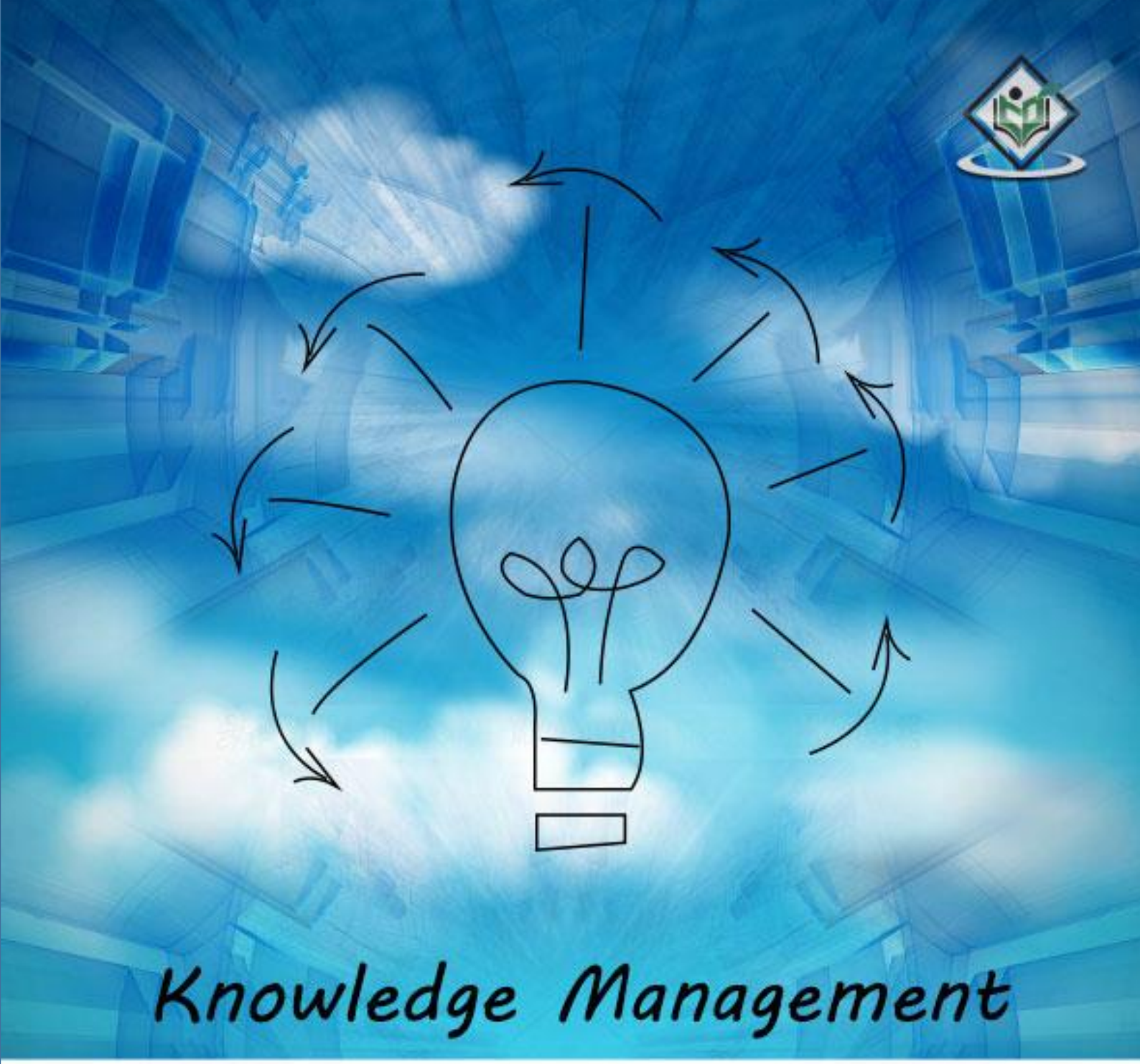

Knowledge Management

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About the Tutorial

Knowledge is more complicated than data or information, because it is subjective, often based on experience, and highly provisional. In this tutorial, we will learn how knowledge management treats both implied and explicit knowledge with the objective of summing up value to the organization. Knowledge management is an activity practiced by enterprises all over the world.

Audience

This tutorial will be useful for both academics and practitioners of knowledge management. It explores and builds on current ideas about the dynamics of knowledge in organizations, answering such questions as: 'What is knowledge management?' and 'What does it mean in today's companies and organizations?'

Prerequisites

It is advisable to have a basic understanding of management and related subjects in order to understand the learning material in this tutorial.

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1. INTRODUCTION

Knowledge management is the systematic management of an organization's knowledge assets for 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.

Each enterprise should define knowledge management in terms of its own business objectives. Knowledge management is all about applying knowledge in new, previously overburdened or novel situations.

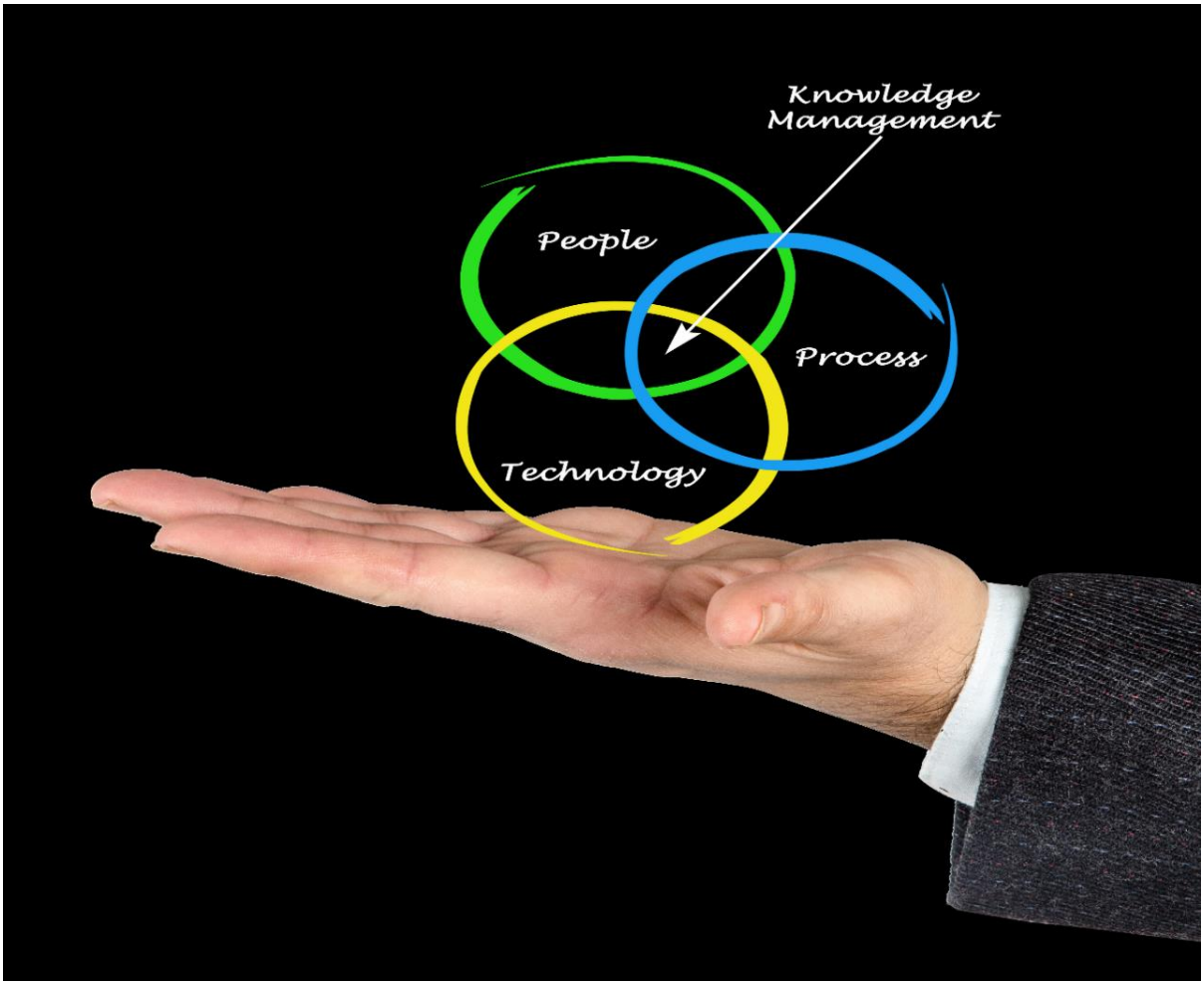


Figure: Systematic Management of People, Process and Technology

Knowledge Management is a Continuous Cycle

Knowledge management is currently seen as a continuous cycle of three processes, namely:

- Knowledge creation and improvement
- Knowledge distribution and circulation
- Knowledge addition and application

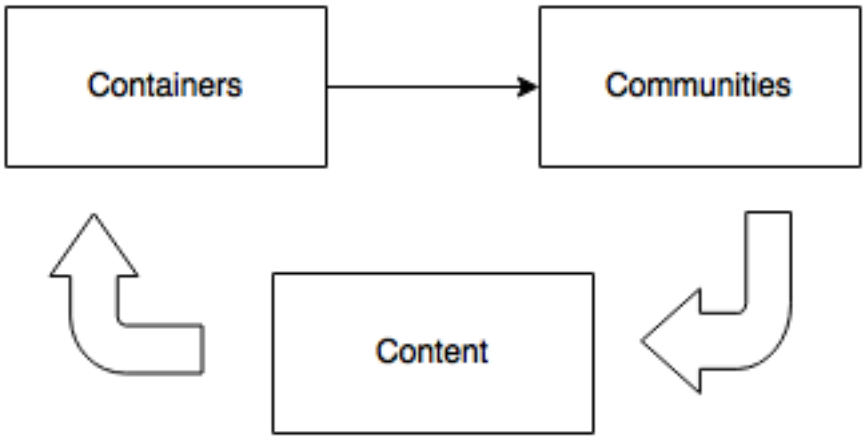
Knowledge management expresses a deliberate, systematic and synchronized approach to ensure the full utilization of the company's knowledge base, paired with the potential of individual skills, competencies, thoughts, innovations, and ideas to create a more efficient and effective company.

In simple words, knowledge management incorporates both **holding and storing** of the knowledge perspective, with respect to the intellectual assets.

It is the deliberate and systematic collaboration of an organization's people, technology, processes, style and structure in order to add value through reuse and innovation.

Knowledge Management Theory

There are three distinct perspectives on Knowledge Management which leads to a different estimation and a different definition.



The Components of Knowledge Management

Knowledge management is a business activity with two primary aspects:

- Executing the knowledge component of business activities as an explicit concern of business in strategy, policy, and practice at all levels of the organization.

- Maintaining a direct link between an organization's intellectual assets both explicit (recorded) and tacit (personal know-how) and positive business results.

What Cognitive Science or Knowledge Science Perspective Says?

Knowledge management is the transformation of knowledge in the form of insights, understandings, and practical know-how that we all possess in other manifestations like books, technology, practices, and traditions within organizations of all kinds and in society in general.

According to the Process/Technology Perspective

Knowledge management is the concept under which information is changed into actionable knowledge and made available effortlessly in a usable form to the people who can leverage it according to their needs.

Why Knowledge Management

Application of Knowledge Management (KM) lie in the below four key areas

- **Globalization of Business**: Organizations today are more universal i.e., they are operating in multiple sites, multilingual, and multicultural in nature.

- **Leaner Organizations**: Organizations are adopting to a lean strategy where they understand customer value and focus on key processes to continuously increase it. The ultimate goal is to provide perfect value to the customer through a perfect value creation process that has zero waste.

- **Corporate Amnesia**: We are freer as a workforce, which creates issues regarding knowledge continuity for the organization and places with continuous learning demands from knowledge worker. We no longer expect to spend our entire work life with the same organization.

- **Technological Advances**: The world is more connected with the advent of websites, smart phones and other latest gadgets. Advancements in technology has not only helped in better connectivity but also changed expectations. Companies are expected to have online presence round the clock providing required information as per the customer needs.

Knowledge Management serves as one of the major response to the challenge of trying to handle this complex, information overloaded work environment. As such, Knowledge management is perhaps best clustered as a science of complexity.

2. MODELS OF KM CYCLE

Knowledge management cycle is a process of transforming information into knowledge within an organization. It explains how knowledge is captured, processed, and distributed in an organization. In this chapter, we will discuss the prominent models of knowledge management cycle.

Till date, four models have been selected based on their ability to meet the growing demands. The four models are the Zack, from Meyer and Zack (1996), the Bukowitz and Williams (2000), the McElroy (2003), and the Wiig (1993) KM cycles.

Zack	Bukowitz & Williams	WIIG	McElroy
Acquisition	Get	Creation	Learning
Refinement	Use	Sourcing	Validation
Store	Learn	Compilation	Acquisition
Distribution	Contribute	Transformation	Integration
Presentation	Assess	Application	Completion

Figure: The Four Major Models of Knowledge Management

Zack Knowledge Management Model

The Zack model is extracted from work on the design and development of information products. In Meyer and Zack's approach, the network between each stage is designed to be logical and standardized.

In this cycle, the major developmental stages of a knowledge repository are analyzed and mapped to the stages of a KM cycle.

The stages are acquisition, refinement, storage/retrieval, distribution, and presentation/use. This cycle is also known as the "refinery."

Acquisition of Data or Information

Acquisition deals with issues regarding origin of raw materials such as scope, breadth, depth, credibility, accuracy, timeliness, relevance, cost, control, and exclusivity.

The guiding principle is the well- known proverb of "garbage in, garbage out." That is, highest quality source data is required, else the intellectual products produced downstream will be lower.

Refinement

Refinement may be physical (like migrating from one medium to another) or logical (like restructuring, relabeling, indexing, and integrating.)

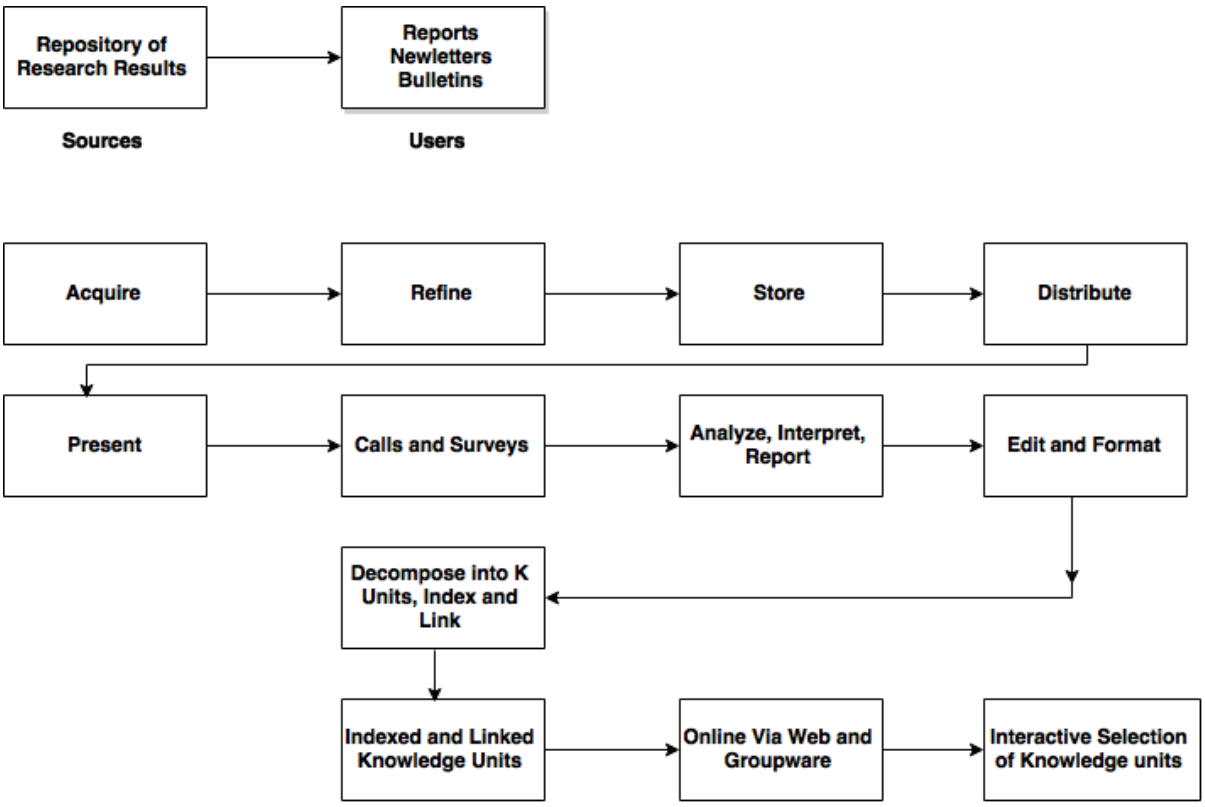


Figure: Zack Model

Refining also defines cleaning up (like sanitizing content so as to ensure complete anonymity of sources and key players involved) or standardizing (like conforming to templates of a best practice or lessons learned as used within that particular organization).

This stage also adds up to the value by creating more readily usable knowledge objects and by storing the content more flexibly for future use.

Storage / Retrieval

Storage or Retrieval forms a bridge between the upstream addition and refinement stages that feed the repository and downstream stages of product generation. Storage can be physical (file folders, printed information) as well as digital (database, knowledge management software).

Distribution

Distribution defines how the product is to be delivered to the end-user (like fax, print, e-mail) and encloses not only the medium of delivery but also its timing, frequency, form, language, and so on.

Presentation

Context plays an important role in Presentation or Application stage. The performance of each of the preceding value-added steps is evaluated here – for example, does the user have enough context to be able to make use of this content? If not, the KM cycle has failed to deliver value to the individual and ultimately to the company.

The repository and the "refinery" combined enable the management of valuable knowledge of a firm. In this cycle, there is also an impression of having to continually renew the repository and the refinery in order to avoid elimination.

The Meyer and Zack model is one of the most complete picture of the key elements engaged in the knowledge management model. To be specific the notion of refinement is a crucial stage in the KM cycle and one that is often neglected.

Bukowitz & Williams Model

Bukowitz and Williams portray a knowledge management process framework that outlines "how organizations generate, maintain and expand a strategically correct stock of knowledge to create value".

In this framework, knowledge includes knowledge repositories, relationships, information technologies, communications infrastructure, functional skill sets, process know-how, environmental responsiveness, organizational intelligence, and external sources.

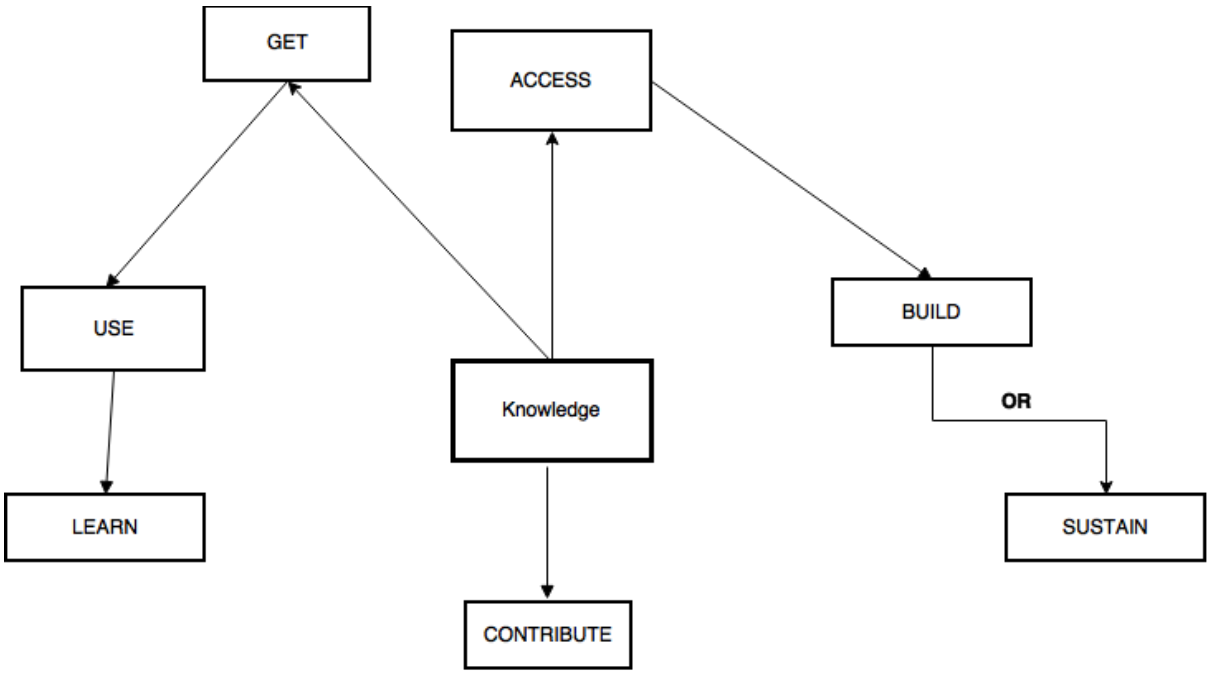


Figure: Bukowitz & Williams Model

These stages aim on more long-range processes of matching intellectual capital to strategic needs.

- **Get Stage** is the first stage, it consists of seeking out information required in order to make decisions, solve problems, or innovate.
- **Use Stage** is the next stage, and it deals with how to combine information in new and interesting ways in order to foster organizational innovation. The spotlight is primarily on individuals and then on groups.
- **The Learn Stage** points to the formal process of learning from experiences as a means of creating competitive gain. Learning in enterprises is important because it

serves the transition step between the application of ideas and the generation of new ones.

- **The Contribute Stage** of the Knowledge Management cycle deals with encouraging employees to post what they have learnt to the communal knowledge base (like a repository). Only in this way, can individual knowledge be made visible and available to the entire organization, where and when appropriate.

McElroy Model

McElroy outlines a knowledge life cycle that consists of the processes of knowledge production and knowledge integration, with a series of feedback loops to organizational memory, beliefs, and claims and the business-processing environment.

- Problem claim formulation is an attempt to learn and state the specific nature of the detected knowledge gap.
- Knowledge claim formulation acts as a response to approved problem claims via information acquisition and individual and group learning.
- New knowledge claims are tested and examined through knowledge claim evaluation processes.
- Evaluation of knowledge claims results in surviving knowledge claims that will be integrated as new organizational knowledge or falsified/undecided knowledge claims.

Experience gained from the application of knowledge in the organizational knowledge base leads to new claims and resulting beliefs, triggering the cycle to begin all over again.

In knowledge production, the primary processes are individual and group learning. Knowledge claim formulation, information acquisition; codified knowledge claim and knowledge claim evaluation.

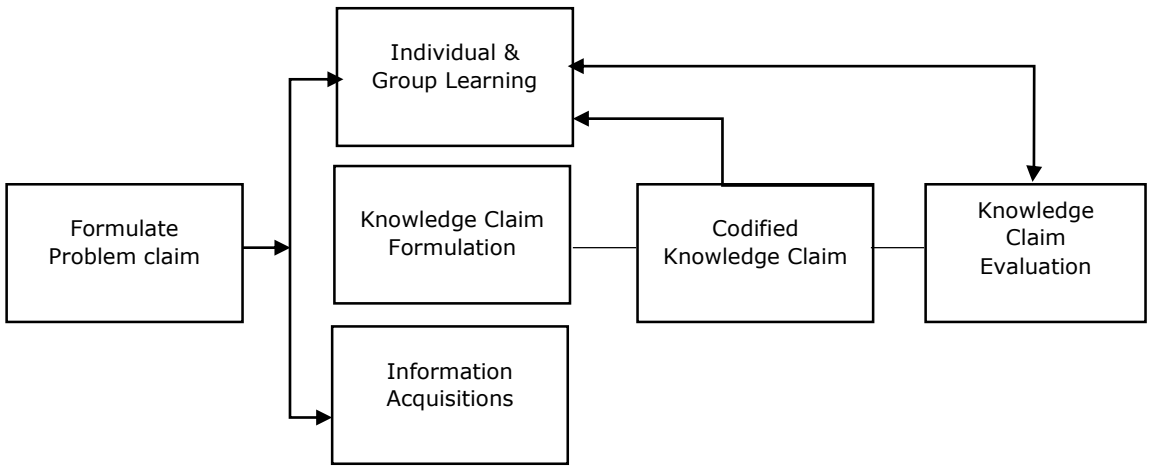


Figure: McElroy Model

These knowledge production processes can be briefed as:

- Individual and group learning marks the first step in organizational learning.
- Knowledge claim validation includes codification at an organizational level.
- A formalized procedure is essential for the receipt and codification of individual and group innovations.
- Information addition is the process by which an organization deliberately or serendipitously acquires knowledge claims or information produced by others, usually external to the company. This stage plays a basic role in formulating new knowledge claims at the organizational level.

Knowledge integration is the process by which an organization announces new knowledge claims to its operating environment and retires old ones. It includes all knowledge transmission such as teaching, knowledge sharing, and other social activities that either connects an understanding of previously produced organizational knowledge to knowledge workers or accommodate newly minted knowledge.

One of the advantages of the McElroy cycle is the clear description of how knowledge is examined and a conscious decision is made as to whether or not it will be included into the organizational memory. The authorization of knowledge is a step that clearly differentiates knowledge management from document management. The KM cycle aims at processes to identify knowledge content that is of value to the organization and its employees

WIIG Model

WIIG highlights the three conditions that need to be present for an organization to conduct its business successfully

- It must have a business (commodities/services) and customers.
- It must have resources (people, budget, and facilities).
- It must have the strength to act.

WIIG marks the major purpose of KM as an effort "to make the organization intelligent-acting by facilitating the creation, accumulation, deployment and use of quality knowledge." WIIG's KM cycle shows how knowledge is built and used as individuals or as organizations.

The following figure shows the four major steps of the WIIG model.

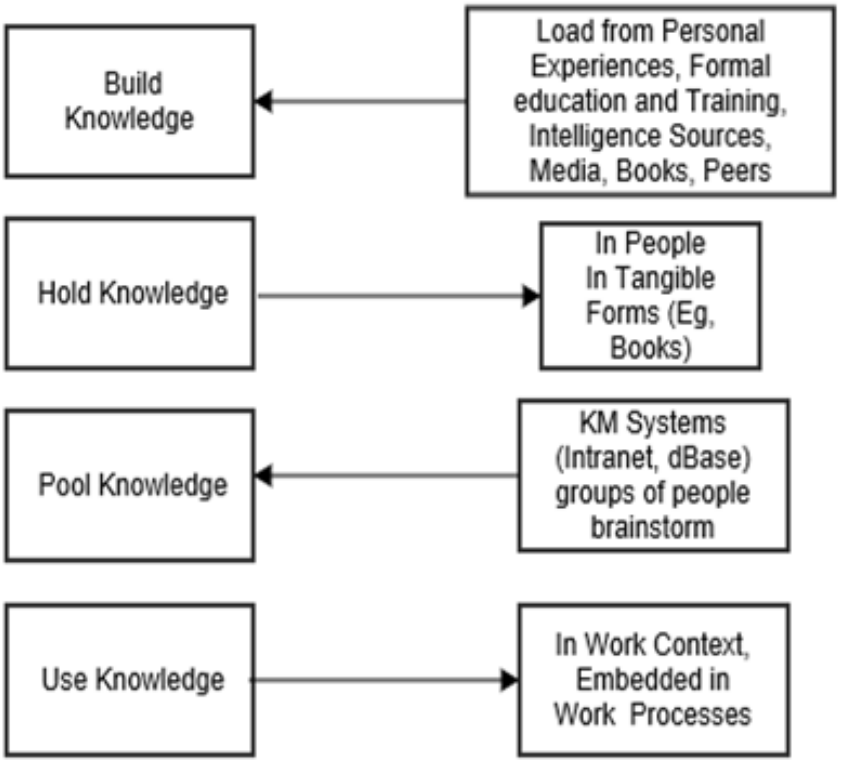


Figure: WIIG Model

- **Building knowledge**: From external and internal knowledge sources
- **Holding knowledge**: Storing the information in a particular form
- **Pooling knowledge**: Through intranets and knowledge management portals
- **Applying knowledge**: In the context of work embedded in process

Integrated Cycle

The following are the three major stages of integrated cycles of knowledge management strategy when introduced in any organization:

- Knowledge capture and/or creation
- Knowledge sharing and dissemination
- Knowledge acquisition and application

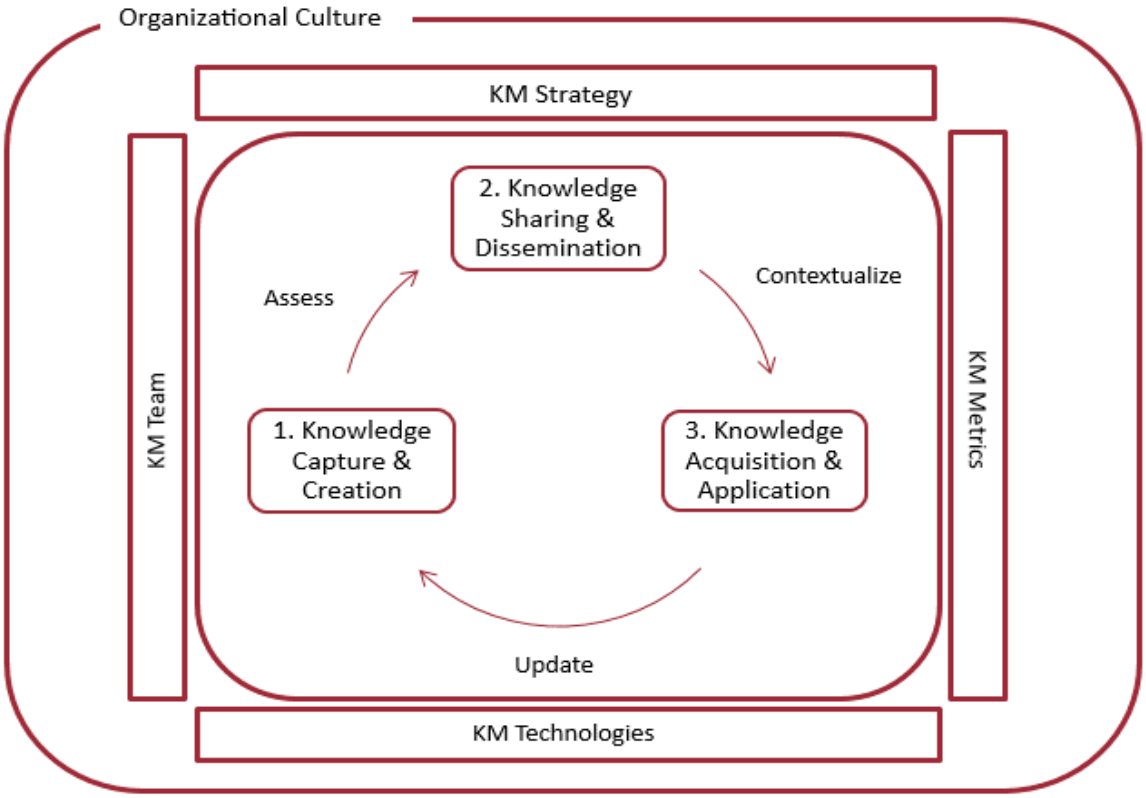


Figure: Integrated KM Cycle

Knowledge Capture states the identification and frequent codification of existing (usually previously unnoticed) internal knowledge and know-how within the organization and/or external knowledge from the environment.

Knowledge Creation is the advancement of new knowledge and know-how innovations that did not have a previous existence within the organization.

Once, it is clear that the newly identified content is of sufficient value, the next step is to contextualize this content. This involves maintaining a connection between the knowledge and those knowledgeable about that content.

Contextualization also indicates identifying the key elements of the content in order to better match to a variety of users. Finally, contextualization succeeds to when the new content is firmly, precisely yet seamlessly, embedded in the business processes of the enterprise.

The knowledge management cycle is then rechecked as users understand and decide to make use of content.

The users will update usefulness, and they will signal when it becomes out of date or when this knowledge is not applicable.

3. KNOWLEDGE MANAGEMENT MODELS

All the Knowledge Management models described in this chapter attempt to address knowledge management from a universal and broader perspective.

von Krogh and Roos Model

The von Krogh and Roos model of organizational epistemology (1995) is the first model that precisely differentiates between individual knowledge and social knowledge.

This model, analyzes the following aspects

- Why and how the knowledge gets to the workers of a company
- Why and how the knowledge arrives at the organization
- What does knowledge mean for the workers as well as the organization
- What are the barriers of organizational knowledge management

In their organizational model, knowledge is to be found both in the mind of the people and in the links between them.

This model examines the nature of knowledge management from the perspective of:

- Staff members
- Communication and connection
- Organizational structure and layout
- Network between members and
- Management of human resources

The above five factors create issues that can prevent knowledge management strategies.

Nonaka and Takeuchi

The Nonaka and Takeuchi model of KM has its base in a universal model of knowledge creation and the management of coincidence.

There are four different modes of knowledge conversion in the Nonaka and Takeuchi model of knowledge conversion:

- Socialization (tacit to tacit) i.e. Indirect way,
- Externalization (tacit to explicit) i.e. Indirect to Direct way,
- Combination (explicit to explicit) i.e. Direct way, and
- Internalization (explicit to tacit) i.e. Direct to indirect way.

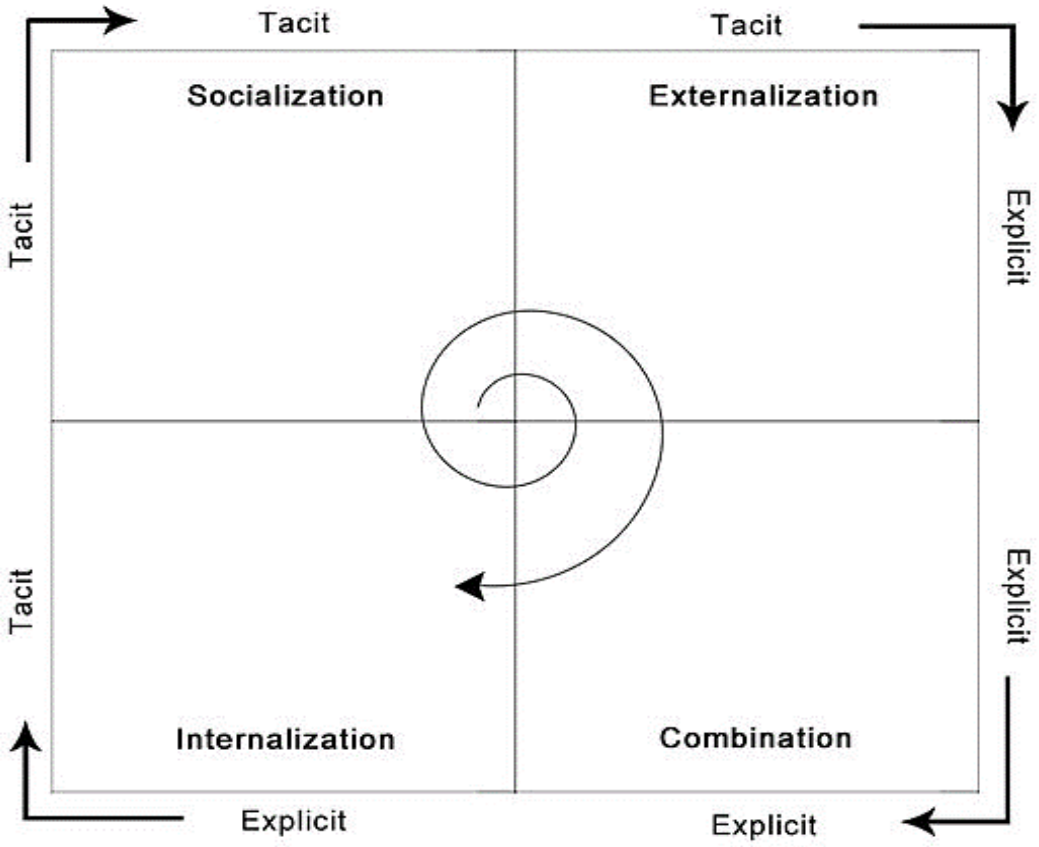


Figure: SECI model

Socialization is the technique of sharing tacit knowledge through observation, imitation, practice, and participation in formal and informal communities and groups. This process is basically preempted by the creation of a physical or virtual space where a given community can interact on a social level.

Externalization is the technique of expressing tacit knowledge into explicit concepts. As tacit knowledge is highly internalized, this process is the key to knowledge sharing and creation.

Combination is the technique of integrating concepts into a knowledge system. Some examples or cases would be a synthesis in the form of a review report, a trend analysis, a brief executive summary, or a new database to organize content.

Internalization is the technique of embodying explicit knowledge into tacit knowledge.

Choo Sense-Making KM model

The Choo Sense-Making KM Model (1998) focuses on

- Sense Making
- Knowledge Creation
- Decision making skills

These three highly interconnected processes play a major role in the unfoldment of the organization's knowledge vision, it's potential to knowledge creation and its commitment into taking knowledge creation to the utmost consequences.

Sense Making: Its long-term aim is the warranty that organizations will adapt and continue to prosper in a dynamic and complex environment through activities of prospecting and interpretation of suitable information enabling it to understand changes, trends and scenarios about clients, suppliers, competitors and other external environment actors.

Knowledge Creation: It is a process that allows a company to create or acquire, organize and process information in order to generate new knowledge through organizational learning. The new knowledge obtained, allows company to develop new abilities and capabilities, create new products and new services, improve the existing ones and redesign its organizational processes.

Decision Making: The Company must choose the best option among those that are plausible and presented and pursue it based on the organization's strategy. Decision making process in companies is constrained by the bounded rationality principle.

This model focuses on how informational elements are selected and fed into organizational actions.

WIIG Model

Karl Wiig KM model (1993) marks the basic principle which says, in order for knowledge to be useful and valuable, it must be organized and synchronized.

Some essential dimensions in the WIIGS KM model are:

- Completeness
- Connectedness
- Congruency and
- Perspective and purpose

Completeness: It describes how much relevant knowledge is available from a given source. Sources vary from human minds to knowledge bases (like, tactic or explicit knowledge).

First of all, we have to make sure, that the knowledge is complete if all the information available on the subject is there but if no one knows of its existence, they cannot make use of this knowledge.

Connectedness: It briefs about the well-understood and well-defined relations between the different knowledge objects. Most knowledge objects are connected to each other, the more connected a knowledge base is then the more consistent the content and the greater its value.

Congruency: A knowledge base congruent when all the facts, concepts, perspectives, values, judgments, and relational links and connections between the objects are consistent. Most knowledge content do not meet such ideals.

Perspective and Purpose: It is a technique through which we know something but from a particular point of view for a specific purpose. We organize much of our knowledge applying to the dual dimensions of perspective and purpose.

This model attempts to define different levels of internationalization of knowledge and therefore could be seen as a further refinement of the fourth Nonaka and Takeuchi quadrant of internalization.

Boisot I-Space

This model is based on the key concept of information which is good and that is different from a physical asset.

Boisot differentiates information from data by emphasizing that information is what an observer will extract from data as a function of his or her expectations or prior knowledge.

Boisot's model can be seen as three dimensional cube with the following dimensions:

- From uncodified to codified
- From concrete to abstract
- From undiffused to diffused

He proposes a Social Learning Cycle (SLC) that adopts the I-Space to model the dynamic flow of knowledge through a series of six phases:

- **Scanning**: Wisdom is gained from generally available or diffused data.
- **Problem-Solving**: Problems are solved offering structure and coherence to these insights as knowledge becomes codified.
- **Abstraction**: The newly codified wisdom is generalized to a wide range of situations as knowledge becomes more abstract.
- **Diffusion**: the new wisdom are shared with a target population in a codified and abstract form as knowledge becomes diffused.
- **Absorption**: The newly codified insights are applied to a variety of situations generating new learning experiences as knowledge is absorbed and produces learnt behavior and so becomes uncodified or tacit.
- **Impacting**: Abstract knowledge becomes fixed in concrete practices, for example in artifacts, rules or behavior patterns as knowledge becomes concrete.

The Boisot's model considers companies as living organisms. Their process of growing and developing knowledge assets within companies is always changing.

This means that companies need to adopt a dynamic KM strategy which accommodates the dynamic nature of the organizational learning cycle.

Complex Adaptive System Models

According to the ICAS (Intelligent Complex Adaptive Systems) theory, an organization is seen as an adaptive, complex system.

Complex adaptive systems includes many independent agents that interact with one another locally and their combined behavior gives rise to complex adaptive phenomena.

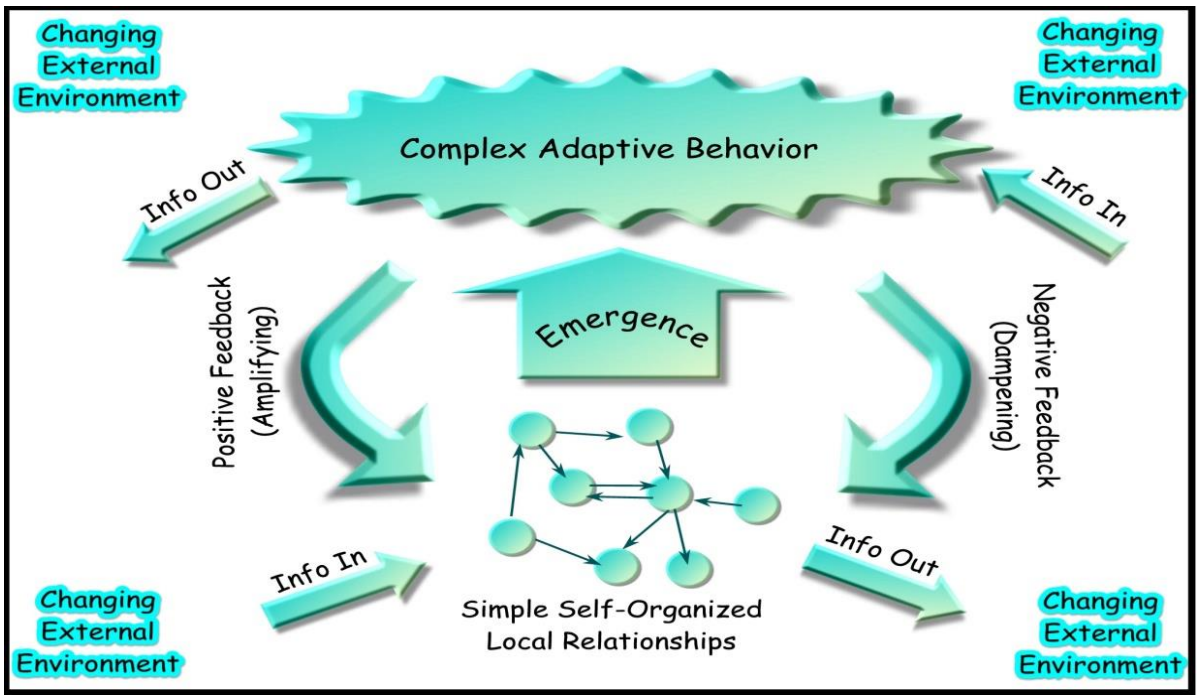


Figure: Complex Adaptive System Model

These models contain a series of functions that makes sure that the viability of any living system in general and of organizations, in particular.

ICAS systems are based on cybernetics principles, which uses communications and control mechanisms in order to understand, describe and predict what a viable organization should do.

Adaptive systems involve lots of independent agents which are interacting. Their behavior makes possible the appearance of some complex circumstances of adaptation. A general model of a complex behavior is the result of all the interactions. Inside the adaptive model, the intelligent elements are made of people who are self-organized, but who can remain as a part of general hierarchies of the organizations.

The challenge is to use the advantage offered by the force of the people when they cooperate, keeping a global sense of unity. Organizations solve issues by creating options, using resources, both internal and external, that can add value over the initial input.

4. KNOWLEDGE MANAGEMENT TOOLS

Knowledge Acquisition and Application

Knowledge acquisition is the process used to describe the rules and ideologies required for a knowledge-based system. It is the process of extracting knowledge from experts and structuring this knowledge into a readable form.

Some techniques used in the process of extracting information are Interviewing, Observations, Protocol Analysis, and Brainstorming.

It is ideally driven by strategies – for example, an organization decides what knowledge is needed, what it has, and then fills in the gap by developing new knowledge or acquiring it. Knowledge acquisition has several applications that we will be discussing in this chapter.

Codifying Explicit Knowledge

Converting unspoken knowledge to a categorical form by way of codifying, and to acquire this tacit knowledge as explicit meta-knowledge (knowledge about knowledge).

This is basically a directory which knows what and how to contact them. The aim of the codification is to make it easy to organize, locate, share, store, and use the knowledge.

Common material including codified knowledge are manuals, spreadsheets, decision support systems and procedures.

Anyhow, the codification process is generally expensive and it is difficult to code for universal understanding too.

Creation of Tools

Knowledge creation is all about continuous transfer, combination, and conversion of the different types of knowledge, as users practice, interact, and learn.

Content creation and management tools are essential to structure and organize knowledge content for each retrieval and maintenance. It consists of the following tools:

- Authoring Tools
- Annotation Tools
- Data Mining and Knowledge Discovery
- Templates
- Blogs

Authoring Tools

Authoring tools include the software that allow users to create web page or multimedia applications. These are tools by which various media elements are brought together to structure and flow.

Authoring tools align with the aim of capturing the author's tacit knowledge and helping structure that knowledge into an explicit form.

Annotation Tools

Annotation tools help in addition of explanatory comments to a document after it has been created. The comments can be public as well as private. Tools like track changes in MS Word is an example of annotation tools. This tool also helps with the goal of capturing tacit knowledge by allowing authors to connect their expertise to a certain document.

Data Mining and Knowledge Discovery

Data mining pioneers new or hidden patterns in data that resides in multiple databases. It includes statistical analysis to discover relations, correlation, and market related analysis.

Various analysis tools are approached in data mining such as statistical analysis tools e.g. SAS, data mining suites, and data visualization tools.

This tool accomplishes the goal of creating new knowledge by being able to analyze existing data and making something useful out of it. It also helps in predicting future occurrence and forecast expected outcomes.

Templates

It includes designing or patterning of an item that acts as a guide for designing or constructing similar items. This tool is helpful to organize knowledge in a systematic manner, by following an established design.

Blogs

These are webpages that typically focus on a specific subject. They can be like personal pages that are much like personal diaries which are periodically updated and accessible publicly. This web tool fits with the aim to elicit knowledge, by authors being able to express their unique ideas and opinions.

Sharing and Dissemination Tools

It includes groupware and collaborative tools. These tools acts as enablers of knowledge flow and knowledge-sharing activities among personnel.

Groupware invokes class of software (programs) that allows to work together while located remotely from each other.

Here, collaboration is mainly referred as groupware, or work group productivity software. For example – LAN (Local Area Network)

Typically, a groupware supports the following operations:

- Password Protection of document
- Schedule meeting and allocate resources
- File distribution
- Electronic newsletter
- Email (Electronic mail)
- Group Calendars
- Collaborative writing system
- Video Communication System
- Chat Systems
- Wikis

5. KNOWLEDGE MANAGEMENT STRATEGY

Knowledge management strategy is a general, issue-based approach to define operational strategy and objectives with specialized KM principles and approaches. It helps in addressing questions like:

- Which knowledge management approach, or set of approaches, will bring the most value to the company?

- How can a company prioritize alternatives, when any one or several of the alternatives are appealing and resources are limited?

A good Knowledge Management strategy possesses the following components:

- **A Stated Business Strategy and Objectives:** It should have products or services, target customers, referred distribution or delivery channels, characterization of regulatory environment, mission or vision statement.

- **A Description of Knowledge-Based Business Issues:** Need for collaboration, need to level performance variance, need for innovation, and need to address information overload.

- **An Inventory of Available Knowledge Resources:** Knowledge capital, social capital, infrastructure capital.

- **An Analysis of Recommended Knowledge Leverage:** Points that briefs what can be done with the above-identified knowledge and knowledge artifacts and lists Knowledge management projects that can be undertaken with the intent to maximize ROI and business value.

Knowledge Audit

A knowledge audit service marks the core information knowledge requirements and uses in an organization. It also outlines the gaps, duplications, and flows and how they contribute to business goals as well as the owners, users, uses, and key attributes of core knowledge assets.

It produces the following types of results:

- Identification of core knowledge assets and flows like who creates, who uses.

- Identification of gaps in information and knowledge required to manage the business effectively.

- Areas of information policy and ownership that needs progress. Opportunities to minimize information-handling costs.

- Opportunities to improve coordination and access to commonly required information.

A better understanding of the contribution of knowledge to business results.

GAP Analysis

This involves establishing the current and desired states of knowledge resources and KM levels. Specific projects further defined in order to address specific gaps that were identified and agreed upon as high-priority areas.

A good gap analysis addresses the following points:

- The major differences between the current and desired KM states of the organization.

- Enlist barriers to KM implementation like culture where "knowledge is power" or where individual possession of knowledge is consistently rewarded.

- Enlist KM leverage points or enablers like existing initiatives that could be built upon.

- Identify opportunities to collaborate with other business initiatives like combine knowledge continuity goals with succession planning initiatives in Human Resources.

- Conduct a risk analysis like knowledge that will soon "walk out the door" due to imminent retirements or knowledge that is at risk because only a few individuals are competent in this area and very little of their expertise exists in coded or tangible knowledge assets.

- Redundancies within the organization like the case of the right hand not knowing what the left hand is doing.

- Presence of knowledge silos like groups, departments, or individuals that hoard knowledge or block fluid knowledge flows to other groups, departments, or colleagues.

This analysis is further used to list and prioritize KM objectives to be addressed by the organization.

6. KNOWLEDGE MANAGEMENT METRICS

Intellectual assets are generally categorized as human capital (like the know-how of knowledge workers that is "rented" by an organization), structural capital (like the policies, procedures, and applications that the organization "owns"), and customer or relationship capital (like the value of customer relationships and loyalty that has been built up over the years).

A variety of fairly sophisticated KM measurement techniques are available now that can help assess how well an organization is progressing. These involve benchmarking, the balanced scorecard method, and the house of quality matrix.

Before introducing any metric-based system, we have to be clear regarding what we want the metrics to answer. Metrics generally helps us to answer several questions, such as:

- Is Knowledge management working as required? And if not, what needs to be fixed?
- Is execution on track, and if not, what needs to be fixed?
- Are people doing what they are assigned to do? Who is doing well, who is not doing well?
- Are we delivering value? If we aren't, let's stop, or find a better way.

Measuring KM Implementation

The first thing to be done is probably wanting to measure, and how well we are managing to implement KM.

When we run your assessment at the start of KM implementation, we will develop some baseline metrics which you can measure the improvement against.

A KM assessment protocol measures various aspects of knowledge flow within an organization, and allows you to identify blockers and obstacles to knowledge flow. Re-running the assessment later allows you to measure progress.

Measuring KM Compliance

Let us assume that an employee named Steve has introduced a knowledge management framework to the organization, with some clear accountabilities and clear expectations in the form of KM policies and standards.

At this stage, Steve might want to measure whether people are complying with these expectations, by using dashboarding and analytical tools to track his project members in an organization. Similar dashboards will be required in other functions of an organization.

Measuring KM Activity

It is also useful to introduce some activity based metrics to track different elements of your Knowledge management system.

Measuring Business Outcome

It is generally believed that, knowledge management leads to continuous performance improvement. As knowledge improves, so does the efficiency and results of an organization. Therefore, the more we deploy these methods and implement them, the better will be business performance.

Benchmarking

Benchmarking is the hunt for industry wide best practices that leads to superior performance. It is a fairly straightforward Knowledge Management metric that represents a good starting point.

Benchmarking basically consists of a study of similar companies to determine how things are done best in order to adapt these methods for their own use. This approach is best summed up by the Hindu proverb: "know the best to become the best."

There are two general types of benchmarking:

- **Internal benchmarking –** Comparisons against other units within the same company or a comparison of a single unit over different time periods.
- **External benchmarking** – Comparison with other companies.

Balanced Scorecard

A Balanced Scorecard method (BSC) is a judgement and management system that enables enterprises to clarify their vision and strategy and which translates them into action. It offers feedback on both the internal business processes and external results in order to continuously improve strategic performance and results.

Balanced Scorecard is a conceptual framework for converting an organization's vision into a set of performance indicators distributed among four dimensions:

- **Financial Dimension** – Involves measures such as operating income, return on capital employed, and economic value added.
- **Customer Dimension** – It is associated with such measures as customer satisfaction, retention, and market share in targeted segments.
- **Internal Business Processes** – Consists of measures such as cost, throughput, and quality.
- **Learning and Growth** – addresses measures such as worker's satisfaction, retention, and skill sets.

Through BSC, an enterprise can monitor both its current performance (finances, customer satisfaction, and business process results) and its efforts to improve processes, motivate and educate employees, and enhance information systems—its ability to learn and improve.

The balanced scorecard method is applicable to both profitable and non-profitable enterprises as well as to both private and public sector companies. It provides a number of significant advantages, including the translation of abstract goals into action items that

can be continuously monitored. In addition, the balanced scorecard method provides objective measures of the current scenario, and helps initiate the changes required to move from the current to the desired future state of the company.

The House of Quality Method

The house of quality method was discovered to show the links between true quality, quality characteristics, and process characteristics. It was done using the **Fishbone Diagram**, with true quality in the heads and quality and process features in the bones.

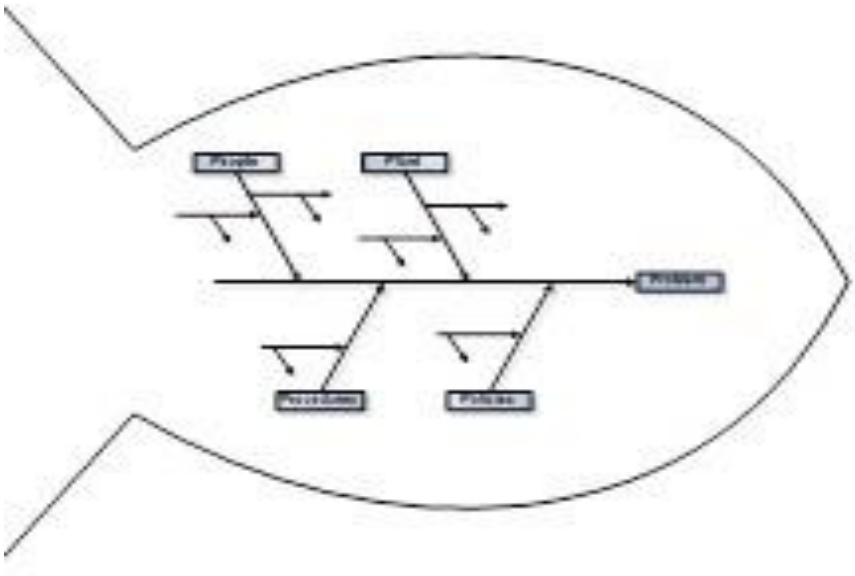


Figure: Fishbone Diagram

This technique was also known as **Quality Function Deployment (QFD)**, as it links the customer's needs with marketing, design, development, engineering, manufacturing, and service functions. It can be used for service as well as software products.

QFD is the only comprehensive quality system that aims specifically at satisfying the customer. It concentrates on maximizing customer satisfaction (positive quality), measured by metrics, such as repeat business and market share.

It focuses on delivering value by seeking out both spoken and unspoken needs, converting these into design targets, and communicating the targets throughout the organization.

In addition to this, it allows customers to prioritize their requirements, tells us how we are doing compared to our competitors, and then directs us to optimize those features that will bring the greatest competitive advantage.

7. KM IN ORGANIZATIONS

Organizational Culture

Organizational culture figures out values and beliefs which are an integral part of what one chooses to see and absorb. It comprises of a shared perception of reality, regarding how things are and how things should be. Furthermore, community and group culture determines the willingness and conditions for knowledge sharing with other members of the enterprise.

Thus, knowledge and knowledge sharing, are inseparable from organizational culture. The interface for culture is social interaction, the web of communications that constitute a community.

Organizational culture can also be described in terms of both its causes and effects. Using results perspective, culture can be defined as a manifested pattern of behavior, consistent behavioral patterns observed across a group of individuals, or "the way we do things around here." So, culture defines consistent ways in which people perform tasks, solve problems, resolve conflicts, treat customers and employees, and so on.

Using a process perspective, culture is defined as a set of mechanisms such as informal values, norms, and beliefs that control how individuals and groups in an organization communicate with each other and people outside the organization.

Different Types of Culture

This classification scheme crops four types of organizational cultures:

- **Communal**: It give its members a sense of belongingness, though it also is task-driven. Leaders of this culture are basically very inspirational and charismatic. The drawback is that they often exert too much influence and other members are rarely vocal.

- **Networked**: Here, the members are treated as friends and family. People closely connect with each other and love each other. They are willing to help each other and share information. The drawback of this culture is that people are so kind to each other that they are reluctant to point out and criticize the poor performance.

- **Mercenary**: It focuses on strict goals. Here members are expected to meet the goals and to get the job done quickly. Since everyone aims on goals and objectivity, there is little room for political cliques. The drawback is that those with poor performance may be treated inhumanely.

- **Fragmented**: Here the sense of belongingness and identification with the organization is usually very weak. The individualists comprise the organizations, and their commitment is first towards individual members and task work. The drawback is that there is a lack of cooperation.

Organizational Culture Analysis

Basically organizational culture can be split into three levels namely:

- **Artifacts**: These impersonate the visible elements such as processes, structures, goals, climate, dress codes, furniture, etc. A foreigner can see them but may not understand why things are the way they are.

- **Espoused Values**: The values are advocated by the leaders. They are mostly grounded in shared assumptions of how the company should be run. If there is a convincing mismatch between the leadership espoused values and this perception, the company may be in trouble.

- **Assumptions**: These are the authentic values of the culture. They basically refer the tacit views of the world itself (like human nature). Again, these inferences should need to correlate at least to a certain degree to the espoused leadership values for the organization to function smoothly.

Effects of Culture on Individuals

There are three basic ways in which a culture effects an individual namely:

- **Social Norms**: It is simply a behavioral expectation that people will act in a certain way in certain situations.

- **Shared Values**: Shared values are the conscious, affective desires or wants of people who guide their behavior. For example, individuals who internalize the value of honesty feel guilty when they are cheating or faking.

- **Shared Mental Model**: It defines a causal relationship between two durables. The idea that people depend on mental models can be traced back to reality that it uses to anticipate events. Mental models are built from perception, imagination, or the comprehension of discourse.

8. ORGANIZATIONAL MATURITY MODELS

Organizational culture includes a set of norms, routines, and unspoken rules of how things are done in that organization. An organization's culture can be in different states of maturity, and these can be assessed using a variety of organizational and KM maturity models.

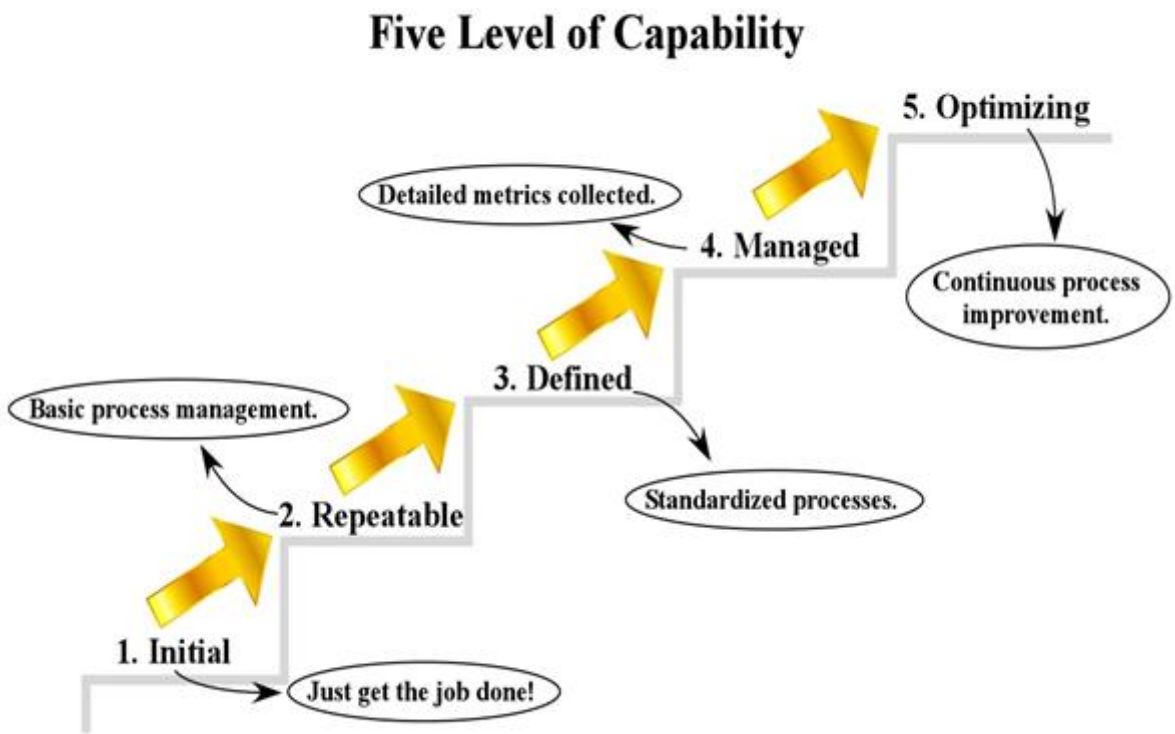
A maturity model is defined as a descriptive model of the stages through which organizations progress as they define, implement, evolve, and improve their processes.

This model acts as a guide for selecting process, improvement strategies by assisting the determination of the current process capabilities and the identification of issues most critical to quality and process improvement within a particular domain, like software engineering or systems engineering.

KM Maturity Models

There are a number of organizational and KM maturity models, mostly derived from the Capability Maturity Model (CMM).

The CMM is a model for judging the maturity of the software processes of an organization and for identifying the key practices that are required to increase the maturity of those processes.



The CMM was developed to describe the phases of software development processes, and the model was subsequently updated to the Capability Maturity Model Integration in 2000 (CMMI Project Team, 2002) in a better way.

The Capability Maturity Model describes five evolutionary levels in which an organization manages its processes. The five stages of the CMM are as follows:

- **Initial**: Processes are improvised, chaotic, rarely defined.
- **Repeatable**: Basic processes are established, and a level of discipline is maintained to stick to these processes.
- **Defined**: All processes are precisely defined, documented, standardized, and integrated into each other.
- **Managed**: Processes are managed by collecting detailed data on the processes and their quality requirements.
- **Optimizing**: Continuous process improvement is affiliated and in place by quantitative feedback and from piloting new ideas and technologies.

Infosys KM Maturity Model

Again, five maturity levels are specified, and each level is characterized by the efficiency of the knowledge life cycle, which consists of:

- Knowledge Acquisition
- Knowledge Dissemination
- Knowledge Reuse

Default

- The only way to create organizational knowledge is through formal training.
- There is a lack of management of knowledge.

Reactive

- Knowledge is only shared when there is a need for it.

Aware

- A basic KM system is developed and meets business requirements.
- Knowledge-sharing activities are sportingly encouraged.
- The advantages of KM are beginning to be realized.

Convinced

- Enterprise-wide KM system has been rooted.
- Quality and usage of contents are assured.

- Reuse of knowledge at a project level.

Sharing

- Knowledge sharing becomes a part of organizational culture.
- Organizational boundaries are discarded.
- Knowledge processes are continuously progressed.

CoP Maturity Models

The Wenger CoP life-cycle model provides a good characteristic to assess whether informal networks exist within an organization and whether they are recognized and supported by the organization.

The life-cycle model shows that a community requires to have attained the maturity and stewardship of knowledge levels in order to begin creating value for its members and for the organization as a whole.

The key features of the maturity model are as follows:

- **Paulk organizational Maturity**: represents the approval of a new technology or process within an enterprise, which is a very good match for the introduction of new KM functions.

- **Fujitsu organizational Maturity**: provides a fast and easy way of assessing how united or pervasive a culture is within a given enterprise, which can provide valuable guidance either in selecting pilot KM sites, if the enterprise is in the earlier stages, or in focusing on closely aligning KM with the overall business strategy.

- **Paulzen and Perc Maturity**: It is quite similar to the Infosys KM model and grants for incremental introduction of KM initiatives into an organization based on the phase of KM maturity.

- **Forrester Group KM maturity**: A model that marks on how employees acquire model relevant content, which is particularly well suited for an incremental introduction of knowledge support services within an organization.

9. KNOWLEDGE MANAGEMENT TEAM

The skills required for a knowledge management team member ranges from business awareness to management skills, learning abilities, communication and interpersonal skills, as well as information management and information technology expertise.

KM professionals should be proficient in retrieving information, evaluating or assessing information, organizing and analyzing content, presenting content, ensuring the security of content, and collaborating around valuable content.

One of the best approaches for forming an effective Knowledge management team is to define different types of knowledge management professionals and the types of skills, attributes, and background they should ideally possess.

A KM dream team collectively possess skills of communication, leadership, expertise in KM methodology, processes, tools, negotiation followed by strategic planning, combined with the following attributes, i.e., know the organization, remain connected to the top, adopt a systems view, and be an intuitive risk taker.

Knowledge Management Roles

The roles involved in knowledge management are quite distinct. These include following categories:

- **Knowledge leaders**, also introduced as **knowledge management champions**, who are responsible for promoting KM within the enterprise.
- **Knowledge managers** are accountable for the acquisition and management of internal and external knowledge.
- **Knowledge navigators** are accountable for knowing where knowledge can be located, also called knowledge brokers.
- **Knowledge synthesizers** are accountable for providing the recording of significant knowledge to organizational memory, also referred as knowledge stewards.
- **Content editors** are answerable for codifying and structuring content, also known as content managers who deal with capturing and documenting knowledge researchers, writers, editors.

Knowledge Management – Roles & Responsibilities

The primary roles and responsibilities can be summarized as follows:

- **Designing Information Systems:** Includes designing, evaluating, or choosing information content, database structures, indexing and knowledge representation, interfaces, networking, and technology.

- **Managing Information Systems:** Includes maintaining the integrity, quality, currency of the data, updating, modifying, improving the system, and operating the system.

- **Managing Information Resources:** Includes managing organizational information resources to support organizational missions and for competitive advantage.
- **Training:** Includes coaching, mentoring, community of practice start-up and life-cycle training support, and feed-back lessons learnt, best practices into training content.

- **Serving as Information Agency:** Playing as information consultants or guides for clients: advising, training, guiding on information, information sources, information use, acting as agents on behalf of clients: gathering, evaluating, analyzing, synthesizing, and summarizing information for clients.

- **Maintaining Healthy Relations**: for information systems/technology.

- **Designing and generating information services** and products publications, databases, information systems, multimedia products, and stories from storytelling

- **Workshops:** Can be leveraged for developing content for internal organizational workshops.

- **Offering Knowledge Journalists**: The employees can offer their services by providing insightful content based on their roles and responsibilities.

Ethics in Knowledge Management

Ethical theories are divided into three general subject areas:

- **Meta Ethics:** Investigates where our ethical principles, standards come from and what they mean. Meta-ethical answers to questions on the issues related to universal truths, the will of God, the role of reason in ethical judgments, and the meaning of ethical terms themselves.

- **Normative Ethics**: It takes on a more practical task, which is to reach at moral standards that regulate right and wrong conduct. This includes articulating the good habits that we should acquire, the duties that we should follow, or the consequences of our behavior for others.

- **Applied Ethics:** It involves examining precise controversial issues, like environmental concerns and how whistleblowers will be treated.

Ethics in Knowledge Management comprises of valuing human beings. Ethics are also considered to be a simple matter, but that is a misconception. Much of ethics can be distilled down to boundaries that can help employees of an organization stay on the correct side of organizational policy and help clarify ethical issues.

Managing ethical liabilities involves four major processes:

- **Prevention**, using codes of conduct and standard operating practices, principles and providing landmarks, fences.

- **Detection**, using automated systems to accomplish and monitor ethical compliance and to verify appropriate use of company assets.

- **Reporting**, where employees are able to address unethical behaviors without suffering any retaliation.

- **Investigation**, which often needs outside assistance in order to be thorough, fair, and neutral.

Knowledge Reuse

Markus (2001) identifies three major roles in the reuse of knowledge:

- **Knowledge Producer**: The original designer of the knowledge

- **Knowledge Intermediary**: The one who packages and prepares the knowledge so that it can be stored, retrieved, and shared. This include any number of functions like indexing, categorization, standardizing, publishing, mapping, etc.

- **Knowledge Consumer**: The person who is the receiver and end-user of the knowledge in question.

The two very general types of knowledge reuse are:

- **Internal**: Here the knowledge producer uses his/her own knowledge at some future point.

- **External**: The knowledge worker uses someone else's knowledge.

Knowledge Repositories

A Knowledge repository is an online database that systematically absorbs, organizes, and categorizes knowledge-based information.

They are basically the private databases that manage enterprise and proprietary information, but public repositories also exist to manage public domain intelligence.

They are also known as digital learning repositories, Digital object repositories and Electronic performance support systems.

It helps organizations connect people with information and expertise worldwide through online searchable libraries, discussion forums and other elements.

The key features of an effective digital knowledge repository are:

- **Centralization**: A wide variety of digital courseware, and content curated from multiple sources, can be stored in a central location where it can be tagged, shared and commented upon globally within one consistent interface.

- **Content Management:** The breadth of learning content includes audio visual files, simulations, data, learning modules, articles, blogs, YouTube videos, best practices

guidance, monitoring capabilities and contact information. Content can be searched by keywords, learning outcomes, and other vehicles.

- **Cost Savings**: Repositories can potentially reduce the cost of training and education by making affordable course materials accessible, reducing the need for classroom training and stimulating productive informal learning.

- **Access Control**: By restricting individual content pieces via password authentication and other security functionality, curators can accomplish various goals. Access controls often involve safeguarding proprietary information and protecting intellectual property. Some, but not all, repositories employ Digital Rights Management (DRM) to protect and monetize intellectual property in the market.

- **Record Management:** Repositories can integrate with learning management systems to blend seamlessly into learning and talent management programs.

10. KNOWLEDGE MANAGEMENT CHALLENGES

Some of major challenges faced by knowledge management function are as follows:

- **Security:** Accommodating the right level of security for knowledge management is key. Conscious information should be shielded from most users, while allowing easy access to those with the proper credentials.

- **Getting People Motivated:** Overpowering organizational culture challenges and developing a culture that embraces learning, sharing, changing, improving can't be done with technology.

- **Keeping Up With Technology**: Regulating how knowledge should be dispensed, transferring it quickly, and effectively is a huge challenge. Constantly changing structures mean learning how to be smart, quick, agile and responsive – all things a KM tool must be able to finish.

- **Measuring Knowledge**: Knowledge is not something that can be easily quantified, and is far more complex because it is copied out of human relationships and experience. The focus should be on distributed purpose rather than results or efforts.

- **Overpowering Shared Leadership**: As a knowledge leader, the concerned person has the responsibility to collaborate with fellow colleagues, persuade them to share their knowledge base for the benefit of the organization.

- **Keeping Accurate Data**: It is also the basic function to keep basic data which is accurate and authentic in nature.

Knowledge Management – Research Issues

Some sample KM research topics include the following:

- The exact mechanisms by which knowledge and learning are institutionalized and embedded in the corporate memory.

- Supporting communities of practice and enhancing professional education.

- The best way to make stories work best and its requirement.

- The urge in employees to share their knowledge with each other or, conversely, to hoard it.

- Steps management can take to increase knowledge sharing among employees.

- Application of weblogs in KM research.

- Different types of data collection and how they can be analyzed.

- Finding the gap between theory and implementation of knowledge management systems and principles?

KM for Individuals, Communities, and Organizations

Knowledge management contributes towards the benefits of individual employees, communities of practice, and the organization itself.

Knowledge Management for the Individual

- Helps them do their work efficiently and save time through better decision making and problem solving
- Develops a sense of community bonds within the organization and keeps the people updated
- Introduces challenges and opportunities to contribute

Knowledge Management for the Community

- Promotes professional skills
- Matures peer-to-peer mentoring
- Provides more effective networking and collaboration
- Fosters a professional code of ethics that members can follow
- Ensures a common language

Knowledge Management for the Organization

- Assists drive strategy
- Settles problems quickly
- Circulates best practices
- Upgrades knowledge embedded in products and services

11. KNOWLEDGE LEADERSHIP

A knowledge leader (or champion) is a person with or without the title of Chief Knowledge Officer (CKO), Head of Knowledge Management, or something similar. However, he or she is widely noticed as the person who is setting the direction for knowledge management and driving it forward.

We have five broad knowledge leadership approaches. They are:

1. The Contingency approach
2. The Behavior approach
3. The Transformational approach
4. The Transactional approach
5. The Trait approach

The Contingency Approach

The different methods of Knowledge Management are not mutually exclusive and we cannot claim one approach is instinctively better than another.

Contingency approach is based on the assumption that there is no universal approach or best practice to manage or solve distinct problems. A constant search for appropriate methods of solutions and management for different situations and conditions characterize it. It is a creative and system approach.

It also recognizes the need for flexibility, dependent on the process applied to achieve a given goal and stresses that the appropriateness of a Knowledge Management approach will depend on the business context and the available resources.

The Cultural / Behavior Approach

The Behavior approach has its origins in change management and business process re-engineering. It regards knowledge as a managerial issue. Based on this approach, although technology is necessary for the management of explicit knowledge resources, it is not the only solution for knowledge management. In this approach, the focus is more on innovation, creativity and learning rather than focusing on manipulating explicit resources or knowledge creation.

The distribution and sharing of knowledge is embedded in interactions and networks among people and their institutionalized groupings, e.g., teams and organizations, that enable us to access the diverse resources of intelligence.

The Transformational Approach

Transformational leadership has the ability to effect employee's perceptions through the returns an organization gets in the form of human capital benefits. Transformational leaders have the ability to make those benefits greater by adding them in the knowledge management processes, encouraging interpersonal communication among employees and creating organizational culture.

Transformational leadership improves the levels of organizational innovation through creating a participative environment or culture and it can do so directly or indirectly by changing organization's culture which supports knowledge sharing and management in the organization.

Figure: Transformational Leadership

Transformational leaders promotes a culture where employees have the autonomy to speak about their experiences. It has been seen that transformational leaders are more innovative than transactional and laisse-faire leaders.

The Transactional Approach

Transactional leadership style is formed by the concept of reward and punishment. Transactional leaders believe that the employee's performance is completely dependent on these two factors.

Figure: Transactional Leadership

When there is an encouragement, the workers put in their best effort and the bonus is in monetary terms in most of the cases. In case, if they fail to achieve the set target they ought to be punished. Transactional leaders pay more attention to physical and security requirements of the employees.

The Trait Approach

The trait approach for knowledge management has been derived by studying the unique characteristics of both successful and unsuccessful leaders. The resulting lists of traits are then compared to those of potential leaders to assess their likelihood of success or failure.

Successful leaders tend to have personality traits and abilities that are superior to those of less effective leaders. The trait approach identifies a set of core traits of successful leaders to predict the effectiveness of a potential leader. While these traits do not guarantee that a leader will be a successful or not, they are seen as preconditions that endow people with leadership potential.