# MODULE1: KNOWLEDGE MANAGEMENT

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Knowledge Management

- Introducing the concept of KM
- Why KM?
- KM system life cycle,
- Aligning KM and business strategy

What is Knowledge?

- **Data** – collection of unprocessed facts, a set of discrete facts about events
- **Information** – organized or meaningful data
- **Knowledge** – information that is contextual, relevant, and actionable
  - Strong experiential and reflective elements
  - Good leverage and increasing returns
  - Dynamic
  - Evolves over time with experience
- Knowledge is also known as **Human Capital**
- The primary difference between the terms **information** and **knowledge** is in the level of understanding of their underlying organizational data

From Facts to Wisdom (Haeckel & Nolan)
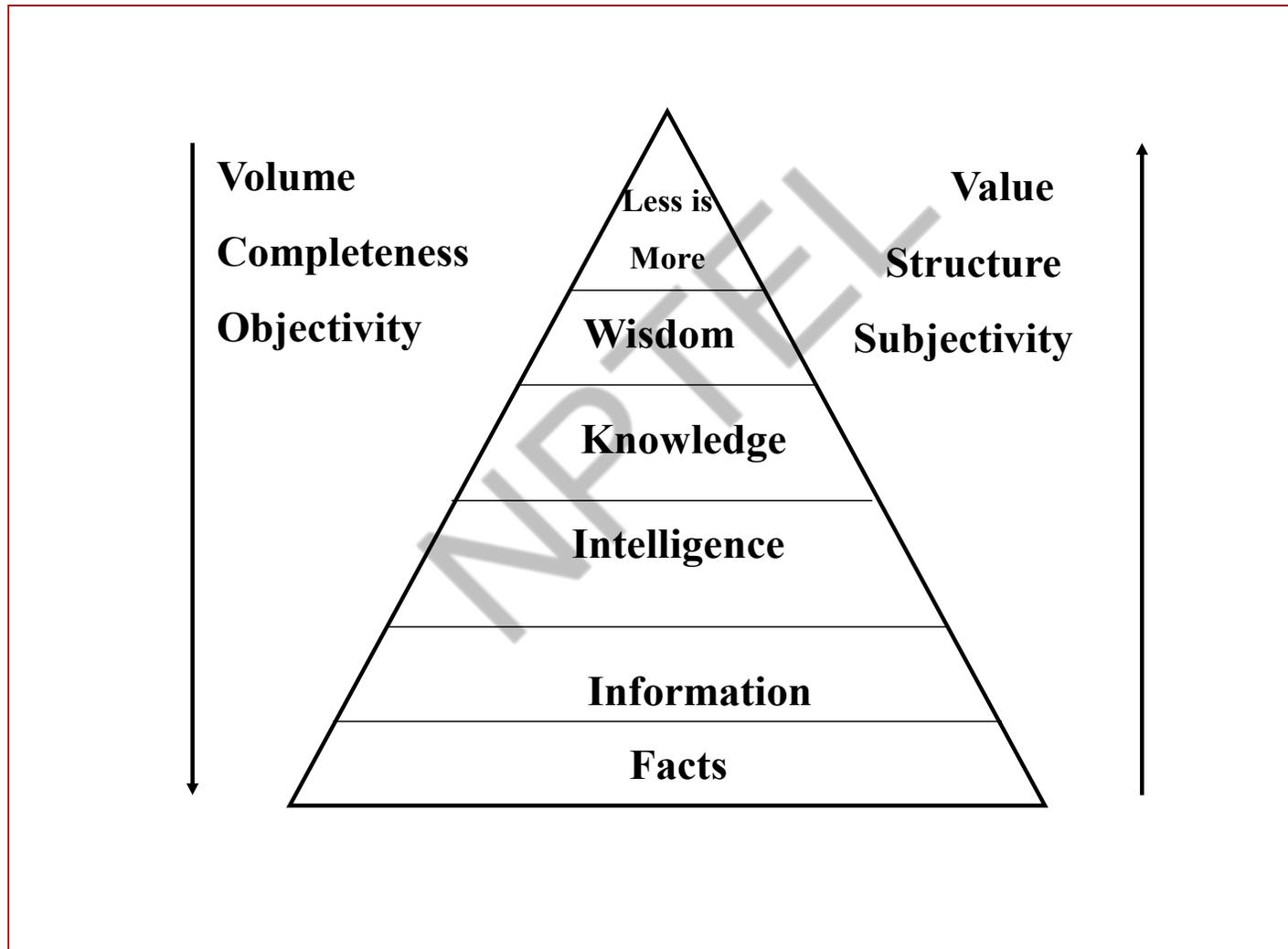
Information, Knowledge and Wisdom
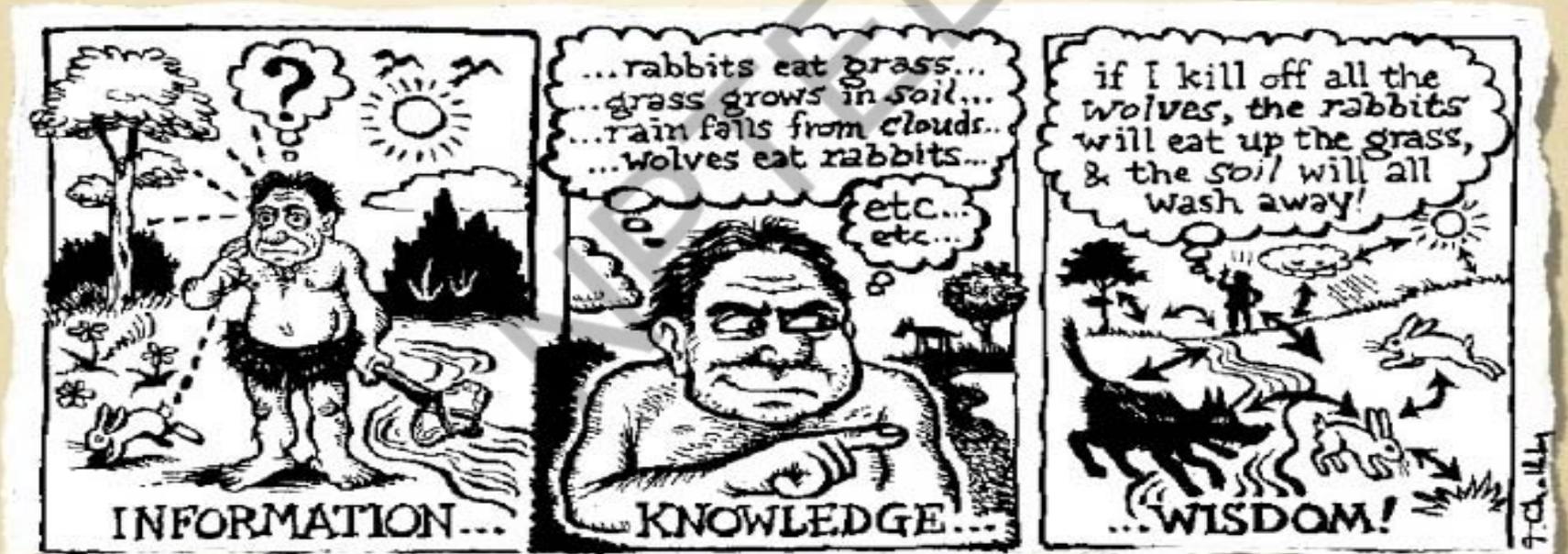
source: "Information as a Resource", Harlan Cleveland

Types of Knowledge

- Shallow (readily recalled) and deep (acquired through years of experience)
- Explicit (codified) and tacit (embedded in the mind)
- Procedural (psychomotor skills) versus episodical (chunked by episodes; autobiographical)
- Chunking knowledge

FROM PROCEDURAL TO EPISODIC KNOWLEDGE

- Shallow
- Knowledge
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- **Deep**
- **Knowledge**

Procedural Knowledge

Knowledge of how to do a task that is essentially motor in nature; the same knowledge is used over and over again.

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Declarative Knowledge

Surface-type information that is available in short-term memory and easily verbalized; useful in early stages of knowledge capture but less so in later stages.

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Semantic Knowledge

Hierarchically organized knowledge of concepts, facts, and relationships among facts.

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Episodic Knowledge

Knowledge that is organized by temporal spatial means, not by concepts or relations; experiential information that is chunked by episodes. This knowledge is highly compiled and autobiographical and is not easy to extract or capture.

Source: Awad, E.M (2007). Knowledge Management

Two major types of Knowledge

- **Explicit knowledge**
  - Deals with objective, rational, and technical knowledge
  - Examples: policies, goals, strategies, papers, reports
  - Structured knowledge that is easy to codify
 - Easily manipulated, shared, taught or learned

- **Tacit knowledge**
  - Unstructured knowledge – in the domain of subjective, cognitive, and experiential learning
  - Highly personal, hard to formalize and document
  - Cumulative store of the experiences, mental maps, insights, expertise, know-how, trade secrets, skills set, understanding, etc.
  - Involves a lot of human interpretation

A few Foundation Principles and Building Concepts

- Knowledge Influences Success
- Knowledge Resides in the Heads of People
- Two Types of Knowledge
    - Codified (explicit)
    - Personalized (tacit)
- Knowledge Sharing Requires a Conduit to Happen Systemically
- Technology is the conduit
- Knowledge Sharing Requires Trust
- KM embraces both the Knowledge Based organization and the Learning Organization
- KM has planned architectural frameworks

Reservoirs of Knowledge

Knowledge Reservoirs

People   Artifacts   Organizational Entities

Individuals

Practices   Technologies   Repositories

Organizational Units

Organizations

Groups

Inter-organizational Networks
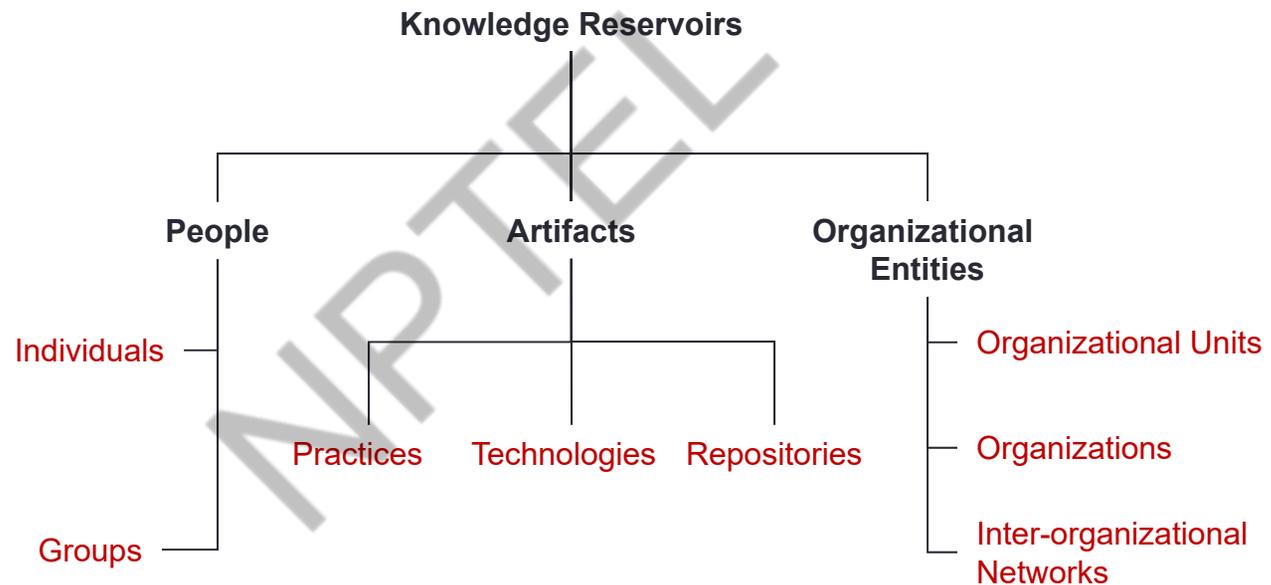
Source: Becerra-Fernandez, et al. (2004). Knowledge Management

Knowledge Assets

Codified Knowledge Assets (Legally Owned)

Patents
Copyrights
Trademarks
Documents

Tip of the iceberg

- Working Solutions
- Web of Relationships
- Communities of Practice
- Experience
- Expertise and Theoretical Knowledge
- Database
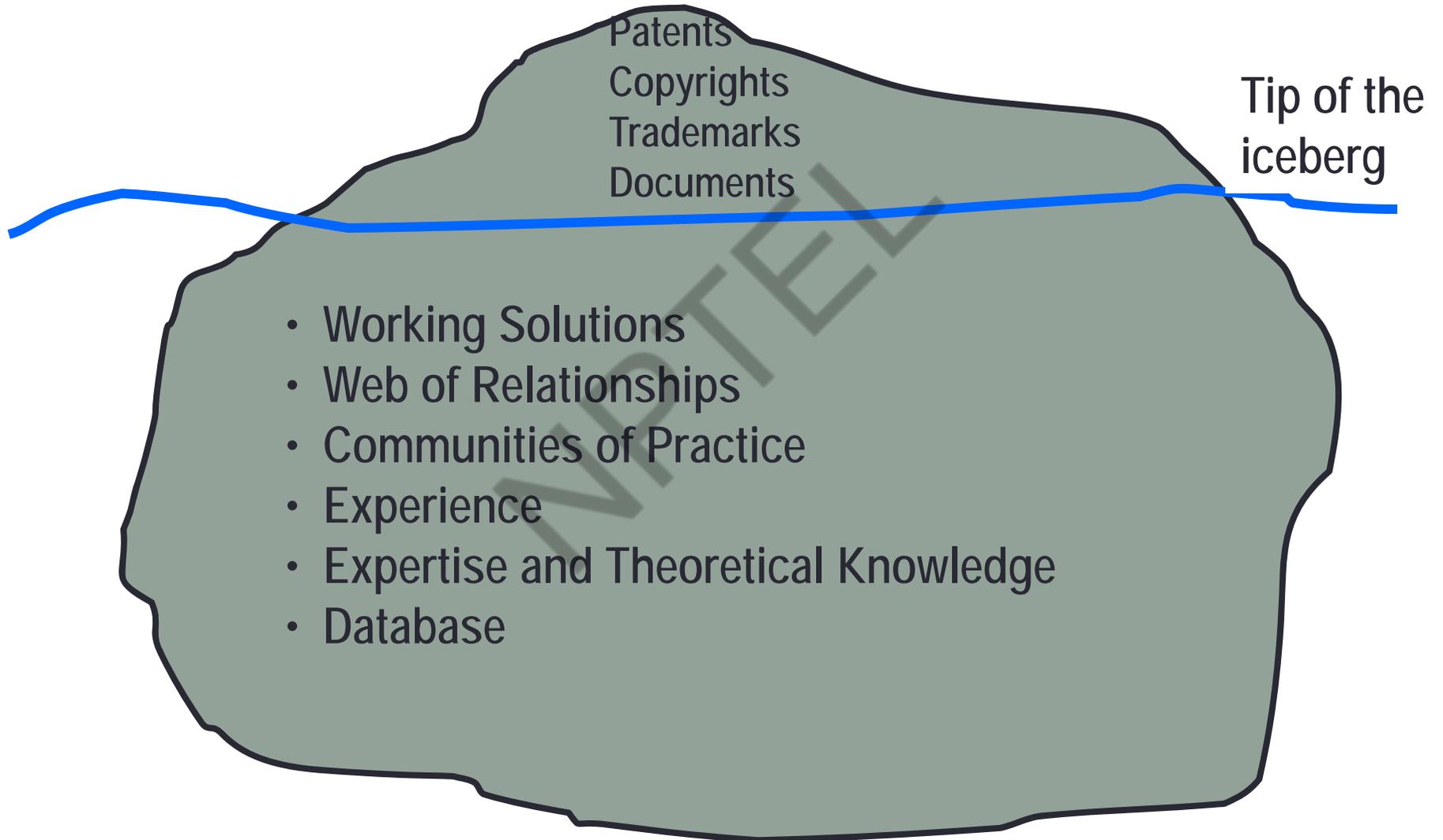
Source: The Knowledge Evolution

Illustrations of the Different Types of Knowledge

		General	Contextually Specific	Technically Specific
Declarative	**Explicit**	A book describing factors to consider when deciding whether to buy a company's stock. This may include price to earnings ratio, dividends	A company document identifying the circumstances under which a consultant team's manager should consider replacing a team member who is having problems with the project.	A manual describing the factors to consider in configuring a computer so as to achieve performance specifications
	Tacit	Knowledge of the major factors to consider when deciding whether to buy a company's stock.	A human relations manager's knowledge of factors to consider in motivating an employee in a particular company.	A technician's knowledge of symptoms to look for in trying to repair a faulty television set.
Procedural	**Explicit**	A book describing steps to take in deciding whether to buy a company's stock.	A company document identifying the sequence of actions a consultant team's manager should take when requesting senior management to replace a team member having problems with the project.	A manual describing how to change the operating system setting on a computer so as to achieve desired performance changes.
	Tacit	Basic knowledge of the steps to take in deciding whether to buy a company's stock.	A human relations manager's knowledge of steps to take in motivating an employee in a particular company.	A technician's knowledge of the sequence of steps to perform in repairing a television set.

Source: Becerra-Fernandez, et al. (2004). Knowledge Management

Conversion processes

	Tacit	Explicit
From Tacit	Socialization	Externalization
Explicit	Internalization	Combination

To

Four Modes of Knowledge Conversion

- Socialization:
  - A process of sharing experiences
  - Apprenticeship through observation, imitation, and practice

- Externalization:
  - A process of articulating tacit knowledge into explicit concepts
  - A quintessential knowledge-creation process involving the creation of metaphors, concepts, analogies, hypothesis, or models
  - Created through dialogue or collective reflection

- Internalization:
  - A process of embodying explicit knowledge into tacit knowledge
  - Learning by doing
  - Shared mental models or technical know-how
  - Documents help individual internalize what they experience

- Combination:
  - A process of systemizing concepts into a knowledge system
  - Reconfiguration of existing information and knowledge

The knowledge creation process
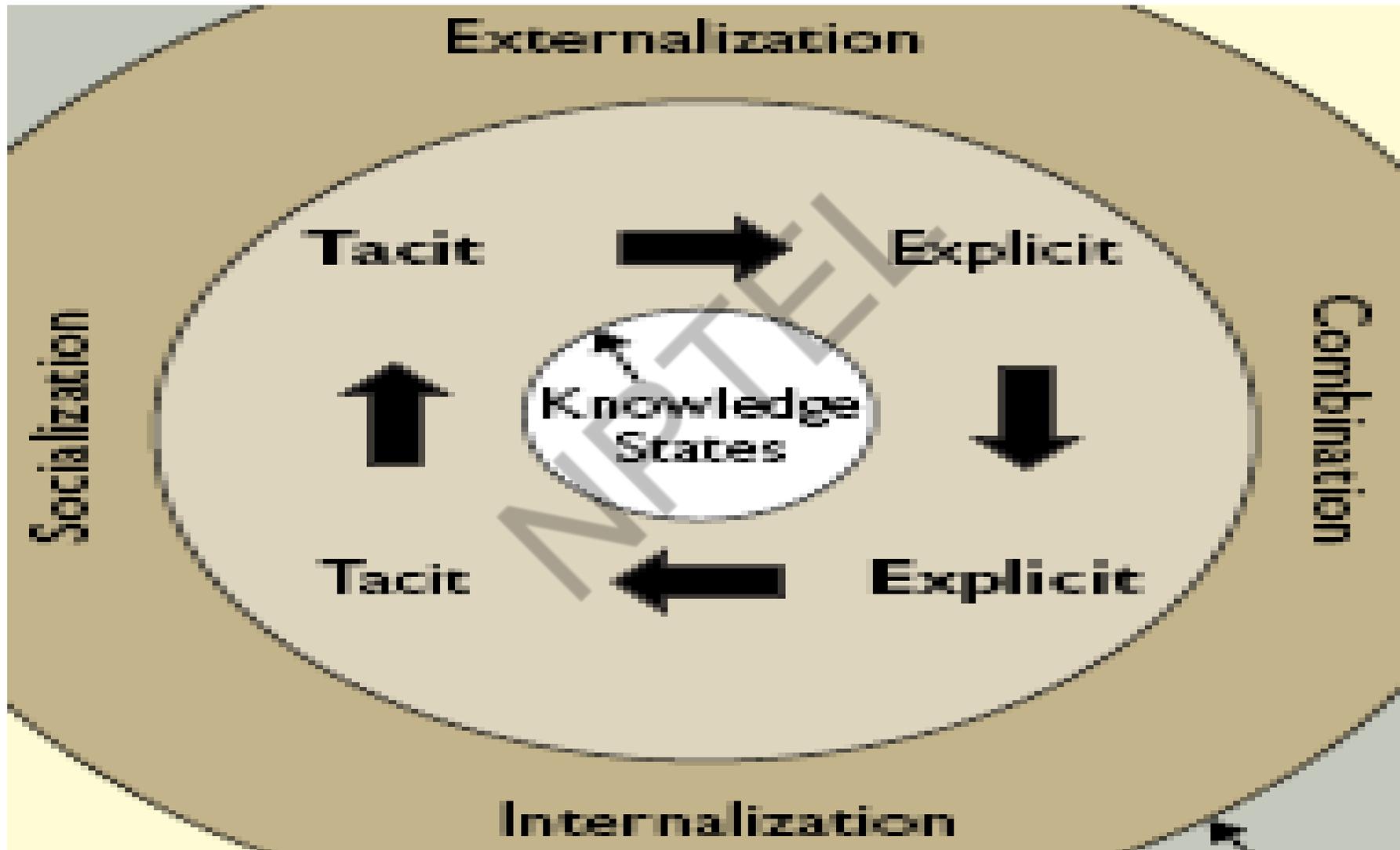
Source: *The knowledge creating company,* I. Nonaka and H. Takeuchi [15]

# Knowledge Requires Capture, Organization, Access and Leverage

OLD WAY
- Capture form is written, auditory or graphical representations
- Organization is via tables of content, indexes, classification systems used by publishers, libraries, etc
- Access when physical body goes to where the knowledge is located…a library, a company, a research laboratory, a school
- Tacit knowledge rarely tapped
- Leverage is a sum game

NEW WAY
- Capture from is digits in cyberspace
- Organization via software programs designed upon engineering principles, mathematical equations, word associations in cyberspace 24/7/365
- Access wherever the physical bodies link via computers
- Tacit knowledge tapped using many different technological tools
- Leverage is exponential, multiples upon multiples
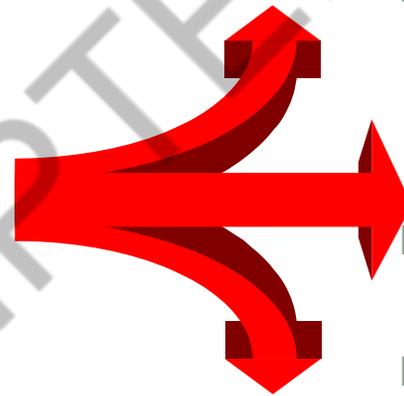
Knowledge Work Activities
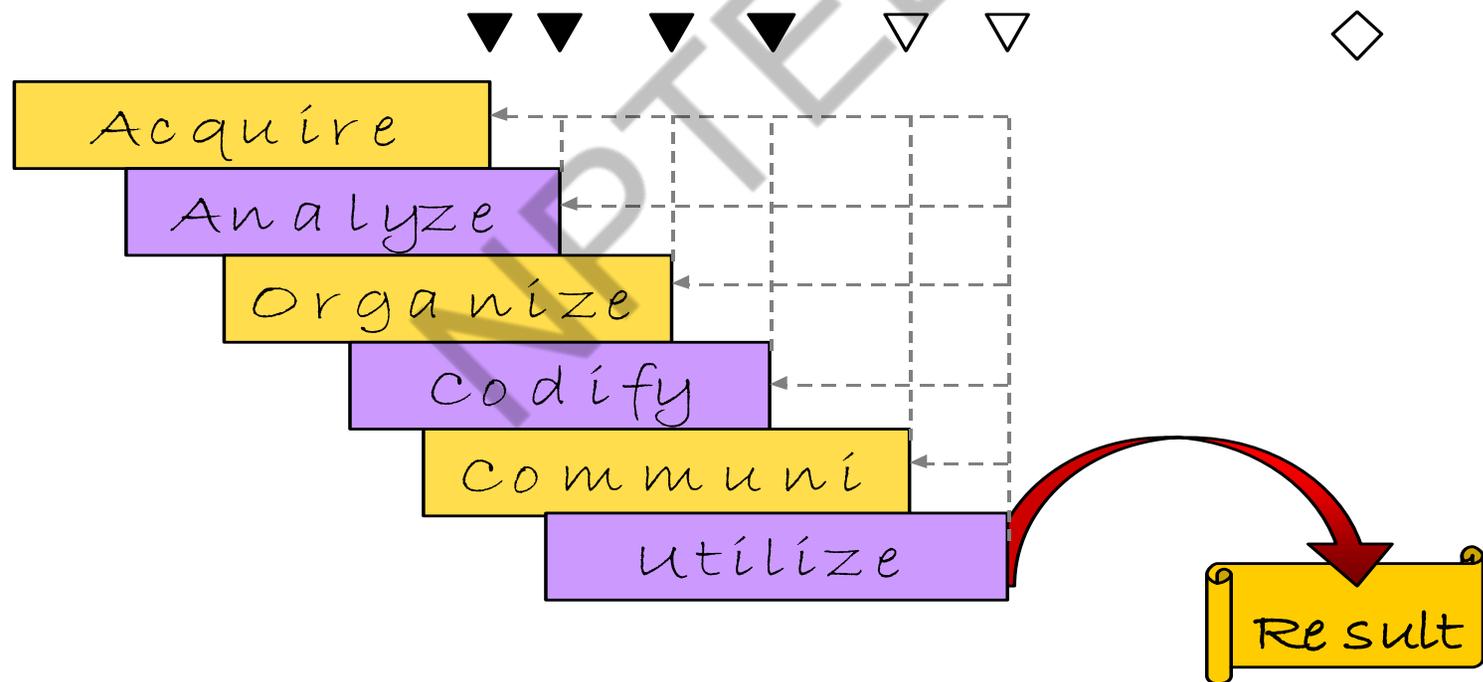
KM in Practice

- Knowledge Teams - multi-disciplinary, cross-functional

- Knowledge (*Data)*bases - experts, best practice

- Knowledge Centres - hubs of knowledge

- Learning Organization - personal/team/org development

- Communities of Practice - peers in execution of work

- Technology Infrastructure - Intranets, Domino, doc mgt

- Corporate Initiatives - CKOs, IAM, IC accounting

Seven Levers of KM

- Customer Knowledge - *the most vital knowledge*
- Knowledge in Products - *'smarts' add value*
- Knowledge in People - *but people 'walk'*
- Knowledge in Processes - *know-how when needed*
- Organizational Memory - *do we know what we know?*
- Knowledge in Relationships - *richness and depth*
- Knowledge Assets - *intellectual capital*

Some Cases

- Create/discover - 3M, Glaxo Wellcome
- Codify - BHA, Standard Life, PwC
- Diffuse - H-P, Thos. Miller, Rover, BP
- Use - Buckman, Steelcase, PwC, Andersen etc.
- Process/culture - Cigna, Analog
- Conversion - Monsanto
- Measure/exploit - Skandia, Dow Chemicals

Knowledge to Knowledge Management

- Process of capturing and making use of a firm's collective expertise anywhere in the business
- Doing the right thing, NOT doing things right
- Viewing company processes as knowledge processes
- Knowledge creation, dissemination, upgrade, and application toward organizational survival
- Part science, part art, part luck

Defining KM

- **Knowledge management (KM)** is managing the organization's knowledge (both explicit and tacit) through the process of creating, structuring, disseminating and applying knowledge to enhance organizational performance and create value

- KM requires a major transformation in organizational culture to create a desire to share

- Structuring enables problem-solving, dynamic learning, strategic planning, decision-making

- Leverage value of intellectual capital through reuse

Roots of Knowledge Managment
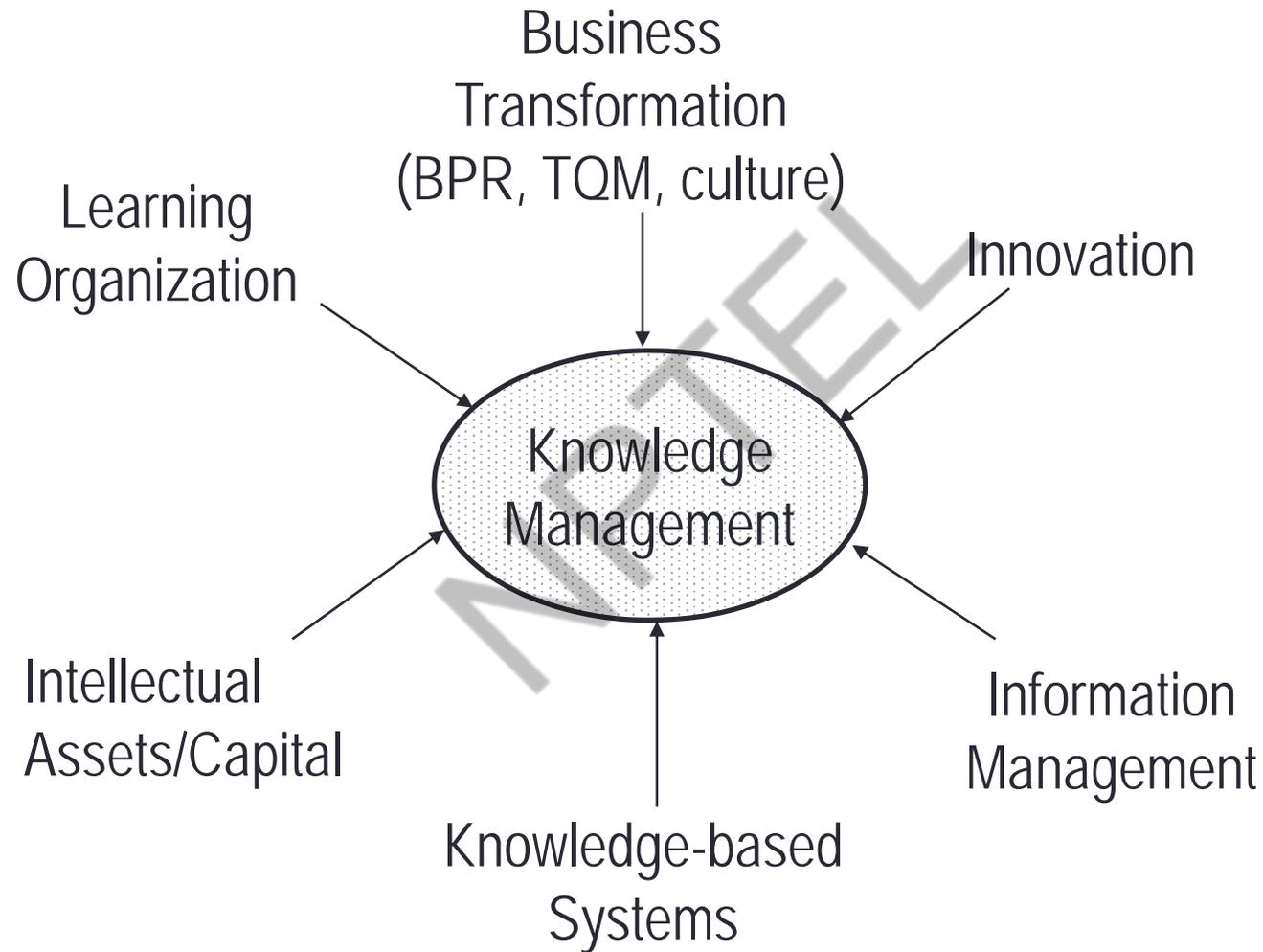
Need for Knowledge Management

- *Knowledge has become the key resource, for a nation's military strength as well as for its economic strength.*

- *It is fundamentally different from the traditional key resources of the economist – land, labor, and even capital*

- *The performance capacity, if not the survival, of any organization in the knowledge society will come increasingly to depend on those two factors (Drucker,1994).*

Forces Driving Knowledge Management

- **Increasing Domain Complexity**: Intricacy of internal and external processes, the rapid advancement of technology.

- **Accelerating Market Volatility**: The pace of change, or volatility, within each market domain has increased rapidly in the past decade.

- **Intensified Speed of Responsiveness**: The time required to take action based upon subtle changes within and across domains is decreasing.

- **Diminishing Individual Experience:** High employee turnover rates have resulted in individuals with decision-making authority having less tenure within their organizations than ever before.

Benefits of KM

- People don't have to spend as much time looking for answers
- People can move quickly on their problem-solving anywhere and anytime
- People can work more effectively and more efficiently
- Share **best practices**
- Competitive advantage
- Expertise can be leveraged
- Better decision-making
- Reduced costs, therefore increased profits
- Retain key talent and expertise
- Improve customer retention and/or satisfaction

THE KNOWLEDGE ORGANIZATION

Indicators of knowledge: thinking actively and ahead, not passively and behind Using technology to facilitate knowledge sharing and innovation
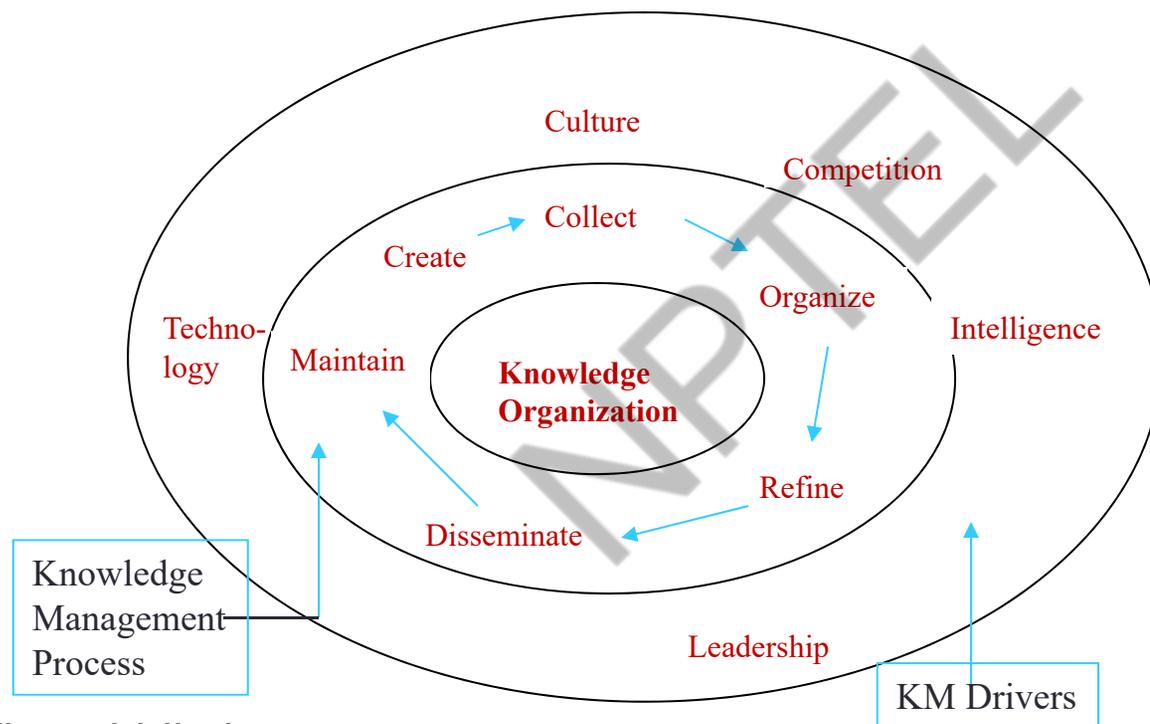
The middle layer addresses the KM life cycle

A knowledge organization derives knowledge from customer, product, and financial knowledge. Also from financial practices
Source: Awad, E.M (2007). Knowledge Management

THE KM CYCLE AND THE ORGANIZATION

Knowledge management cycle

- Creates knowledge through new ways of doing things
- Identifies and captures new knowledge
- Places knowledge into context so it is usable
- Stores knowledge in repository
- Reviews for accuracy and relevance
- Makes knowledge available at all times to anyone
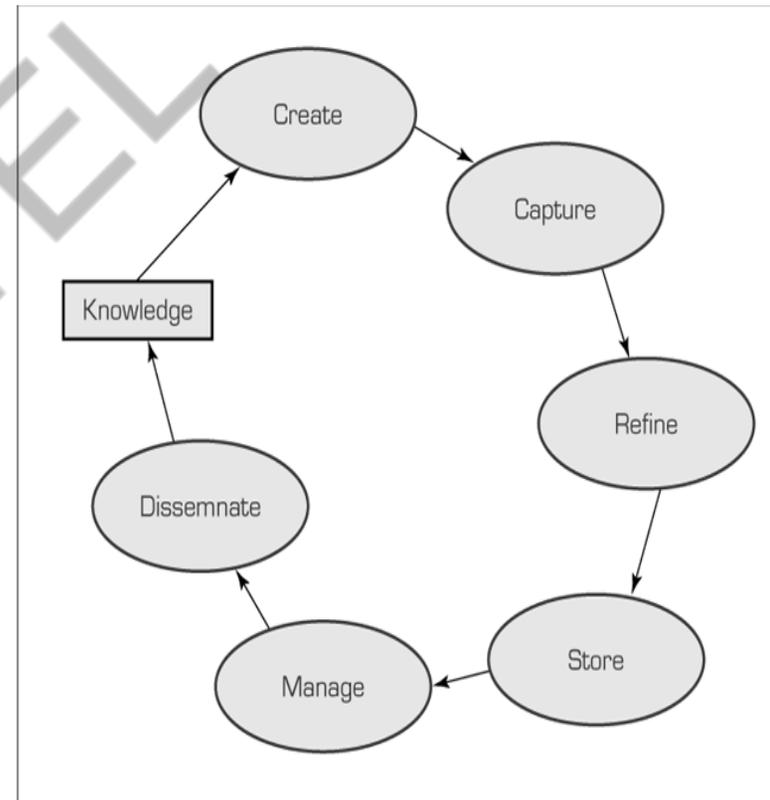
WHAT KM IS NOT ABOUT

- Reengineering
- Discipline or philosophic calling
- Intellectual capital, per se
- Based on information or about data
- Information value chain or knowledge capture
- Limited to gathering information from the company's domain experts or retiring employees and creating databases accessible by intranets
- Digital networks

WHY KNOWLEDGE MANAGEMENT?

- Sharing knowledge, a company creates exponential benefits from the knowledge as people learn from it

- Building better sensitivity to "brain drain"

- Reacting instantly to new business opportunities

- Ensuring successful partnering and core competencies with suppliers, vendors, customers, and other constituents

- Shortens the learning curve

KM System Justification

- Is current knowledge going to be lost?
- Is proposed system needed in several locations?
- Are experts available/willing?
- Can experts articulate how problem will be solved?
- Is there a champion in the house?

Critical Success Factors

- Strong link to business imperative
- Compelling vision and architecture
- Knowledge leadership
- Knowledge creating and sharing culture
- Continuous Learning
- Well developed ICT infrastructure
- Systematic knowledge processes

Soft Infrastructure

- A culture of sharing - vs. information fiefdoms
- Directors of Knowledge (Intellectual Capital)
- Facilitating knowledge processes
  - change teams, development workshops etc.
- Developing personal skills
  - info management, 'dialogue', online techniques
- New measures of human capital, capabilities

KM System Development Life Cycle

- Evaluate existing infrastructure
- Form the KM team
- Knowledge capture
- Design KM blueprint (master plan)
- Test the KM system
- Implement the KM system
- Manage change and reward structure
- Post-system evaluation

Evaluate Existing Infrastructure

System justification:

- Will current knowledge be lost through retirement, transfer, or departure to other firms?
- Is the proposed KM system needed in several locations?
- Are experts available and willing to help in building a KM system?
- Does the problem in question require years of experience and cognitive reasoning to solve?
- When undergoing knowledge capture, can the expert articulate how problem will be solved?
- How critical is the knowledge to be captured?
- Are the tasks non algorithmic?
- Is there a champion in the house?

The Scope Factor

- Consider breadth and depth of the project within financial, human resource, and operational constraints
- Project must be completed quickly enough for users to foresee its benefits
- Check to see how current technology will match technical requirements of the proposed KM system

The Feasibility Question

A feasibility study addresses several questions:

- Is the project <u>doable</u>?
- Is it <u>affordable</u>?
- Is it <u>appropriate</u>?
- Is it <u>practicable</u>?

Areas of feasibility:

- *Economic* feasibility determines to what extent a new system is cost-effective
- *Technical* feasibility is determined by evaluating hardware and supportive software within company's IT infrastructure
- *Behavioral* feasibility includes training management and employees in the use of the KM system

The Feasibility Question (cont'd

Traditional approach to conducting a feasibility study:

- Form a KM team
- Prepare a master plan
- Evaluate cost/performance of proposed KM
- Quantify system criteria and costs
- Gain user support throughout the process

Role of Strategic Planning in KM System Development

Risky to plunge with a new KM system without strategizing. Consider the following:

- *Vision* — Foresee what the business is trying to achieve, how it will be done, and how the new system will achieve goals

- *Resources* — Check on the affordability of the business to invest in a new KM system

- *Culture* — Is the company's political and social environment amenable to adopting a new KM system?

KM Team Formation

- Identify the key stakeholders in the prospective KM system.
- Team success depends on:
    - Caliber of team members
    - Team size
    - Complexity of the project
    - Leadership and team motivation
    - Promising more than can be realistically delivered

KNOWLEDGE CAPTURE

- Explicit knowledge captured in repositories from various media
- Tacit knowledge captured from company experts using various tools and methodologies
- Knowledge developers capture knowledge from experts in order to build the knowledge base
- Knowledge capture and transfer often carried out through teams, not just individuals

Role of the Knowledge Developer

- The architect of the system
- Job requires excellent communication skills, knowledge capture tools, conceptual thinking, and a personality that motivates people
- Close contacts with the champion
- Rapport with top management for ongoing support

Design of the KM Blueprint

The KM system design (blueprint) addresses several issues:

- System interoperability and scalability with existing company IT infrastructure
- Finalize scope of proposed KM system with realized net benefits
- Decide on required system components
- Develop the key layers of the KM architecture to meet company requirements. Key layers are:
    - User interface
    - Authentication/security layer
    - Collaborative agents and filtering
    - Application layer
    - Transport Internet layer
    - Physical layer

Testing the KM System

- *Verification* procedure: ensures that the *system is right*
- *Validation* procedure: ensures that the system is the *right system*
- Validation of KM systems is not foolproof

Implementing the KM System

- *Converting* a new KM system into actual operation
- This phase includes *conversion* of data or files
- This phase also includes user training
- Quality assurance is paramount, which includes checking for:
  - *Reasoning errors*
  - *Ambiguity*
  - *Incompleteness*
  - *False representation (false positive and false negative)*

Resisters of Change

- Experts
- Regular employees (users)
- Troublemakers
- Narrow-minded superstars
- Resistance via projection, avoidance, or aggression

Knowledge Management Strategies
and
Aligning KM Strategy with the Business

Knowledge Management Approaches

- **Personalization strategy** focuses on connecting knowledge workers through networks and depends on tacit knowledge and expertise

- It provides creative, rigorous and highly customized customer services and products.

- **Codification Strategy** focuses on technology that enables storage, indexing retrieval and reuse.

- It provides high quality fast, reliable and cost effective service.

Knowledge Management Strategies
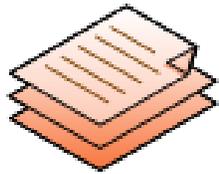
|	**codification**	**personalization**	
	Document driven	Linking people	
	Reports	Meetings	
	Formalization	Communication	
	Focus on reuse of codified knowledge	Focus on finding individual expertise	
	Specialization	Flexibility	
	ERP	Wiki	

Knowledge maps to link knowledge to strategy

Systematically mapping, categorizing, benchmarking and applying knowledge with the help of a KM system can not make only such knowledge more accessible, but also focusses and prioritizes KM.

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┌─────────────────────┐                              ┌─────────────────────┐
│  What your company  │ ◄── Strategy-knowledge link ─│  What your company  │
│     must know       │                              │     must do         │
└─────────────────────┘                              └─────────────────────┘
        ▲                                                     ▲
        │  Knowledge gap                                      │  Strategic gap
        ▼                                                     ▼
┌─────────────────────┐                              ┌─────────────────────┐
│  What your company  │ ── Knowledge-strategy link ──►│ What your company can│
│       knows         │                              │        do           │
└─────────────────────┘                              └─────────────────────┘
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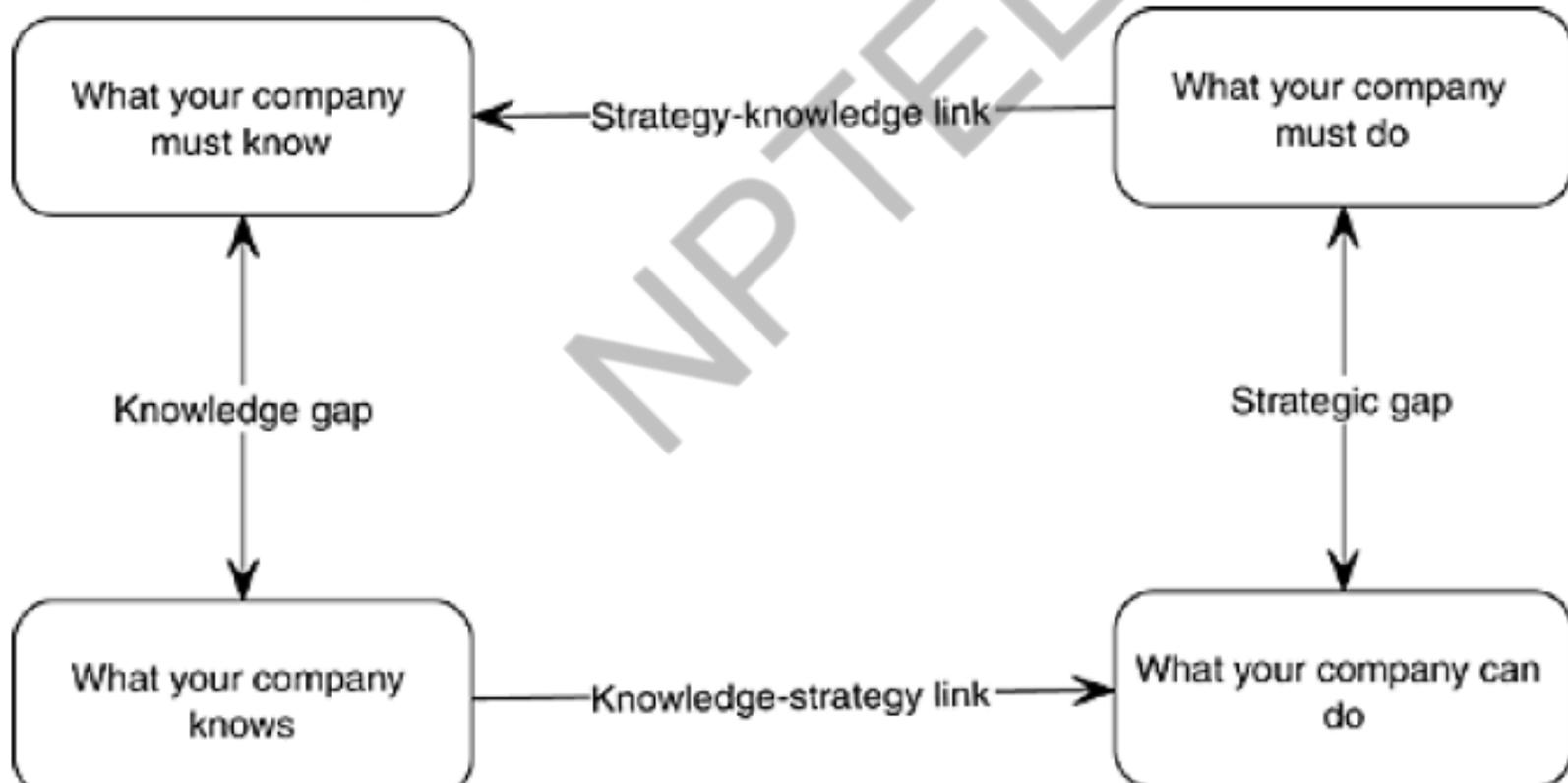
Source: A Tiwana (2002). The Knowledge Management Toolkit

# Creating a knowledge map to evaluate corporate knowledge
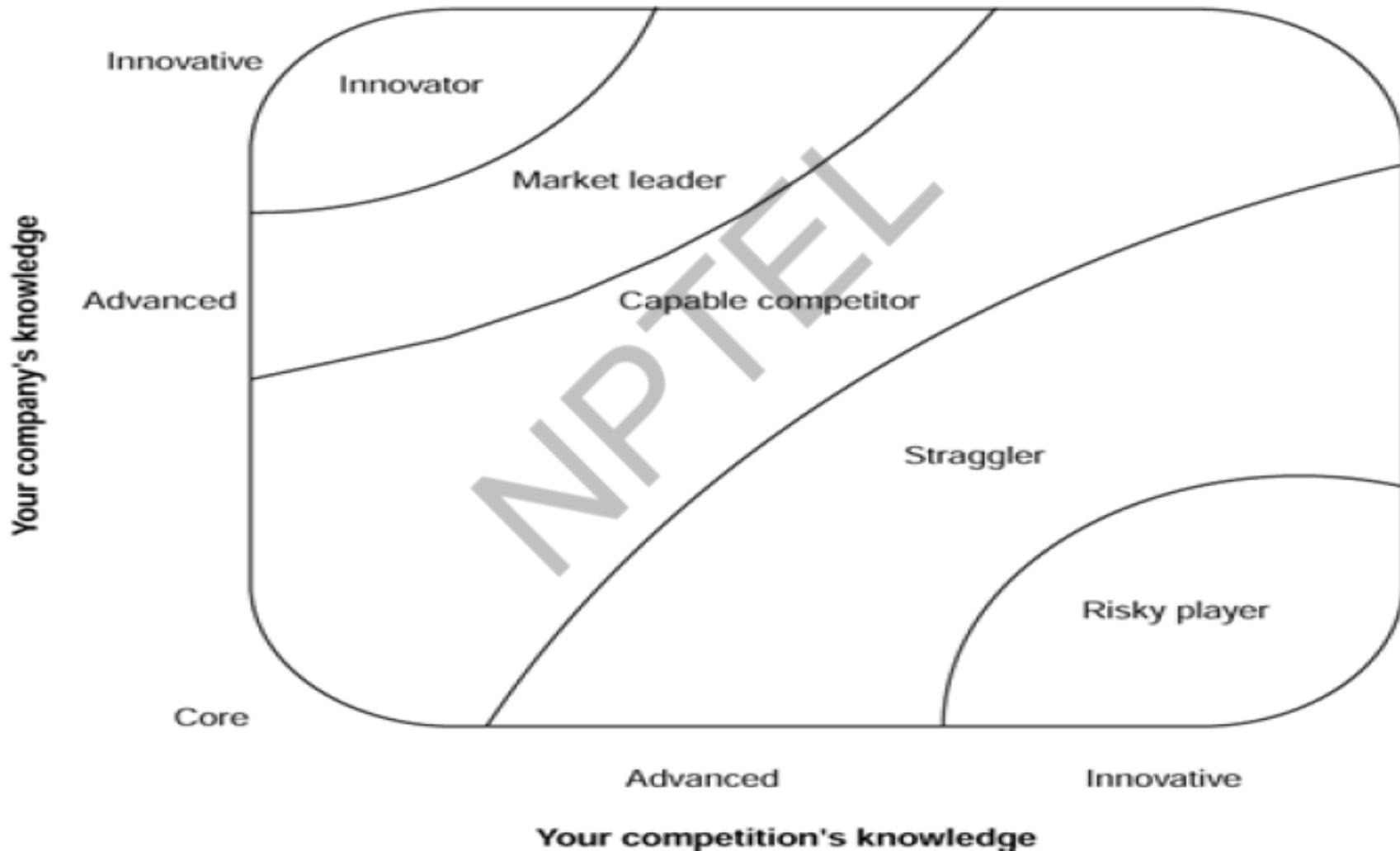
Source: A Tiwana (2002). The Knowledge Management Toolkit

# Aligning Business Strategy With KM Strategy
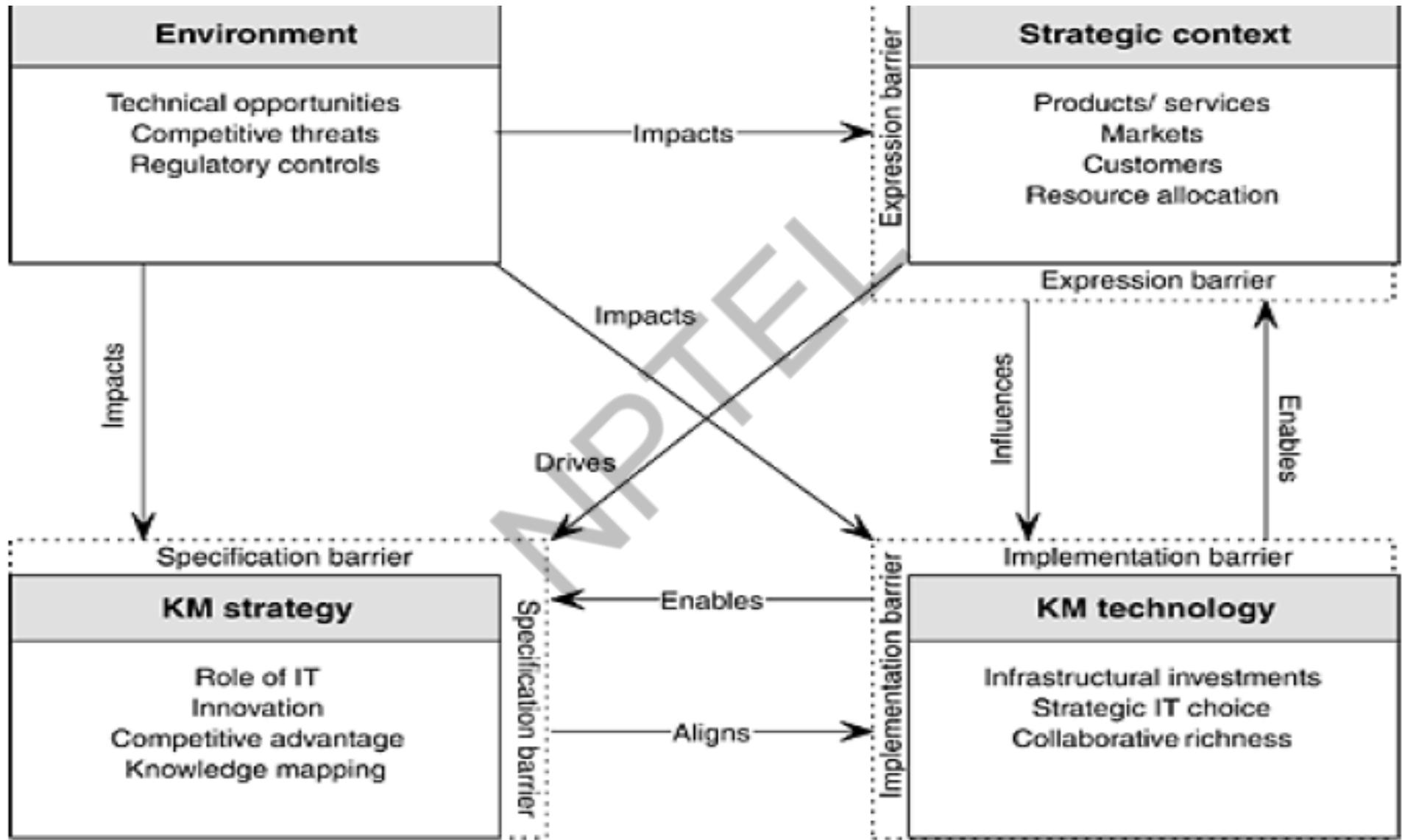
Source: A Tiwana (2002). The Knowledge Management Toolkit

Process of linking knowledge with business Strategy (Tiwana,1999)
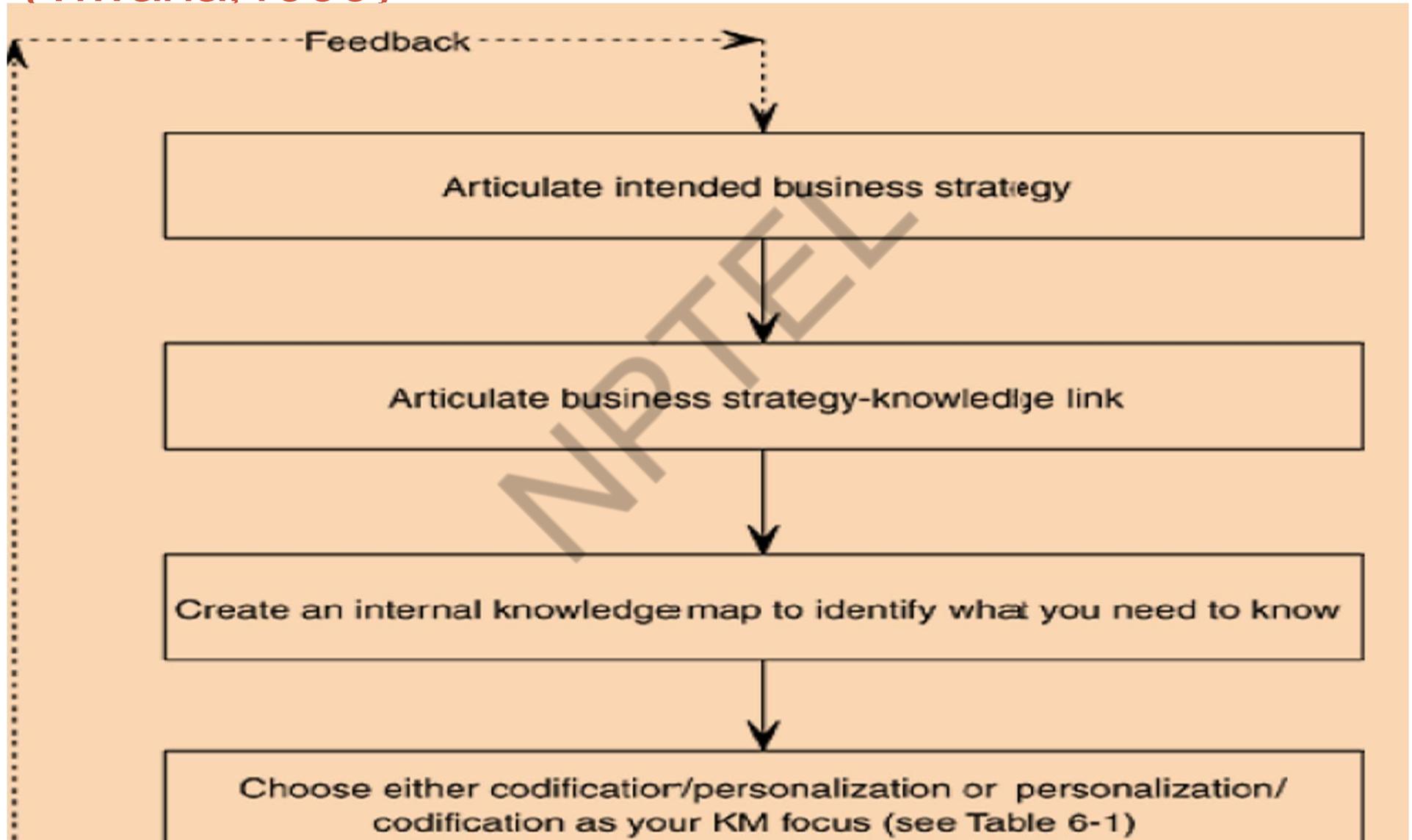
Source: A Tiwana (2002). The Knowledge Management Toolkit

Process of linking knowledge with business Strategy (Tiwana, 2002)

Create a knowledge map for each key competitor

Create a knowledge map for your industry

Assess your and your competition's learning capabilities

Assess how your internal/external knowledge gap influences your current and future business strategy

Determine the balance between exploitation and exploration that you want your knowledge strategy and KMS to support

Feedback
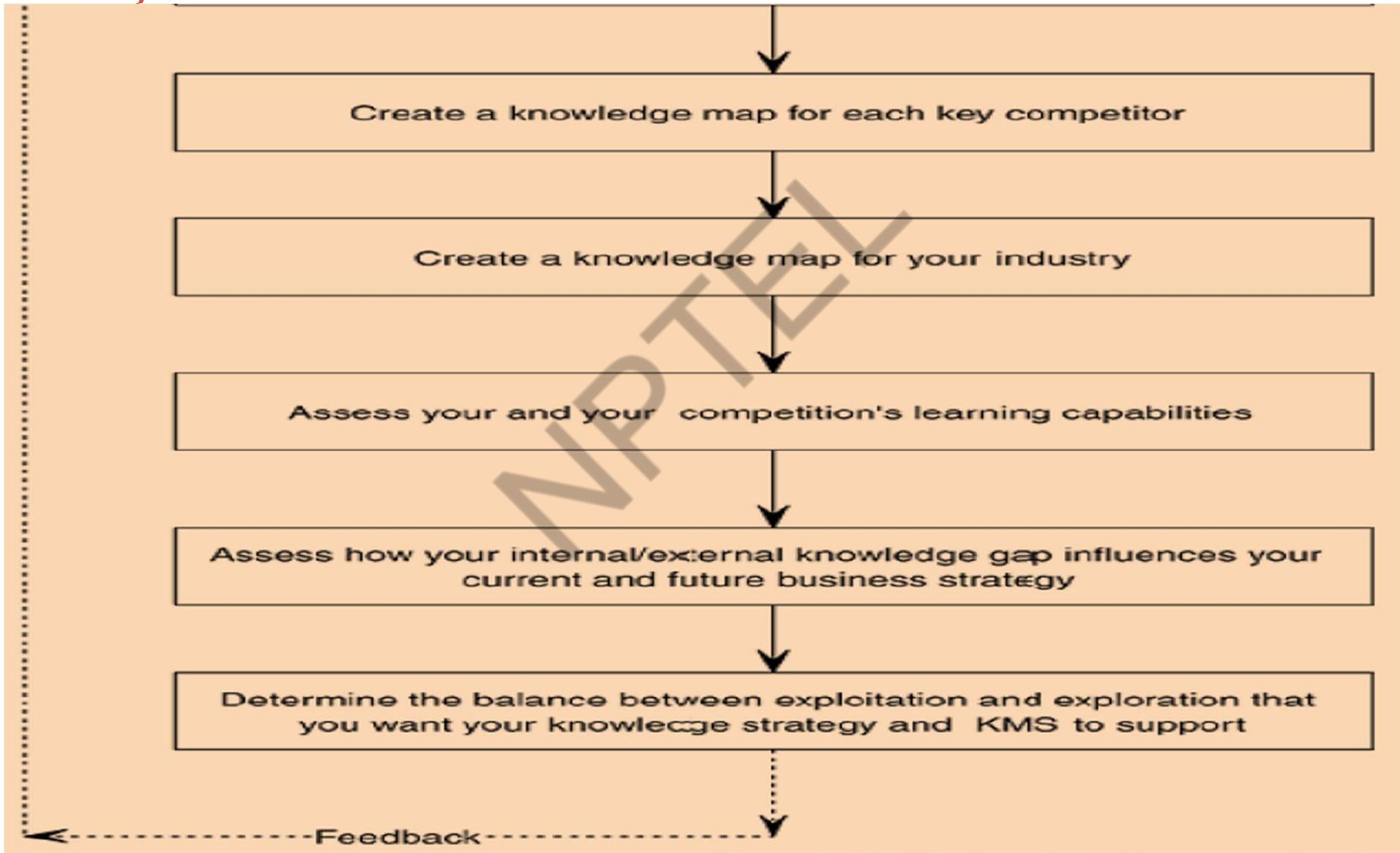
Source: A Tiwana (2002). The Knowledge Management Toolkit

Glaxo Wellcome

- A strategy led initiative - learning org. focus
- Workshops to convert rhetoric to action plans
- Using Intranets to share R&D, help approvals
- Library, document management support
- Reoreinted Technical Architecture
- Challenge is creating 'sharing culture'

Bottom Line - better RoIC

Glaxo Wellcome - Knowledge Net

Learning History

Process Improvements
- Quality etc.

Team Skills

Communications

Knowledge
Network
Architecture

New science
competencies

People
- manager skills
- 'Yellow pages'
- expertise

Strategy

Marketing products
- customer dialogue
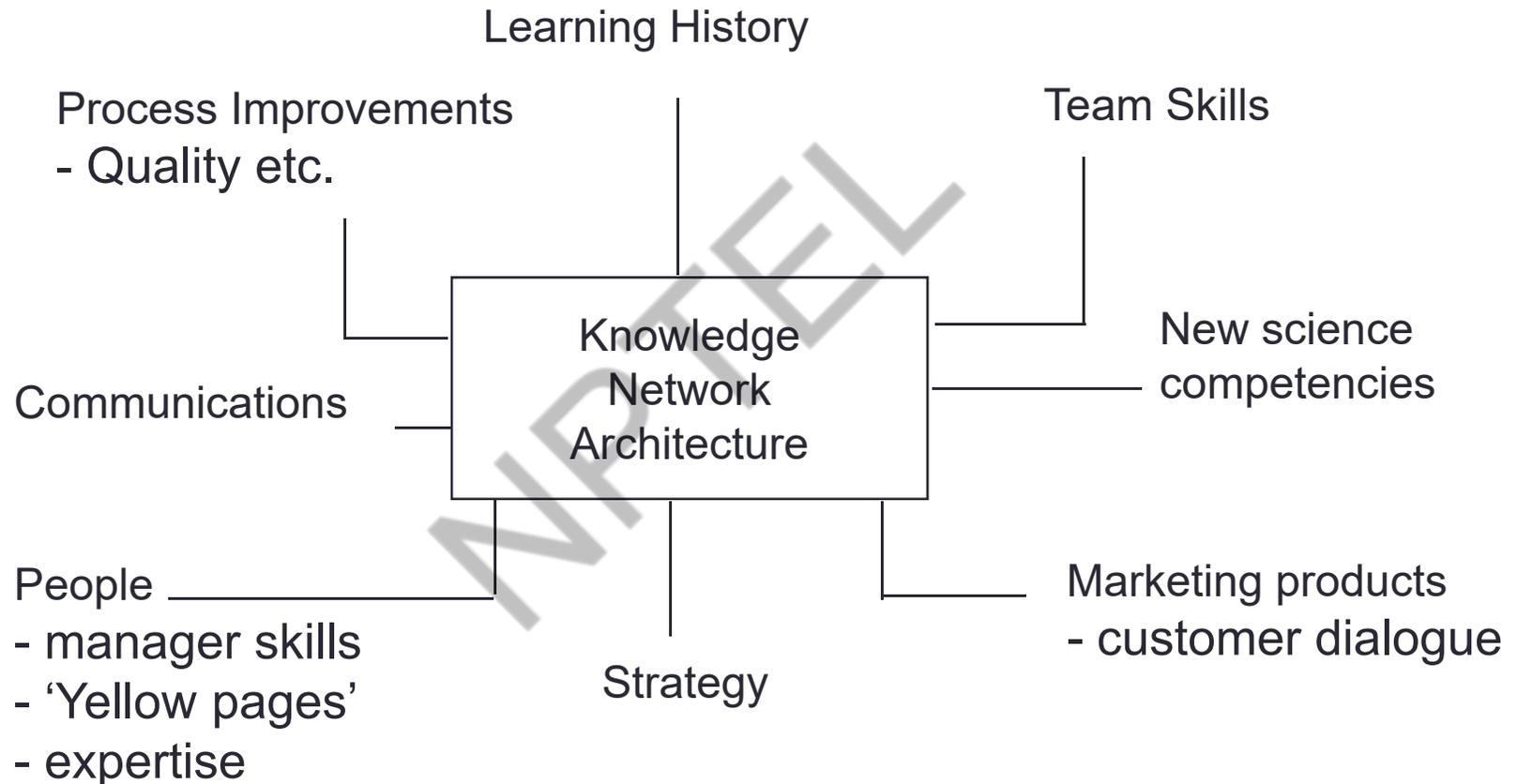
Ernst & Young's Framework for KM
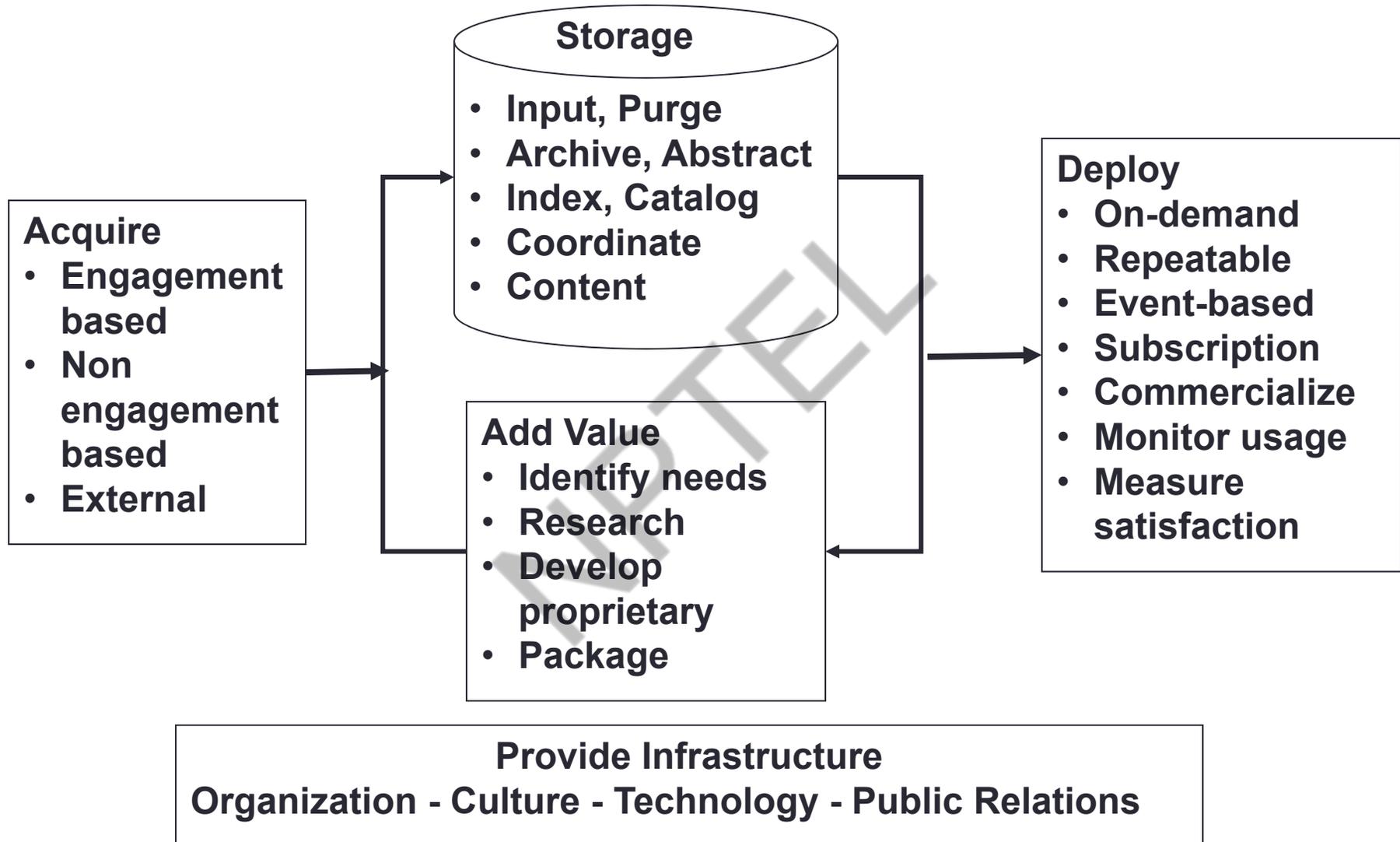
Storage
- **Input, Purge**
- **Archive, Abstract**
- **Index, Catalog**
- **Coordinate**
- **Content**

Acquire
- **Engagement based**
- **Non engagement based**
- **External**

Deploy
- **On-demand**
- **Repeatable**
- **Event-based**
- **Subscription**
- **Commercialize**
- **Monitor usage**
- **Measure satisfaction**

Add Value
- **Identify needs**
- **Research**
- **Develop proprietary**
- **Package**

Provide Infrastructure
Organization - Culture - Technology - Public Relations

Organizational Impacts of Knowledge Management

Levels of Impact	Impacted Aspects
People	Employee Learning Employee Adaptability Employee Job Satisfaction
Processes	Process Effectiveness Process Efficiency Process Innovativeness
Products	Value-added Products Knowledge-based Products
Organizational Performance	Direct Impacts Return on investment Indirect Impacts Economies of scale and scope Sustainable competitive advantage