

Introduction to ... Knowledge World

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Knowledge Economy (KE) - definitions

KE - "Production and services based on **knowledge-intensive activities** that contribute to an accelerated pace of technical and scientific advance, as well as rapid obsolescence. The key component of a knowledge economy is a greater reliance on **intellectual capabilities** than on physical inputs or natural resources."

Powell, Walter W. & Snellman, Kaisa (2004). "The Knowledge Economy". Annual Review of Sociology 30

A key concept of the knowledge economy is that **knowledge and education** (often referred to as "**human capital**") can be treated as one of the following two:

- A **business product**, as educational and innovative intellectual products and services can be exported for a high value return.
 - A **productive asset**
-
- Put more prosaically, we can say the knowledge economy is what you get when firms bring together **powerful computers** and **well-educated minds** to create wealth.

Knowledge Economy (KE) – definitions (cont)

- “the role of *knowledge* (as compared with natural resources, physical capital and low skill labour) has taken on *greater importance*.”

Although the pace may differ all OECD economies are moving towards a knowledge-based economy” (OECD 1996)

- “... one in which the *generation and exploitation of knowledge has come to play the predominant part in the creation of wealth*. It is not simply about pushing back the frontiers of knowledge; it is also about the most effective use and exploitation of all types of knowledge in all manner of economic activity”

(DTI Competitiveness WPaper 1998).

- “economic success is increasingly based on upon the *effective utilisation of intangible assets* such as knowledge, skills and innovative potential as the key resource for competitive advantage. The term “knowledge economy” is used to describe this emerging economic structure” *(ESRC, 2005, UK).*

- In *March 2000*, the European Council in *Lisbon* set out a *ten-year strategy* to make the Union “the *most competitive and dynamic knowledge-based economy in the world*, capable of sustainable economic growth, with more and better jobs and greater social cohesion”.

Driving forces of Knowledge Economy

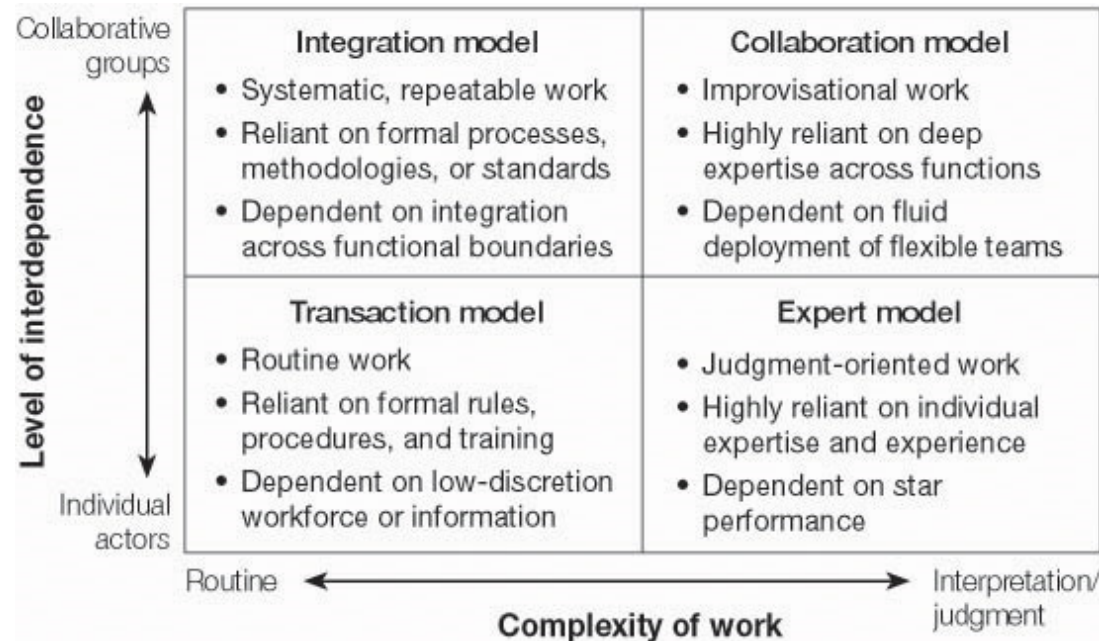
- [Globalization](#) — markets and products are more global.
- [Information technology](#), which is related to next three:
 - [Information/Knowledge](#) Intensity — efficient production relies on information and [know-how](#); over 70 per cent of workers in developed economies are information workers; many factory workers use their heads more than their hands.
 - [New Media](#) — New media increases the production and distribution of knowledge which in turn, results in [collective intelligence](#). Existing knowledge becomes much easier to access as a result of networked data-bases which promote online interaction between users and producers.
 - [Computer networking](#) and Connectivity — developments such as the [Internet](#) bring the "[global village](#)" ever nearer.

Characteristics and Differences than Traditional

- The economics are not of scarcity, but **rather of abundance**; information and knowledge can be shared, and actually grow through application.
- The effect of **location** is either
 - **Diminished**: virtual **marketplaces** and **virtual organizations** offering benefits of speed, agility, round the clock operation and global reach.
 - or, on the contrary, **reinforced** in some other economic fields, by the creation of **business clusters** around **centres of knowledge**.
- **Laws, barriers, taxes and ways to measure are difficult to apply solely on a national basis.** Knowledge and information "leak" to where demand is highest and the barriers are lowest.
- Knowledge enhanced products or services can command **price premiums** over comparable products with low embedded knowledge or knowledge intensity.
- **Knowledge when locked into systems or processes has higher inherent value** than when it can "walk out of the door" in people's heads.
- **Human capital — competencies — are a key component of value in a knowledge-based company,** yet few companies report competency levels in annual reports.
- **Communication** is increasingly being seen as **fundamental to knowledge flows**. Social structures, cultural context and other factors influencing social relations are therefore of fundamental importance to knowledge economies.

Knowledge worker

- [Peter Drucker](#) (1954) was the first to use the term knowledge worker:
 - A person who has knowledge important for the organisation and is often the only person who has it
 - A person who can use the knowledge in their work
 - The knowledge is partly subconscious; the worker may not know about it or may not understand its importance.
 - Knowledge workers often work intellectually, but this is not a rule.
- [Thomas H. Davenport](#) (*Thinking for a living*)
 - Knowledge workers have high degrees of expertise, education, or experience, and the primary purpose of their jobs involves the creation, distribution, or application of knowledge.



Knowledge worker (cont)

- All those who work in the top three standard occupational classifications (managers, professionals, associate professionals)
- All those with high levels skills, indicated by degree or equivalent qualifications (NVQ level 4)

National Vocational Qualification L 4:

Competence that involves the application of knowledge in a broad range of complex, technical or professional work activities performed in a variety of contexts and with a substantial degree of personal responsibility and autonomy. Responsibility for the work of others and the allocation of resources is often present

- All those who perform tasks that require expert thinking and complex communication skills with the assistance of computers.

**Knowledge workers in the UK economy
1984-2014**

Occupations	1984	1994	2004	2014
Knowledge workers	31%	36%	41%	45%
Personal services; sales; admin/clerical	25%	28%	28%	28%
Skilled/semi-skilled; manual	28%	23%	19%	18%
Unskilled jobs	16%	14%	11%	9%

A literature review reveals that the different types of workplace competencies that are most agreed upon by different analysts, surveys and country reports are:

Inter-personal skills:

- Team work and the ability to collaborate in pursuit of a common objective.
- Leadership capabilities.

Intra-personal skills:

- Motivation and attitude.
- The ability to learn.
- Problem-solving skills.
- Effective communication with colleagues and clients.
- Analytical skills.

Technological or ICT skills.

Definition of Knowledge

- "Justified true belief" - [Goldman 1991](#), Nonaka and Takeuchi (1995)
- "Information in context" - [Aune 1970](#)
- "Understanding based on experience" - [James 1907](#)
- "Experience or information that can be communicated or shared" - [Allee 1997](#)
- "Knowledge, while made up of data and information, can be thought of as much greater understanding of a situation, relationships, causal phenomena, and the theories and rules (both explicit and implicit) that underlie a given domain or problem." - [Bennet and Bennet 2000, 19](#)
- "Knowledge can be thought of as the body of understandings, generalizations, and abstractions that we carry with us on a permanent or semi-permanent basis and apply to interpret and manage the world around us ... we will consider knowledge to be the collection of mental units of all kinds that provides us with understanding and insights." ([Wiig 1998](#))
- "Knowledge is the capacity for effective action." - [Argyris 1993](#)
- "The most essential definition → it is composed of and grounded solely in *potential acts* and in those signs that refer to them" - [Cavaleri and Reed 2000](#)
- "Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms" ([Davenport and Prusak, 1997, 5](#)).

If data and knowledge are Information,
what happens to the pyramid?

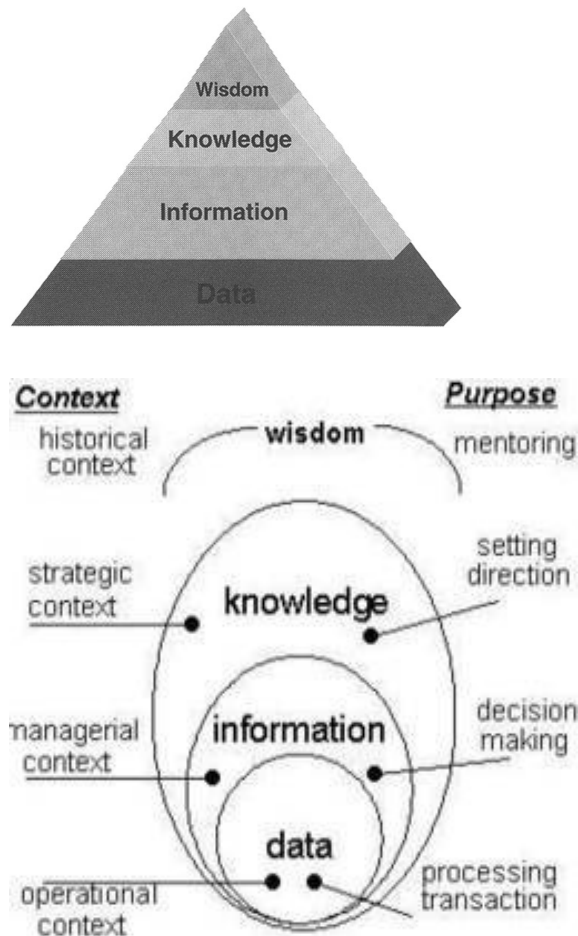
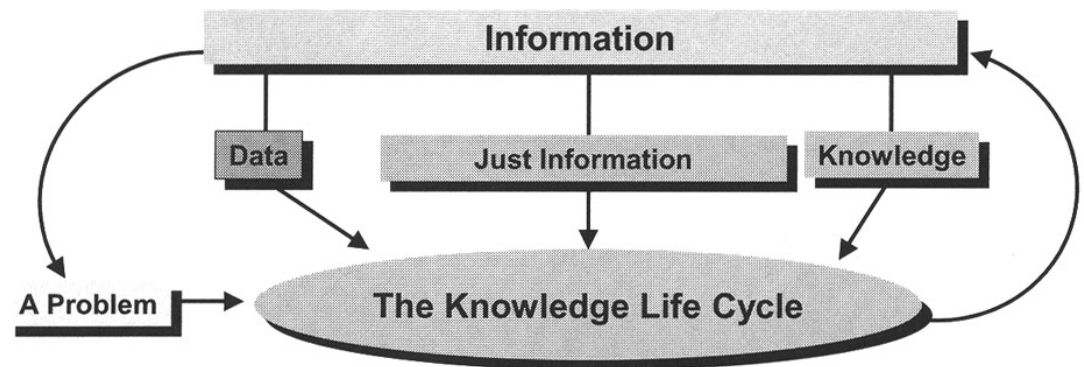


Figure 1: The hierarchy of meanings

Misconceived Pyramid vs Knowledge Life Cycle

Data, knowledge and “just information” are types of information!
Information is not made from data. New data and knowledge are
made through the Knowledge Life Cycle from preexisting information,
that is: from “just information,” data, knowledge, and problems.



IM vs KM

KM and IM, as well as knowledge and information, are often used interchangeably. So what exactly is the difference?

DATA & INFO

Numbers & facts structured & unstructured

TECHNOLOGY

Technology driven

EXPLICIT

Articulated, well-defined, easy to identify & share

KNOW WHAT

Facts, statistics, etc.

EASY TO COPY

Useful but easy to replicate and with less substance



KNOWLEDGE

Structured info, understanding, wisdom

PEOPLE

People, process, & management driven

TACIT

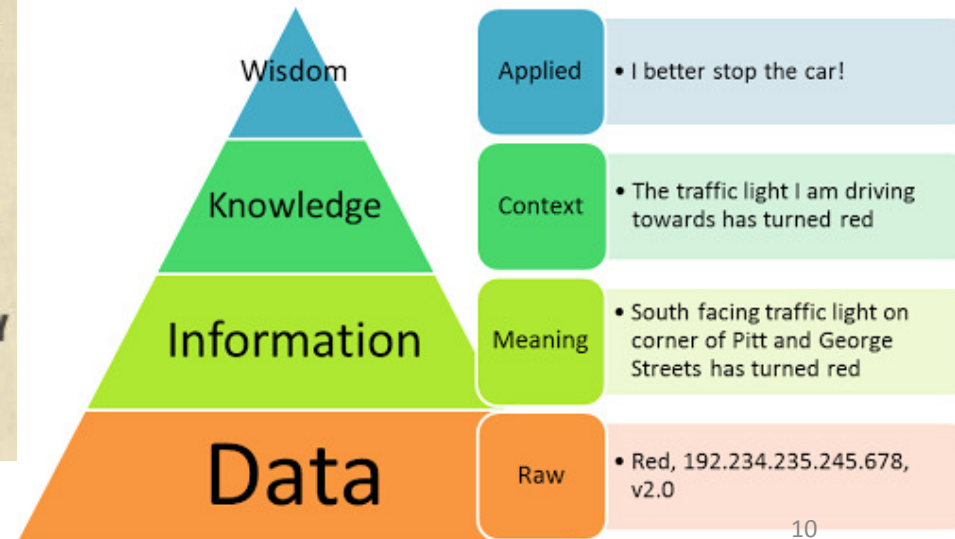
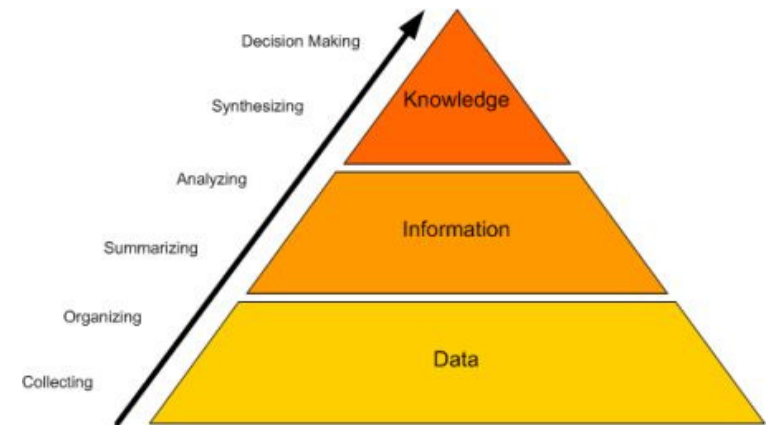
Unarticulated, hard to identify & share

KNOW HOW

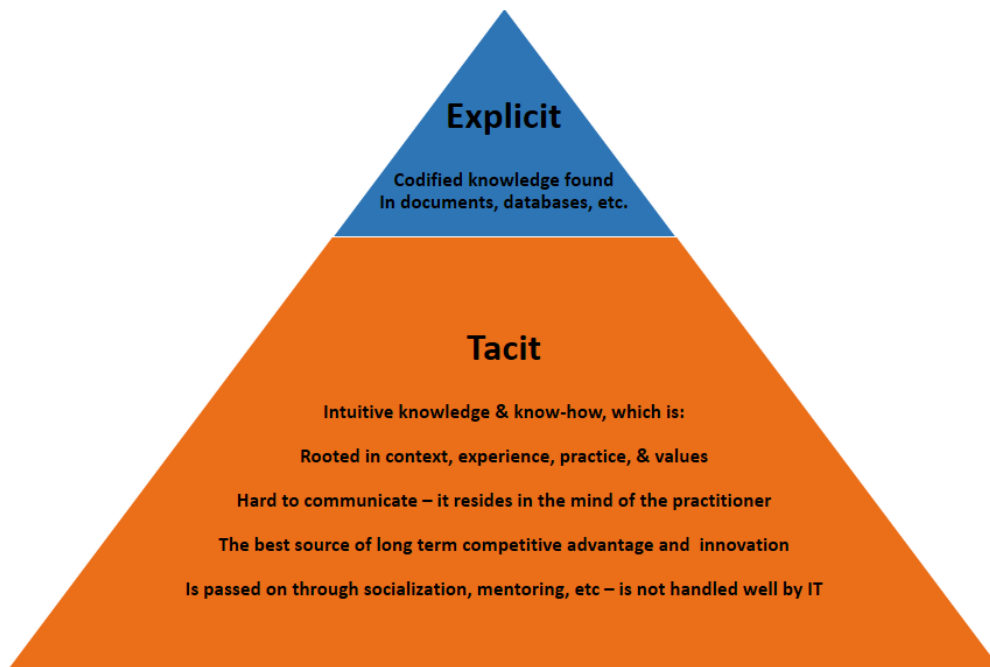
Action, experience, innovation

HARD TO COPY

More likely to lead to innovation, comp. adv. etc.



Different Types of Knowledge



- **Explicit Knowledge**

- formalized and codified, and is sometimes referred to as know-what (Brown & Duguid 1998), being fairly easy to identify, store, and retrieve (Wellman 2009); most easily handled by KMS, which are very effective at facilitating the storage, retrieval, and modification of documents and texts.

- **Tacit Knowledge** (Polanyi, 1966)

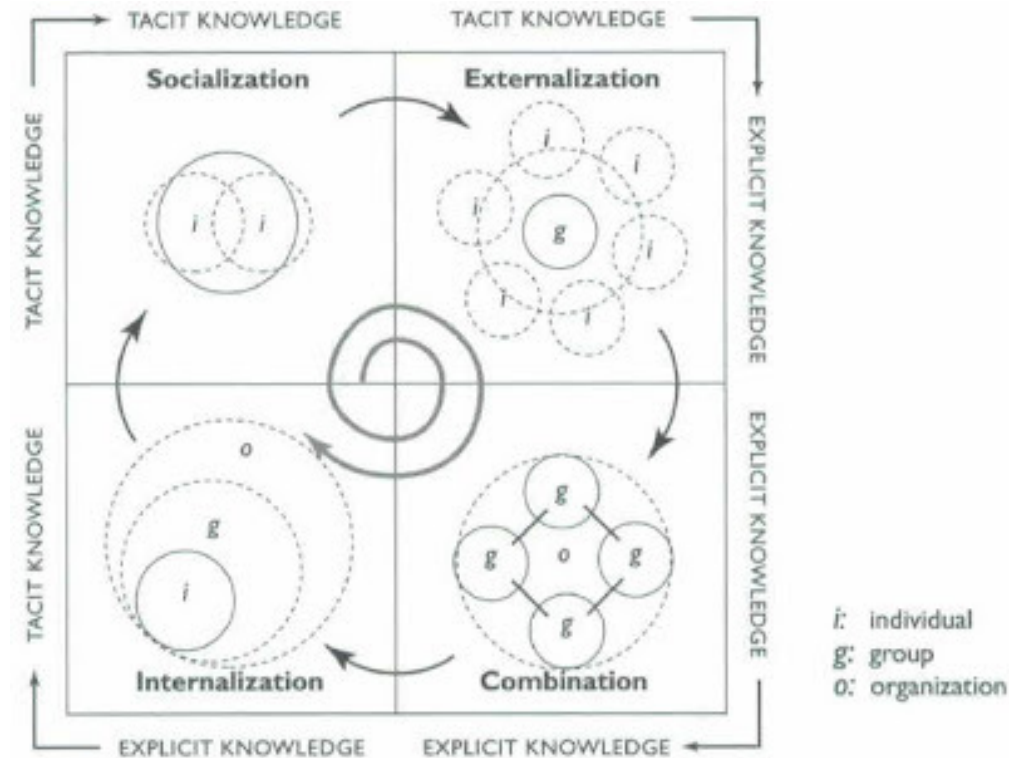
- it is sometimes referred to as know-how (Brown & Duguid 1998) and refers to intuitive, hard to define knowledge that is largely experience based; is often context dependent and personal in nature.

- **Embedded Knowledge**

- knowledge that is locked in processes, products, culture, routines, artifacts, or structures (Horvath 2000, Gamble & Blackwell 2001); knowledge is embedded either formally, such as through a management initiative to formalize a certain beneficial routine, or informally as the organization uses and applies the other two knowledge types.

SECI Model Knowledge Creation Spiral

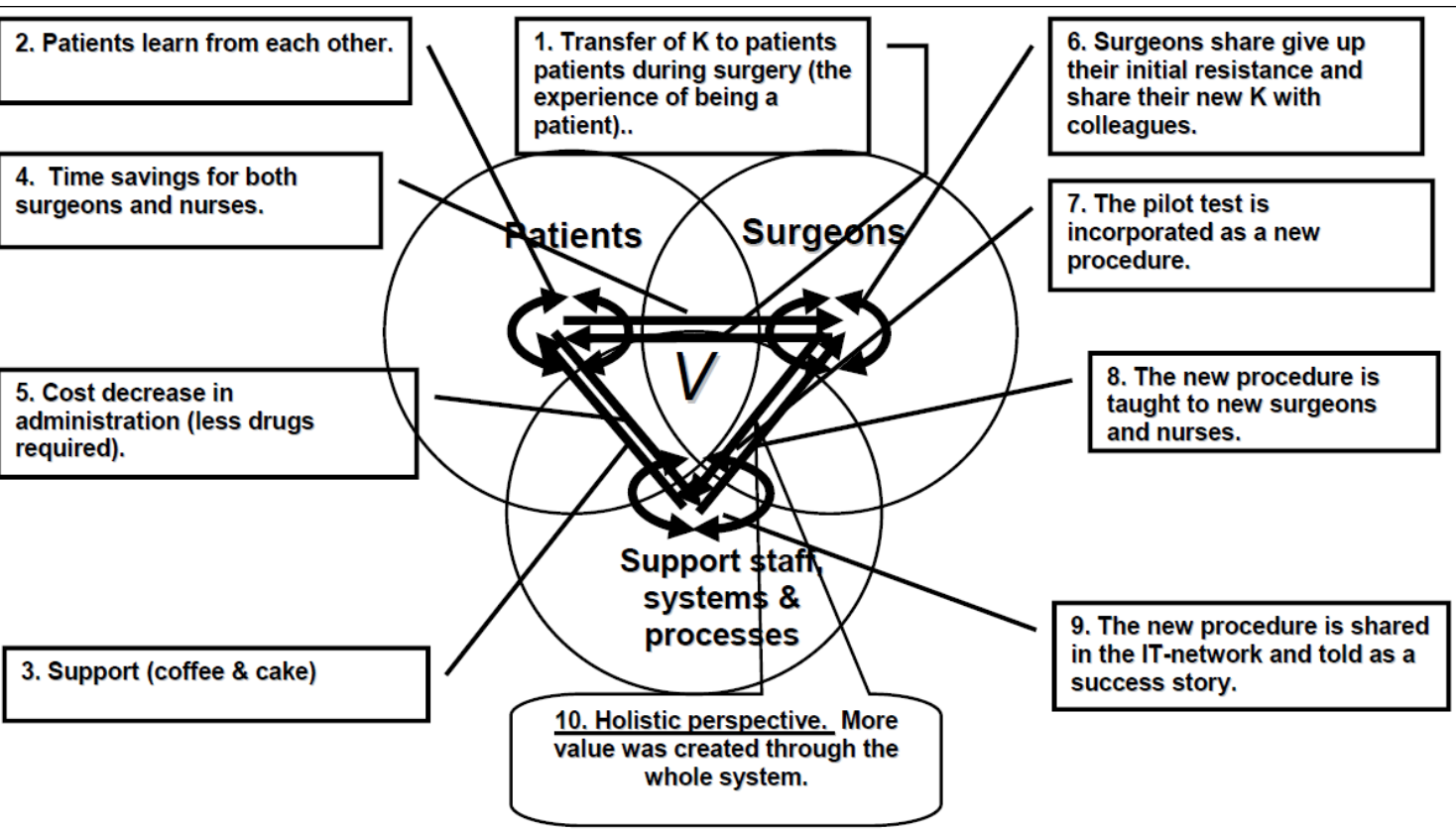
Nonaka & Takeuchi, 1996



- **Socialization:** Tacit to tacit. Knowledge is passed on through practice, guidance, imitation, and observation.
- **Externalization:** Tacit to explicit. This is deemed as a particularly difficult and often particularly important conversion mechanism. Tacit knowledge is codified into documents, manuals, etc. so that it can spread more easily through the organization. Since tacit knowledge can be virtually impossible to codify, the extent of this knowledge conversion mechanism is debatable. The use of metaphor is cited as an important externalization mechanism.
- **Combination:** Explicit to explicit. This is the simplest form. Codified knowledge sources (e.g. documents) are combined to create new knowledge.
- **Internalization:** Explicit to tacit. As explicit sources are used and learned, the knowledge is internalized, modifying the user's existing tacit knowledge.

A Knowledge-Based View of the Hospital – case study –

Knowledge flows created value was in all three categories of IC. Some of the value was financial, but the bulk was intangible: enjoyment, time savings and structural capital value in the form of new policies and procedures.



- K-flow 1. Ex-patients possess a unique knowledge and a unique credibility (they survived!) as a consequence of having had personal experience of the hospital process.
- K-flow 2. Ex-patients taught their knowledge to the new patients (an enjoyable experience for both parties),
- K-flow 3. supported by the structure (ability to produce a nice atmosphere, coffee & cake, cutlery, etc).
- K-flow-4. Due to their new knowledge the new patients lost their fears and reduced their demands on the nurses and surgeons, who saved time.
- K-flow 5. The new patients also reduced costs for support materials (drugs).
- K-flow 6. The surgeons shared their experiences with their colleagues and agreed to continue.
- K-flow 7. The coffee and cake meetings are stored as a new procedure for more complex surgeries.
- K-flow 8. The new procedure is taught to new surgeons and nurses.
- K-flow 9. The new procedure is shared via the network to all parts of the hospital – and also outside as a success story.
- K-flow 10. Thanks to the KM manager's holistic perspective value was generated through the whole chain of IC.

Knowledge Management – definitions

- Peter Drucker: KM is "the coordination and exploitation of organizational knowledge resources, in order to create benefit and competitive advantage" (Drucker 1999).
- Davenport & Prusak (2000): KM "is managing the corporation's knowledge through a systematically and organizationally specified process for acquiring, organizing, sustaining, applying, sharing and renewing both the tacit and explicit knowledge of employees to enhance organizational performance and create value."
- David Skyrme Associates: KM is the explicit and systematic management of vital knowledge - and its associated processes of creation, organization, diffusion, use and exploitation.
- Dr. Karl-Erik Sveiby: The Art of Creating Value from Intangible Assets.
- and so on

Knowledge Management – synthetic definitions

- Knowledge management is the systematic management of an organization's knowledge assets for the purpose of creating value and meeting tactical & strategic requirements; it consists of the initiatives, processes, strategies, and systems that sustain and enhance the storage, assessment, sharing, refinement, and creation of knowledge.
- KM involves the understanding of:
 - *where and in what forms knowledge exists;*
 - *what the organization needs to know;*
 - *how to promote a culture conducive to learning, sharing, and knowledge creation;*
 - *how to make the right knowledge available to the right people at the right time;*
 - *how to best generate or acquire new relevant knowledge;*
 - *how to manage all of these factors so as to enhance performance in light of the organization's strategic goals and short term opportunities and threats.*
- KM must therefore create/provide the right tools, people, knowledge, structures (teams, etc.), culture, etc., so as to enhance learning; it must understand the value and applications of the new knowledge created; it must store this knowledge and make it readily available for the right people at the right time; and it must continuously assess, apply, refine, and remove organizational knowledge in conjunction with concrete long and short term factors.

Knowledge Management implementation

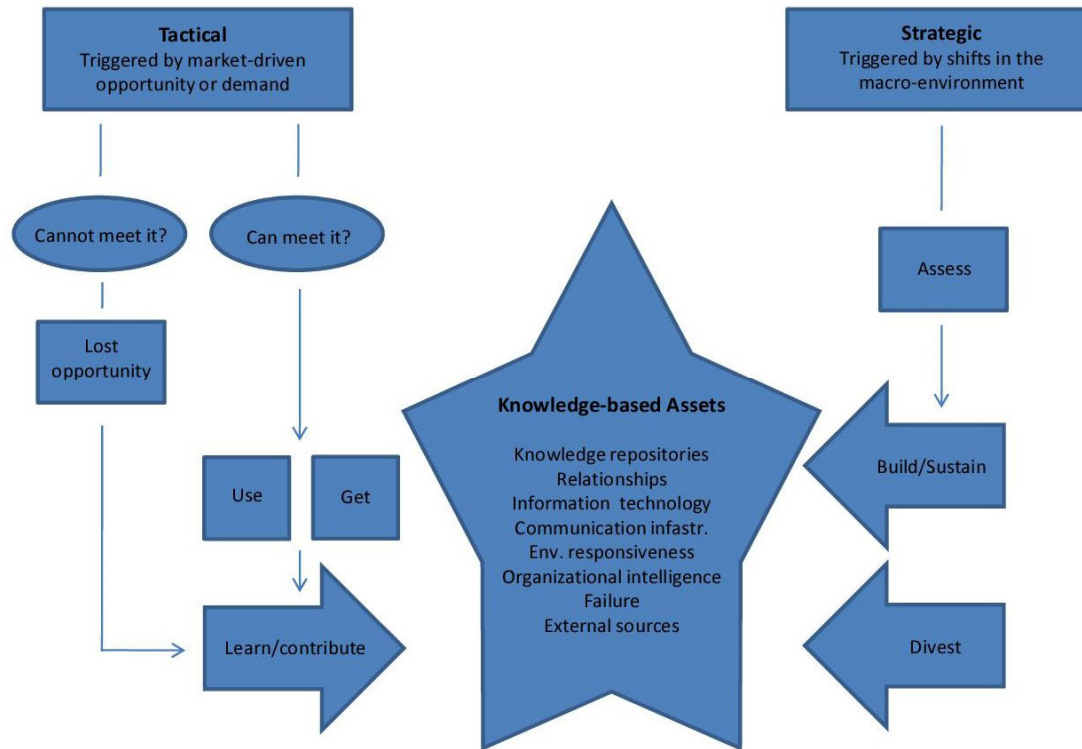


- **KM Strategy:** Knowledge management strategy must be dependent on corporate strategy. The objective is to manage, share, and create *relevant* knowledge assets that will help meet tactical and strategic requirements.
- **Organizational Culture:** The organizational culture influences the way people interact, the context within which knowledge is created, the resistance they will have towards certain changes, and ultimately the way they share (or the way they do not share) knowledge.
- **Organizational Processes:** The right processes, environments, and systems that enable KM to be implemented in the organization.
- **Management & Leadership:** KM requires competent and experienced leadership at all levels. There are a wide variety of KM-related roles that an organization may or may not need to implement, including a CKO, knowledge managers, knowledge brokers and so on.
- **Technology:** The systems, tools, and technologies that fit the organization's requirements - properly designed and implemented.
- **Politics:** The long-term support to implement and sustain initiatives that involve virtually all organizational functions, which may be costly to implement (both from the perspective of time and money), and which often do not have a directly visible return on investment.

KM Taxonomy



The KM Process Framework



Bukowitz and Williams (1999)

KM Models (1)

- depicts the process that defines the **strategy** for management to **build**, **divest**, and **enhance** knowledge assets. It is a model that emphasizes the "why" and "when" aspects.
- the strengths of this model rest on its strategic focus, which essentially puts knowledge management action into context. It is also worth noting that the notion of "divestment" is included

KM Models (2)

The KM Matrix -general theoretical framework-

Type Approach	Embodied	Represented	Embedded
Sense	Observe	Gather	Hypothesize
Organize	Contextualize	Categorize	Map
Socialize	Share	Disseminate	Simulate
Internalize	Apply, Decide, Act		

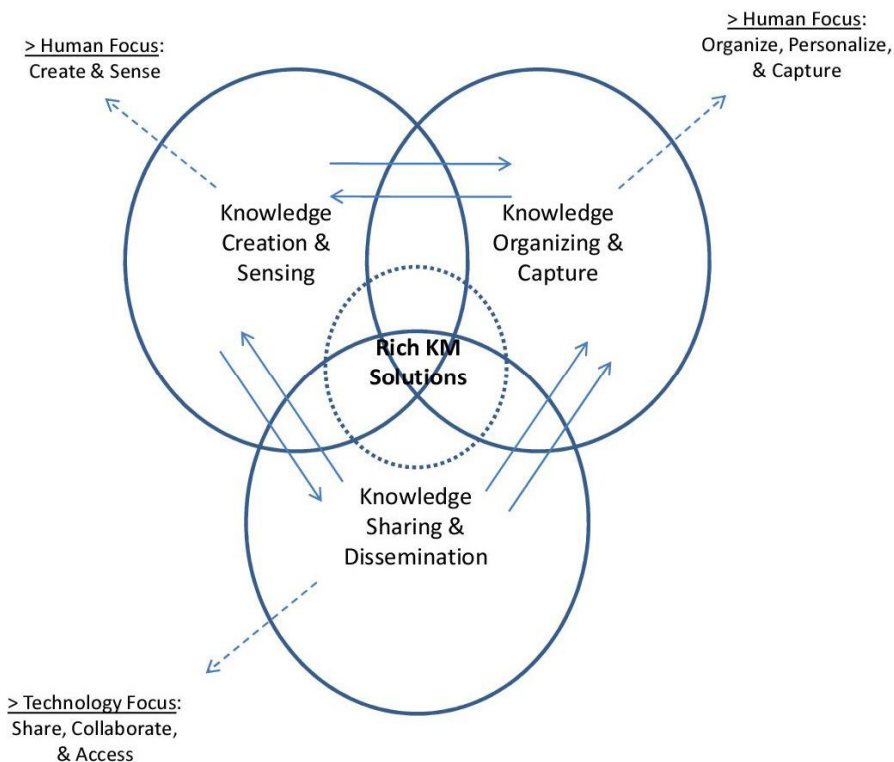
Gamble and Blackwell (2001)

The KM process is split into **four** stages:

- First, management must locate the **sources** of knowledge.
- Then they must **organize** this knowledge so as to assess the firm's strengths and weaknesses and determine its relevance and reusability.
- This is followed by **socialization**, where various techniques are used to help share and disseminate it to whomever needs it in the organization.
- Finally, the knowledge is internalized through use.

KM Models (3)

The Knowledge Management Process Model



- This model attempts to offer a more realistic overview of the KM process; the three broad categories overlap and interact with one another
- the focus is on managerial initiatives
- shows which of the three categories are more people oriented and which are more technology focused

Botha et al (2008)

Knowledge Management Processes

- Amrit Tiwana (2002) identified three basic processes of knowledge management:
 - *Knowledge acquisition* is the process of developing and/or creating intellectual capital, including insights, skills, experiences, and relationships (typically a chief province of information technology, to capture data and develop databases; *Knowledge repositories* are a way to categorize and store collected knowledge.
 - *Knowledge sharing* is disseminating and making available the collected knowledge of the agency and its staff, enabled through a social process made possible by an organizational culture that honors and rewards sharing activities; many of these involve the application of information technology
 - *Knowledge utilization* is the process of integrating knowledge into the agency. One increasingly important method to accomplish this task is by establishing and promoting greater use of communities of practice (informal groups of individuals with a common interest in a topic or a program connected in electronic networks to share members' experience, knowledge, and advice).

Knowledge Management Strategies

Knowledge management strategy dimensions

- The Knowledge Management Strategy (KMS) of a firm is based on the best possible strategic design in order to create, maintain, transfer and apply organizational knowledge to achieve competitive goals ([Earl, 2001](#); [Maier and Remus, 2002](#); [Choi and Lee, 2003](#); [Garavelli et al., 2004](#); [Donate and Guadamillas, 2007](#)).
 - The development of a KMS includes all the operations related to the creation, acquisition, integration, storage, transmission, protection and application of knowledge ([Day and Wendler, 1998](#)).
- **Knowledge Management Conception**
 - **Knowledge Management Strategy Objectives**
 - **Knowledge Management Policies:**
 - **Creation**
 - **Storage and retrieval**
 - **Transfer/sharing**
 - **Application**
 - **Protection**
 - **Implementation Support Systems:**
 - **Leadership**
 - **Culture**
 - **HR practices**
 - **Flexible structure**
 - **Technological systems**

Elements of KM Strategies Implementation

- Human resources practices
 - learning and sharing —all that which it has been learned— is a **social act**, and that knowledge transmission implies **willingness and positive attitudes** both in the receiver and in the person (or group) who transfers the knowledge
- Culture ← principles:
 - The knowledge exchange among areas is supported by a **common language**
 - The employees experiment and implement their ideas in the **work journal**.
 - **Mistakes are part of learning** and they are tolerated up to a certain level.
 - Culture is characterised by **openness and trust** among employees.
 - Employees have a **responsible behaviour** and a high capacity for learning.
 - The **exchange of knowledge is encouraged by the firm**, at informal level.
 - The **members of the organization perceive the same company intention**, with which they feel compromised.
- Flexible structures
 - a high **decentralization**, fluid **horizontal communications**, flexible and **narrowly defined tasks**, a **small number of hierarchical levels**, organization in projects or **team work**, and a number of **strategic alliances**

Elements of KM Strategies Implementation (cont)

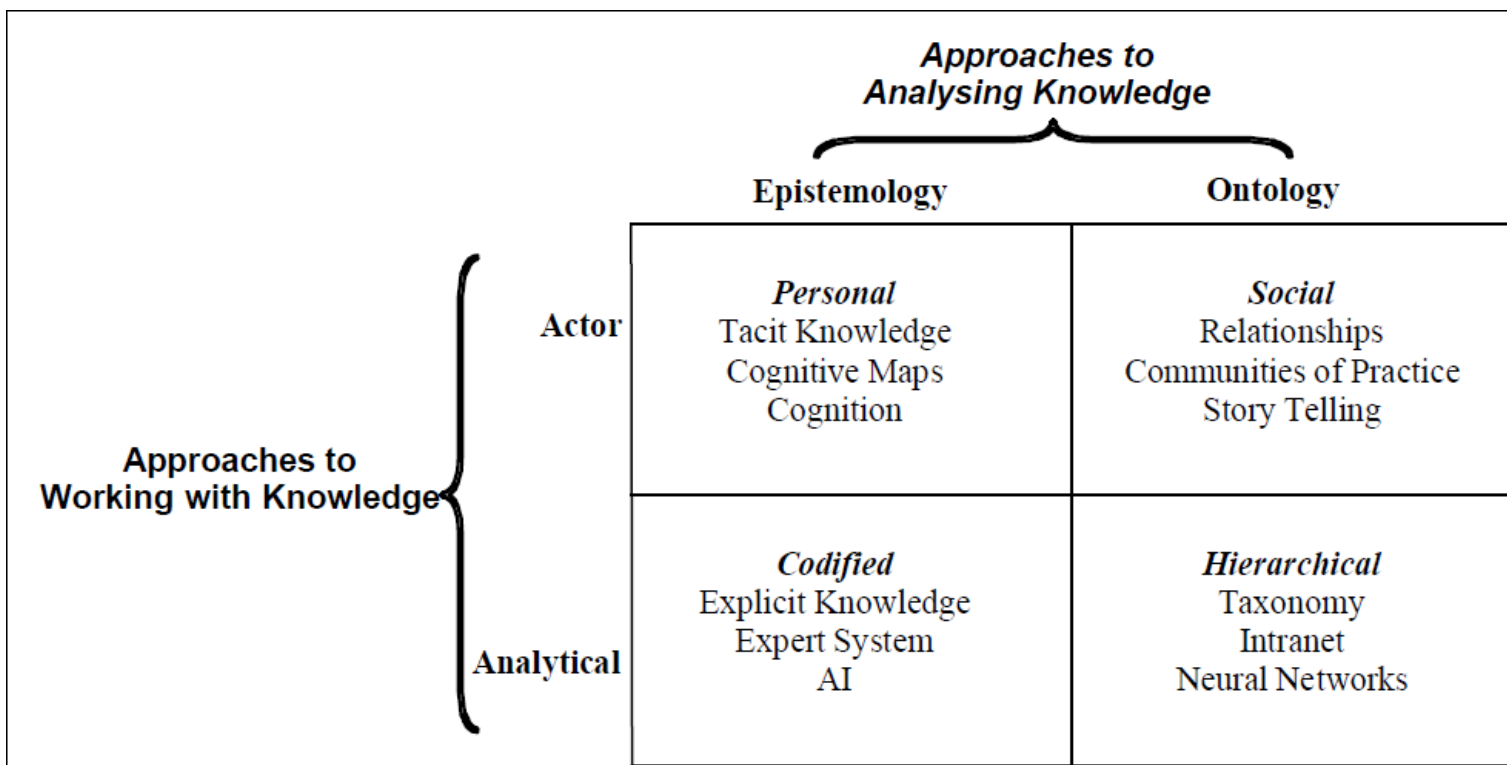
- (ethical) Leadership

- leadership based on [ethical principles](#) ([Margolis and Walsh, 2003](#))
- the managers in charge of KMS implementation must assume their role as [facilitators of the knowledge processes](#) in the firm ([Guadamillas and Donate, 2006](#); [Leidner et al., 2006](#)); their efforts are centred on building an adequate setting for the diffusion, creation and application of knowledge.
- In this sense, [Spender \(1996: 47\)](#) asserts that managers should promote a certain level of [independence at work](#), the [assumption of responsibility and experimentation](#) as well.

- Technological systems

- technological systems are those tools [based on information technologies \(IT\)](#) which are used to [develop \(and to make easier\) knowledge processes](#). They support and, in some cases, systematize some processes of creation, storage, transfer and application of knowledge ([Davenport and Prusak, 1998](#)).


KM Systems Modelling Matrix



Knowledge management systems (KMS) refer to any kind of IT system that stores and retrieves [knowledge](#), improves collaboration, locates knowledge sources, mines repositories for hidden knowledge, captures and uses knowledge, or in some other way enhances the KM process.

- James Robertson (2007) goes as far as to argue that organizations **should not even think in terms of knowledge management systems**. He argues that KM, though enhanced by technology, is not a technology discipline, and thinking in terms of knowledge management systems leads to expectations of "silver bullet" solutions. Instead, the focus should be determining the functionality of the IT systems that are required for the specific activities and initiatives within the firm.

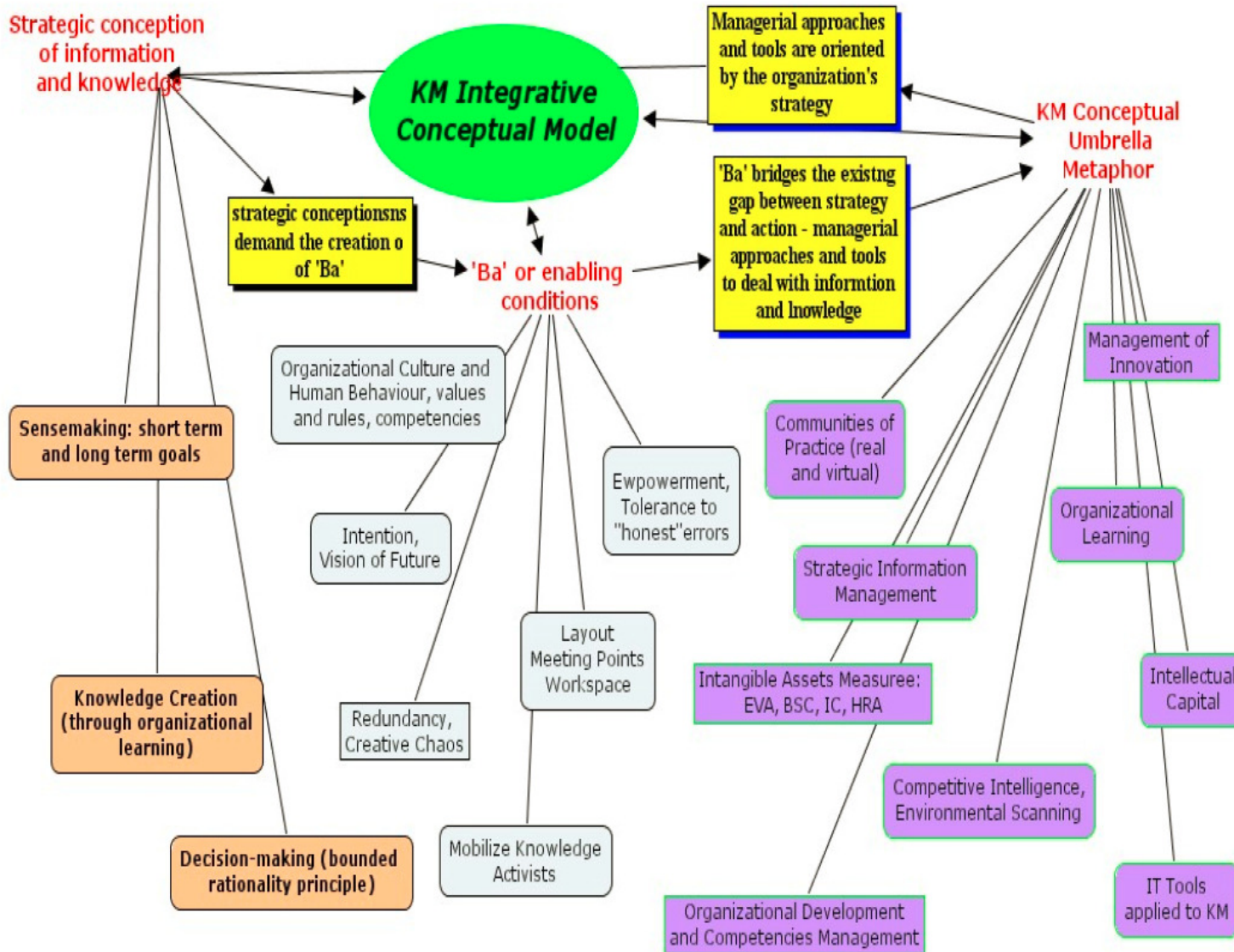
Tools based on IT (supporting KMS)

KM process	Creation	Storage and retrieval	Transfer/sharing	Application
KM tools (IT) 	<ul style="list-style-type: none"> E-learning Collaboration support systems 	<ul style="list-style-type: none"> Data warehousing Data mining Repositories 	<ul style="list-style-type: none"> Communication support systems Information company site Knowledge directories 	<ul style="list-style-type: none"> Expert systems Support systems to the decision making Work-flow systems
IT make easier...	<ul style="list-style-type: none"> Combination of new knowledge sources "Just in time" learning 	<ul style="list-style-type: none"> Support to the organizational memory Knowledge access among groups 	<ul style="list-style-type: none"> More wide internal network More availability of communication channels Rapid access to knowledge sources 	<ul style="list-style-type: none"> Knowledge can be applied in a number of localizations Rapid application of new knowledge through the work-flow automation

Source: adapted from [Alavi and Leidner \(2001:125\)](#) and [Alavi and Tiwana \(2003: 115\)](#)

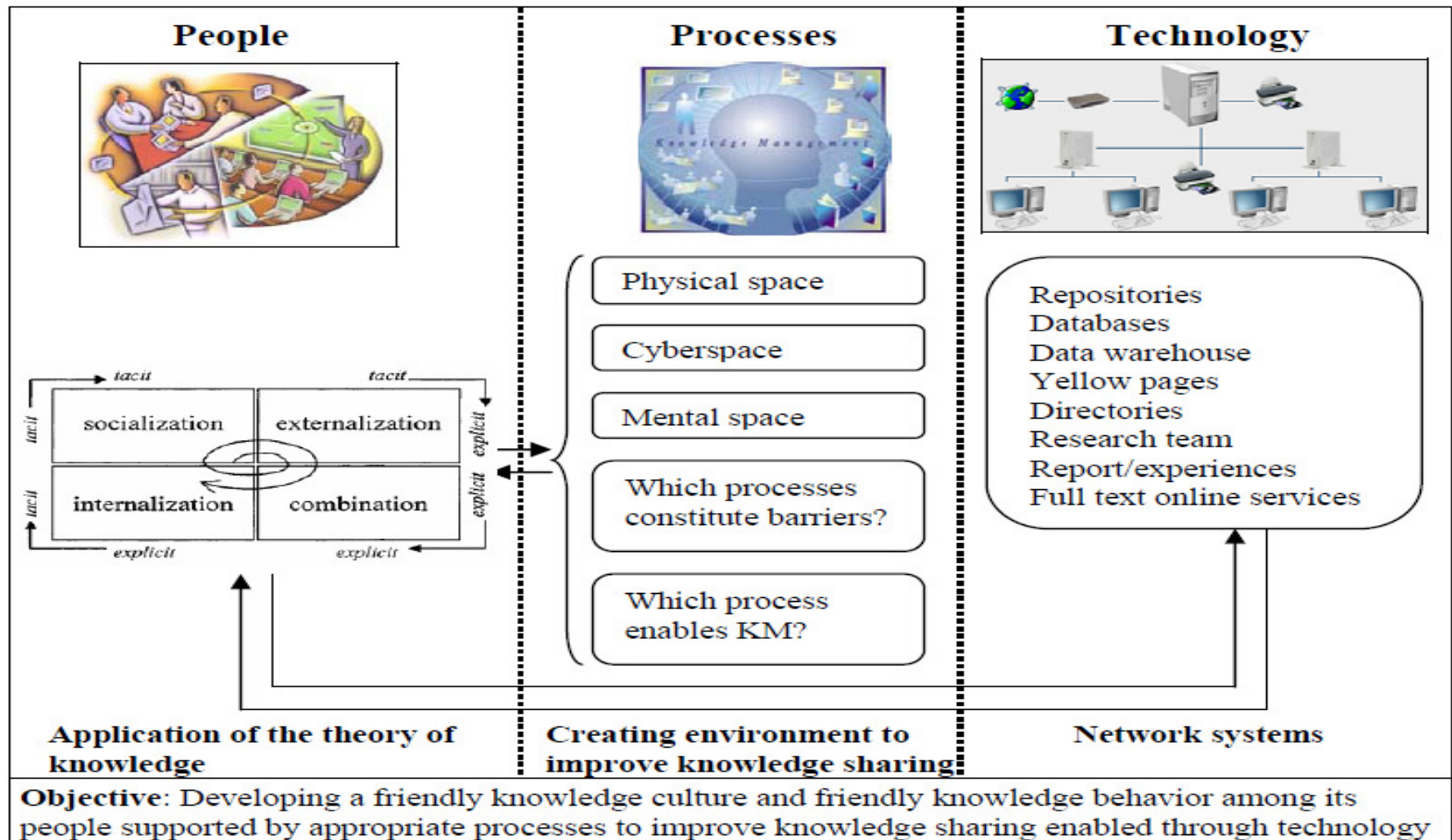
Organizational Learning vs Learning Organization

- the **distinction** between the concepts of organizational learning and learning organizations **rests on the product of the learning process**—what results from learning; the most valuable product of learning is an **ability to adapt to change**.
 - A **learning organization** is one in which **people continually expand the capacity to create the results they desire**, and where new expanding patterns of thinking are nurtured, where collective aspirations are set free, and where members of the organization are continually learning together to see the whole. (Senge 1990, 3); it is one with a **vision of what it might achieve**
 - **Organizational learning** is the term used to describe the **processes involved during the learning that takes place by individuals and the collective learning** that occurs within organizations; it is based upon a foundation of learning theory, and is often used to describe the processes and results of employee training and management development; it's about the processes needed to bring about a fundamental change in the culture of the organization, transforming it from a reactive to a proactive organization. Smith added that organizational learning is the activity and the process by which an agency eventually becomes a learning organization.
- organizational learning and **“Community of Practice”** (is NOT a team):
 - “a group of professionals **informally bound** to one another through exposure to a common class of **problems**, common pursuit of **solutions**, and thereby themselves **embodying a store of knowledge**”



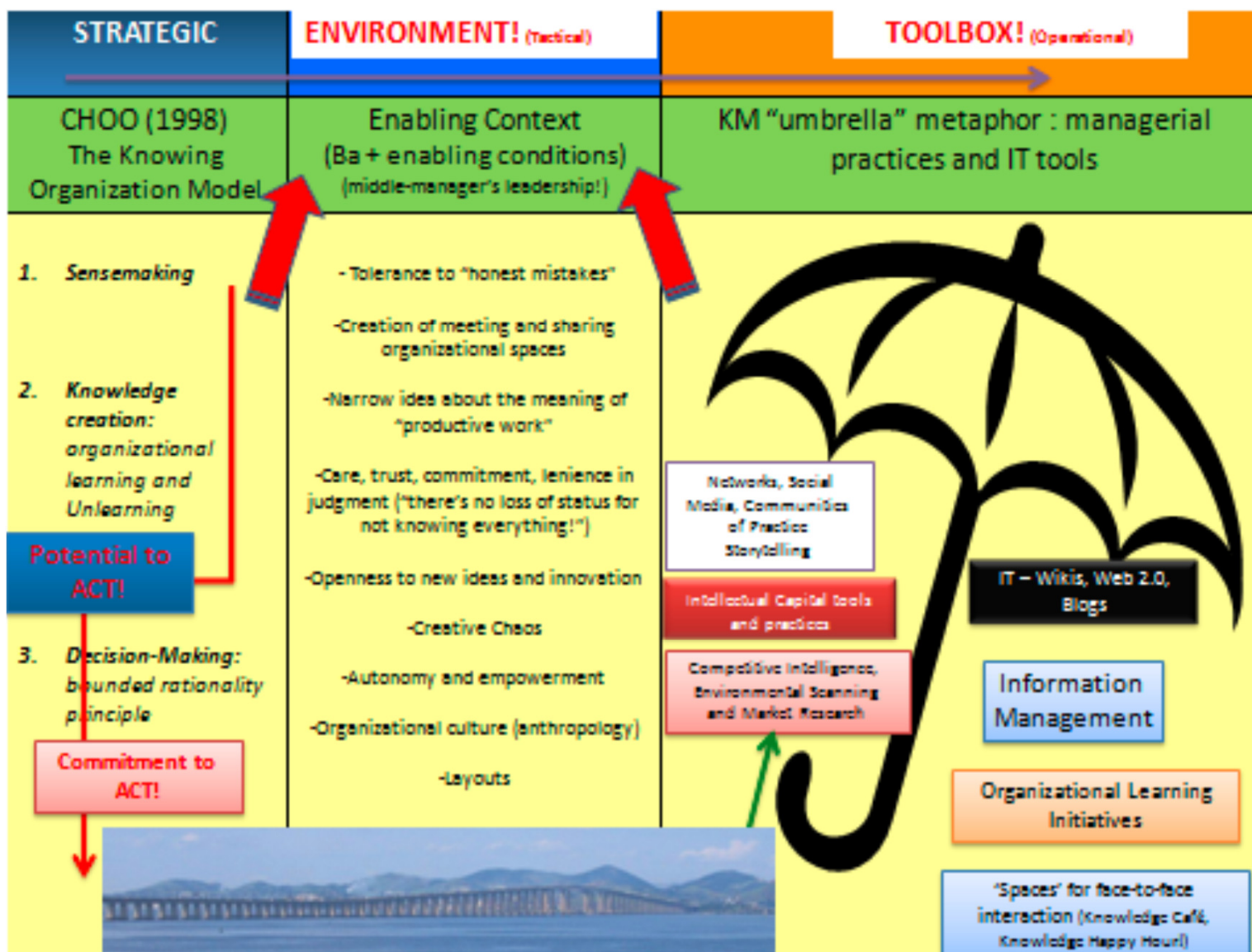
- Von Krogh, Ichijo and Nonaka (2001) introduced the concept of “Ba” (~”place” in English) - enabling conditions or enabling context.
- “Ba” is needed in the tactical level in order to bridge the existing gap between strategy and action
- Elements of “Ba”: creative chaos, redundancy, layout, organisational culture and human behaviour, leadership, intention or vision of future and empowerment, not to mention organizational structure and layout, among others.

ELEMENTS OF A KM INITIATIVE

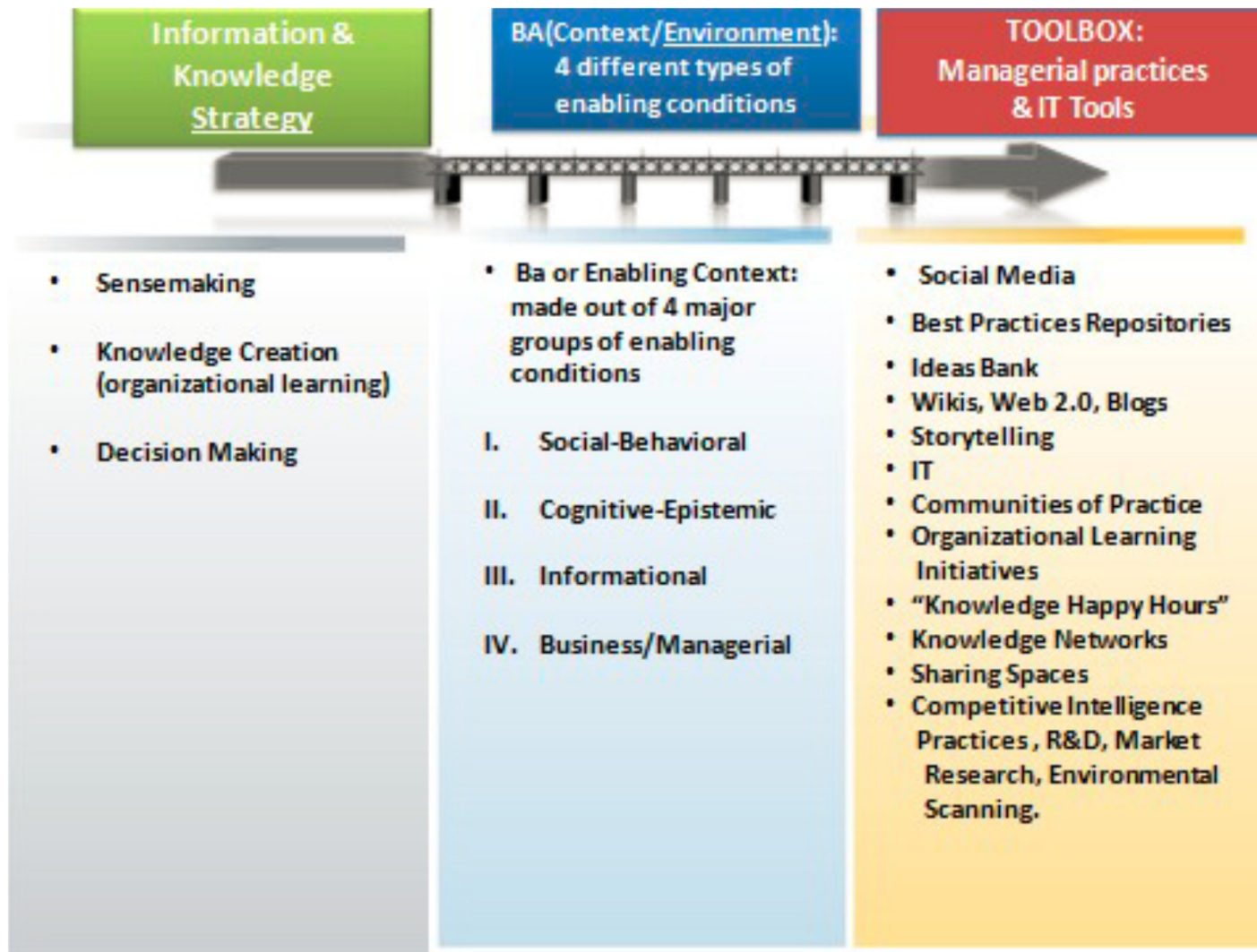


Model by Nonaka and Takeuchi, 1995²⁹

SET KM Model



- as a dynamic model to unify the trinity of:
 - strategy (knowledge vision)
 - environment (enabling context)
 - toolbox (action)



SET KM Model -variant-

KM and BPR

On the surface they may seem to share a similar approach, focusing on strategy, organization, etc so as to achieve better results. However, BPR's approach typically treats the firm more like a machine (with the cogs representing the various processes and systems). KM tends to look at the firm more like a living organism, where removing or changing any part must be done with extreme care so as not to cause damage to the whole organization. KM also places the greatest focus on the informal processes and relationships.

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Thank you!