding them with knowledge-intensive services.
- **Knowledge in People**  
nurturing an innovative culture where learning is valued and knowledge is shared.
- **Knowledge in Processes**  
embedding knowledge into business processes.

## Knowledge Creation



### ● **Potential Sources**

work place (e.g. handling a new task), books (transferring existing information into individual's knowledge), data stores (identifying patterns data mining), knowledge engineering activities (development of computerized knowledge).

## Knowledge keeping

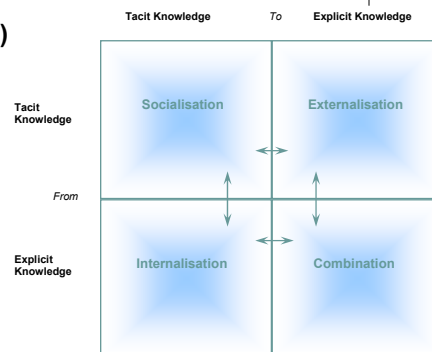


- **Knowledge Repositories**

explicit knowledge normally stored in the knowledge bases, while tacit knowledge can be associated with various documents, data stores in the forms of (abstract) pictures, flowcharts etc., which are not directly computable.

## Knowledge Conversion

- **Tacit-to-tacit (socialization)**  
individuals acquire new knowledge directly from others through observation and dialogue.
- **Tacit-to-explicit (externalization)**  
the articulation of knowledge into tangible form through discussion and documentation.
- **Explicit-to-explicit (combination)**  
combining different forms of explicit, e.g. as those from databases, or documents.
- **Explicit-to-tacit (internalization)**  
learning by doing, e.g. reading from books and internalising the knowledge into their own experience.



Four modes of knowledge conversion

# IT issues in KM

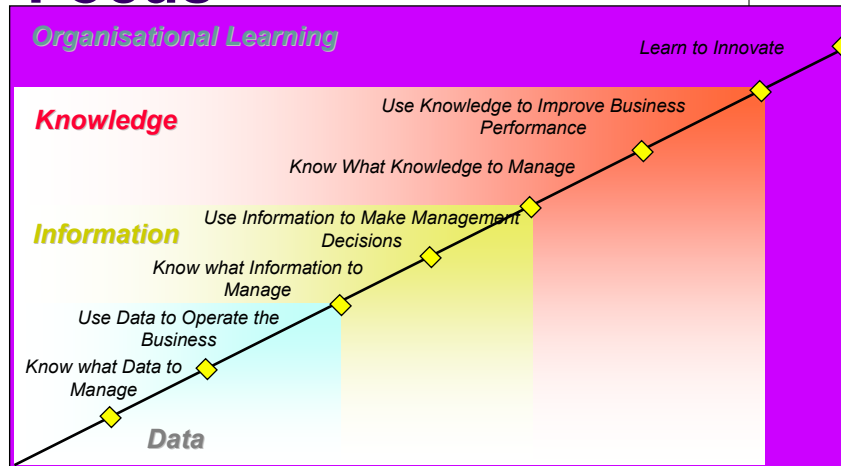


## Knowledge in Computing & Info Systems



- Trend is toward (increasingly explicit) “knowledge representation” in systems
  - Programs 1960's-
  - Database schemas (data independence from programs) 1970's-
  - Conceptual data modeling (domains, enterprises) 1980's-
  - Knowledge-based systems (knowledge about world separate from inference engine) 1980's-
  - Knowledge sharing among systems (“ontologies”) 1990's-
  - Software agents 1990's-
  - Semantic web 2000's-
  - ...
- What is the role of knowledge in IS?
  - Shouldn't knowledge be a fundamental concept in IS?

# Understanding the Focus



# Five Paradigms of IT Support





## 1. the “processing” paradigm

- focus is on the processing (usually fixed a priori)
- Examples: sales orders processing, bank account statements, teller machine processing...

### Qualities

#### emphasized:

#### Info. operations:

- calculate
- transform
- ...

#### Info. structures:

- data items
- lists
- arrays
- trees
- ...

- speed

- accuracy

- correctness

**Processing**



## 2. the “repository” paradigm

- focus is on the storage and retrieval
- Examples: document management systems, online catalogues, databases.

### Qualities

#### emphasized:

#### Info. operations:

- create/read/  
update/delete
- lookup
- navigate
- integrate
- ...

#### Info. structures:

- records
- links/  
relationships
- indexes
- catalogues
- ...

- persistence

- accessibility

- integrity

- security

**Repository**

### 3. the “tool” paradigm



- focus is on enabling the user
- Examples: spreadsheet, word processing...

#### Info. operations:

- manipulation of user's information representations
- ...

#### Info. structures:

- conceptual information structures e.g., cells in spreadsheets
- ...

#### Qualities

#### emphasized:

- usability
- flexibility
- extensibility

**TOOL**

### 4. the “medium” paradigm



- focus is on communication
- Examples: email, teleconferencing, groupware

#### Info. operations:

- send/receive
- share
- ...

#### Info. structures:

- message
- conversation
- conference
- ...

#### Qualities

#### emphasized:

- presence
- fidelity
- authenticity
- pr...
- ...

**Medium**



## 5. the “agent” paradigm

- focus is on assisting the user
- Examples: mail filters, web crawlers, knowledge discovery...

### Info. operations:

- planning & goal achievement
- “understanding”
- delegation
- ...

### Info. structures:

- goals
- tasks/plans
- conceptual structures
- interdependencies among agents...

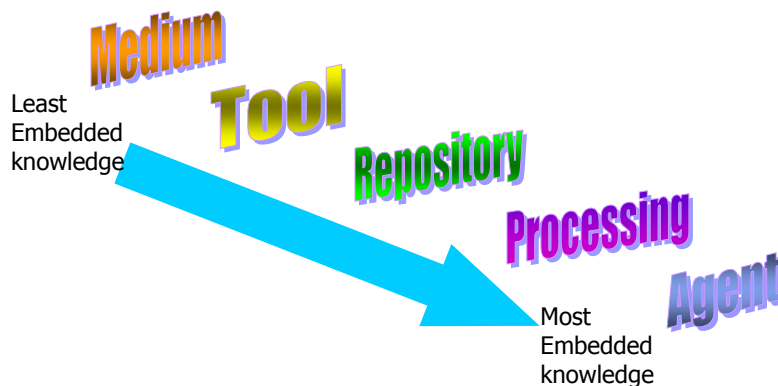
### Qualities

#### emphasized:

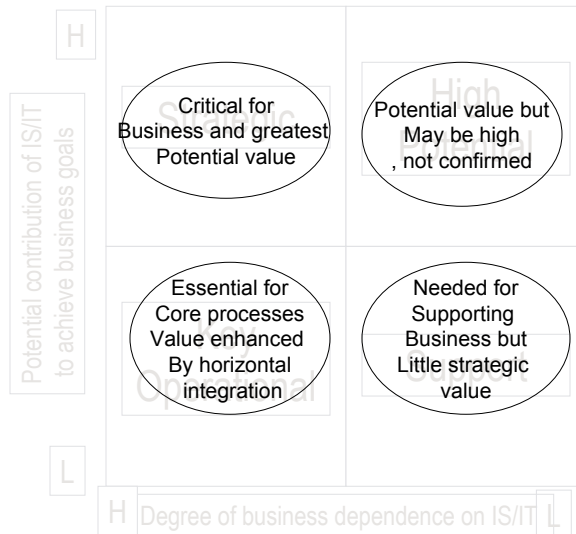
- ability
- intelligence
- trustworthiness

**Agent**

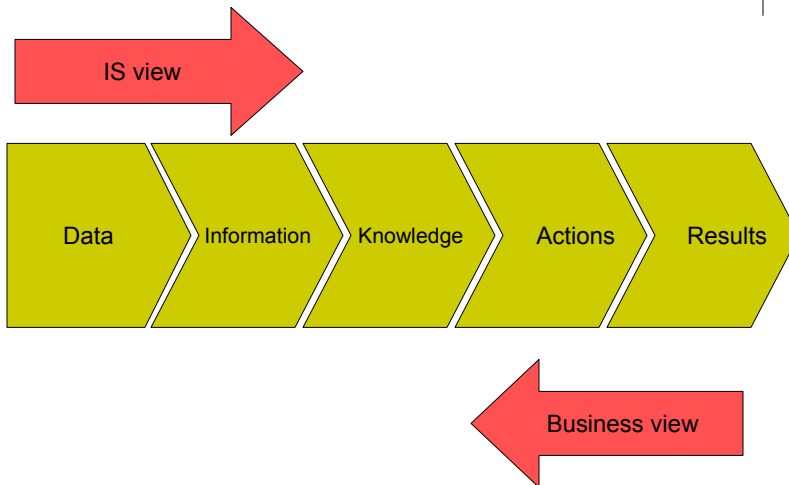
## How much domain knowledge is embedded in the system?



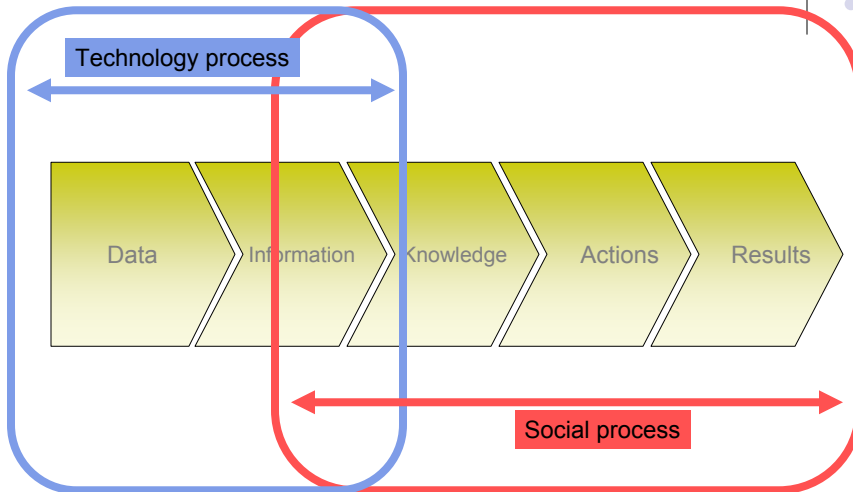
# Value of information & Knowledge



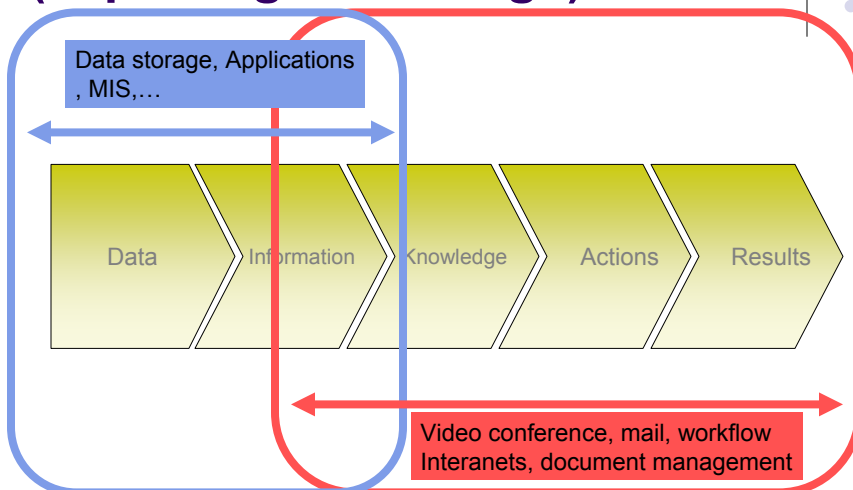
# DIKAR model , Framing KM



## Role Of IT



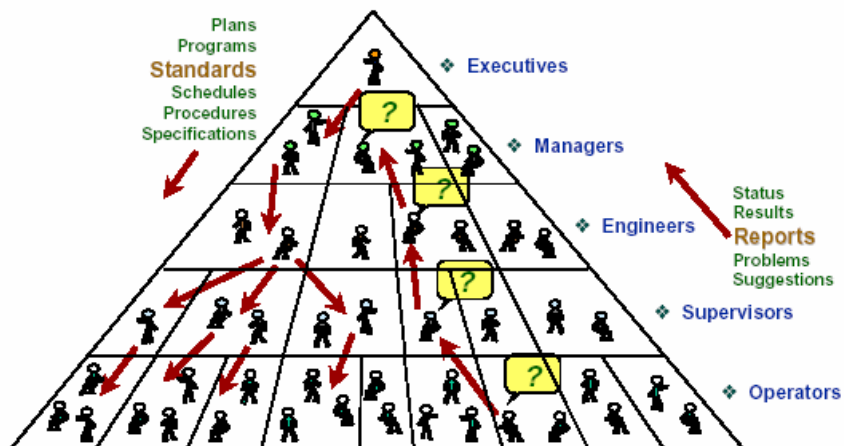
## Role of Technology (capturing knowledge)



# Organizational issues in Knowledge management



## Knowledge Gaps



## The cost of not doing KM



- Time wasted finding knowledge or expertise
- Re-invention of the wheel in different parts of our organization
- Several parts of the organization dealing with the same partner
- Same mistakes made more than once
- New employees taking a long time to become effective
- Knowledge lost when employees leave

## Strategies for managing knowledge



<p><b>Codification</b> Provide high-quality, reliable, &amp; fast IS implementation by reusing codified knowledge</p>	<p><b>Personalization</b> Provide creative, analytically rigorous advice on high-level problems by channeling individual expertise</p>
<p><b>People-to-documents</b> Develop an electronic document system that codifies, stores, disseminates &amp; allows reuse of knowledge</p>	<p><b>Person-to-person</b> Develop networks for linking people so that tacit knowledge can be shared</p>
<p><b>Information Technology</b> Invest heavily in IT: the goal is to connect people with reusable codified knowledge</p>	<p><b>Information technology</b> Invest moderately in IT: the goal is to facilitate conversations &amp; the exchange of tacit knowledge</p>
<p><b>Human resources</b> Hire new graduates who are well suited to the reuse of knowledge &amp; the implementation of solutions</p>	<p><b>Human resources</b> Hire post-graduates who like problem solving &amp; can tolerate ambiguity</p>
<p><b>Reward for using &amp; contributing to document database</b></p>	<p><b>Reward people for directly sharing knowledge with others</b></p>

## KM Environment



- People
- Processes
- Technology

## People



- Why people don't want to share knowledge – or do they?
- The two big makers or breakers: culture and behaviour
  - Organisational culture
  - Individual behaviour

# People



- How do we make the changes?
  - Culture – work with it while we work towards changing it
  - Lead by example
  - Align rewards and recognition
  - Make knowledge work part of everyone's job
  - Develop relationships
  - Educate people about what is involved and skill them to do it
  - Demonstrate the value
  - Create champions and heroes
  - Make it easy
- Cultural change is not just a KM issue – integrate with overall organisational change, learning and development

# Process



- Organisational processes and infrastructure
- Knowledge management processes
  - Audits, strategies, people2people, people2information, k-creation, peer assists
- Knowledge management infrastructure
  - Ownership and a 'home'
  - Knowledge managers and the core team
  - Steering committees and senior supporters
  - Knowledge brokers and champions
  - Support from outside



## Technology

IT is a KM enabler through collaborative tools

- File sharing
- Document management
- Chat rooms
- Electronic whiteboards
- Internet/intranet with dedicated pages for
  - Searchable who's who and intranet
  - Chat rooms
  - Communities of Practice, Communities of Interest
  - Discussion forums with threading