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Knowledge Management

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MBA - HUMAN RESOURCE MANAGEMENT

III Semester

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➢ To understand the challenges of Knowledge Based Organisations and the HR mechanisms to manage them effectively.

➢ To identify the importance of the values of autonomy and accountability in Knowledge based organisations.

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UNIT – I

Learning Objectives

After learning this unit, the students will understand the concepts of

- ➢ Knowledge management
- ➢ Knowledge society
- ➢ Types of knowledge
- ➢ Challenges of HRM in Knowledge based organizations.
- ➢ Characteristics of knowledge management
- ➢ Concept of knowledge management
- ➢ New roles in knowledge based organizations

Unit Structure

Lesson 1.1 Introduction to Knowledge Management

Lesson 1.2 An Introduction to Life in Organization

Lesson1.3 Concept and Characteristics of Knowledge Based Organization

Lesson 1.4 Dimensions of Knowledge Management

Lesson 1.5 New Roles and Challenges for HRM in the KBOS

Lesson 1.1 - Introduction to Knowledge Management

In today's current business scenario, knowledge is not a mere product but a great capability. It is a multi faceted resource. The ability, skills and commitment of the knowledge workers are the key for success of any organization.

We are moving toward a post industrial or post bureaucratic society where knowledge and information drive economic growth. This is

where HRM should respond to the changes brought from the traditional to knowledge based organization.

If it is not so, then the HRM might face crisis. This is believed by most of HRM experts due to the radical developments in information and knowledge based services in recent years.

Knowledge management is a discipline that treats intellectual capital as a management asset. Unlike other assets it doesn't require specific procedures to utilize them. Knowledge is an idea created from various sources and how those ideas can help to improve the organizational effectiveness.

In other words knowledge management system aims to get right information to the right people at the right time, thereby providing them tools for analysis of information and respond to them at a faster rate.

By analyzing the information it gains insight to the information and developing methods to achieve the goals of the organization effectively.

The following are some of the reasons which led to the interest in knowledge management:

1. The valuation of the companies is dependent on their fixed asset rather than their management skills.

2. Most of the time in the past the investors invest in the organization based upon what they perceive about the organization.

3. Meaner organizations.

Definitions of Knowledge Management

I) "The physical toil of manufacturing is being replaced by a world where we work more with our brains than our hands"

- Sewell

ii) Knowledge management refers to identifying and leveraging the collective knowledge in an organization to help the organization to compete with their competitors.

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iii) "Knowledge management (KM) is an effort to increase useful knowledge within the organization. Ways to do this include encouraging communication, offering opportunities to learn, and promoting the sharing of appropriate knowledge artifacts"

- McInerney, C.

iv) "KM [Knowledge Management] involves blending a company's internal and external information and turning it into actionable knowledge via a technology platform"

- Susan DiMattia and Norman Oder

Nature of Knowledge Management

Knowledge management draws upon a vast number of diverse fields such as:

➢ Organizational science.

➢ Cognitive science.

➢ Linguistics and computational linguistics.

➢ Information technologies such as knowledge- based systems, document and information management, electronic performance support systems, and database technologies.

➢ Information and library science.

➢ Technical writing and journalism.

➢ Anthropology and sociology.

➢ Education and training.

➢ Storytelling and communication studies.

➢ Collaborative technologies such as computer supported collaborative work and groupware, as well as intranets, extranets, portals, and other web technologies.

This list is by no means exhaustive, but it serves to show the extremely varied roots that gave life to KM and continues to be its basis today. Figure illustrates some of the diverse disciplines that have contributed to KM.

The multidisciplinary nature of KM represents a double- edged sword. On the one hand, it is an advantage because almost anyone can find a familiar foundation on which to base their understanding and even practice of KM.

Someone with a background in journalism, for example, can quickly adapt his or her skill set to the capture of knowledge from experts and reformulate them as organizational stories to be stored in corporate memory. Someone coming from a more technical database background can easily extrapolate his or her skill set to design and implement knowledge repositories that will serve as a the corporate memory for that organization.

Interdisciplinary Nature of Knowledge Management
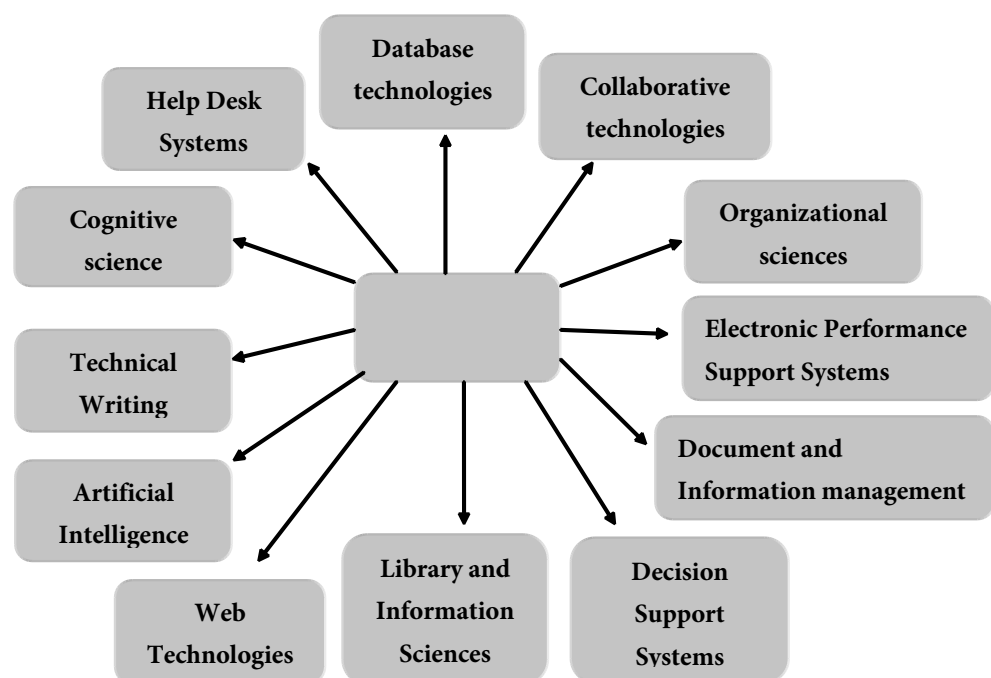
Reasons for Developing Knowledge Management

- ➢ Nearly 60% of the job requirements need knowledge
- ➢ Knowledge works have high demand
- ➢ The knowledge workers can do the job effectively than traditional workers
- ➢ The success factor in today economy is knowledge
- ➢ Knowledge is power and it is very scarce

Challenges Faced by the Organization

The key challenges faced by any organization are listed below:

1. How to attract customer and service them in the world of internet and electronic commerce?

2. How to transfer the technology and use them according to the customer wants and develop the organization?

3. How to re-engineer the mindsets of employees and motivate them and develop the organization into a learning organization?

This is due to the fact that the application of knowledge and practice of knowledge management will be able to create excellent results in the organization.

In current business scenario of value addition, products to customers and value creation to stake holders and technology capabilities at various levels of organization can be effectively managed with the help of knowledge management.

Knowledge Society

Earlier the term knowledge society was known as information society or post industrial society. The term knowledge society was coined by UNESCO towards the end of 90's. The general sub director of UNESCO Mr. Abdul Waheed Khan quoted as given below:

"Information society is the building block for knowledge societies. Whereas I see the concept of information society as linked to the idea of

technological innovation, the concept of knowledge societies includes a dimension of social, cultural, economic and political transformation and more a pluralistic and development perspective".

The knowledge rhetoric is used to shape business and educational policy in the United Kingdom. Then in late 90's the academics were keenly interested in knowledge management and drafted various articles about knowledge management.

The knowledge management has been analyzed in the mid of 70's because society in 70's was knowledge and information intensive.

Society can be categorized into 3 namely:

1. Pre industry society
2. Industry society
3. Post industrial society
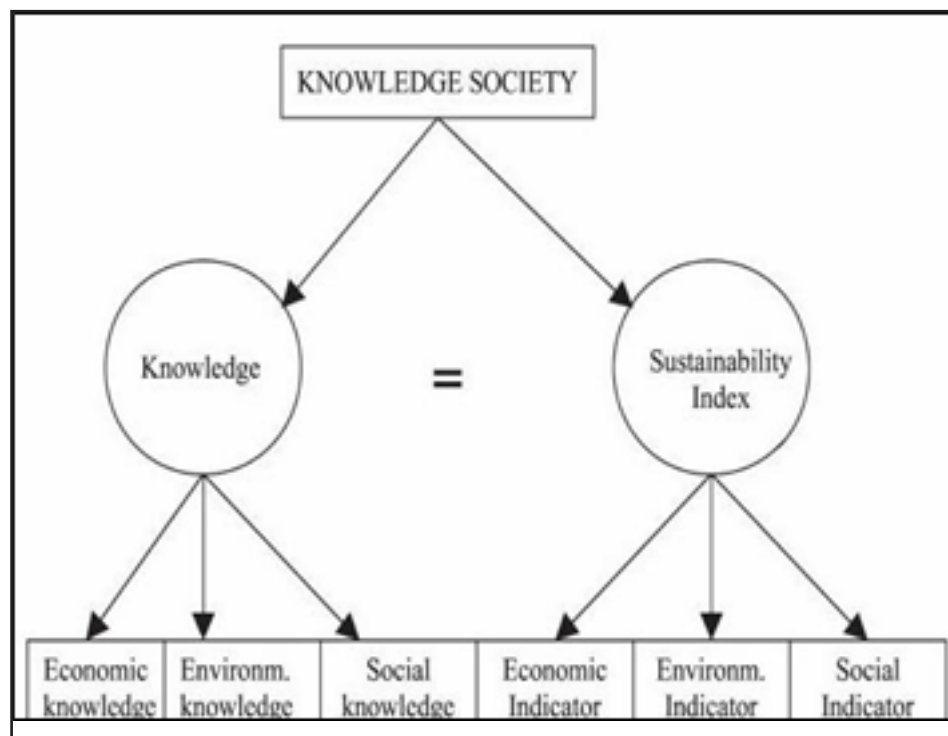
Knowledge Society

1. Pre Industrial Society

➢ This society is where the mankind started its civilization.

➢ They never used machines to produce goods.

➢ They used manual (hand) techniques to produce the goods.

➢ They were ruled by kings and military leaders.

2. Industrial Society

➢ This is the era when the industrialization was blossoming after the world war.

➢ The machines were invented and the manufacturing industries developed at an unprecedented rate.

➢ The people were ruled mostly by their democratic leader.

➢ The importance was given to process rather than information.

3. Post Industrial Society

The post industrial society can be defined as "A society where the service sector is dominant and knowledge based goods or services have replaced industrial and manufactured goods as the main wealth generation".

➢ This society is gaining momentum in the start of 20th century.

➢ The people started giving importance to service sector rather than manufacturing sector.

➢ In this era knowledge is power.

➢ The most knowledge people were given respect in this society

The main character of this society is that the knowledge is used as a main resource for wealth creation.

The following diagram gives as an idea of characteristics of post industrial society.

Mr. Daniel Bells in his book named "The coming of post industrial society" published in the year 1973 described his analysis based upon the

typology of societies. These societies are characterized by their mode of employment.

In the industrial society there are characterized by the manufacturing where as in post industrial society it was characterized by service sector.

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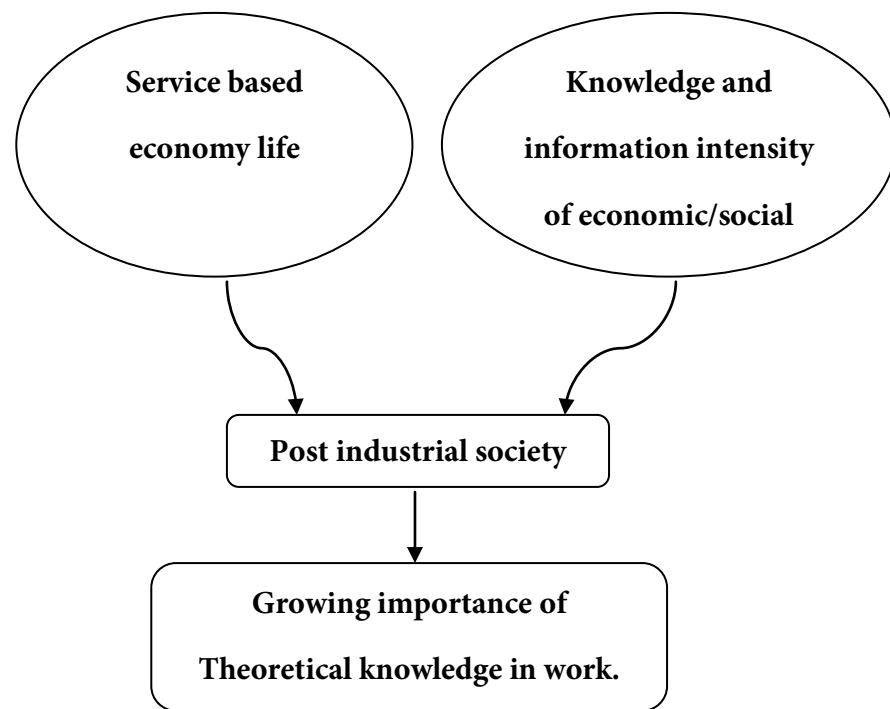
The Post industrial society

Another important factor stated by Mr. Bells is that the knowledge and information play a vital part in the post industrial society. He also suggests the quantity as well as the quality of the knowledge is considered important by the people.

The knowledge will be used of development use and theoretical knowledge to perform work like research & development. The table below compares the pre industrial, industrial and post industrial society.

Basis	Pre industry	Industry	Post industry
Resource	Land	Machinery	Knowledge
Social locus	Farm, plantation	Business firm	University, research institute
Dominant figures	Landowner military	Business people	Scientist researcher
Means of power	Direct control	Indirect control	Balance of technology and political force.
Class base skill	Property	Property	Technical
Access	Inheritance seizure by armies	Inheritance, patronage and education	Education mobilization cooptation

In this society the knowledge workers (employees) will have more satisfying work and they will perform the work individually and also in group. Morozoff suggests the drastic development and usage of computer has led to more knowledge intensive environment and the transition from industrial era to post industrial society will result in increased employment opportunities.

The service sector provides a variety of job opportunities like consultants, researchers, cleaners, marketing executives, etc. Some of the jobs require knowledge whereas other jobs are repetitive and require less skills to perform the job. Therefore all service sector jobs are not knowledge intensive.

One of the key features in knowledge management literature relates to epistemology and social order. The term epistemology refers to the knowledge management, its benefits and its criticism.

The diagram below shows the Epistemology of knowledge management

Epistemology

Duality	Dualism
Dialogic Discourse Knowledge as discipline people in ongoing resist to change totalizing knowledge claims theories: post structuralism, postmodern.	**Critical Discourse** Knowledge as power knowledge is asset in conflict between management and workers Theories:labour process theory.
Constructivist Discourse Knowledge as mind organization as distributed knowledge system, with knowledge embedded in work practices Theories: practice based	**Neo Functionalist Discourse** Knowledge as asset Knowledge development and used in organizations seen as unquestionably positive and progressive. Theories: Resource/knowledge based view.

The above table was given by Schultz & Stab ells; they say there are four disclosures namely

Dialogic Discourse
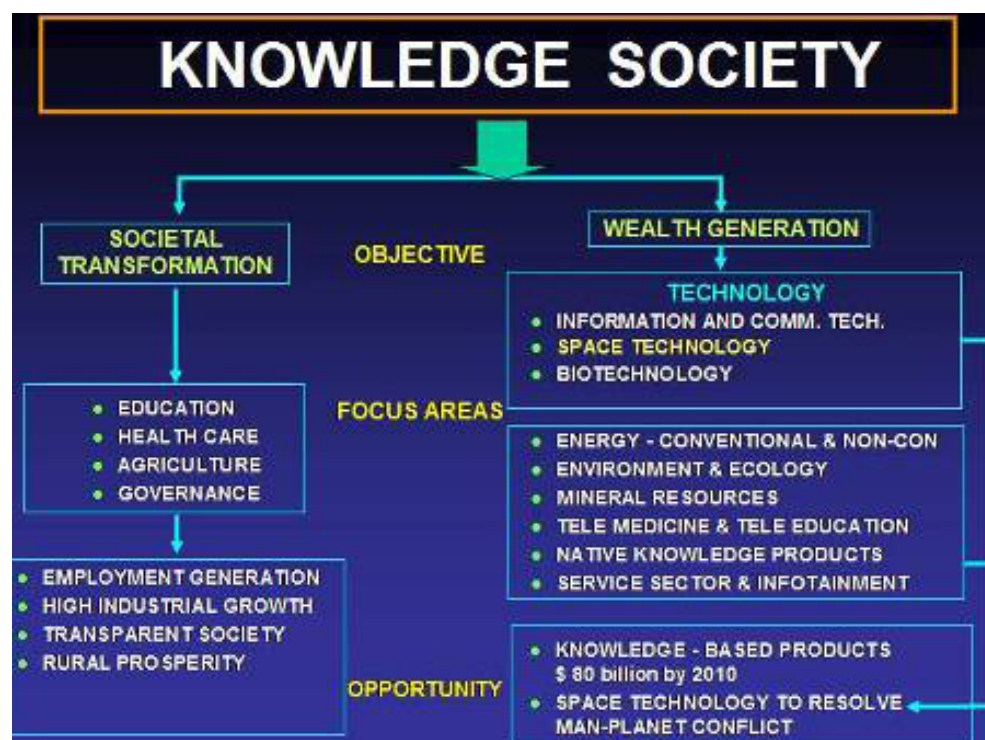
The Knowledge society and its objectives

Types of Knowledge

"We know more than we can tell"

➤ Polanyi.

The term knowledge means skill or information acquired either through education or experience.

The knowledge can be broadly classified into two types

1. Tacit knowledge
2. Explicit knowledge

Tacit Knowledge

➤ The word tacit means understood and implied without being stated.

➤ The tacit knowledge is unique and it can't explain clearly.

➤ That is the knowledge which the people possess is difficult to express.

➤ The cognitive skills of an employee are a classic example of tacit knowledge.

➤ The tacit knowledge is personal and it varies depending upon the education, attitude and perception of the individual.

➤ This is impossible to articulate because sometimes the tacit knowledge may be even sub conscious.

➤ This tacit knowledge is also subjective in character.

➤ This knowledge is exhibited by the individual automatically.

➤ They utilize this knowledge without even realizing it.

2. Explicit Knowledge

➤ The word explicit means stated clearly and in detail without any room for confusion.

➤ The explicit knowledge is easy to articulate and they are not subjective.

➤ This is also not unique and it will not differ upon individuals.

➤ It is impersonal.

➤ The explicit knowledge is easy to share with others.

Both explicit and tacit knowledge are compared in below table:

Basis	Tacit knowledge	Explicit knowledge
Characteristics	Inexpressive in a codified form	It can be expressed in codified manner
	Subjective	Objective
	Personal	Impersonal
	Context specific	Easy to share
	Conscious	Unconscious
	It cant be recorded	It can be recorded
Properties	Ability to adapt, to deal with new and exceptional situations.	Ability to disseminate to reproduce the access and to reapply throughout the organization
	Expertise, know-how, know-why and care – why.	Ability to teach and train.
	Ability to collaborate, to share a vision, to transmit a culture.	Ability to organize, to systematize; to translate a vision into a mission statement into operational guidelines.
	Coaching and mentoring to transfer experiential knowledge on a one – to-one, face-to-face business.	Transfer of knowledge via products, services and documented processes.

Some people argue that the knowledge does reside with individuals, they also think that knowledge also reside in social groups.

This led to classify knowledge into two type's namely individual and social level knowledge. Mr. Spender combined this type of knowledge with explicit and tacit knowledge and formed a matrix named generic knowledge types which are illustrated below:

Generic knowledge type

	Individual	Social
Explicit	Conscious	Objectified
Tacit	Automatic	Collective

Objectified knowledge refers to the explicit knowledge in social groups. Operating procedures of a machine or preparing the documents according to the rules is an example for objectified knowledge.

This objectified knowledge can be disseminated to others clearly. Collective knowledge is a social group which possesses tacit knowledge. The values and the beliefs of the society can be codified clearly which is an example for collective knowledge.

Environmental Scanning

➤ In order to keep them updated with the external environment the organization always carry out environmental scanning frequently.

➤ Environment scanning is the process of monitoring the external environment.

➤ This is because the external environment has a greater impact on the organization.

➤ By scanning the environment frequently we can know what the customer wants and how our competitors cope with the changes of the competitors.

The following external factors are watched carefully during the environmental scanning:

➤ Economic factors
➤ Technological factors
➤ Political factors
➤ Socio cultural factors

Economic Factors

- ➢ It refers to all those economic factors which have a bearing on the functioning of a business.
- ➢ The economic factors and business are mutually interdependent.
- ➢ The various economic factors with respect to Indian economic environment are listed below diagram:

Industrial Policy	Foreign Licensing	Technology Agreements	Public Sectors

Monopolies and restrictive Trade Industries	Foreign Trade	Privatization	Small Scale Practices

Financial Sector	Income Levels	Five - Year Plans	Agricultural Sector

B U S I N → Government Service
B U S I N → Voluntary programs
B U S I N → Taxes
B U S I N → Information
B U S I N → Contracts

G O V E R N → Money and Credit
G O V E R N → Law and Order
G O V E R N → Inspection and Licenses
G O V E R N → Infrastructure
G O V E R N → Growth
G O V E R N → Tariffs and Quotes
G O V E R N → Information
G O V E R N → Small Industries

B U S I N E

The responsibilities between Government and Business

They also have the ability to make existing products and services obsolete. The interface between business and technology is shown in below figure

TECHNOLOGY

Influences

BUSINESS

New Products

Demand for more skilled employees

Demand for more capital

Expectations of the customers

Social Change

Regulations & Oppositions

Organization structure becomes Techno-structure

Rise in Productivity
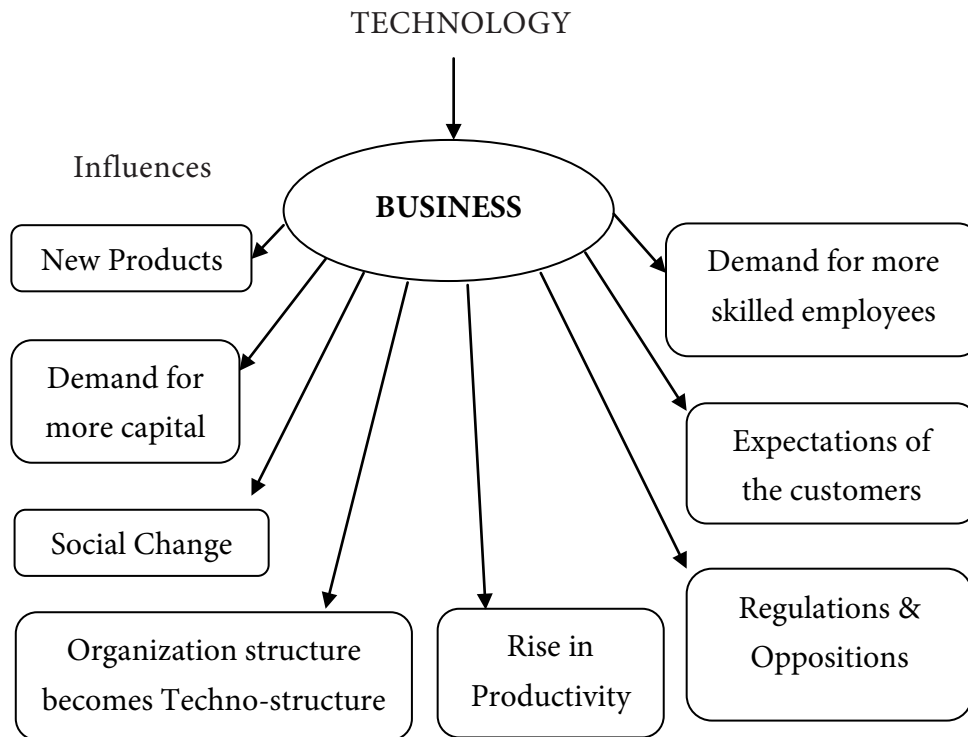
The influence of Technology over Business

Socio-Cultural Factors

➢ The influence exercised by certain social factors which are beyond the company's gate.

➢ The need for understanding and appreciating cultural differences across countries is essential as business units go international.

➢ They describe characteristics of the society in which the organization exists.

The interface between the socio-cultural factors and the business is given in the below diagram:
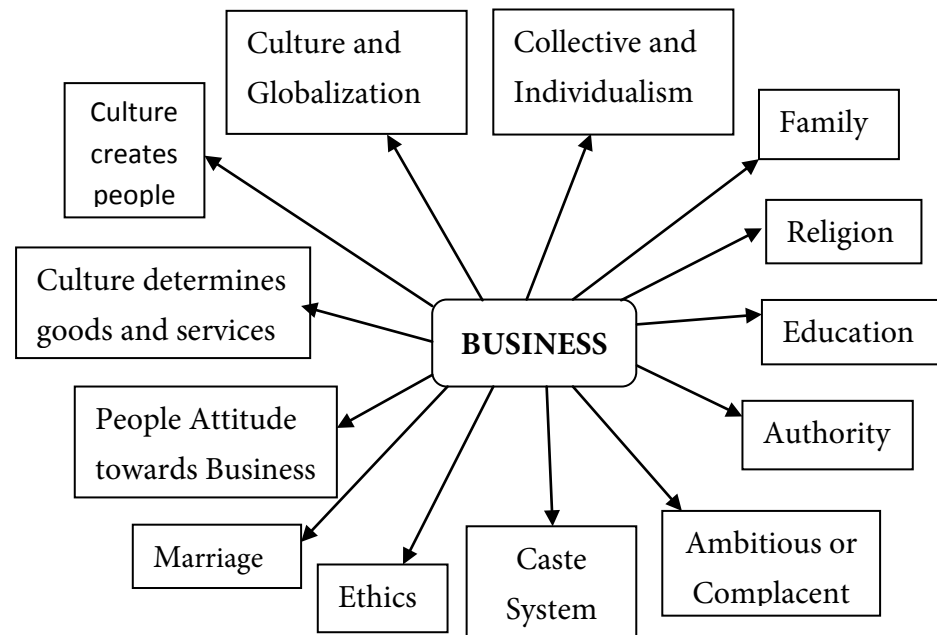
The interface between socio-cultural factors and business

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Lesson 1.2 - An Introduction to Life in Organization

Organization is an inevitable part of human life. All human beings work in some kind of organization or they start their own venture. Either way their experience with organizations can't be avoided in their lifetime.

Organization is a place where different kind of people with different type of attitude, education, cultures come together to achieve common objectives. Therefore the organization consists of diversified people and it is the job of HR manager to manage these diversified people and to get work done from them effectively.

In a knowledge based organization, the work nature requires skilled workers. In KBO, the use of information technology ensures the delivery of the project/service at the stipulated time schedule. The HR manager in KBO can initiate two types of changes in the organization called reactive or proactive change.

When a KBO changes itself when there is a change in the environment then it is known as reactive change. This change happens due to the factors in external environment like technological changes, political and legal changes, etc. When an organization initiates a change within the organization then it is known as proactive change. This change occur due to internal environment factors like top management level, change in strategy, diversification of the firm, etc.

The role of HR manager is to unify the workforce and resist from the change being implemented. The factors such as demographic and cultural factors may be a hurdle while implementing the change.

Life in Organizations

People have always been central to organizations, but their strategic importance is growing in today's knowledge-based organizations. An organization's success increasingly depends on the knowledge, skills,

and abilities of employees, particularly as they help establish a set of core competencies that distinguish an organization from its competitors. When employees' talents are valuable, rare, difficult to imitate and organized, an organization can achieve a sustained competitive advantage through people.

Advanced technology has given rise to reduced number of jobs that require little skill and has increased the number of jobs that require considerable skill, thus a shift is taking place from touch labour to knowledge work. This displaces some employees and requires that others be retrained. In addition, information technology has influenced HRM through human resources information systems (HRIS) that streamline the processing of data and make employee information more readily available to managers.

Both proactive and reactive change initiatives require HR managers to work with line managers and executives to create a vision for the future, establish an architecture that enables change, and communicate with employees about the processes of change. In order to contain costs, organizations have been downsizing, outsourcing and leasing employees, and enhancing productivity. HR's role is to maintain the relationship between a company and its employees, while implementing the changes.

The workforce is becoming increasingly diverse and organizations are doing more to address employee concerns and to maximize the benefit of different kinds of employees. Demographic changes, social and cultural differences, and changing attitudes towards work can provide a rich source of variety for organizations. But to benefit from diversity, managers need to recognize the potential concerns of employees and make certain that the exchange between the organization and employees is mutually beneficial.

Through strategic planning, organizations set major objectives, and develop comprehensive plans to achieve those objectives. Once the strategy is set, executives must make primary resource allocation decisions, including those pertaining to structure, processes, and human resources.

Companies such as Domino's Pizza, Sony, Southwest Airlines, and Wal-Mart revolutionized their industries by developing skills – core competencies – that others didn't have. These competencies helped them gain advantage over their competitors and leverage this advantage by

learning faster than others in their industries. Underlying a firm's core competencies is a portfolio of employee skills and human capital. In any given organization, different skill groups can be classified according to the degree to which they create strategic value and are unique to the organization.

Core knowledge workers: This group of employees has firm-specific skills that are directly linked to the company's strategy e.g., R&D scientists in a pharmaceutical company, computer scientists in a software development company. These employees are typically engaged in knowledge work that involves considerable autonomy and discretion. Companies tend to make long-term commitments to these employees, investing in their continuous training and development and perhaps giving them an equity stake in the organization.

Traditional job-based employees: This group of employees has skills that are quite valuable to a company, but not unique e.g., sales people in a department store, truck drivers for a courier service. These employees are employed to perform a predefined job. As it is quite possible that they could leave to go to another firm, managers frequently make less investment in training and development and tend to focus more on paying for short-term performance achievements.

Contract Labour: This group of employees has skills that are of less strategic value and generally available to all firms e.g., clerical workers, maintenance workers, staff workers in accounting and human resources.

Individuals in these jobs are increasingly hired from external agencies on a contract basis, and the scope of their duties tends to be limited. Employment relationships tend to be transactional, focused on rules and procedures, with very little investment in development. Alliance/partners:

As a consequence, companies tend to establish longer-term alliances and partnerships with them and nurture an ongoing relationship focused on mutual learning. Considerable investment is made in the exchange of information and knowledge. An increasingly vital element of strategic planning for organizations that compete on competencies is determining if people are available, internally or externally, to execute an organization strategy.

Managers have to make tough decisions about whom to employees internally, whom to contract externally, and how to manage different types of employees with different skills who contribute in different ways to the organization. Human resource planning plays an important role in helping managers weigh the costs and benefits of using one approach to employment versus another.

Changes in the external environment have a direct impact on the way organizations are run and people are managed. Environmental Scanning is the systematic monitoring of the major external forces influencing the organization. Managers attend to a variety of external issues; however, the following six are monitored most frequently:

➢ Economic factors, including general and regional conditions.

➢ Competitive trends, including new processes, services, and innovations.

➢ Technological changes, including robotics and office automation.

➢ Political and legislative issues, including laws and administrative rulings.

➢ Social concerns, including child care and educational priorities.

➢ Demographic trends, including age, composition, and literacy.

By scanning the environment for changes that are likely to affect organization, managers can anticipate their impact and make adjustments proactively. In a rapidly changing environment, it is extremely dangerous to be caught off guard.

The labour-force trends illustrate the importance of monitoring demographic changes as a part of human resource planning. Such changes can affect the composition and performance of an organization's workforce. In addition to scanning the external environment, organizations such as Syntex, Lotus Development, and Southwest Airlines are careful to also scan their internal environments.

Because these companies view their employee-oriented cultures as critical to success, they conduct cultural audits to examine the attitudes and activities of the workforce. Sears has found that positive employee attitudes on ten essential factors – including workload and treatment

by superiors – are directly linked to customer satisfaction and revenue increases. Cultural audits essentially involve discussions among top-level managers of how the organization's culture reveals itself to employees and how it can be influenced or improved. The cultural audit may include such questions as:

➤ How do employees spend their time?

➤ How do they interact with each other?

➤ Are employees empowered?

➤ What is the predominant leadership style of managers?

➤ How do employees advance within the organization?

By conducting in-depth interviews and making observations over a period of time, managers are able to learn about the culture of their organization and the attitudes of its employees. Cultural audits can be used to determine whether there are different groups, or subcultures, within the organization that have distinctly different views about the nature of work the quality of managers, and so on.

Any knowledge management strategy designed to improve business performance must address three components: the work processes or activities that create and leverage organizational knowledge; a technology infrastructure to support knowledge capture, transfer, and use; and behavioral norms andpractices (organizational culture) that are essential to effective knowledge use.

Even though the economic incentives are becoming clearer and technological capabilities now exist to support knowledge-based organizations, pioneers in knowledge management are finding the behaviours supported by their existing organizational cultures to be a major barrier to this transformation. In short, the organizational knowledge and culture are intimately linked, and that improvements in how a firm creates, transfers, and applies knowledge are rarely possible without simultaneously altering the culture to support new behaviours.

The HR managers must counsel the employees and use their diversified skills to improve productivity and cut down the cost of production using innovative process.

Many companies develop their core competency as they think it is the crucial factor for success and withstand the cut throat competition. Companies like GE; Sony has survived the competition by revamping their organization and developing their core competency. The core competency of retail giant Wal Mart is it supplies chain management.

The knowledge workers can be classified into various types namely:

1. Core Knowledge Workers

These workers are the intellectual asset of the organization. They are very highly skilled knowledge workers.they are also rich in experience. They are the people who form the vision, mission and strategy of the organization. The people perform work that involves autonomy and discretion.

The organization invests in them by giving them training & development. Generally the organization will have long term commitments with these types of workers and even in some companies they also given a share in the organization as a sign of reward and commitment to the organization... typical example for core knowledge workers is Research & development employees in a pharmaceutical company.

2. Traditional Job Based Workers

These are employees who possess skill and they are vital for the organization. These employees possess skill which not unique likes core knowledge workers. Sometimes these traditional workers perform work which is repetitive in nature. The employees generally perform the predefined job/ these employees are not committed to with the organization for a longer period.

The organization invest very less amount of capital for their training 7 development as these employees can quit their job and move to an another company. The company expects the traditional job based workers to perform their work effectively and they are rewarded accordingly. The short term performance of these employees is taken into consideration while rewarding them. An example for traditional based workers is sales person in a departmental store.

3. Contract Labor

Unlike the traditional job workers, the contract workers have an agreement with the organization to work for certain period of time. Once the time limit is over, their contract is terminated and thereby they are not connected with to organization in any terms. The organization will hardly invest in contract labor.

Generally these issues are taken care by the third parties like consultants. These consultants are like a bridge to the company and the contract labor. The contract labor may be unskilled or semi skilled workers. A clerk in a bank is an example for contract labor.

4. Alliance/Partners

These are people in which organization tends to have long term relationships. These people indirectly related to the organization like formulation of strategy, documentation of financial reports, etc. They possess skill in particular field with rich knowledge. They have great demand in the market and the number of people with such skill is very scarce. This is the reason why the organization tends to have long term commitments with either alliance or partners. Charter accountant is a classic example for this category.

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Lesson 1.3 - Concept and Characteristics of Knowledge Based Organization

The primary attribute that differentiates knowledge based organization from manufacturing sector is that it uses knowledge as an intellectual asset to generate wealth whereas the manufacturing sector uses machine and raw material as a source for wealth generation.

The main characteristics of knowledge based organization are Process, Place, Purpose, and Perspective. Before going in depth about these characteristics let us know other characteristics of the knowledge based organization. They are as follows:

1. It Uses Technology to Create Symbolic Goods

As stated earlier the KBO uses knowledge along with the technology and provide services for the customer. The organization not only utilize the knowledge of the employees they use latest technology to share their knowledge among the employees.

2. It places Little Reliance on the Physical Concentration of Resources

The resources like money, material, machines are not highly relevant for KBO. They emphasis on dissemination i.e. they emphasis on knowledge creation and sharing.

3. They Exist Beyond National Boundaries

Since the KBO can be also a type of virtual organization it exists beyond national boundaries. There is no physical boundary between nations or firms when it comes to KBO.

4. There is Elimination of Intermediates in the Economic Activity

Generally in manufacturing sector, intermediates play a vital role in disturbing the products to the consumer.. Since the KBO have

direct link with their customers regarding their requirements the role of intermediates is eliminated in this type of organization.

5. Pricing of Goods and Services is Dynamic

Since the goods and services produced by KBO is tailor made the price varies depending upon the customers and their specification. Hence the pricing is not the same for all the customers.

6. Business is Transacted in Real Time Without Any Delay

The KBO uses knowledge with technology to create products and services. They services or products are delivered within the shortest time after the customer gives order. This is because there is high probability the knowledge obsolete is faster than the technology obsolete and also by delivering the services in a faster rate with quality the customer is satisfied and they can retain the customers in the long run.

7. The Resource can't be Depleted

Unlike the manufacturing sector, they use knowledge as their resource which can be depleted like material or money. The knowledge will be there as long as the human race exists, but the human mind can also be depreciated when they grow old, which can be replaced by the younger generation.

8. The Evaluation of Knowledge is Difficult

The performance appraisal is difficult when it comes to knowledge based organization. Here the people are evaluated based upon their knowledge which is a qualitative and it can't measure exactly in quantity, thereby making the appraisal more difficult.

The main characteristics of the knowledge based organization are

1. Process

The process deals with the all activities that are directly or indirectly related to the manufacturing a product. Since the KBO doesn't deal with

using machineries to product a product, the process refers to knowledge creation and sharing them among the knowledge workers.

The goal of KBO is the effective application of existing knowledge. The other goals are that the knowledge is shared from one part of the organization to the other part of the company. They also ensures that they learn from their past experiences and also to make knowledge workers to collaborative with each other thereby sharing and developing their knowledge which benefit them personally and organization.

Holcim's one of the world largest company with respect to manufacturing cement which has presence more than 65 countries. They also have 100 cement manufacturing plants across the world. The management found that then knowledge management is the glue that binds the organization united. In 1996 the Holcim management and consulting which is now changed to Holcim group support decides to develop, identify and transfer and apply knowledge across the organization.

In cement manufacturing the energy cost is the most expensive cost while producing the cement, the management and the consulting firm helps the manufacturing plant to improve their efficiency by sharing knowledge about how to manufacture cement less expensive. Thereby it became the repository of knowledge and expertise and followed best practices in the knowledge management.

The management of the Holcim used knowledge management to solve their problems and now they are one of the leading innovative organizations in the world. The process in the knowledge based organization refers to the creation and sharing of the knowledge among the knowledge workers and other departments in the company.

2. Place

This characteristics of knowledge based organization deals with the knowledge boundaries. The sharing and creation of knowledge is not bound by the boundaries of the organization or the nation. In above case of Holcim it is understood that they share the knowledge form various manufacturing plants across the world. Hence it is evident that boundaries of KBO are not clearly limited by the physical boundary if the nation and they are dynamic and it has virtual boundary.

The people can gain knowledge form their customers, peers, vendors and their alliances. For example the employees of Buckman Labs spend more time with their customers than in the office.

At point the KBO stopped to worry about who works for whom. Rather they start to concentrate on who needs to work with whom. The P & G started a new supply chain management with the retail giant Wal mart. This helps to share information between both the companies so that they understand the visions of other company. This has benefited mutually to both the companies.

The knowledge based organization knows that by not able to share the knowledge it will become a potential hinder in the growth of the organization.

3. Purpose

The purpose deals with the strategy of the organization. Even though the process is directly linked with KBO we can't ensure that it will result in the success or perform better than the competitors.

The managing knowledge is far important than the managing the right knowledge. The strategy helps us to manage the right knowledge. This results your organization to be always a step ahead of your competitors. If your organization didn't think of aligning their knowledge with strategy then it can be a dearth sentence of your organization. The organization must think the ways for competing and surviving over the long term in terms of knowledge as a key strategic resource.

The following questions must be asked before the integrating the knowledge along with the strategy

➢ What do we need to know to formulate and to execute our desired strategy?
➢ What do we currently know?
➢ What strategies can we successfully execute given what we do know?
➢ What do our competitors know?

If an organization carries out knowledge SWOT analysis there will be two gaps namely internal knowledge gap and external knowledge gap. The gap between what an organization knows and needs is called as an internal knowledge gap.tis gap represents the strength and weakness of an organization. The gap between what it knows and what its competitors know is called as an external knowledge gap. This gap represents the opportunities and the threats for an organization. They must focus on the ways to eliminate the gap by making organization as a learning organization thereby making it far more effective than their competitors.

4. Perspective:

The character deals with the knowledge point of view i.e. examining the organization's fundamental point of view regarding knowledge. If an organization utilizes the knowledge in every aspect of its operation then it is known as true knowledge based operation.

It evaluates the strategy of the company on the basis of knowledge and every activity as a potentially knowledge and learning from every situation is one of the primary characteristics of a knowledge based organization. The other characters for evaluating are how the company organizes who it hires, how customers are related, what it makes and nature of the competitors.

The companies like Buckman labs who produce chemical microbicides realized that their products were becoming commodities in the minds of customers. In order to survive in the long run they realized they need to deliver knowledge based services.

Therefore they implemented process, strategy and training that supports and solves customer's problems. The Buckman company direct all its strategy to learn about the customers about their operations, the economies of their business. They made this by possible by training the employees and having alliance with different companies.

For example the Buckman Company rewarded their sales men based upon number of chemical products they sold but now they were rewarded based how much they have minimized the utilization of chemicals.

Many of the knowledge based organization made a significant transition in perspective by redefining their mission from more traditional products and services to products and services based on knowledge.

The international institute for sustainable development in the year 1997 suggested that the knowledge management comprises of 5 activities namely

- ➢ Knowledge creation,
- ➢ Knowledge acquisition,
- ➢ Knowledge assimilation,
- ➢ Knowledge use,
- ➢ Knowledge dissemination.

The knowledge creation is very important for any knowledge based organization. The knowledge acquisition means acquiring the knowledge from various resources like research articles, from competitors and from knowledge workers. The knowledge assimilation means the information or the techniques which we learn them or adapt ourselves according to them.

This is not easy as the traditional workers resist from adapting the management from new technology. Once the knowledge has been learned by the knowledge workers the knowledge is utilized in the every operations related to the product manufacturing or the services.

The knowledge dissemination means the sharing the knowledge among the knowledge workers across the departments. By sharing the knowledge with others the products or services can be produced effectively.

The KBO lives and breathes knowledge. From day-to-day operations to long-term strategy, Creating and applying knowledge is always in the forefront for the organization can be Knowledge-based and ensuring the application of knowledge it in all operations.

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Lesson 1.4 - Dimensions of Knowledge Management

Mr. Ron Young, is a project member when his company was part of a project named Know Net which was sponsored by European Commission. In that project they developed a Holistic knowledge asset centric framework which is illustrated below:
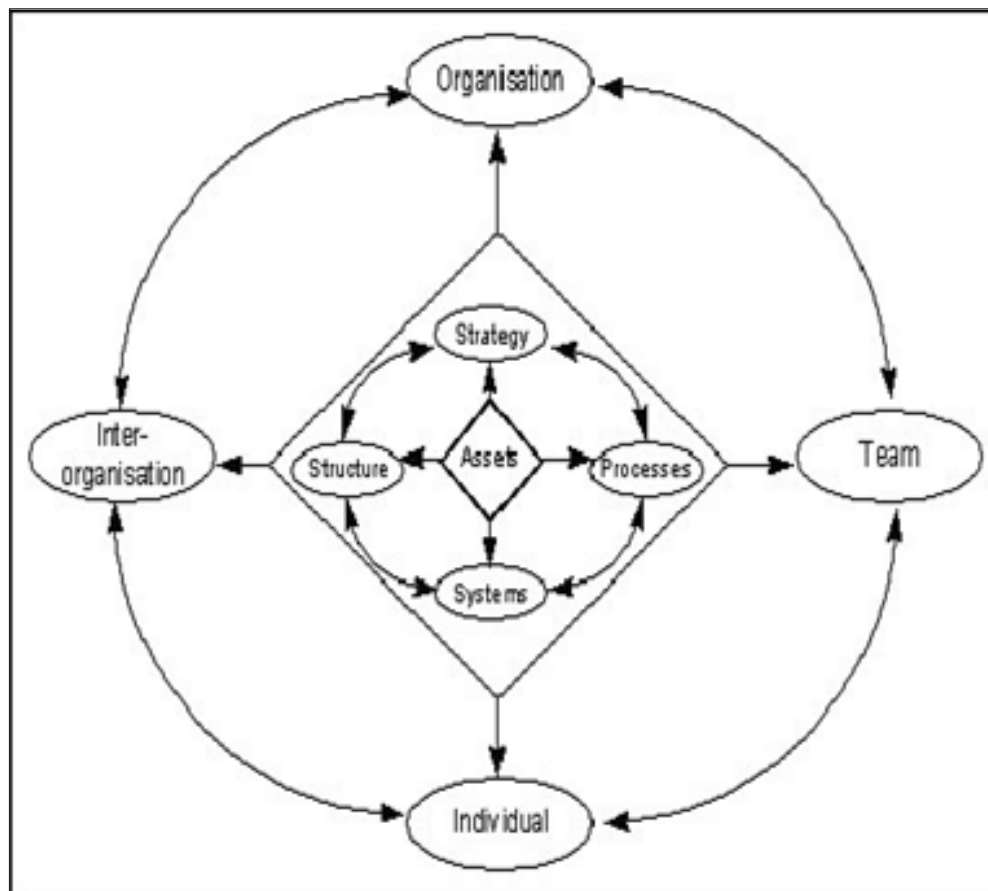
Holistic Knowledge Asset Framework
(Reference: Know-Net - EP-28928)

The above diagram consists of 2 rings. The outer ring is known as knowledge networking levels. The components of outer ring are individual, team, inter-organization, organization. The inner ring is known as KM infrastructure. The inner ring consists of structure, strategy, systems, and processes.

The interdependency between two rings determines the leveraging, flow of knowledge and knowledge asset in the organization.

Therefore this holistic approach suggests that the organization which thinks knowledge as its Intellectual asset then it must maintain the mutual dependence between the components of both the inner and outer ring. The four dimensions of knowledge management are Personal knowledge management, team, organizational and inter organizational

Personal Knowledge Management

Mr. Ron Young is convinced that Personal knowledge management is the most essential skill of knowledge worker in the 21ˢᵗ century. When an organization thinks about implementing knowledge management in its premises, then it should make sure that its knowledge workers are good in personal knowledge management.

This is due to the fact if knowledge workers is not have good personal knowledge then any number of methods or process will not yield good results. Hence the organization must give importance to this dimension of knowledge management.

The other reason for this is that there will be information overflowing in the organization. It is the capability or responsibility of the knowledge workers to filter the information that are necessary to them & organization. This is where the personal knowledge management comes into the picture of knowledge management.

Generally the organization follows the bottom up approach for developing personal knowledge management. This is because it helps the knowledge workers to understand and identify the knowledge and apply them aptly into the organization.

Today with the help of electronic gadgets like I-pod, tablet and World Wide Web the personal or individual knowledge management can be improved significantly.

Team Knowledge Management

In much organization the knowledge management teams are known as "Knowledge engines" of the organization. This is true because they are the key knowledge work units in an organization. It is proved that the knowledge can be learnt faster when it is shared. Therefore by sharing and transfer a knowledge form one member of team to other team member or other cross functional team it synergizes the entire team and the work is completed with high efficiency. This helps to develop knowledge and cohesiveness between team members.

The team knowledge management is based on models like share and Pull models for knowledge transfer. They are also based upon team knowledge plans. The high tech gadgets and technology facilitate the transfer of knowledge between cross functional teams across the globe and making the knowledge based organization as virtual.

Organizational Knowledge Management

Even though the knowledge workers are good in personal knowledge and team knowledge management, if their practices or application process doesn't fit with the organization strategy or its vision or mission statement it will lead to the fall of the organization. Therefore the organizational knowledge management is a top down approach.

The top officials of the organization meet together and decide the key knowledge asset, knowledge strategy and infrastructure to support the same. This helps to identify, capture, share and retain the knowledge and if it is possible to reuse them. They also support knowledge systems and tools to achieve their objectives in a faster and shortest time frame.

Inter Organizational Knowledge Management

The stake holders are the knowledge networks of the organization. The stake holders include suppliers, share holders, competitors, partners, and suppliers. This dimension of knowledge management deals with the inter relationship and knowledge networks. The aim of inert organizational knowledge management is to utilize the valuable knowledge resources which are present in the outside of the organization. United Nations is

an example for inter organizational knowledge management globally. The World Wide Web and other knowledge sharing communities create a conducive environment for inter organization knowledge management.

The 4 dimensions of knowledge management are very powerful and yet it is different from each other. It is very critical and important to the organization to organize all the dimensions of the knowledge management to take organization towards their growth.

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Lesson 1.5 - New Roles and Challenges for HRM in the KBOS

It is evident that the individual knowledge is the asset in knowledge based organization. The knowledge workers must be have good morale which helps to improve the productivity and helps to retain them for leading the organization. This is where the HRM helps in knowledge based organization to understand in what ways the HR managers can make the knowledge worker being satisfied and happy in the organization. The HR managers play a supportive role to knowledge workers.

These HR managers are analytical; they use methods and skills to appraise the work done by the knowledge worker. They are act as a counselee to the employees and thereby helping them to improve their skills and capabilities.

Roles of the HR Function How is the HR function being affected by the growing importance of knowledge capital, and why should HR managers be concerned about it. One reason is that people-related issues are the key to knowledge capital. No organizational function is better suited to spearhead the maximization of knowledge capital than the HR function. Cultivating knowledge capital requires concerted action in all areas of the HR function at once.

In the context of this trend, compliance oriented practitioners resist change, supporting the old command-and-control structures of the past, which only frustrate the development of knowledge capital by creating a work environment that diminishes the value of individual creativity and motivation.

Supporters are passive, doing only what they are told. Since line managers are not usually as knowledgeable about the formal processes related to people issues as are HR practitioners, HR practitioners operating from a supporter role will only continue to do what has been done in the past.

Performance consultants are analytical, applying skills to specific situations in which they troubleshoot problems or discover opportunities. They can create situations that will develop individuals and groups, but their approach is often too tactical to be felt by the organization on a strategic level. They must be cognizant of the business issues facing the organization and the capabilities of people to confront them. This requires more than a tactical approach. HR leaders are proactive, taking initiative to influence others to achieve competitive advantage through the human side of the enterprise.

HR leaders are thus best suited to encourage managers and other stakeholders to think about people as creators of wealth rather than as expenses. HR leaders may also involve top managers or other key stakeholders in group activities that can help them think about how the growing importance of knowledge capital affects the HR function, components of the organization or the organization as a whole, the causes of those changes, their likely consequences, and HR action plans or strategies needed to address those changes.

What Business Needs Require Change from the HR Function? To remain competitive in the future, businesses need to find ways to make the most of human talent and creativity. While this goal certainly requires flexible and adaptable HR systems and processes, business trends facing organizations are at the centre of this HR change endeavour.

By understanding these trends, HR practitioners can develop processes that enrich the knowledge capital of their organizations.

What Changes are Needed from Each HR Functional Area? It needs to be examined that how each HR functional area can make an impact on business operations while dealing with the growing importance of knowledge capital.

Rewards and Recognition

People must be rewarded for cultivating knowledge that is useful to the organization. That may mean that decision makers will need to explore such strategies as pay-for-knowledge programs in which individuals, and groups, are rewarded for cultivating valuable competencies of use to the Organization.

In addition, non-pay-related incentives can be used to reward the attainment and use of knowledge capital, such as promotion, title differentiation, access to or membership in special teams or task force efforts, and nomination to attend special development programs.

Employee Relations: Employee communications programs, vital to employee relations, should be launched to show employees and managers alike what is meant by knowledge capital, how it applies to them individually, why it is important to the organization, what happens when knowledge capital is not cultivated or developed, and how knowledge capital can be developed and evaluated.

Above all, employees must be informed that developing work-related knowledge is key to the success of the business, and to their career security at a time when jobs are disappearing. Employees have a self-interested and selfdirected role to play in their own development, and they should be told what that is ----- and, when necessary, how to take proactive steps to develop themselves for future career growth inside or outside the organization.

Job security can best be enhanced by profitability and growth. To work toward this security, employees need information about the business environment, the industry, and the organization's finances for informed decision making.

Organizational Effectiveness

Organizations need to launch programs that encourage learning and knowledge acquisition. By pursuing efforts to create learning organizations and high-performance workplaces, decision makers can set the right tone to support continued individual and team growth and development.

Changes in company culture do not occur overnight, so it is important to establish a track record of experiences in the organization to show that development and creativity do matter and are considered in pay raises, promotions, work assignments, and other issues of importance to employees.

Organizational effectiveness is enhanced when people have targets of focus. What a better target than effectively servicing a customer or beating the competition? Knowledge attainment centered around such endeavours can change a corporate culture.

Professional Development

Training and development is a key means by which to groom individuals for the future. Training is, of course, an individualized change effort that is designed to narrow gaps between what people know or do and what they should know or do to be successful.

Training has also been associated more recently with efforts to generate creative solutions to difficult problems farcing organizations. Training-related activities are likely to lead organizational efforts to build and maintain competitive knowledge capital.

HR will be responsible for maximizing the productivity of the workforce through initiatives that build organization community.

Well-educated and well-trained workforce will be deployed, and HR practitioners will be required to function as consultants, not as police officers. Training can be used to build a sense of community by facilitating cohesive performance by work teams.

It can also be used to enhance communication by providing information about the reasons to take action and by articulating approaches to individual development.

Training can be used to show people how to become more self-directed in their approaches to learning on their own, and to fostering the development of others in the organization. Training can be used to direct attention to a broad array of human performance improvement strategies that can be used to develop bench strength, troubleshoot human performance problems, and seize human performance improvement opportunities.

Money spent on professional development efforts has increased over the past decades. Yet, expectations by organizations have changed

concerning the return on investments of such efforts. Professional development providers are thus having to take both an individual and organizational view of these development efforts.

Resource and Productivity Management

Although defined differently by various experts, HR planning is often characterized as long-term planning for the people needed by an organization. It is perhaps the single most important issue to consider in building knowledge capital.

While HR planning has traditionally been focused on identifying and closing current and projected gaps in headcount, shortfalls between labour demand and supply, it can also be focused on identifying and acting to close present or future gaps in talent, shortfalls between present and future talent demand and supply.

One way that HR can lead the way towards building human capital is to introduce and use a systematic approach to HR planning in the organization.

Too many organizations many needs from vacancy to vacancy. But with HR planning, an organization's decision makers can link corporate core competencies directly to individual competencies and work to build them over time.

An effective HR planning process can also be useful in conducting strategic planning for HR, bringing a systematic approach to succession planning, integrating HR functions horizontally around meeting desired HR needs, and providing information about current or anticipated— overdrafts—in human capital. In order to tap into the knowledge capital of an organization, senior leaders first need to know where and with whom it resides.

This is the job of HR function – to track and identify knowledge communities and match them with the needs of the business. This task must be done for both current and future knowledge capital requirements. Once the task is accomplished, only then can the HR function be deployed appropriately within the organization to address both—now—and— then—business issues.

Recruiting and Staffing

Recruiting and selecting people are also central to building knowledge capital. After all, the individuals chosen by the organization affect its supply of knowledge capital, the competencies on which it can draw to meet business objectives.

HR practitioners must find ways to achieve the following:

➢ Recruit and select the right talent to meet pressing organizational needs.

➢ Retain the right talent once it is available

➢ Leverage the talent through appropriate uses of rotations, temporary and permanent team assignments, transfers, and promotions so that the organization's knowledge capital is brought to bear on the most pressing challenges.

These goals may require focusing on specific universities, competitors, or other talent pools to attract people with the specific competencies needed to help address business trends. Challenges and Opportunities In an era of globalization and rapid technological change, the prospects for knowledge-based organizations would appear to be bright. Certainly, Internet based communications and plummeting information processing costs provide ample opportunities in such areas as research, networking and information management. However, by the same taken, the organizations face challenges in a number of areas.

How can funding affect the vision of a knowledge-based organization? Funding availability is a case in point. Stability of funding remains a concern. Funding that pushes institutions from crisis to financial crisis works against the development of a strategic posture and leads to weaker rather than stronger institutions.

How do information overload and uncertainty affect the viability of a knowledge-based organization? With the rapid growth of Internet and computer processing power, another challenge often facing knowledge-based organizations is the over-abundance of information, or information of an uncertain quality.

How does data quality affect the vitality of knowledge-based organizations? Also relevant in this regard is the issue of data quality. That is to say, for an organization to remain credible, it must be assured of the accuracy, comprehensiveness and relevance of the information it is using to implement projects or formulate policy options. For example, the Australian Indigenous Health Info Net addresses quality assurance in two main ways. First, they have documented procedures for all aspects of their day-to-day operations.

These procedure ensure that all materials have been subjected to quality control checks before being added to their site. To complement their internal procedures, they have established a network of Health Info Net Consultants, whose functions include peer review of any substantial academic material to be added to the site.

How does a knowledge-based organization maintain its visibility? While the publication of such material on the Internet may be extremely useful to academics, policy makers and other experts, its relevance is somewhat less obvious to an individual living in a remote community without access to adequate shelter, sewerage or health services.

Accordingly, knowledge-based organizations must grapple with the challenge of remaining relevant to their constituencies at the risk of alienating them and losing their support.

On one hand, good leadership is critical in this regard, both in fostering constructive relationships with community members, and in focusing organizational energies in the ways which reflect constituents' concerns. On the other hand, feedback mechanisms also provide a valuable means of ensuring that organizational priorities are in harmony with community needs.

New Roles for Hr Managers

I) The Usage of Technology

Earlier decade the HR managers hardly use technology for their work profile. But this is not the case now. The HR managers especially in knowledge based organization must have good knowledge in technology

as the technology is one of the vital resources for wealth creation in KBO. They also must adapt various technologies for training & development of knowledge workers.

ii) The HR Managers are Mappers/ Engineers

Earlier the work of HR managers starts from recruitment till their retirement it and identifies methods to improve their knowledge. They won't map the knowledge of the employees i.e. they won't find or identify how the labors employ their tacit or explicit knowledge in the work. But now the role of HR manager is to map the knowledge worker brain and how they utilize it

iii) Gatekeepers of Knowledge

In KBO organization the HR managers must have rich knowledge about the project or work they are carrying in the organization. They.are not experts but they also form new terminology and taxonomies.

iv) Knowledge Brokers

The HR managers must act like a broker to access and identify opportunities inside and outside the organization. They must developing networking with outsiders which can help in identifying the opportunities in the external environment.

v) Knowledge and Information Disseminators

Earlier the HR managers the information provided to them was kept confidential. But in knowledge based organization they are not only the custodians of information and knowledge they must also disseminate that information and knowledge to the other knowledge workers which is a part of their ole as HR manager.

vi) Help the Knowledge Workers Beyond the Operational Zone

The HR managers will usually aid the employees with their problems related to work and their peers. But the role of HR managers in KBO goes beyond the normal operating zone. They aid or counsel the

knowledge workers related to their problems as it is important for the knowledge workers to be in clear mind as their work profiled is closely related with their mental health.

vii) Update Themselves with Technology and Specialized Subjects

As stated earlier it is important for HR manager in a KBO organization to know the technology. It is further more important for them to update their technological knowledge and specialized subjects which help them to identify the global opportunity for the growth of organization.

Apart from new roles **the** challenges of the HR managers are given below:

Employee Relations

The best way to have smooth working environment is to have good employee relationship among knowledge workers. The communication between the employees and with their superiors will help to maintain a conducive work environment. In KBO the knowledge workers are intrinsically motivated and they hardly require external motivated force to develop their skills and knowledge. So the HR managers must be proactive and devise the methods through which the communication and group cohesiveness will be improved between the knowledge workers in the firm.

Training & Development

The knowledge only grows when a person constantly update themselves with the time. If they don't then their growth is buried by themselves. Especially where knowledge is power it is very important for a knowledge worker to update their knowledge. So the HR managers must formulate ways to develop the skill of the knowledge workers.

Rewards & Recognition

Earlier the employees were rewarded based upon their productivity. But it can't continue in the knowledge based organization as the knowledge is very difficult as it is qualitative character. So the knowledge workers

are rewarded based on the knowledge creation and most importantly the sharing of the information and knowledge across the various department of the organization.

Challenges and Opportunities

We all know we live in a world where we can get anything from any part of the world with a click on the computer. The technology has helped the company as well as the customer to have wide variety of choice.

The company must need to access the information available on the World Wide Web. But unfortunately all the information available is not completely reliable. These act as an obstacle to explore the opportunities provided because of globalization.

➢ Challenges related to Finance:

The organization needs fund to run the day today operations to run the operations. The globalization in knowledge based organization funding plays a vital role to import technologies and update them frequently. This may affect the company's strategic vision leading to further crisis which is a negative sign for the company's good performance.

➢ Information overload:

In KBO organization the information are raw materials for productivity. There will be 'n' number of information accessible by the knowledge workers form the company database as well as form the internet. So the knowledge workers must ensure that the information overload don't deviate them from their planned schedule.

➢ Reliability of the information:

The accuracy or the reliability of the information over the internet is not 100% reliable or accurate. This will affect the data quality used by the organization. This will result on the vitality of the knowledge services or products provided by the organization. In order to avoid this, the organization should identify ways so that the accuracy of the information is verified before it is used by the organization for its purpose.

> ➤ Access to remote area:

There is no doubt that these technologies helps company to improve their business in the metropolitan cities and urban areas. Unlikely it is not in the case of rural areas. The people over there are not accessible to technology because they are not equipped to know about them. Even though they are equipped to understand the technology they really don't have the chance to access them. Therefore the organization must find a way to make their business into the rural by keeping them committed to their organization strategy.

Dimensions of HRM in KBOs

Conventionally, acquisition, development, motivation and maintenance of human resources are seen as four major dimensions of human resource management with quality of work life, productivity and readiness for change as outputs. In 1983, American Society for Training and Development identified nine human resource areas, which were considered by them as spokes of the Human Resource wheel. Each area affected the outputs which were placed in the center of the wheel. The human resource areas identified by ASTD were:

Training and Development, Organization Development, Organization/Job Design, Human Resource Planning, Selection and Staffing, Personnel Research and Information Systems, Compensation/Benefits, Employee Assistance, and Union/Labour Relations. Although line managers and HR managers need to work together, their responsibilities are different, as are their competencies and expertise. The dimensions of human resource management can also be understood in terms of the major activities for which an HR manager is typically responsible, such as Advice and Counsel, Service, Policy Formulation and Implementation, and Employee Advocacy.

Advice and Counsel

The HR manager often serves as an in-house consultant to supervisors, managers and executives. Given their knowledge of internal employment issues (policies, labour agreements, past practices, and the needs of employees) as well as their awareness of external trends (economic and employment data, legal issues, and the like), HR managers can be an invaluable resource for making decisions. As in-house consultants, HR

managers should be concerned with the operating goals of the managers and supervisors.

In turn, these managers must be convinced that the HR staff is there to assist them in increasing their productivity rather than to impose obstacles to their goals. This requires not only the ability on the part of the HR executive to consider problems from the viewpoint of line managers and supervisors but also skill in communicating with the managers and supervisors.

Service

HR managers also engage in a host of service activities, such as recruiting, selecting, testing, planning and conducting training programs and hearing employee concerns and complaints. Technical expertise in these areas is essential for HR managers and forms the basis of HR program design and implementation.

Policy Formulation and Implementation

HR managers generally propose and draft new polices or policy revisions to cover recurring problems or to prevent anticipated problems. Ordinarily, these are proposed to the senior executives of the organization, who actually issue the policies. HR managers may monitor performance of line departments and other staff departments to ensure conformity with established HR polices, procedures, and practice. Perhaps more importantly, they are a resource to whom managers can turn for policy interpretation.

Employee Advocacy

One of the enduring roles of HR managers is to serve as an employee advocate – listening to the employee's concerns and representing their needs to managers. Effective employee relations provides a support structure when disruptive changes interfere with normal daily activities. In the process of managing human resources, increasing attention is being given to the personal needs of the participants. Increasingly, employees and the public at large are demanding that employers demonstrate greater social responsibility in managing their human resources.

Complaints that some jobs are devitalizing the lives and injuring the health of employees are not uncommon. Charges of discrimination against women, minorities, the physically and mentally disabled, and the elderly with respect to hiring, training,advancement, and compensation are being leveled against some employees. Issues such as comparable pay for comparable work, the high cost of health benefits, day care for children of employees, and alternative work schedules are concerns that many employers must address as the workforce grows more diverse. All employers are finding that privacy and confidentiality of information about employees are serious matters and deserve the greatest protection that can be provided.

Top management generally recognizes the contributions that the HR program can make to the organization and thus expects HR managers to assume a broader role in the overall organizational strategy. In view of this, HR managers need to acquire a complementary set of competencies. HR professionals need to know the business of their organization thoroughly. This requires an understanding of its economic and financial capabilities so that they can—join the team—of business managers. It also requires that HR professionals develop skills of external relations focused on their customers. HR professionals are the organization's behavioral science experts. In the areas, such as staffing, development, appraisal, rewards, team building and communication, HR professionals should develop competencies that keep them abreast of changes.

HR professionals have to be able to manage change processes so that HR activities are effectively merged with the business needs of the organization. This involves interpersonal and problem-solving skills, as well as creativity and innovativeness. HR professionals must establish personal credibility in the eyes of their internal and external customers.

Credibility and trust are earned by developing personal relationships with customers, by demonstrating the values of the firm, by standing up for one's own beliefs, and by being fair-minded in dealing with others. The ability to integrate business, HR and change competencies is essential. By helping their organizations build a sustained competitive advantage and by learning to manage many activities well, HR professionals are becoming full business partners.

Forward-looking CEOs make certain that their top HR executives report directly to them and help them address key issues. At lower levels in the organization, a rapidly growing number of companies assign HR representatives to business teams to make certain that HR issues are addressed on the job and that HR representatives, in turn, are knowledge about business issues rather than simply focusing on the administrative function.

Concept and Characteristics of KBOs

The definition of the knowledge-based organization is centered around three attributes: its principal mission is to acquire, manipulate and deploy information and knowledge; it strives to be a—learning organization—in which its members, both individually and collectively, are continuously enhancing their capacity to produce results and adapt to changing circumstances; and it is guided by commitment to organizational excellence through such pursuits as benchmarking, best practices and the fostering of collaborative relationships among its various stakeholders. Knowledge organizations have been characterized as enterprises in which the key asset is knowledge.

Their competitive advantage comes from having and effectively using knowledge. Examples include the law office, accounting firm, marketing firm, software company, most of the government agencies, universities, the military, and significant parts of most of the manufacturing companies, whether they make cookies or cars.

A knowledge-based organization has four characteristics which can be summarized in terms of process, place, purpose and perspective. Process refers to the activities within an organization, some of which are directly involved with making a product or selling a service and others that are ancillary but no less important. Place refers to the boundaries of the organization, which for the purpose of sharing and creating knowledge often go beyond traditional legal boundaries. Purpose refers to the mission and strategy of the organization – how it intends to profitably serve its customers.

Perspective refers to the worldview and culture that influences and constrains the decisions and actions of an organization. Each of these

elements forms a basis for evaluating the degree to which knowledge is an integral part of the organization and the way it competes. Executives who understand how the four elements interact will be able to start changing their companies to take advantage of the vast intellectual assets hidden bellow the surface.

Process

Knowledge Sharing and Creation Most organizations are primarily focused on the concrete and observable activities that make up what they do on a day-to-day basis. A knowledge-based organization attends to two related processes that underlie these direct processes: the effective application of existing knowledge and the creation of new knowledge. The goal is fourfold: to ensure that knowledge from one part of a company is applied to activities in other parts; to ensure that knowledge is shared over time so that the company benefits from past experience; to make it possible for people from various parts of the organization to find each other and collaborate to create new knowledge; and to provide opportunities and incentives for experimentation and learning.

Consider how a company whose process for making its main product has been essentially unchanged for more than 100 years – Holcim, one of the world's largest suppliers of cement – took on this challenge.

The company operates more than 100 cement-manufacturing facilities, 240 quarries and 600 mixed concrete facilities in over 70 countries. Although it functions in a highly decentralized manner (country managers have the authority to make many decisions on their own), Holcim realized several years ago that the exchange of knowledge and expertise is the glue that holds the company together. It now explicitly regards knowledge as its key resource and learning as its key capability.

In order to make that view operational, an internal group, Holcim Management and Consulting (now Holcim Group Support), was reorganized in 1996 to develop, identify, transfer and apply strategic knowledge among all Holcim's entities worldwide. The group reports directly to the executive committee, a clear indication of its strategic importance. In addition to facilitating interaction among managers worldwide, Holcim Management and Consulting is itself a repository of

knowledge, expertise and best practices that it shares and reapplies by consulting to the company's various units. For example, energy costs are the most expensive part of cement production, and Holcim Management and Consulting helped plants improve process efficiency by diffusing knowledge about how to use cheaper and more efficient fuels.

A related problem facing Holcim has been the need to reduce carbon dioxide emissions, as part of its strategy to be a responsible corporate citizen promoting worldwide sustainable development. Holcim Management and Consulting helps Holcim to document and transfer new energy-related technologies and manufacturing methods among the company's plants worldwide. Company engineers and managers have, therefore, invested effort in learning more about alterative fuels.

For example, Holcim Switzerland developed the use of waste plastic, used tyres, and dried sewerage sludge as replacement fuels along with the technologies to burn them cleanly. In addition, the company has enjoyed product innovation (possible even with cement) as plants experimented with various admixtures to vary and improve the properties of cement for different local market applications. Even though it makes a simple, industrial-age product, Holcim is clearly operating as a knowledge-based organization.

Place

Knowledge Boundaries: Knowledge creation and sharing in today's economy are not bound by the traditional physical and legal limits of the corporation. Companies are increasingly realizing that knowledge is often produced and shared as a by product of daily interactions with customers, vendors, alliance partners and even competitors. The knowledge-based organization, then, is a collection of people and supporting resources that creates and applies knowledge via continued interaction.

Its boundaries are blurred, malleable and dynamic. At some point, the knowledge-based organization stops worrying about who works for whom and focuses instead on who needs to work with whom. For example, the field service technicians at Buckman Labs, an international specialty chemicals company, spend more time on the premises of their customers than at Buckman offices.

Similarly, when Procter & Gamble was creating a new supply chain management process with Wal-Mart, it sent several of its information management people to work with their counterparts at Wal-Mart's headquarters so that they could mutually learn how to implement their vision of better sales management via the sharing of information.

Holcim built knowledge communities within its global organization that transcended formal boundaries; it also made the necessary investments to learn from customers.

The knowledge based organization recognizes that the dangers of failing to share knowledge across traditional boundaries outweigh any potential benefits that may come from hoarding it.

Purpose

Knowledge Strategy: Even a highly effective set of knowledge management processes does not guarantee that an organization will perform well or better than its competitors.

Only a few years ago Polaroid, for example, had generally effective processes in place to capture and share knowledge about products, customers, applications, technologies and the competitive environment. The culture was conducive to sharing and cooperation, and the company had implemented a reasonably good information system for supporting virtual collaboration. All in all, it appeared to be managing knowledge well.

The knowledge being created and shared, however, was entirely focused on analog film and cameras. Polaroid knew little about digital imaging and this contributed to its eventual bankruptcy. Companies that succeed over the long term align their knowledge management processes with their strategy.

The knowledge-based organization recognizes that knowledge is a key strategic resource, and asks what do we need to know to formulate and execute our desired strategy? What do we know? And what do our competitors know? The gap between what an organization knows and needs to know focuses attention internally, just as the strengths and weaknesses components of a SWOT analysis does.

The gap between what it knows and what its competitors know focuses attention externally on the opportunities and threats.

Companies must seek to close those knowledge gaps, both external and internal, faster and more effectively than their competitors. Holcim clearly recognized the strategic nature of its knowledge.

Given its strategy to provide the best quality and most innovative cement-based products using the most efficient, sustainable and environmentally friendly processes, it engaged the hearts and minds of its entire organization in managing the knowledge and learning to support that strategy.

Perspective

The Knowledge Point of View: The knowledge-based organization, regardless of whether its products are tangible or not, holds a knowledge-oriented image of itself. That is, it takes knowledge into account in every aspect of its operation and treats every activity as a potentially knowledge-enhancing act.

It uses knowledge and learning as its primary criteria for evaluating how it organizes, what it makes, where it locates, who it hires, how it relates to customers, the image it projects, and the nature of its competition. Buckman Labs has the knowledge perspective. The company started in 1945 manufacturing chemical microbicides – products that would kill or control the growth of microbes in pulp and paper manufacturing and leather treatment.

Over time, however, it realized that its products were becoming commodities and that to stay competitive it would need to deliver knowledge-based services. To support that strategy, Buckman implemented processes, technologies, training and incentives to promote the development, sharing and delivery of knowledge about how to actually apply microbicidal chemicals to solve customers' treatment problems.

The company has continually refreshed its strategic knowledge and directs all activity toward learning as much as possible about its customers. This approach culminated in the decision to learn more about how to

manage the chemistry of their customers' plants than even its customers knew. In the late 1990s, Buckman undertook to learn about customers' operations in detail, the economics of their businesses, and their strategic direction – a tall order for a bunch of chemists. To accomplish this learning, the company first implemented a business-oriented training program tailored to the specifics of their customers' industries.

It then entered into a learning partnership with a major paper manufacturer. For a fixed fee, Buckman became the exclusive provider of all chemicals and treatment services the manufacturer needed.

Though sales technicians were formerly rewarded for selling as much chemical products as possible, now they are rewarded for minimizing chemical use. They were free to use any product, regardless of who made it, that created the most efficient and effective customer operation.

In return, Buckman gained exclusive access to the customer and thus the opportunity to learn more about how to service that segment of the market than any of its competitors. Buckman now considers itself to be in the knowledge business: Chemicals are merely the tangible tip to their knowledge iceberg. Many other companies in recent years have made a similar transition in perspective by redefining their fundamental mission from one based on selling traditional products and services to one based on exploiting knowledge.

If knowledge is a raw resource, who should benefit from it? A close link between knowledge and power has widely been recognized. For example, the World Health Organization states that as a knowledge-based organization in an environment where knowledge has become a raw material, serious consideration should be given to how such knowledge is managed, disseminated and used.

Integrity and value-based leadership are recurring themes in the case of knowledge-based organizations. Also relevant in this context is the attention paid by the organizations to the pursuit of excellence in their work. In the majority of cases, this involves a commitment to engage in research and programming which is of a supervisor quality, and addresses the actual needs and priorities of the target population.

In the May 1997 report prepared for the International Institute for Sustainable Development, Geoffrey Oldham and Rob McLean suggested that knowledge activities encompass five distinct dimensions: knowledge creation, knowledge acquisition, knowledge assimilation, knowledge use, and knowledge dissemination.

Turning to issues related to knowledge creation and acquisition, the organizations dedicate considerable resources either to the execution of research, thereby generating new knowledge, or to scoping exercises designed to identify and gather relevant information generated elsewhere. However, the means by which they pursue these activities vary considerably from organization to organization. In a large measure, this variance can be explained by differences in funding base and mandate.

Knowledge creation is not the only challenge facing the organizations. Knowledge assimilation, which might also be termed knowledge management, is arguably of equal importance, since this is what allows one to exploit the information generated, and ensure that it is accessible when and where it is needed.

For example, International Development Research Center (IDRC) acts principally as a sponsor of research carried out by outside experts, though it also engages in a range of information gathering activities. The latter includes the maintenance of an extensive library collection along with the development of information systems to document and evaluate center activities, and to preserve a corporate memory.

Deployment and use of new information technology is one way in which organizations can effectively manage their knowledge base, and the International Development Research Center in particular has been a world leader in this area. Not surprisingly, knowledge creation and acquisition is also a priority for the World Health Organization.

A particularly noteworthy example in this area is its Evidence and Information for Policy (EIP) Cluster, a programme established in 1998 with a mission to strengthen the scientific and ethical foundations of health policies and programmes so that they respond better to the needs of populations.

With an emphasis on building effective partnerships, the EIP cluster compiles, analyses, and disseminates an evidence base on the major dimensions of health and health systems. Organizational learning is an important dimension of knowledge assimilation.

In short, if an organization is to continue to generate new knowledge, or put existing knowledge to work, its members must have an understanding of key issues and be able to relate them to the organization's mandate.

In the case of United Nations Development Fund for Woman (UNIFEM), for instance, it prides itself on having put into place a feedback process of pioneering, learning, information-sharing and advocacy.

➤ Closely related to the issue of knowledge assimilation is knowledge use and dissemination. While the organizations exploit their knowledge resources in a wide variety of ways, they can nonetheless be categorized in the following manner:

➤ Dissemination of knowledge resources (e.g., research reports, activity or status reports, policy statements) to a general audience through mass media channels e.g., Internet, wide circulation publications.

➤ Dissemination of knowledge resources to a limited audience e.g., policy makers, politicians and experts through selective channels e.g., narrow circulation journals, conferences.

➤ Use of knowledge resources for the purposes related to advocacy or to the Use of knowledge resources.

➤ Development of policies, programs or projects; and for the purposes related to the generation of new knowledge.

Questions for Discussion

1. Can different skill groups be classified in an organization? Discuss various such groups to highlight the life in organization.

2. What is environmental scanning? What are the external issues that are frequently monitored by the managers? Discuss with appropriate examples.

3. What is cultural audit? Discuss its importance in a knowledge-based organization.

4. Discuss the characteristics of a knowledge-based organization in terms of process, place, purpose and perspective.

5. What are the dimensions of Human Resource Management in KBOs? Discuss in detail.

6. Discuss the roles of HR function in KBOs.

7. Discuss the challenges faced by a knowledge-based organization

Self Assessment Questions

1. What is Knowledge Management?

2. What are the Characteristics of knowledge management?

3. What is knowledge Society?

4. Explain the Concepts of Knowledge management.

5. Explain the types of knowledge Management.

6. What are the roles of Knowledge based organizations in modern management?

7. Explain the challenges of HRM in Knowledge based organizations.

8. What are the new roles of HR manager in the emerging KBO?

9. What are the three categories of knowledge society?

10. What are the reasons for developing knowledge management?

CASE STUDY

Ms. Yanow, a research scholar suggests that the privileging and prioritizing of what she calls expert or theoretical knowledge can result in local, contextual tacit knowledge becoming so marginalized that it can be often neglected if not ignored.

One of the most vivid organizational examples she gives to illustrate her argument concerns the knowledge of some delivery drivers employed by a bakery.

The owners of the bakery decided that they wanted to better understand the changing nature of the tastes and demands of the final customers who bought their goods (which they bought from the shops that were the bakery's direct customers).

Despite of the fact that the some of the bakery's own employees (the delivery drivers who took their goods to the shops) arguably possessed such knowledge, through the Ongoing conversations they had with the shops' owners that happened when their deliveries were made, this source of knowledge wasn't used.

Instead, the bakery's owner spent a significant amount of money employing external consultants to conduct some market research. For Yanow, the reason that the delivery driver's knowledge was overlooked and not used was due to its character. Fundamentally, this knowledge was tacit, subjective, experience based and content specific and was possessed by the workers low down in the organizational hierarchy. For the owners of the bakery this was regarded as a less legitimate and less objective form of knowledge to that which the market research consultants could provide (which was regarded as objective, abstract, generalizable and scientific).

Yanow suggests that this is far from an isolated example and that the privileging of theoretical knowledge over local contextual, tacit knowledge is an attitude which is prevalent in many, if not majority of the organizations.

Questions

➢ Do you agree with this conclusion regarding the dominance of this perspective?

➢ From any organizational experiences you have can you think of other similar examples where potentially important and useful knowledge is overlooked and neglected due to its tacit, contextual and experiential character

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UNIT - II

Learning Objectives

After studying this unit, the students will understand the following topics:

➢ Knowledge Process and methods

➢ Concept of Intellectual Capital

➢ Learning Organizations

➢ Performance Appraisal in KBO

➢ Knowledge and role related issues.

Unit Structure

Lesson 2.1 Managing Knowledge for Organizational Effectiveness

Lesson 2.2 Intellectual Capital and Learning Organizations

Lesson 2.3 Knowledge and Role Related Issues

Lesson2.4 Performance Appraisal in KBO

Lesson 2.5 Intellectual Property Rights (IPR)

Lesson 2.1 - Managing Knowledge for Organizational Effectiveness

Process and Methods

The companies in 21st century are faced by number of imperatives that have to be addressed for the smooth functioning of the company. Often knowledge management is known as "Pack Rat".

This term implies the meaning that in knowledge management if the information is not useful today, save the information it may be valuable in the future. The following issues need to be addressed by any firm.

I) Embracing Technology

The technology is to knowledge management how hands are to humans. The technology helps to disseminate the information in the best optimal method. This explains the need for the firm to adapt suitable technology. Not only installing the technology they must also embrace any latest versions are available in the technology utilized by them. Only then they are alive in this competitive market.

II) Managing Change

There is a saying that Change is the only thing that is permanent. The changes are an inevitable part of human life and organizations. The change is almost unavoidable in the organization while knowledge management is implemented in the company. This may result in change n organization structure, job profile of the workers.

Mostly workers doesn't accept the change, it is generally tendency of the labours to resist the change. Therefore the management must find method to minimize the change and manage the change effectively in the firm.

III) Globalization

This is one of the factors responsible for severe competition prevailing in the market. Due to globalization the company can source, produce and distribute its products or services in any part of the world. This globalization provides enormous opportunity for business on the other side it provides competition from companies around the globe. Therefore the companies must devise strategy to tackle the threats posed by the globalization.

IV) Employee Rights

Earlier the employees were treated like a factor for production like raw materials and machines. But it is not the case now, the employees are well aware of their rights. Therefore they demand their employers to provide them equality in the firm and treat them with dignity as they deserve it. The trade Union has forced the companies to treat their employees with respect and treat them fairly.

V) Balancing Work Life

Presently the workers are giving equal importance to their family and workers. Earlier the workers didn't object even they have to work for 18 hours. Bu now employees giving importance to completion to work rather than how many hours they spend in the office.

They demand their bosses to give importance to productivity rather than to sit simply on the office for long time. Even most of the multinational companies permit their workers to work from home.

The solutions for above imperatives are vital in any organization. In order to be effective the organization must formulate the principle which helps in effective management for organizational effectiveness. The four principles are

i) Shared Information

The employees in past decade didn't show any interest to know about the business strategies followed by their firm. Even though they are interested they are not allowed to know them. Their boss expects them to perform the job given to them and to involve in any other activities. They are not permitted to give suggestions to improve the productivity of the company.

On the contrary, they employers expect their workers to know in depth about the functioning of the company and welcome their ideas and suggestions to improve the productivity or any processes in the organization.

By doing so, the employees will feel committed to the organization and their binding to the organization will be in high level. More over the principle of sharing information helps the employers to overcome resistance form workers any plans are implemented in the organization.

This is because the employees are a part of decision making process and the decisions are made along with the consent of the employees which make them not to agitate against it. Thereby the decision will be implemented faster with more effectiveness.

By sharing the information all employees are able to develop their knowledge and making firma s learning organizations, this will create a culture of sharing environment and ensures smooth working of business operations.

ii) Knowledge Development

In knowledge based organization the company competes with their competitors in the form of their knowledge workers. In today's market it is very important for the company to identify knowledge worker. It is even more important to develop their knowledge by giving them development programs and giving real time experiences.

The firm needs to find the brightest talent available in the labour market and recruit them. They must encourage and reward them for their performance which will motivate them to perform even better.

They must all provide equal opportunities to all employees. They must be unbiased in either in rewarding or performance appraisal of the workers. The employees also require skill to perform a job. Therefore the employees must use their skills along with their knowledge to perform their job effectively. The training must be given to improve their skills also. This is possible by giving them practical demonstrations on how and which circumstances they utilize their skills.

The organization must ensure that their employees will perform individually as well as in teams. They must encourage their employees to develop close inert personal relationship with all their peers, and superiors.

Thereby when they are placed in teams, they can work with ease. The employees must use innovative approach for problem solving and they must also well verse with decision making and leadership styles. Most importantly the employees must never stop learning new things, they should also learn continuously to improve their career and the company.

iii) Performance – Reward linkage

The employees work in an organization so that they can continue their living with a good standard and respect in the society. There is no

explanation required to emphasize the need to reward the employees. It is because it is mandatory for an organization to reward their employees either monetary or in non monetary for the service rendered by them to the firm.

The employees have their personal goals which may differ from the organization goal. The organization must devise goals so that they can synchronize with the employees personal goals. The term goal congruency means the goal so f the employees and the firm are same. So that it doesn't influence the performance o the employees. This helps the employees to achieve the goals which mutually benefits to both the parties i.e., themselves and the company.

When employees are rewarded, they sense that they are important for organization success and this makes them to work beyond the work hours. This also improves the morale of the employees. They become self regulators. There is no need to appoint supervisor to supervise the performance of such employees because they will perform their job perfectly even when there is no supervisor to supervise their actions. It will ensure a conducive work environment and high employee satisfaction.

iv) Egalitarianism

The harmony in the work place is essential for smooth working conditions. In order to maintain harmony the emloyees must have good interpersonal relationship with each other. Unfortunately it is not possible to be maintaining harmony always in the firm. The factors like Status and Power create disturbances and develop the gap between the workers.

The employees who have power feel that they are superior to others and they don't treat others with fairness and respect. The companies have to eliminate the status and power to maintain harmony in the workplace. This can be eliminated by collaborating the workforce and empowering the employees which results in improved productivity.

The company understands the importance of this, so that only they develop quality circle, employee involvement group, employee surveys and suggestion system to eliminate the differences between them. They frequently change their organizational structure providing more

authority to the people. The motivational techniques like Job Enrichment, job Enlargement and work teams are formed by the management.

The employees can also give their views to improve the organizational effectiveness in decision making process, HR practices followed by the firm. The following techniques are used by the organization o eliminate Power and Status

➢ Work Flow Design and Team work

The business process that is carried out in last decade has become ineffective today. The organization uses business process reengineering to manufacture the product in low number of steps possible. The concept of Total Quality Management is also practiced by the management.

TQM implies that each and every process in the organization must be created and directed towards the customer needs and satisfaction. Business Organizations today emphasise to concentrate on core business process rather than entire internal business process.

For example Federal Express redesigned their truck drivers to carry job by taking their own route and making them to understand the delivery schedule of their customers. They also equipped with how their fellow drivers are completing their job assignment.

➢ Complementary Human Resource Policies and Practices

Many researchers say that when job redesign is combined with HR practices the employee performance as well as satisfaction is improved considerably. Job redesign doesn't improve the job performance of the employee every time.

When the job redesign combined with developing skills of the employee it results in high performance. By doing so the employees involvement will be increased resulting in job satisfaction of the employees.

This helps the employees to improve their talents and skill and contribute more towards the growth of the firm. The most important thing to be kept in mind is that the organization must identify the correct right people and train them according to their skill and talent level.

If not then the time and money invested on them may not return the ROI (Return on Investment) on those employees.

➢ Team Work

This uses the concept of Synergy. The synergy means when two or more people join together and accomplish job then the results will be higher than the work done by them if they perform it individually.

In short 2+2= greater than 4 is the concept of Synergy.

If people work in groups they accomplish their work faster and more effectively. This is why the management form various teams to carry their activities.

They also transfer the employees from one team to another so that all team members have good relationship with all teams.

➢ Compensation Package

The compensation is very important for an employee to retain in an organization. They are also linked with performance of the employee. When a worker who performs well is not compensated accordingly, he will be demotivated and resulting in absenteeism.

This is the reason behind organization include various compensation packages according to the employee.

Many organization compensate workers based upon their skill and diversified job performed by them. By this the organization will, have pool of labours who are good at all departments in the organization.

The employees who are very good in specific and unique skills are compensated accordingly as they are experts in their own field and it is very hard o replace them with someone. Therefore there is no necessary to emphasise the need for unbiased compensation package for the employees.

➢ Management process and Leadership

Earlier the managers used to supervise their sub ordinates and get work done by them. In this changing environment where team structure

is followed, the managers are termed as "Team Leaders". They are like coach or mentor to their team members. They are the integrate force with integrates employee with the employers.

The team leaders invite their team member to give their suggestion in decision making process. The team members also share responsibility in making a management decision and implementing the same successfully which is not the case in past decade.

The team leader follows democratic leadership style rather than autocratic. In democratic style of leadership the team members have sense of empowerment and feeling of synergy.This will result in close relationship between the team leaders and team members. The team leaders will be also be counselors when their team members require their support especially when they are stressed or depressed.

Knowledge Management Architecture

The Knowledge Management architecture consists of 4 components namely developing knowledge, consolidating knowledge, distributing knowledge and combining available knowledge. The process like analysis plans and actions are falls under these 4 components.
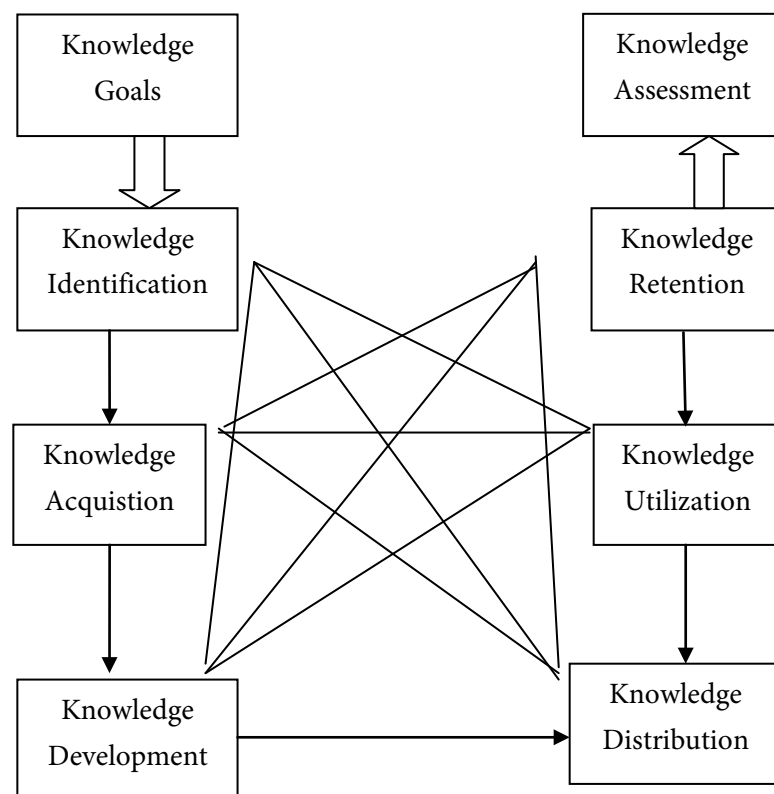
Now let us each components of knowledge management architecture in detail

Developing Knowledge

It is very important for the employees and the firm to develop their knowledge. They can develop the knowledge by learning new things form their day today experiences. The knowledge creation is always based upon the individual and their keen interest to develop and utilise the knowledge obtained.

Mr.Nonaka and Mr.Takeuchi developed a model of knowledge conversion after studying the success of Japanese companies. In The Nonaka and Takeuchi model of knowledge conversion they consist of four steps:

➢ The process of Socialization,

➢ The process of externalization,

➢ The process of combination,

➢ The process of internalization.

➢ Tacit knowledge to explicit knowledge

Socialization	externalization
Internalization	combination

Tacit knowledge From Explicit
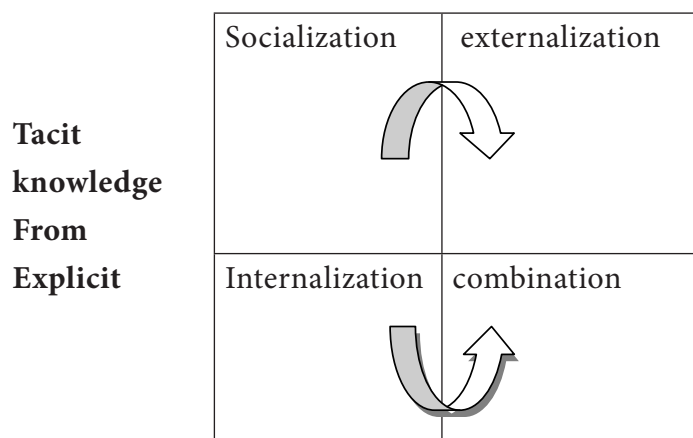
Nonaka and Takeuchi model

The Process of socialization means tacit to tacit knowledge. This means sharing of knowledge directly i.e. face to face or by any other ways of social interactions. The process like brain storming or mentoring the employees is some example for socialization. The organization has knowledge cafes or knowledge days to develop the process of socialization.

The process of Externalization deals with tacit to explicit knowledge. This means the knowledge workers will transform their tacit knowledge

like know how into explicit knowledge which others can understand. For example developing Hypothesis, analogy is example for converting tacit knowledge into explicit knowledge.

The process of combination deals with explicit to explicit knowledge. In this the knowledge are not innovative they are already known to everyone. But the people see it different perspective.

For example in a database grouping the events based upon the occurrence of date and place. While doing so we may find any pattern of their occurrences and the reason behind them. This is how conversion explicit to explicit knowledge is possible in the company.

The process of internalization deals with converting explicit knowledge to tacit knowledge. This is linked with the learning behaviour of the individuals. The individual experiences or learning are converted into tacit knowledge (mental mode). This helps the employees to understand, learn and manifest as observable change, to do their job differently and effectively.

Consolidating Knowledge

This is the second component of knowledge management architecture. The knowledge is created in the mind of the people. They are documented or stored in the organization.

So that even though people retire or quit the company their knowledge are stored into the organization which acts as a guidelines for the young employees who have joined in the company.

These storing of knowledge must be supported by corporate programmes and they must stored perfectly at the right place at right time. This consolidating the knowledge must be accessible to the all employees whenever it is required. The firm must develop system or committee to consolidate the knowledge and to maintain it accordingly which may provide a great use in the future.

Origin and Evolution of Knowledge Management Concepts and Tool

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┌─────────────────────────┐
│    Performance failure   │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│  Problem identification  │
│      and analysis        │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│     Understanding        │
│    problem nature        │
└─────────────────────────┘
            │
            ▼
```

| People Origin | → | Locating root cause for failure | ← | Process origin |

Technology origin

Further refinement

- ➢ **Redesigning process details and process environment**
- ➢ **Technology refinement and modification**
- ➢ **Enhancing people's skills**

Good performance   **Enhanced performance**
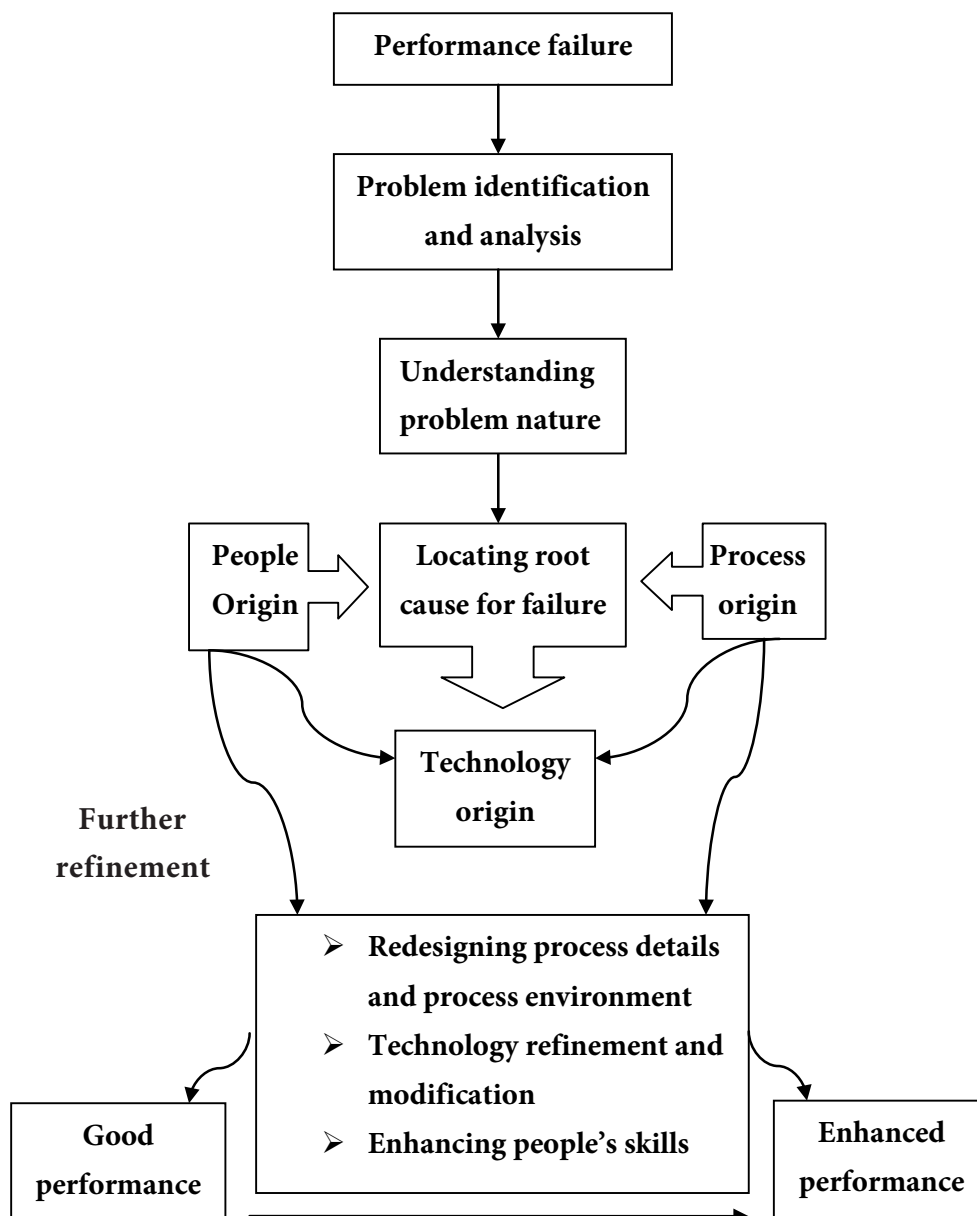
Distributing Knowledge

The third component of knowledge management architecture is distributing knowledge. If the consolidated knowledge is kept static it is not useful to the company. They must distribute the knowledge to all employees of the organization. By doing so, they will utilise the same to perform their job effectively. The turnaround speed of the knowledge is very important for the organization to stay alive in the competition.

The entire knowledge or information cannot be distributed to all the workers in the organization. It is not advisable to convey all

information to all employees. Therefore the company must decide what kind of information or knowledge should be distributed to what level of organization and to whom? It helps to avoid overloads of knowledge to all levels of management. The intranets and help desks help the firm to distribute the knowledge to the concern knowledge workers of the firm.

Integrated System Management

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┌─────────────────┐     ┌─────────────────┐     ┌─────────────────┐
│  Readying the   │ ◄─► │  Project/activity│ ◄─► │    Activity     │
│  spring – board │     │    execution    │     │   take - off    │
│  for a take - off│    │   management    │     │                 │
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        └──────────────────► Provide ◄──────────────────┘
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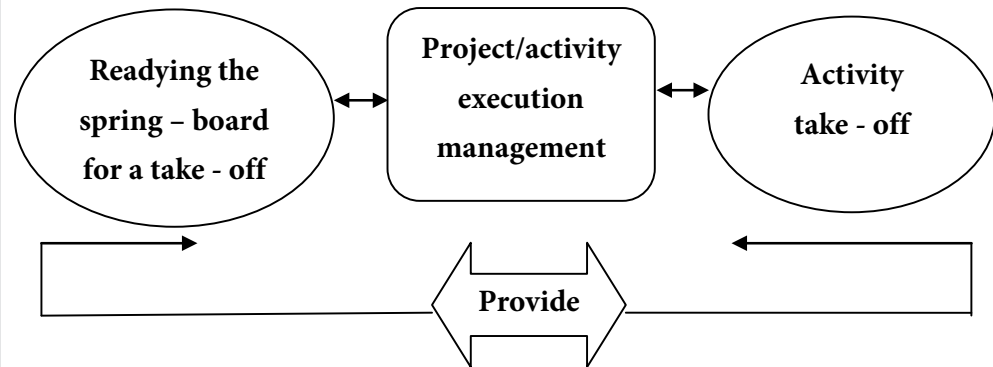
Combining Available Knowledge

The organization in order to be successful it must combine all the teams available in the organization and direct them towards the goals of the firm. Then only it is possible by any company to utilize the opportunities provided in the market.

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Lesson 2.2 - Intellectual Capital And Learning Organizations

In current scenario the companies can't depend upon the traditional management styles for business operations. It will result in losing the market share of the company. The organization must use the knowledge of their workers which makes them stand tall than their competitors. This is because using knowledge as a source for wealth is different from generating wealth from manufacturing products with the help of machines and materials.

The factors like globalization, drastic improvement in science & technology, rapid proliferation of internet, changing demands of the customer, decreased life span of products have driven the firm to go for intellectual capital. The intellectual capital means using the knowledge of employees to create innovative methods in production, quality and providing the customers what they required from the company.

Intellectual capital can be defined as the collective experience of an organizational workforce. It means what people remember about their firm and how they use the same to solve the present situation and how it will be utilised in the future. Intellectual capital is defined as the collective knowledge whether documented or not documented in the organization.

The collective knowledge will be either from individual employees or teams in the organizations. According to Wikipeda, intellectual capital is referred as "the difference in value between tangible assets (physical and financial) and market value". In simple words intellectual capital can be described as the stored knowledge possessed by the organization.

The intellectual capital becomes obsolete very soon with the rapid growth of technology but it can be deployed and regenerated by providing the career development and training programs for the workers thereby they can enrich their knowledge and learn new things constantly. This is why Peter Drucker says that intellectual capital is important and it is different from all other kinds of resources.

It helps to access the knowledge management system in the firm which involves continuous streamlining the internal process thereby the capability of the organizational learning is improved significantly

Classification of Intellectual Capital

The Intellectual capital is classified under three categories namely

- Human Capital
- Structural capital
- Relational capital

1. Human Capital

This deals how employees of an organization provide solutions to solve both internal problems and external threats. It also deals with how well a knowledge worker is able to explore the opportunities available to the company in the external environment. The technical skills of know how, the tacit and explicit knowledge of the employees falls under this category.

This human capital is owned by individual and not by the company. The human capital will vary depending upon the knowledge and skills of an individual. The education and experience of the individuals are also a factor which has part in the intellectual level of individuals. Human capital also measures how effectively the organization utilise their employees in delivering innovative products and services to their clients.

2. Structural Capital

The structural capital deals with the supportive tools which enable the functioning of human capital. The structural capital includes the infrastructure, processes, database, and software available to assist the knowledge workers. It also includes the buildings, patents, trademarks, copyrights and even the image of the company. The structural capital can be categorized based upon the organization and the process.

3. Relational Capital

These classifications deal with the interaction with the customers and the relationship with the customers. It also includes franchisee, licensing and ways through which organization interacts with its stake holders. The stake holders are customers, vendors, contractors, shareholders and all those people who are directly and indirectly related to the functioning of the organization. Apart from these broad classifications of intellectual capital, there are also some categories namely.

Organizational Capital

The organizational philosophy and system used by the company to leverage its business is known as organizational capital. It includes the vision, mission and strategy of the company.

Process Capital

The process capital involves the techniques, procedure and methods used to manufacture and enhance the features of a product. It also includes all things which were used to deliver quality products and services to the customers.

Importance to Intellectual Capital

a) Competency Required by the Knowledge Worker

Earlier employee is required only technical skill if he/she is employed at the low level of management. If the employee is employed at middle or high level of management they must posses several competencies like technical knowledge, ability to handle the critical situation, to turn the threats into opportunities, to handle the conflict inside as well as outside the organization.

The knowledge workers generally tend to work individually or in teams. These teams must be informed regarding the values and strategic intent of the organization. So their actions didn't affect the values of the firm. This must be taken into account in the mind of knowledge workers when take a decision. If not the decisions will not yield benefits to the companies.

This is where the mangers or team leaders have to play their roles to integrate the employees with the company's strategic intent. Therefore the knowledge management strategy will go hand in hand with the company overall strategy. In order to be successful an individual must be skilled in all areas of the organization. In short the employees must have diversified work skill.

b) Mobility of the Knowledge Workers

The business operations have been changed recently. Now the employers go and search for talented and skilled employee instead of employee searching for job. This is because the environment of business is changed rapidly as they compete with their competitors in terms of their intellectual asset (knowledge workers) neither in terms of capital nor technology.

It is hard to find such people and even more hard to retain them. Mostly these knowledge workers work as contractors, consultants or joint venture partners instead of full time employee to the organization. They are paid ransom since they have high demand in labour market and their availability of such labour is very little. This had made the management to focus on how to identify, employ and retain the knowledge workers in the organization.

c) Need For Training

Earlier the training was given to particular level to employees to improve their performance. But now training is provided to all levels of management. This is because in this fast changing environment the employees must perform their job faster with the least amount of resources and also with efficiency.

This had forced the organization to train all levels of employees. By doing they will understand the philosophy, strategy of the organization and it will help them to perform their job better. Some times they may even give suggestion to management to solve a problem.

It is also important for entire work force of an organization to think strategically to accomplish the objectives of the firm. Therefore the

firm indulges in training their employees. The companies generally prefer hands on training to employees especially people involved in handling machines which allows applying the knowledge practically gained by them in the training program.

The managerial executives are provided with the development programs like sensitivity training, role playing to develop their managerial skills. They don't see that training employees as expenses rather they see it as invest in human asset for future returns and benefits availed by the company from their knowledge and performance.

Learning Organizations

This term was coined by Mr.Peter Sange in the year 1990. He has defined learning organizations as "those people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free and where people are continually learning how to learn together".

These learning organizations are followed by companies all over the world as this term guides them to cope up wit the dynamic environment. It tells the firm how to learn new things constantly and update them in the rapidly changing environment.

Mr.Pedler defines the learning organization as "an organization which facilitates the learning of all its members and consciously transforms itself and its context". He developed a frame work for learning company which is listed below along where the organization needs to focus and detailed description for each core characteristics are given below:

Focus	Core Characteristics	Description
Strategy	1. Learning approach to strategy 2. Participative policy making	Strategy making/implementation/evaluation structured as learning processes for example with experiments and feed-back loops Allow all organizational members opportunity to contribute to making of major policy decisions.
Looking in	3. Informating 4. Formative accounting and control 5. Internal exchange 6. Reward flexibility	Use of IT to empower staff through widespread information dissemination and having tolerance to how it is interpreted and used. Use of accounting practices which contribute to learning combined with a sense of self responsibility, where individuals / groups encouraged to regard themselves as responsible for management Constant, open dialogue between individuals and group within an organization and encouraging collaboration not competition New ways of rewarding people for learning contribution which may not be solely financial and where principles of reward system are explicit
Structures	7. Enabling structures	Use of loose and adapted structures which provide opportunities for organizational and individual development.
Looking Out	8. Boundary workers as environmental scanners 9. Inter – company learning	The bringing in to an organization of ideas and working practices developed and used externally – an openness and receptivity to learning from others. Use of mutually advantageous learning activities with customers, suppliers, etc.
Learning Opportunities	10. Learning climate 11. Self development opportunities for all	Facilitate the willingness of staff to take risks and experiment, which can be encouraged by senior management taking the lead. People not punished for criticizing orthodox views. Have opportunities for all staff to be able to develop themselves as they appropriate

(Adapted from the learning company framework of pedlear etal. (1997))

Sometimes people used to think organizational learning and learning organizations are same. But it is not so, they are different form each other. The term organizational learning means the organization gain insights from its experience from the past and the observations and analysis of all the activities in the organization and determining the reasons for failure and success of a project. The learning organizations are something similar to organizational interventions. They will find a way to learn and changes the organization from the traditional way of business operations into new methods where there is a chance for employees learn and develop new things constantly. The learning organizations are must develop the following 5 disciples in order to be an effective learning organization. These disciplines can be mastered only by practicing them constantly for a long period. They are also inter related and inter dependent on other discipline.

1. Personal Mastery

This term is classified based upon the individual perspective. The personal mastery deals with the commitment of individuals to learn new things constantly for their self development. This helps them to achieve their personal goals and continue to have long term commitment to the organization. The companies encourage these kinds of practices because it is mutually benefit to the individual and the organization.

2. Building a Shared Vision

The process of creating a vision is very important from strategic point of view. Thus vision statement must be created with the managerial executives and their employees. By doing so it will develop long term commitment and we can transform our shared vision into reality

3. Mental Modes

This is imaginary images which we crate in our mind about what we are going to be in future. The mental mode also contains our opinion about others. They also play a part in shaping our future decisions and actions. The mental mode doent have any limitations and sometimes it many not be practical applicable.

4. Team Learning

In team learning the team members are closely related to one another and they trust each other. The team leaning emphasizes ion collaborating and performing a job together. The authority is applied very little in team learning. The team learning transforms team knowledge and intelligence to perform their job at a faster rate with utmost efficiency.

5. System Thinking

The system thinking serves as a corner stone for other disciplines. It means all the teams or departments in the organization are inter- related and inter dependent with each other. The other important character of system thinking is that all the teams or department in the organization work toward the achievement of same objectives.

All the above 5 disciplines will help the firm to establish the following

Sense of Purpose

The employees have a clarity why they are supposed to perform an activity. This articulated view of future helps them to move in the direction along with the firm.

Information Flows

The systematic method of flow of information ensures that all employees know what is happening in and around the company. They also help in a greater extent to perform their roles and duties perfectly in the organization.

Decision Process

The decision making process is made simpler as the suggestions are given by employees who know the job better then the top level managerial as it them who are directly related to the work. I.e. they are actual implementers of the decision. This encourages the organization to alter the status quo for the betterment of employees and the company.

Communication

The organization shares the information among employees and there is proper flow of information. This ensures there is no miscommunication between the management and their employees. It also ensures that all employees are well aware about the company strategy and the gaols of the organization.

Culture

The organizational culture is changing as the companies encourages their workers to learn new things constantly, thereby the traditional organizational culture in changed into a learning organizational culture.

Knowledge Management Strategy

The various cross functional teams in a knowledge based organization follow various knowledge strategies to accomplish their objectives. This strategy and sometimes it will be conflict with other teams.

The best way is to analyse whether the strategy formed runs in parallel with organization mission and focus to strengthen its core competency.

The knowledge management strategy adopted in the firm is illustrated below in form of a diagram:

Business Strategy

| Culture and people | Organization development process | Infrastructure and facilities | Intellectual asset |
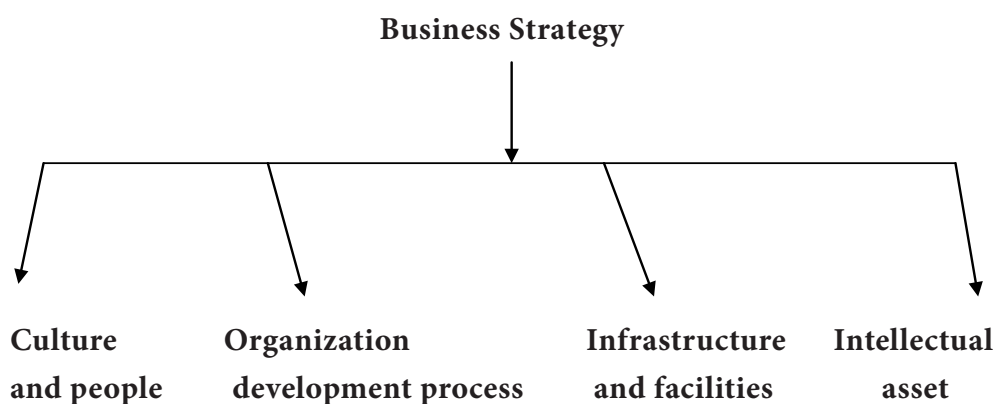
Knowledge Management Strategy

(Refernce:Angela, Abell and Nigel Oxbrow, people who make knowledge management work)

The organization must involve in long term planning for man power. It is different from long term, planning for productivity. There are various factors needs to be carefully considered before planning how to develop the labour force in terms of knowledge, skill and creativity. The organization must be very careful in approaches related to succession planning as it requires vast amount of time to plan and implement it. The long term planning also plays a role in the HR practices followed in the organization.

The organization need to invest in training and development of their laborers. They must look it a s way for gaining competitive advantages at all levels of the firm. The leaders play an important role in shaping people as the intellectual asset to the company, thereby giving the firm competitive advantage from their competitors.

Mr.Peter Drucker told that the members of an organization need to learn about expanding knowledge and it is much more imperative to learn how and when to utilise the same.

Generally the employees especially in the middle and low level of management have a tendency that their performance doesn't have impact or important for the success for organization. They are wrong about this, in fact it is their performance and their presence indeed has a great impact on the firm's success.

The organization must find a way to make employee realize this fact. The organization must inform their employees and make them aware of the realities and threats posed by external environment.

The strategic planning process is usually formulated by any firm to obtain their objectives. This strategic planning must changed completed as it supports the knowledge management and evolving strategy which supports both organizational strategic intent and knowledge management.

The organization must identify the talents and the competency required for every individual job in the organization. Then the people must be recruited according to their competencies, thereby putting right people at the right job which improves the performance of the employees and their job satisfaction level.

Even though employees are very skilled if he is placed in the wrong job, his performance will be very poor. Therefore it is utmost important for the employers to appoint employees in the work profile according to their competency, skill and ability level.

Knowledge Life Cycle

```
              ┌────────────────────┐
              │  Use and leverage  │
              │     knowledge      │
              └────────────────────┘
       ↑                                    ↓
┌──────────────┐                   ┌──────────────┐
│   Deploy     │                   │  Create new  │
│  knowledge   │                   │  knowledge   │
└──────────────┘                   └──────────────┘
       ↑                                    ↓
┌──────────────────────┐   ←   ┌──────────────────┐
│     Organize and     │       │ Capture and store│
│ transform knowledge  │       │    knowledge     │
└──────────────────────┘       └──────────────────┘
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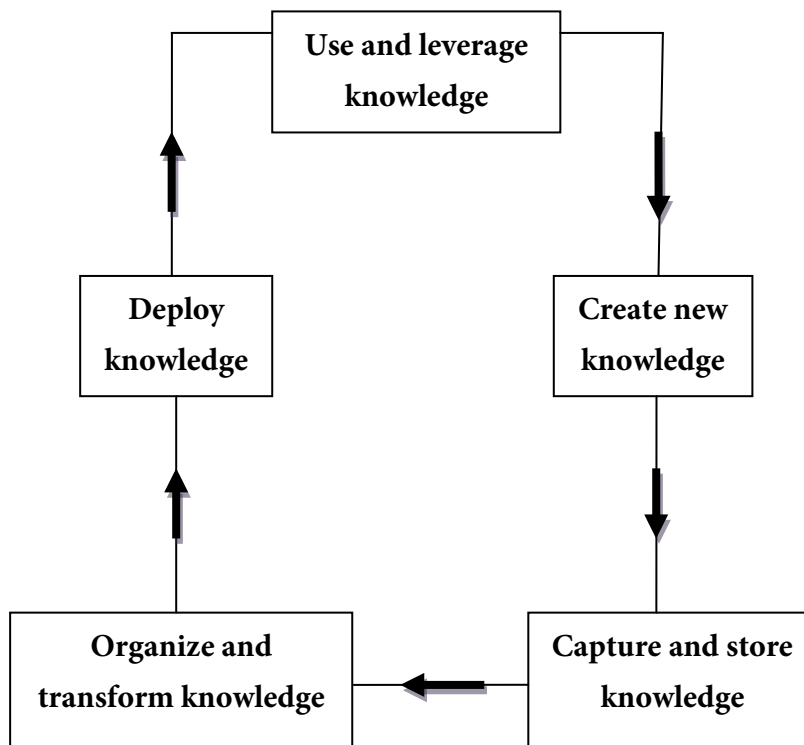
Knowledge Life Cycle

The various stages of knowledge life cycle are explained below:

I) Creation of Knowledge

It is the first phase of knowledge life cycle. In this the knowledge workers studies the entire process and works carried in the firm. They started to create knowledge either from the existing processes or by thinking about it. The observations, training and development, helps an individual to gain new knowledge.

They can gain knowledge from other experience or by spending their time with knowledge champions. In this the individuals must do the following actions

> ➤ Learn

> ➤ Research

> ➤ Innovate

i

i) Capture and Store Knowledge

It is the second phase of knowledge life cycle. In this phase, the knowledge workers must reuse and built on the ways to utilise their knowledge. They must store their knowledge in an appropriate manner thereby it acts a guide for the future generations. The organizations must ensure that the knowledge is stored properly in the organization.

ii) Organize and Transform the Knowledge

It is the vital phase in knowledge life cycle. This is the phase where the knowledge acquired by the individuals is transformed and applied practically. If individuals applies any wrong methodology of applying the knowledge in real life then all the efforts taken by the individuals in learning and capturing knowledge goes waste. In short this phase is all about to make knowledge broadly available and embedding it to the business processes carried in the firm.

iv) Deploy Knowledge

This phase is all about improvising the processes, products and services. The knowledge workers take measures to improve the business processes thereby turning the threats into strengths. The knowledge workers aims to optimise the resources utilised by the firm and the exploit the opportunities available across the globe.

v) Use and Leverage Knowledge

To put in a nut shell, in this phase the knowledge workers act intelligently for success and viability. They use their knowledge as an asset to leverage the firm's growth.

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Lesson 2.3 - Knowledge and Role Related Issues

By implementing knowledge management in the organization, they can explore the opportunity available in the external environment and most importantly they provide ways to utilize the knowledge of their employees. The company which can encourage, store and capture the creativity and unleash them in the form of innovative products will be the market leaders as well as trend setters in the market.

The knowledge management also helps the organization to respond quickly to the ever changing dynamic business environment and international trade whereby they can respond faster and delivery goods as per the expectations of their clients. If the companies are not able to adapt them fast enough to this dynamic environment then will slowly lose their customers resulting either in bankrupt or merger & acquisitions with other firms. In spite of these benefits it also has some issues relating in successful implementation of knowledge management. According to Mr.Shermon the issues are listed below:

Loss of Knowledge Workers

In knowledge management workers are considered as intellectual asset of the company. When these personnel arte transferred due to promotion or quit their job then their knowledge also moves with them which is a not a positive sign for the organization growth. In order to avoid such incident the organization must develop procedures to deposit or store the knowledge so that people can access them even though the knowledge personnel moves or transfer in to different branches or cross functional team.

Resistance to Share the Knowledge

In this era, the knowledge is power. So people are very resistance to share the knowledge with others. But to develop the firm it is very vital to develop an organization culture when people share their knowledge with

others. This is possible only when the mental setup of the employees is changes. By rewarding the knowledge sharing employees it will help to minimise the resistance of sharing the knowledge with others.

Absence of Adequate Knowledge Management System

Generally in knowledge based organizations work in team structure, when a team works and complete a project there is no mechanism to store their experience and methods used by them to complete their work. If some other team engage in similar type of work they have to start fresh. If there is mechanism to store the knowledge and dissemination of information will help other to complete their work faster. Similarly they will help other workers to know how to handle a similar situation when it happens in the future.

Absence of Developing Learning Organizational Culture

There organizational culture has to encourage continuous learning. The company must need to set up some common knowledge domain where the experienced and the new employees of the organization can learn about the organization.

The common knowledge domain may consists of PowerPoint presentation, training methods and suggestions, preliminary questions, research articles, Journal publications, effective knowledge managements systems and answers to the some common queries that may arise in the mindset of the employees.

Hurdles in Disseminating Knowledge

There are various departments and functional teams in the organization. The information from the knowledge centre must be communicated or disseminated properly to other departments like manufacturing, logistics and marketing departments.

The dissemination of information must be understood properly by the receiver without any misunderstanding. The management must ensure that there is no miscommunication while dissemination the information.

Benchmarking

The organization must develop ands share the best practices within the organization as well as outside the organization. They must adapt such best practices and implement in the organization. They must not stop with it they have to evaluate and see whether the adapted practices are yielding good results to the organization.

Generation of Knowledge

The organization must find the knowledge sources. They need to devise a mechanism to tap the internal and external knowledge resources and encourage the employees by setting up knowledge communities for the generation of knowledge. It helps to develop the knowledge of the workers and creating a pool of knowledgeable workers in the organization.

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Lesson 2.4 - Performance Appraisal In KBO

In layman's language, performance appraisal is the assessment of employee's job performance against well defined objectives. Performance appraisal is one of the important roles carried out by HR managers. The performance appraisal is carried out for the following objectives:

➢ To promote and reward the employees based upon their performance

➢ To make the employees understand where they stand in accordance to their performance

➢ To identify the training programs required by the employees to improve their skills and job performance

➢ To determine the underlying reasons for effective or ineffective performance

➢ Performance appraisal helps to improve the communication between their superiors, peers, subordinates.

➢ To evaluate whether the HR selection process followed by the organization is effective or not.

Objectives of Performance Appraisal

The evaluation of employee's performance against pre set standard serve four objectives namely

➢ Developmental Uses,

➢ Administrative uses/decisions,

➢ Organizational maintenance / objectives,

➢ Documentation.

The table below briefly describes each of the objectives along with their purposes

General Applications	Specific Purpose
Developmental Uses	➤ Identification of individual needs ➤ Performance feedback ➤ Determining transfers and job assignments ➤ Identification of individual strength and developmental needs
Administrative uses/ decisions	➤ Salary ➤ Promotion ➤ Retention or termination ➤ Recognition of individual performance ➤ Lay-offs ➤ Identification of poor performers
Organizational maintenance / objectives	➤ HR planning ➤ Determining organization training needs ➤ Evaluation of organizational goal achievement ➤ Information of goal identification ➤ Evaluation of HR practices ➤ Reinforcement of organizational developmental needs
Documentation	➤ Criteria for validation research ➤ Documentation for HR decisions ➤ Helping to meet legal requirements

Adapted from Cynthia D.Fisher, Human Resource Management.

Performance Appraisal

➤ Performance evaluation or performance appraisal is the process of assessing the performance and progress of an employee or a group of employees on a given job and his potential for future development.

- Acc to Flippo, " PA is the systematic, periodic, and an impartial rating of an employee's excellence in matters pertaining to his present job and his potential for a better job"

- Merit rating measure what the person is whereas PA measures what the person does

- MR judge the caliber of an employee so as to decide salary increment

- PA focus on the performance and future potential of the employee.

Potential Benefits of Performance Appraisals

- Facilitation of communication
- Enhancement of employee focus through promoting trust
- Goal setting and desired performance reinforcement
- Performance improvement
- Determination of training needs

Methods of PA

1. Appraisal of employees according to traits, attributes and general behavior on the job – trait approach
2. Appraisal of results, work and goals achieved by the employees, known as appraisal by results.

Appraisal Based on Traits

1. Ranking method
2. Paired comparison
3. Grading
4. Forced distribution method
5. Forced choice method
6. Check-list method
7. Critical incidents method
8. Graphic scale method
9. Essay method
10. Field review method

1. Ranking Method

➢ Oldest and simplest

➢ A person is ranked against others on the basis of certain traits and characteristics

➢ Difference in ranks do not indicate absolute or equal differences of ability bet individuals, the method has limited value

2. Paired Comparison

➢ Slight variation of ranking system designed to increase its value for use in the large groups

➢ Each person is compared with other persons

➢ Only One trait suitable to perform the job is considered

➢ The rater is provided with a bunch of slips each containing a pair of names

➢ He put a tick mark against the person whom he considers the better of the two

➢ Final ranking is determined by the no. of times that person is judged better than others.

3. Grading

➢ Abilities or performance are defined well in advanced and persons are put in particular category depending on their traits and characteristics.

➢ Grade like outstanding

➢ Promotion

➢ Limitation – rater may rate for most employees higher grades.

4. Forced Distribution Method

➢ Evaluator rates subordinates according to a specified distribution. Unlike ranking methods, forced distribution is frequently applied to several rather than only one component of job performance.

> Forced distribution method is demonstrated to manager to rate subordinates according to the following distribution: 10 percent low; 20 percent below average; 40 percent average; 20 percent above average; and 10 percent high.

> This method is not used in small groups or when group members are all of high ability.

5. Forced Choice Method

> FCM contains a series of group of statements and the rater checks how effectively the statement describes each individual being evaluated.

> Two statement positive or negative.

> Only one statement is considered for final analysis of rating

> E.g.. The employee is hard working

> The employee gives clear instruction to his subordinates

> Both the statements are positive but the rater is asked to rate only one which is more descriptive of his subordinate's behavior in order to avoid subjectivity in rating.

> This method may be more objective but it involves lot of problems in constructing such sets of statements.

6. Check-List method

> The rater provides appraisal report answering a series of questions related to the appraisee.

> Questions prepared by PD related to behaviour of the appraisee with two alternatives, Y or N

> This method is easy to handle if proper questions are framed for different categories of employees

> Acc to flippo, it is difficult to assemble, analyse, and weigh a no. of statements about employee characteristics and contributions.

7. Critical Incidents method

> Critical incidents and behaviour associated with these incidents are taken for evaluation

- Three steps – a test of noteworthy on the job behaviour is prepared.
- Group of experts then assigns scale values to them depending on the degree of desirability for the job.
- Checklist of incidents which define good and bad employees is prepared.
- The rater is given this checklist for rating.
- The idea behind this is to identify the person who do well in critical situations

Limitations

a. Critical incidents technique of evaluation is applied to evaluate the performance of superiors rather than of peers of subordinates.

b. Negative incidents may be more noticeable than positive incidents.

c. It results in very close supervision which may not be liked by the employee.

d. The supervisors have a tendency to unload a series of complaints about incidents during an annual performance review session.

8. Graphic Scale Method

- Linear rating scale
- Printed appraisal form is used for each appraise
- It contains various employee characteristics and his job performance
- In employee characteristics qualities like initiative, leadership, co-operation, dependability, industry, attitude, enthusiasm, loyalty, creative ability, analytical ability, and co-ordination.
- In job performance quality of work, the quantity of work, specific goals achieved, regularity of attendance attitude towards superiors and associates etc.,
- 5 point rating scale

9. Essay Method

- Under this method the supervision makes a free form open-ended appraisal of the employee in his own words and puts down his impressions about the employee.

- Job knowledge and potential, employee characteristics and attitude, quality and quantity control etc.

- The quality standard for the appraisal may be unduly influenced by appearance rather than content.

10. Field Review Method

- Appraised not by direct superior but by another person usually from PD

- Under this method a trainer employee from the personnel interviews line supervisors evaluate their respective subordinates.

- The appraiser is fully equipped with definite set of question usually memorized in advance.

- The supervisor is required to give his opinion about the progress of his subordinate

- This system is useful for large organization and does not suffer from weakness

- The main defect is that it keeps management representative too busy with appraisal

Limitations of Appraisal Based on Traits

1. This approach is more prone to biases – trait is the personal quality of an individual which cannot be identified by mere observation

   - if test are not used appraisal based on observation is likely to be misleading

   - in less rating employee feel that they have been unfairly treated.

2. Identification of Traits to be Evaluated

   - Psychologists have identified 300 traits

- To select trait for evaluation is difficult
- Select trait based on job description.

3. Resistance of Employees

- Org should consider work performance and not personal values and thinking.
- Superior also resist because they have to rate without knowing fully how exactly to rate

Appraisal by Results or Objectives

- Managerial level, against the setting and accomplishment of objectives
- It is a joint process bet a superior and his subordinates
- The subordinate prepares his plan for specific period usually for one yr. the final plan is prepared through mutual consultation
- Both of them decide the evaluation criteria, supporting role of superior is also finalized so that the subordinate is clear about the various supports he will get
- At the end of specified period, superior makes a per eval of the subordinate on the basis of mutually agreed-criteria
- Superior discusses the results of his evaluation with the subordinates

Appraisal by Results

1. The method has been evolved by Peter Ducker

2. It seeks to minimize external controls and maximize internal motivation by joint goal setting between the manager and the subordinates and increasing subordinates own control of the work.

3. It strongly reinforces the importance of allowing the subordinates to participate actively in decision that affects him directly by M.B.O Process

4. In M.B.O we has five steps to follow

5. Set organization goals

6. Joint goal setting

7. Performance reviews

8. Set checks posts

9. Feedback.

Benefits of M.B.O Program

➢ M.B.O helps and increases employee motivation

➢ Managers are more likely to compete with themselves then with other managers.

➢ M.B.O results in a mean end chain.

➢ M.B.O reduces role conflicts.

➢ M.B.O provides more objective appraisal

Drawbacks

1. M.B.O program takes a deal of time energy and from completing on the part of the managers he becomes so enmeshed in the assigned functions that he loses sight of the goal.

2. Those executives who have been involved find it very difficult to think about the results of work rather than the work itself.

3. There is sometimes a tug of war in which the subordinates try to set lowest targets possible and the superior's highest targets possible.

Barriers to Effective Appraisal

1. Faulty Assumptions

a. Managers wish to make a fair and accurate appraisal of subordinates is untenable

b. They will continue a particular PAS for ever

c. Personal opinion is better than formal appraisal

d. Managers assumptions on employee to know about the performance is not valid.

2. Psychological Blocks

➢ PA depends on skill of user

➢ PB – feeling of insecurity, appraisal as an extra burden, dislike to communicate and to treat employees in case of poor performance

3. Technical Pitfalls

Criterion problem and distortions that reduce the validity of results

1. Criterion is the standard against which actual performance compared. It is hard to define in measurable or even objective terms – Traits

2. Distortions – biases and errors in making the evaluation

   a. **Halo or Horn Effect** – This is an assumption on the part of the supervisor that because the employee was good at one thing, they will be good at another, or vice versa

   b. **Tendency Error** – There are two kinds of tendency errors. Central tendency is when the supervisor tends to see everything as average, such as a 3 on a 5-point scale. Leniency is another tendency error where the supervisor tends to see the employee only in a positive light.

   c. **Contrast Effect** – This occurs when comparing the skill of the employee with the skill of another employee, which results in an unfair judgment of the first employee.

   d. **Personality Conflict** – Personality conflict between the employee and the supervisor can cause the leader to make an inaccurate assessment of the employee's contribution

   e. **Constant errors** – easy rater and tough raters

   f. Rater's liking and disliking.

The Performance Appraisal Process

The foremost step in performance appraisal process is to establish the objectives. This means the employees should their objectives to be attained priority. This helps the employees to devise ways to obtain their objectives. Presently the companies go for system approach which means all the departments in the organization focus towards one common goal.

Then the second step is to establish job expectations. The employers must understand what their employees expect from their job. By doing so, we can understand their expectations regarding the job.

The performance appraisal is done once the performance appraisal questionnaire has been filled by the superiors. After this the appraisal data is processed and accordingly the employees are either rewarded or promoted based upon their performance.

1. Establishing Performance Standards

 ➢ The first step is to set standards which will be used as the base to compare the actual performance of the employees.

 ➢ This step requires setting the criteria to judge the performance of the employees as successful or unsuccessful and the degrees of their contribution to the organizational goals and objectives.

 ➢ The standards set should be clear, easily understandable and in measurable terms.

The above process is illustrated in the form of flow chart
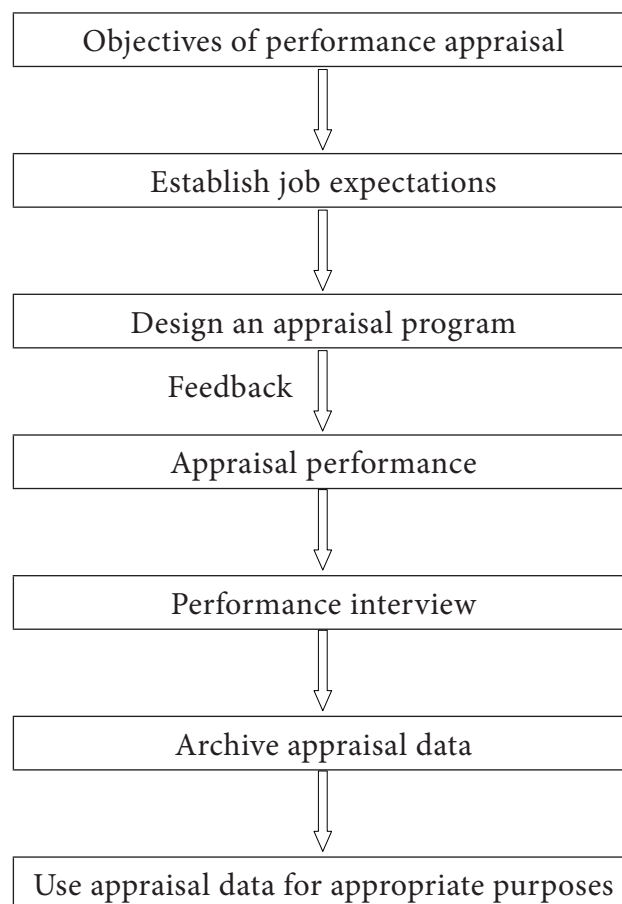
Performance Appraisal Process
(Reference: Ashwathappa.K Human resource management)

2. Communicating the Standards

- ➢ The management should communicate the standards to all the employees in the organization.

- ➢ The standards should be clearly explained and this will help them to understand their roles and to know what exactly is expected from them.

- ➢ The standards should also be communicated to the appraisers or the evaluators

- ➢ At this stage the standards can also be modified according to the relevant feedback from the employees or the evaluators.

3. Measuring the Actual Performance

- ➢ The most difficult part of the Performance appraisal process.

- ➢ It is a continuous process which involves monitoring the performance throughout the year.

- ➢ This stage requires the careful selection of the appropriate techniques of measurement, taking care that personal bias does not affect the outcome of the process and providing assistance rather than interfering in an employees work.

4. Comparing Actual with the Desired Performance

- ➢ The comparison tells the deviations in the performance of the employees from the standards set. The result can show the actual performance being more than the desired performance or, the actual performance being less than the desired performance depicting a negative deviation in the organizational performance.

5. Discussing Results

- ➢ The result of the appraisal is communicated and discussed with the employees on one-to-one basis.

- ➢ The focus of this discussion is on communication and listening.

- ➢ The results, the problems and the possible solutions are discussed with the aim of problem solving and reaching consensus.

- ➢ The feedback should be given with a positive attitude as this can have an effect on the employees' future performance.

- ➢ The purpose of the meeting should be to solve the problems faced and motivate the employees to perform better.

6. Decision Making

- ➢ The last step of the process is to take decisions which can be taken either to improve the performance of the employees, to take the required corrective actions, or the related HR decisions like rewards, promotions, demotions, transfers etc.

Making PAS more effective

1. Mutual trust
2. Clear objectives
3. Standardization
4. Training
5. Job relatedness
6. Documentation
7. Feedback and participation
8. Individual differences
9. Post appraisal interview
10. Review and appeal

Developing a PAS

Objectives, benefits and main features of the approach

1. Where and how should PS be introduced?
2. Decide who is to be covered
3. Decide on whether the same approach should be adopted at each level
4. Set up project team
5. Define the role of HRD
6. Decide whether to use outside consultants

7. Define PM process and documentation

8. Pilot test

360 Degree Appraisal Technique

Systematic collection and feedback of performance data on an individual or group, derived from a number of the stakeholders in their performance.the appraisal given by peers, subordinates, workers, head of the department etc.

The half yearly report or yearly report of work schedule goes from the company to the head quarter of all the workers performance is the appraisal it contains all the demotion, promotion and other activities related to the performance.

Appraisal Technique

➢ Minimum 15 person assess

➢ 360 degree appraisal has four integral components:

1. Self appraisal

2. Superior appraisal

3. Subordinate's appraisal

4. Peer appraisal.

1. Self-Appraisal

Employee himself gives the feedback or his views and points regarding his performance.

➢ Usually this is done with the help of a self appraisal form where the employee rates himself on various parameters, tells about his training needs, if any, talks about his accomplishments, strengths, weaknesses, problems faced etc.

2. Superior's Appraisal

➢ Superior's appraisal forms the traditional part of the 360 degree performance appraisal where the employees' responsibilities and actual performance is rated by the superior.

3. Subordinate's Appraisal

➢ Subordinates appraisal gives a chance to judge the employee on the parameters like communication and motivating abilities, superior's ability to delegate the work, leadership qualities etc.

4. Peers' Appraisal

➢ It can help to find employees' abilities to work in a team, co-operation and sensitivity.
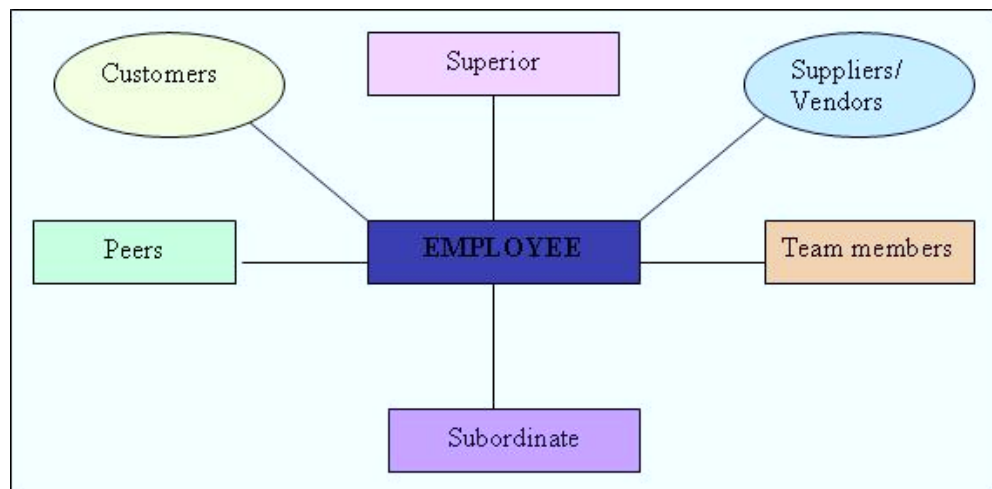
Uses of 360 Degree Appraisal

➢ 360 Degree Feedback is a system or process in which employees receive confidential, anonymous feedback from the people who work around them. This typically includes the employee's manager, peers, and direct reports.

➢ Self development and individual counseling

➢ Part of organized T and D

➢ Team Building

➢ Performance Management

➢ Strategic or Organizational Development

➢ Validation of training and other initiatives

➢ Remuneration

Learning and Growth Dimensions

➢ They emphasise that learning is very important for the knowledge based organization. The knowledge workers are repository of knowledge thereof they must always learn things that improve their knowledge. In this era, the knowledge becomes obsolete faster than technology.

➢ So, not only the knowledge workers learn but they must also apply the knowledge in the activities carried by them. The mentors can be appointed within the organization to guide the knowledge workers in learning new things; they can also set metrics by which they can know where the employees lack in learning new things.

Business Process Dimensions

This perspective deals with how a product or service is deliver to the customers. The business re-engineering falls under this perspective. It deals with how fast and efficient the process scan be carried out by which goods or services can be delivered to the customers as soon as possible.

This perspective also deals with whether our products are satisfying the customer needs or do we produce products based upon the customer requirements or not. The metrics are set up the management to keep an eye over all the internal process in the firm.

The Customer Dimensions

If the company doesn't produce products based upon the preferences of the customers, they will lose them. The customers will shift to another brand, which is a loss to the company. If the same pattern continues, then the firm can't survive in the market for the long run.

Therefore it is utmost important for the company to understand their customers and produce goods based upon their preferences. By doing so, the customer will be satisfied and will remain loyal to the company. The company must also have additional feature top retain the customers in the long run.

The Financial Dimensions

We can't discard the traditional financial methods to know the performable of the organization. The financial data are necessary for the firm and the mangers must always update them. Then these data were analysed and the financial performance of the company can be calculated.

The financial data must be accurate if not it will create a disaster in the financial measure of the company. Based union the financial results, the management must take necessary actions to develop the company.

Balanced Score Card Method for Performance Appraisal in KBO

It is the most popular method used by much organization to measure the provenance of the employees. To put in a nutshell it is a managements system used to align business practices towards its strategy and monitor the performance of the organization. This method was devised by Drs. Robert Kaplan and Mr.David Norton.
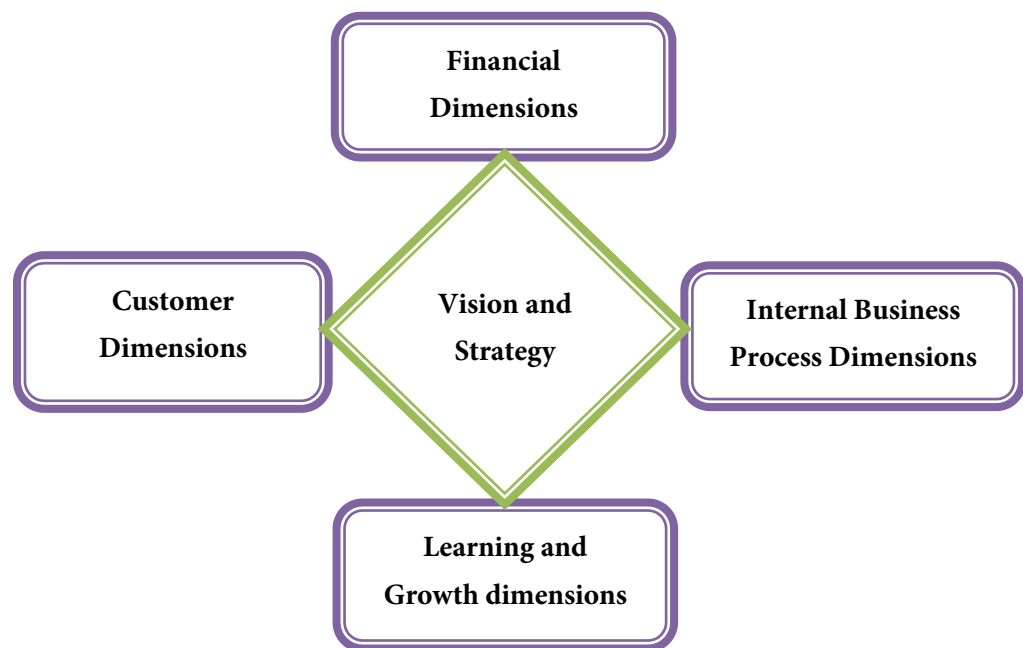
The dimensions of Balance Score Card

The table below is an example for Sample Balance Score Card method Implementation

	Objectives	Metrics	Targets	Initiatives
Financial				
Customer				
Internal Processes				
Learning and growth				

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Lesson 2.5 - Intellectual Property Rights (IPR)

The Intellectual Property is intangible in nature. The Intellectual Property Right is a kind of ownership right in relation to certain material object that is created or invented by the owner i.e. individuals. The owner innovate a new product or made changes in the existing product.

The Intellectual Property Rights (IPR) helps the individual to protect their creative ideas or products from duplication. By doing so, they can compete in the market with new technology which gives edge over their competitors. The goal of Intellectual Property Right is to accrue evenly to creators and users without distinction of any kind and the deployment of resources should be directed in such a manner as to equal opportunity among nations to enjoy the benefits of knowledge based process.

The term Intellectual Property Rights covers Patents, designs, trademarks, know -how and any confidential information. The industrial designs also fall under Intellectual Property Rights under the Design Acts 1911, in relation to the goods for which it is registered for a maximum of 15 years subject to payment of renewal fees prescribed by the rules. After 15 years the competitors can use the industrial designs if they wanted to do so.

During those 15 years they need to pay a certain amount of money called Royalty to the individual or company which created the industrial design.

Patents

It is a kind of intellectual property when an individual discovered or invented any new innovative ideas or products they patent their product or ideas. By doing so, it restrict other individuals to copy their ideas or products which are against the law. The objective of patent system is to encourage technology and economic improvement by rewarding intellectual creativity of the individuals or an organization.

The patent is given to the inventor for a limited period of time of 20 years from the date on which the inventor applies for patent. The inventor can have the patent to have the right for himself/herself only in exchange for full disclosure to the public regarding how to use it. During those limited time frame, the inventor can use the same to produce and market their products or services.

The patents are available for all kinds of technological innovation even though for small technological increments. There are certain exceptions from getting patent. For example human genes and perpetual machine which goes against the laws of nature cannot be patented unless anyone demonstrates how it is working.

Copyrights

The term copyright means an exclusive right to do or authorize others to do a certain things in relation to literary, dramatic, musical and artistic works, cinematography and sound recordings. Unlike the paten the copyright doesn't have any specific time limit.

The copyright exist until the author of the work exists. Sometimes the time limit of copyright exceeds 60 years with certain exceptions. India has enacted Copy right Act 1957 which is amended under the Amending Act 1994.There were major changes in the India Copyright act in 1994 and it came into effect form 10th May 995.

The works specified in the act are listed below:

  ➢   A literary, a dramatic and musical or artistic work,
  ➢   A cinematography film,
  ➢   A Sound recording.

For example let's say, Intellectual Property Right of computer software is covered under the provisions of Indian Copyright Act 1957.

The aim of copyright is to motivate the authors, artists, designers and composers by rewarding them with rights for limited time frame where they can earn money from their works. The end goal of this act is to prevent the unlawful reproduction or exploitation of an individual work or masterpiece.

'Piracy 'is a term related to copyrights. It is used to describe the deliberate infringement of copyright on a commercial scale. The piracy rate is increased drastically in the recent years due to rapid advancement of technology. Today copyright is also given for the original industrial machine drawings and machine parts in the manufacturing sector.

Ideas and live events are exception to copyrights. The copyrights can be provided only if the ideas are converted into material form. It is legitimate to adopt ideas form one individual or organization.

Trademarks

Unlike patent and copyrights the trademarks are kind of Intellectual Property with Perpetuity subjected only to the condition that it is used and renewed periodically. Thereby taking prompt and timely actions against the infringes.

The Trademarks perform the following functions:

- ➢ Identifies the product and its design,
- ➢ Guarantees its unchanged quality,
- ➢ Advertises the product,
- ➢ Creates an image for the product.

The trademark is created to give an indication to the purchaser the trade source from which the goods come, or trade hands through which they pass on their way to the market. Thereby the purchaser is sure that the product he/she is buying is a quality product. Trademark is not used to indicate the manufacturer an also the quality of the goods. The laws related to Trademark are Trade and Merchandise Marks Act 1958 and Trade and Merchandise Marks Rules 1959. For example if the product has AGMARK it means it is a quality product and it is free from adulteration. Thus the AGMERK trademark is used to indicate the quality to the customers.

World Trade Organization

The World Trade Organization (WTO) is the only global international organization dealing with the rules of trade between nations. At its heart are the WTO agreements, negotiated and signed by the bulk of

the world's trading nations and ratified in their parliaments. The goal is to help producers of goods and services, exporters, and importers conduct their business.

The WTO began life on 1 January 1995, but its trading system is half a century older. Since 1948, the General Agreement on Tariffs and Trade (GATT) had provided the rules for the system. (The second WTO ministerial meeting, held in Geneva in May 1998, included a celebration of the 50th anniversary of the system.) It did not take long for the General Agreement to give birth to an unofficial,*de facto* international organization, also known informally as GATT. Over the years GATT evolved through several rounds of negotiations. The last and largest GATT round, was the Uruguay Round which lasted from 1986 to 1994 and led to the WTO's creation. Whereas GATT had mainly dealt with trade in goods, the WTO and its agreements now cover trade in services, and in traded inventions, creations and designs (intellectual property).

There are a number of ways of looking at the WTO. It's an organization for liberalizing trade. It's a forum for governments to negotiate trade agreements. It's a place for them to settle trade disputes. It operates a system of trade rules. (But it's not Superman, just in case anyone thought it could solve — or cause — all the world's problems!)

It's a Negotiating Forum

Essentially, the WTO is a place where member governments go, to try to sort out the trade problems they face with each other. The first step is to talk. The WTO was born out of negotiations, and everything the WTO does is the result of negotiations. The bulk of the WTO's current work comes from the 1986-94 negotiations called the Uruguay Round and earlier negotiations under the General Agreement on Tariffs and Trade (GATT). The WTO is currently the host to new negotiations, under the "Doha Development Agenda" launched in 2001. Where countries have faced trade barriers and wanted them lowered, the negotiations have helped to liberalize trade. But the WTO is not just about liberalizing trade, and in some circumstances its rules support maintaining trade barriers — for example to protect consumers or prevent the spread of disease.

It's a Set of Rules

At its heart are the WTO agreements, negotiated and signed by the bulk of the world's trading nations. These documents provide the legal ground-rules for international commerce. They are essentially contracts, binding governments to keep their trade policies within agreed limits. Although negotiated and signed by governments, the goal is to help producers of goods and services, exporters, and importers conduct their business, while allowing governments to meet social and environmental objectives.

The system's overriding purpose is to help trade flow as freely as possible — so long as there are no undesirable side-effects — because this is important for economic development and well-being. That partly means removing obstacles. It also means ensuring that individuals, companies and governments know what the trade rules are around the world, and giving them the confidence that there will be no sudden changes of policy. In other words, the rules have to be "transparent" and predictable.

It helps to Settle Disputes

This is a third important side to the WTO's work. Trade relations often involve conflicting interests. Agreements, including those painstakingly negotiated in the WTO system, often need interpreting. The most harmonious way to settle these differences is through some neutral procedure based on an agreed legal foundation. That is the purpose behind the dispute settlement process written into the WTO agreements.

GATT

- ➢ General Agreement on Tariffs and Trade.
- ➢ Treaty organization affiliated with the United Nations whose purpose was to facilitate international trade.
- ➢ The primary actions of the organization were to freeze and reduce tariff levels on various commodities.
- ➢ GATT was created in 1947, and was originally intended to become a part of the International Trade Organization (ITO); however, the

ITO failed to be created, so the GATT was left as an independent organization.

➢ In 1994, GATT was superseded by the WTO.

History

GATT was originally signed in 1947 and now includes around 150 signatory nations. The treaty is negotiated in rounds, with the latest round ending in 1993 in Uruguay. This round led to the creation of the World Trade Organization (WTO), which turned the treaty from a simple agreement to an administrative body.

Function

GATT's main function is to promote fair trade among member nations by reducing and regulating trade tariffs and by providing a common way to solve any sort of trade dispute. More recently, the GATT has become concerned with how global trade is impacting the environment as well as intellectual property rights

The GATT includes a provision of most favored nation status. This status is also referred to normal trade relations by the U.S. government. According to the GATT/WTO, all nations that are part of the GATT must be considered most favored nations when dealing with other WTO members. This status does leave a gray area between GATT rules and rules of other treaties like NAFTA, CAFTA and EU regulations.

Jackson-Vanik Amendment

The Jackson-Vanik Amendment was part of the 1974 Trade Act. This amendment made normal trade relations unattainable for nations that did not have market economies and that restricted emigration rights. This was designed to put pressure on communist nations. The U.S. president has the right to grant yearly waivers to nations who do not meet the standards set by Jackson-Vanik, such as China and Vietnam. This has led to problems with former Soviet republics joining the WTO.

GATT Items not Covered by the Uraguay Round

For the most part, the service industry remained untouched by the GATT after the Uruguay round. This meant banking, insurance, airlines and entertainment were still not covered.

TRIPS

1) The Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) is an international agreement administered by the World Trade Organization (WTO) that sets down minimum standards for many forms of intellectual property (IP) regulation.

2) It was negotiated at the end of the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) in 1994.

3) The WTO Agreement on Trade Related Investment Measures (TRIMs) are rules that apply to the domestic regulations a country applies to foreign investors, often as part of an industrial policy.

4) Policies such as local content requirements and trade balancing rules that have traditionally been used to both promote the interests of domestic industries and combat restrictive business practices are now banned.

5) Trade related Investment Measures is the name of one of the four principal legal agreements of the WTO trade treaty.

6) TRIMs are rules, which restrict preference of domestic firms and thereby enable international firms to operate more easily within foreign markets.

WTO and Indian Laws Relating to Intellectual Property Rights

The World Trade Organization (WTO) plays a vital role in imposing Intellectual Property Rights across the globe. They are the global body created laws like TRIPS (Trade Related Intellectual Property Rights). The TRIPS was in effect from 1995.Often the TRIPS is known as Paris-Plus Agreement. The requirements required for the Intellectual Property Rights are framed by the WTO. The Requirements of the WTO are listed in below table.

Wto Requirements	Indian Law	Status
Both Process and Product patents must be available in all fields of technology	Indian Patents Act 1970 allowed process patents only for food, medicine, drugs and chemicals.	Product patent id made available from January 2000
Duration of the Patents must be 20 years	Duration of the process was 5 years from the date of sealing or 7 years from the date of filing. Duration of the product patents is 14 years.	Patent Laws have been amended.
Microbiological products must be patented	Patenting of life forms is not legitimate	The Biodiversity conservation Bill, which will protect Indian germ plasm has been approved.
Plant Varieties must be protected through patents	No protection of plant varieties	Implementation stage
Agricultural Subsidies to be reduced if the aggregate measure of support (AMS) for agricultural sector exceeds 100%	Due to price controls AMS is less than 10%	No compulsion to reduce agricultural subsidies
Export Subsidies for exports account for more than 3.25% of world trade in that product to be phased out after 2003.	Export income exempts from tax. Export credit provided at concessional rates of interest (Nominal Tax on income on Exports)	Export subsidies will have to be phased out only for gems and jewellery
In Telecom sector, government monopoly over long distance and international services reviewed	Private parties are being permitted as operators.	Limited commitments provide no compulsion to liberalise further.
Information Technology sector has zero tariffs on computer, telecom products, semi conductors and software by 2005	30% duty on telecom equipment,10% on computer components and zero duty on computer software	Task force has recommended accelerating phase out for zero tariffs.

(Reference: Justin Paul, International Trade)

Self Assessment Questions

1. Explain the process and methods of managing knowledge for organizational effectiveness.
2. Explain the Concept of Intellectual Capital.
3. Explain briefly about the Learning Organizations.
4. What is Performance Appraisal in KBO?
5. What are the knowledge and role related issues?

CASE STUDY

It is, of course, not enough to create rich environments where people can share. Xerox provides lot of these environments: online knowledge universe with a catalog of best practices, chat rooms for CoPs, a company Yellow Pages, and a section of the public website,

Knowledge Street, which is devoted to promote knowledge sharing. Also required are good ideas, leadership and motivated people. A few years ago, Jack Whalen, a sociologist, spent some time in Xerox customer service call centre outside Dallas studying how people used Eureka.

The trouble was that the employees were not using it. Management therefore decided workers needed an incentive to change. To this end, they held a contest in which workers could win points (convertible into cash)each time they solves a customer problem, by what ever means. The winner was an eight year veteran named Carlos, who had more than 900 points. Carlos really knew his stuff and everyone else knew this too. Carlos never used the software.

The runner -up however was a shock to everyone. Trish had been with the company only a few months, had no previous experience with copiers and did not even have the software on her machine.

Yet her 600 points doubled the score of the third place winner. Her secret was she sat right across from Carlos. She overheard him as he talked and she persuaded him to show her the inner workings of the copiers during the lunch breaks. She asked other colleagues for tips too.

Questions

1) What is the reason for the success of Trish?

2) Is really the knowledge sharing the secret of Trish success or both technology and subject matter are also necessary?

Glossary of Words

1. Apprasial
2. Intellectual
3. Resistance
4. Mobility
5. Consolidating
6. Tacit
7. Explicit

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Notes

UNIT - III

Learning Objectives

After learning this unit, the students will be wellversed with the following topics

➢ Managing Knowledge and Personnel and Organizational health (OPH)
➢ Rewarding knowledge
➢ Retention management

Unist Structure

Lesson 3.1 Managing Knowledge and OPH

Lesson 3.2 Management of Retention in KBO

Lesson 3.1 - Managing Knowledge and OPH

Understanding the Need for Knowledge Management

"Successful companies of the 21st century will be those who do the best job of capturing, storing, and leveraging what their employees know"

➢ CEO of Hewlett Packard

Our world has shrunk due to drastic development in the field of science and technology. The changes are happening very fast in our world which has effect on the way the business has been operating in the last decades. To explain clearly, the demand of the customers is changing constantly as a result the organization must be in a position to innovate new products according tit the customer preferences.

Organizations are used to meet the customer's expectation, even though they already used to it in the last 3 decades where the market is customer driven. But recently due to rapid growth of technology along with the usage of internet the needs and demands of the customer are changing very rapidly.

The globalization and electronic commerce are surprisingly making it difficult for the customers to be loyal to one particular brand. The companies find it hard and devise various ways to retain their costumers. In a recent research it is discovered if a company retain 5% of its customers, there will be 30% increase in of profit for the company. The retention of customers is easy that to acquire a new one.

The organizations are forced to follow the market facing enterprise concept. This concept states that the customer neither has either loyalty nor respect any brand, they expect the product which had many features and aesthetics which provides the higher value for their money.

In order to keep pace with the changing market, the companies are using concepts like

Business Reengineering

This process is carried to have drastic improvement in the various departments and making the procedure simple and efficient. This helps the organization to interact with its customers.

Benchmarking

It is the concept of comparing one's own company against the industrial best practices, thereby the company can find where it lags and what are the methods can be used to reduce the gap.

Information Technology

The companies install HR software to perform the various operations in the organization to complete the work faster with efficiency. For example HRIS (Human Resource Information System) is used to carry out the various works like payroll, training & development by the HR managers.

Total Quality Management

Without quality it is impossible for an organization to survive in long run. The quality plays an important factor in the minds of customer to buy a product. Thereby the concept of TQM is to check and improve quality in each and every process of manufacturing and deliver the best quality products to the customers.

Changes in the Organization

As stated earlier there is a change in the operation a carried in a firm. Therefore the work profile of the employees is also changed in the recent years. The employees are expected to be customer focused. Earlier they were task focused but now they must understand what their customer want and proceed accordingly. They must technology and the available resources to produce a product. Most importantly they must always be interested in learning new things and share their knowledge with peers.

The organizations saw the suppliers and subcontractors as vendors not more than that. But now they are considered as stake holders or business partners who are directly related to the organization.

They develop close relationship with them thereby which helps the company in producing goods much faster according to the market needs.

The challenges in the organization are as follows:

1. How to attract new customers
2. How to retain old consumers?
3. How to compete against electronic commerce?
4. How to built market facing enterprise?
5. How to change the resistance of employees in implement information technology in the firm?
6. How to develop organization as a learning organization?

The above challenges are faced by the firm in the last decades, but many companies are proved to be successful in spite of these challenges.

The underlying factor in their success is that they know. Their employees much better and use their knowledge as asset while addressing the above challenges.

The most successful organization in today's environments is those who store, capture and utilise the knowledge of their workers. They must also develop ways to generate and implement the knowledge in the organization.

The Importance of Knowlegde Management

The Nokia one of the most successful company in mobile technology has the capacity to introduce a new mobile model once in 12 days. This shows how well they organize and utilise the knowledge of their employees.

We can see that employees perform their job using their knowledge. They may use tacit or explicit knowledge to complete a work. This varied among employees.

The term knowledge is nothing but how the employees process the information and utilize the same in his job. When he combines the information with management information system or decision support system he uses the technology to complete his work. This will help to complete the work faster and he gains knowledge on every transaction. The productivity of the employees is increased.

It is important feature to apply the knowledge and practice them constantly in their job. This will result in the awesome results in the organization context and customers will be delighted in the services provided by the firm. Most importantly it will create value addition at all levels and it creates intellectual capital which can be used for the survival of the firm in the long run.

The organization believes that instead to predicting the future it is better to know how to utilize the tacit knowledge to create the products. They also believe that no need for external help when they utilise both explicit and tacit knowledge of their employees which results in reducing the cycle time.

The Technology Push for Knolwedge Management

Our knowledge has been used earlier in many ways to develop our society philosophy and culture. Recently only firm noticed that knowledge can be grouped and used as a resource to develop the organization.

In 1970's the computers were dominating the working environment and during 80's the information technology had a rapid growth and it is used strategically by the firms to achieve their goals.

The various push for gaining momentum of knowledge management are

Information Technology

Even though the information technology existed earlier it was used to achieve goals but now it is a pre requisite to o frame the strategy of the organization. The top management of the firm combines the strategy along with information technology to develop their core competency which gives them edge over their competitors in the industry.

Rapid Proliferation of the Internet

The intranet and extranets plays a vital role of communicating information within the company. This helps the employees to know the information faster and avoiding paper work. The consumers are aware of the variety and choices available for them in all most all kinds of products and services available across the world because of the Rapid proliferation of the internet.

Introduction of Electronic Commerce

With the advent and reach of organization many firms started electronic commerce a virtual organization which is not limited to physical boundary. They bought the concept of online auction and to shop online for customers across the world 24*7.they provides a greater opportunity by integrating the E – commerce with the business process.

They many company stated to provide personal services to their customers. For example, Yahoo one of the pioneers in the filed of internet services, provide personal services of their customers by having individual access points like my Yahoo.

There are many reasons why people prefer individual services because they can focus on the things which they are interested rather than having to search for multiple websites, this can be done by crating a template exclusively for them based upon their taste and preferences.

Presently many companies start to invest to develop the personal services to individual across the globe based upon their preferences.

Knowledge Management From Art to Science

Knowledge management can be implemented in an organization when there is an opportunity for the company to build and develop knowledge among their employees. For example the European insurance corporation is one of the largest insurance companies in Europe which has 2 million customers.

The employees of this firm have to address solution to 10,000 calls every day and 30000 insurance claims which results to 1.5 million pounds. So the organization started to utilize call centres to address the customers for their queries.

The concept of outsourcing or call centre is gaining momentum in Europe and USA, so the company approved to go ahead to hire employees for call centres. The hurdles in this are listed below:

➢ To hire the employees and enrich them about the company rules and policies.

➢ How to address the customers when they have queries?

➢ How to retain the trained employees?

➢ How to improve quality service to the customers and the solution offered by the employees must adhere to the company's regulations?

Knowledge management have been implemented by many companied across the globe for the growth of the organization. Chase Manhattan Bank with the aid of visual basic program they created a comprehensive relationship management system. As a result all employees of the organization have the entire database of their customers at a click of the mouse including their loan details, their payment details and complete transaction history related to the concern customer.

Similarly the Chevron, an oil firm have used Lotus Notes for deploy knowledge management for group ware solution. This is shared with the help of intranet across the company; thereby the employees can know the policy and change of plans form their routine work with the help of this software.

The greatest difficult in implementing knowledge management is to make sure that the all benefits are reaped by the organization not the third party. Since knowledge management is related to intellectual property there is a chance of duplication, therefore the management must ensure that imitation of their knowledge management framework.

The Chief knowledge officer / chief executive officer must set knowledge performance index to evaluate the effectiveness in the firm by implementing knowledge management. The technology used for knowledge management and how it is applied in the organization decides the winner or runner in this competitive world.

Application of Knowledge Management in the Organization

In theory we can suggest 'n' number of ways to implement knowledge management in an organization. But all the ways can not be practical applicable to all kinds of organizations. If your method of implementing knowledge management gives you clear solution for below questions, then you can go ahead in implementing knowledge management

How knowledge management is interlinked into company's business activities and functions:

➢ Whether the implementation will yield benefits rather than being a discrete experiment?

➢ How knowledge management will have impact on the ROI of the firm?

➢ Is there a correlation between business objectives and knowledge strategies?

➢ How the outcomes are are to be evaluated?

Steps to Implement Knowledge Management

The Dataware technology formulated 7 steps to implement knowledge management in an organization.
The steps involved are

Step 1: Identify the Business Problem

Step 2: Prepare for Change

Step 3: Create the KM Team

Step 4: Perform the Knowledge Audit and Analysis

Step 5: Define the Key Features of the Solution

Step 6: Implement the Building Blocks for Knowledge Management

Step 7: Link Knowledge to People

Identifying Business Problem

The management understands clearly that knowledge management is used to solve the business problems. So it is utmost important that the knowledge management must be devised to provide solutions to the bottlenecks in the organization.

If not then, there is no use for implementing knowledge management, which is explained clearly in below quotes.

"Knowledge management tends to become just another activity imposed on people for no apparent reason."

➢ Dave Ledet, director of Amoco Corp.,

➢ When company announces their employees regarding the application of knowledge management, employees go in a state of fear. This fear occurs because employees think they have to process a large chunk of information from company database and also from the internet.

More over they feel they are not adequately trained or experienced with knowledge management. Therefore the management must ensure them that knowledge management is processing of information along with the aid of technology and it is continuous process.

> ➤ Then the organization must identify the departments or products that are not performing upto the standards, and then they must devise knowledge management strategies to improve performance in those weaker sections.

Preparing for Change

The knowledge management doesn't require traditional workers. This requires employees who can think and utilize their knowledge to provide knowledgeable solutions.

The knowledge management also involves a change in culture also. The perception of the employees towards their nature of work also changes while implementing knowledge management. Eventually they may be resistance to change but the management must convince the resistors for change.

Creating A Team

In knowledge based organizations, knowledge is the power. So the employees will not share their knowledge with others. This is because they feel insecure that if they share knowledge with others, then will be promoted instead of them.

In the reality it is not so. The underlying factor in the success of knowledge based organization is the sharing of knowledge.

This must be encouraged by rewarding those employees who share their knowledge with their peers and other departments. By doing so, the firm can create a team structure to complete the projects undertaken by the company.

Performing the Knowledge Audit

Generally audit is carried out to verify all the activities are carried as per the plan or if there are deviations or any exceptions while implementing them. Similarly knowledge audit is carried to identify what exactly is needed to solve the business problem and how to organize it.

The foremost step in knowledge audit is to identify what is missing in the knowledge management. The people will document the explicit and tacit knowledge utilised by the employee in various scenarios. Apart from this we also have look into external environment and check for any latest version or how your competitors are handling the situation.

The second step in knowledge audit is to organize the knowledge. In this the knowledge is mapped into physical system thereby utilising it to produce products or services.

The tacit knowledge of the employees must be developed and every employees look into a matter form different perspective. The knowledge audit helps the firm to identify where exactly the firm lag behind and how to overcome the same.

Defining Key Features

➤ This deals with developing the knowledge management solutions along with improving the information technology infrastructure.

The principles involves

Open and Distributing

The technology should be access and evenly distributed to all. The intranet within the company will make sure information are transparency and accessible to every employee in the organization.

Measurable

The Information system used so able to reduce the bottleneck of the firm. Information system must also offer guidelines to individual who access them in a precise manner.
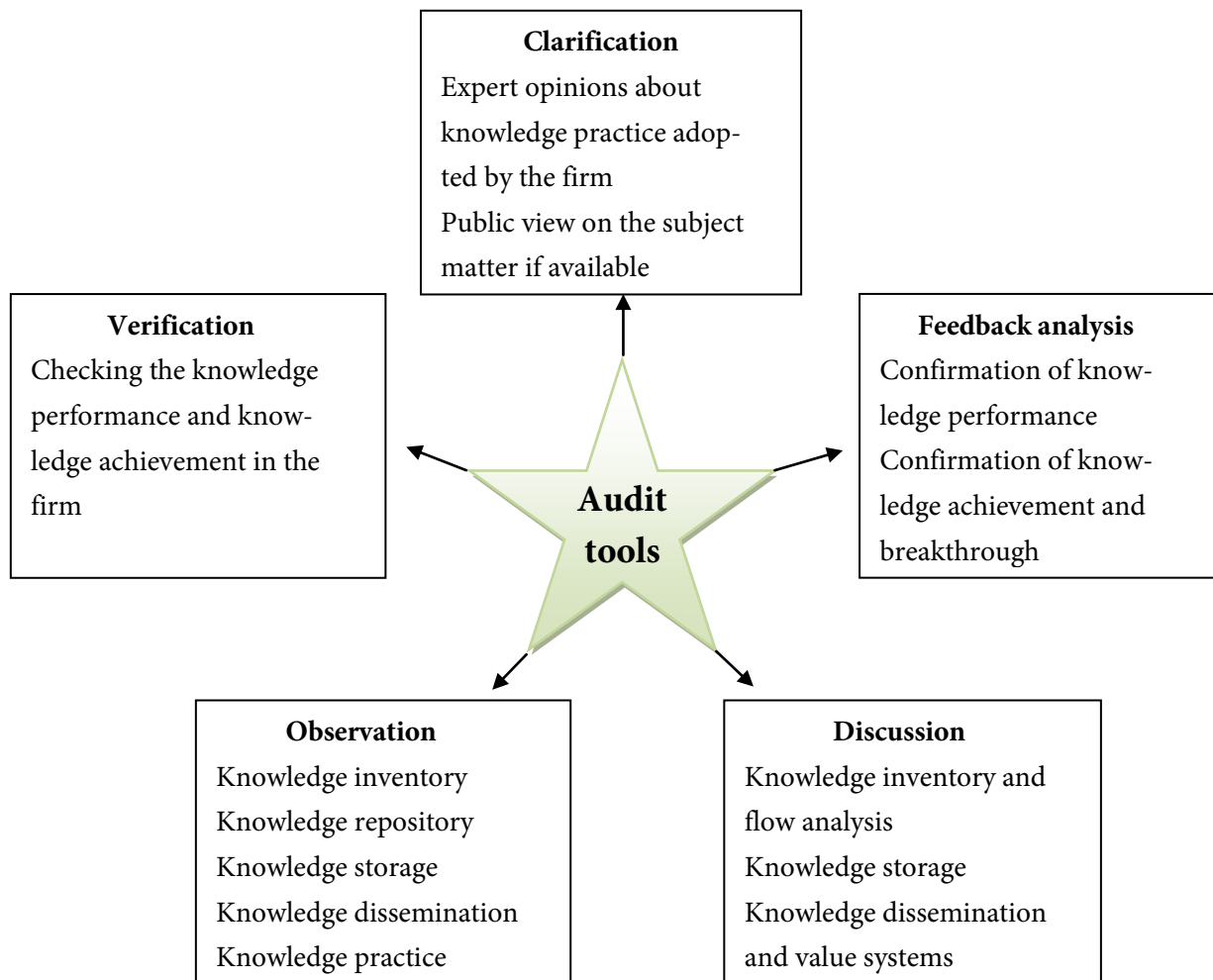
Customise and Secure

The information can be customised according to the need of the hour and it can be stored for future reference. The information system and the data are sources of the organization.

They security is also equally important like sharing them across the organization. Therefore the companies should check twice if they decide to upload their information in the world wide web.

Knowledge Solution Model	Knowledge Sets	Knowledge Sources	Application Layer
Transformation model	As identified in the need analysis phase	➢ Structured databases	a. Data mining/knowledge extraction applications b. Interface and gateways to bedrock systems
		➢ Existing information repositories	a. Text mining and retrieval applications b. Workflow and messaging applications
		➢ Non digitized sources	a. Document, capture and management, search and retrieval applications.
		➢ Skill enhancement programs	a. Web based training solutions with learning management solutions.

Independent Model		➢ External resources
		  ➢ People / organizations
		  ➢ Websites
		➢ Internal resources
		  ➢ People
		  ➢ Products/ processes
			Yellow paging applications
			Web crawler and broadcast applications
			Communities of practice (using expert locators, collaboration, virtual work place applications)
			Best Practice sharing (Using knowledge repositories.

The basic Knowledge audit tools are observations and interactions.

The below figure will provide an overview of audit tools and their objectives

Clarification
Expert opinions about knowledge practice adopted by the firm
Public view on the subject matter if available

Verification
Checking the knowledge performance and knowledge achievement in the firm

Feedback analysis
Confirmation of knowledge performance
Confirmation of knowledge achievement and breakthrough

Audit tools

Observation
Knowledge inventory
Knowledge repository
Knowledge storage
Knowledge dissemination
Knowledge practice

Discussion
Knowledge inventory and flow analysis
Knowledge storage
Knowledge dissemination and value systems

Knowledge Audit

(Modified from Knowledge Management by Mruthyunjaya H.C)

Building Blocks for Knowledge Management

The knowledge management identify the business problem and they divide them into smaller task. In constructing a house, each room is completed before moving to the next floor. Similar in knowledge management uses building blocks which address solution to task.

It is known as phrased methodology. The following table give a brief idea about building blocks for implementing knowledge management solutions.

By following below 7 steps the organization can implement knowledge management successfully in an organization

Phase	Goal	Technology Building Blocks Used In This Phase	Recommended Method of Implementation
1	Quickly improve ROI on existing knowledge assets.	Meta-Level search broker and text-based electronic repositories with advanced search and retrieval capabilities	Implement Meta-search software that accepts a single query from users, then submits the query to multiple Internet and intranet-based Knowledge silos. Results from these silos are returned to the meta-search engine, which then orders and presents a single set of results to the user. For information that is focused and relatively homogeneous, implement a text-based electronic repository of the information with advanced search and retrieval capabilities. This provides immediate ROI and enables this silo for later inclusion in the knowledge Warehouse.
2	Enhance the process of locating applicable Knowledge.	Knowledge Mining Software	Add knowledge mining software that allows query results to be sorted and clustered according to a set of pre-defined categories that are applicable to the target business problem.
3	Increase the accuracy and speed of classifying Knowledge.	Automated Categorization Tools	Implement automated categorization software and apply it to knowledge in existing silos as well as incoming streams of new knowledge. These tools can be used to assist persons assigned to the task of knowledge classification by providing a preliminary "first cut" based on the contents of a Knowledge source.

| 4 | Provide substantially enhanced functionality, security, and performance for the growing knowledge management activity in your organization. | Knowledge Warehouses | Roll-out knowledge warehouses. Integrate existing knowledge silos (implemented in phase 1) into these warehouses through the use of filters which preserve the original source and allow automated updates to the knowledge warehouse when the original source is changed or augmented. As part of the process of initially filling the knowledge warehouses, supply applicable metadata such as the knowledge source and author. Make knowledge warehouses available as knowledge sources through the use of the technology implemented in phase 1. |
| 5 | Start capturing valuable "tacit knowledge" that was previously lost to retirement, downsizing and Employee turn-over. Make the contribution of Knowledge easier and faster. | Forms-based contribution of knowledge assets | Allow end-users to directly contribute Knowledge to the knowledge warehouses. Create and deploy Internet or intranet-based forms for the most often used types of Knowledge assets. These forms provide a structured way to collect required metadata, to start capturing valuable "tacit knowledge". Example forms include resumes, best practices, news articles, research notes or any other types of user-created or user-discovered Knowledge. |

| 6 | Enable faster access to Critical knowledge. Reducing the risks of not finding key Information. | Knowledge mapping software | Pre-build taxonomies ("knowledge maps") are designed for specific tasks (e.g. quality assurance) or departments (e.g. marketing or Research). Examine existing knowledge assets and those that have been contributed to the knowledge warehouse to identify the applicability of pre-configured taxonomies and to identify where existing taxonomies need to be augmented, simplified or Eliminated. Connect these taxonomies with the forms implemented in phase 5 to assist in the rapid and accurate classification of new and existing corporate knowledge. Use more sophisticated versions of the Knowledge Mining Tools implemented in Phase 2 to quickly find key knowledge assets. |
| 7 | Quickly find people in your organization who have Specific knowledge. | Knowledge directory Software. | Knowledge directory Software. |

(Adapted from Data ware Technologies)

Linking Knowledge to People

The final step in implementing knowledge is to link knowledge to people. In this the managers must answer to the question who knows what. In other words, it is to link right people with right knowledge required to do right job. The person who is very knowledge with marketing can't be forced to in a knowledge management team related to HR practices.

The K-Gap Analyzer

If an organization wants to be successful, it needs to know what the assets it requires to be successful. Similarly the knowledge based organization must identify what knowledge assets they are going to concentrate on developing their edge over the competitors.

Mostly the organizations like to improve their core competency to sustain in the market and be a leader or pioneer to other firm. The strategy and the vision of the firm will not be based only upon the current situation of the firm. It will be focused how the organization can develop its core competence in the long run.

The K-Gap Analyzer acts as a tool to identify the following:

➢ What is the current status of the firm

➢ What kind of skill acquisition plans need to be contemplated

➢ What are the requisites time frame

Generally a strategy is broken into small tasks to achieve the objectives. For each knowledge business drivers, the knowledge assets which are known as Knowledge – sets required to achieve that Knowledge business drivers need to be identified.
In this context, the

K- Gap Analyzer aids in the following processes

➢ Building the knowledge strategy

➢ Aiding a Knowledge Need analysis

➢ Evolving a learning strategy as well as integrated subset of the knowledge strategy

➢ Synchronizing a top down knowledge strategy with a bottom up skills acquisition plan

➢ Providing a basis for a quantitative analysis of investments in knowledge acquisition versus realization of business goals.

RETHINK STARTEGY		
EVEN CHANCE		
GO MAKE A KILLING		

The K- gap analyzer as a tool

The knowledge sets for each business functions are formulated. Then the As-Is analysis is done by categorizing the current knowledge level of the organization as High, medium and low. Many of the firms decide their current knowledge level based upon the knowledge level of their personnel's. The competitors are similarly rated as high, medium and low based upon the market surveys, market intelligent reports and the expert's opinion.

This enables the top management to take strategic decisions based upon the knowledge gap and thereby bridging the gap in future. The K-Gap analyzer as a tool serves as a reality check to decide whether the business strategy is practically feasible under the given knowledge base of the firm.

Integrating Knolwedge Management into the Millenium Enterprise

Knowledge management has paved companies to explore the business opportunities across the globe. They also aid the organization to achieve their short term and long term goals. This goal accomplishment is made easier because the goals and strategies to achieve the goals have been clearly explained to the employees, contractors and vendors.

This is made much easier when the company uses information technology in the management activities and developing solutions for them with the aid of software like Supply Chain Management, Customer relationship management, Entrepreneur resource, planning, etc. In spite of all these benefits the knowledge management it also have some threats.

The foremost threat is that in knowledge management all departments are independent and they have provided with authority to accomplish their job, but the million dollar question is whether the knowledge management will integrate and hold the departments in the same string or it will disintegrate the unity among departments.

This fear of the organization is made worse as they are faced by cut throat competition in the market. This competition was created by pull factors like globalization, privatization and technology development along with the usage of internets by many people. In today market it is very hard to develop brand loyalty among the customers. This is because the customers are given variety of choices in each product, which make them to expect value added services. The only way to build brand loyalty among customers is to develop customer intimacy

The customer intimacy means that all processes and products manufactured by the organization must reflect the need of the customers. Therefore the organization must understand the nature of the customers about their wants and preferences. This can be developed by having good rapport with the customers. The management must ensure that all its business strategy and business products must be directed towards the customer preferences; thereby the customer intimacy will be developed. If an organization is really a market facing enterprise, then it means the customer needs are known to the all levels of the organizations including the lowest level of management.

The empowerment of employees is important in a knowledge based organization. It is only factor which enables the companies to be successful beyond the expectations of the customers. Every organization can able to disseminate, capture ands store the information and process the same with the aid of technology. The employee empowerment is the factor which makes an organization to stand apart from their competitors. The knowledge management tools and process must ensure that all

initiatives taken by the management will utilise the knowledge potential of their workers. They can avail the opportunities provided by Electronic Commerce using their potential knowledge workers.

A true knowledge based organization is the one which ensures the knowledge management philosophy in its underlying strategic intent and all the transactions like Business to consumers, customer relationship management are directed towards to learning new things thereby developing the knowledge of their employees.

In business to consumer perspective the organization must develop process so that the consumers not need the assistance of the employees. I.e. they can be self helpers. This help the organization to know the consumer preferences and buying psychology thereby improving the customer intimacy with the firm.

The kind of electronic commerce is Consumer to business. This transaction is ineffective until the organization has the capacity to transfer the customer needs into all levels of production, thereby the customer data flow will be known even to the lowest level of employees. This can be enabled by using intranets within the organization ensuring smooth flow of information across all levels of the firm.

Apart from these, the knowledge management must be integrated with the data integration of the strategy. The software like Entrepreneur Resource Planning helps in the integrating of knowledge management with the data integration.

By doing so, we can transfer the information across the physical boundaries of a country, thereby making the firm as virtual organization. The virtual organization disseminates information to ht e vendors, sub contractors, employees around the world.

There is no doubt that with the aid of technology the organization can transform into a knowledge based organization which is also a learning organization. Learning is a continuous process which enables the organization to develop core competency. The knowledge management will reflect in every internal stage of the organization which helps the organization to survive the global competition.

Knowledge Management in the Organizational Context

The organizations in present era must revamp themselves from the traditional way how the business was operated in the past decades. The organizations in the 21st century will have to face the following imperatives:

> Customer focused business process
> Highest quality at lower prices
> IT playing a transformational role
> Best in class performance measures
> Right people for the right roles.

To overcome the challenges provided in the millennium the organization has initiated remedial measures in the following form:

Improved Customer Service

The customer satisfaction is very crucial for the firms to attract and retain the customers. The company devise various methods by which the customers can access the required information by themselves.

It is found that if a customer is able to access the necessary information by themselves their satisfaction level was very high. This also solves the problem of the firm by training the employees on customer care. Thereby the company can achieve dual goals namely no need to appoint many customer care executives for a large scale organizations and the customer is also satisfied.

The intranets and collaborating computing technologies help the customer to know more about the company and their products in depth.

Customer Care and Managing Relationship

The customer care and managing the relationship with the clients is the area which is being explored in this millennium. Inside the organization the Customer relationship management takes in charge for managing the customer relationship with the company's executives.

The success of Amazon, E-bay has proved to the world how best the Electronic commerce can be successful when it comes to business to consumer perspective. But many people believe that still business to business transactions have yet to explore and opportunity to be used by the firms in this millennium.

Many companies have agreed to this fact by investing money and developing business to business transactions with their suppliers, partners and corporate customers. This kind of transaction have widely recognized by professional like Doctors, lawyers and government officials throughout the world.

Enterprise Wide Integration

We say that truly market facing enterprises means an organization expected to be complementary by enabling its customers to interact and understand their process deeply thereby all the internal process have the ability to provide quick response towards business process re engineering for quick response to the quench the need thirst of their clients.

Earlier the organization was surrounded by the concepts like material management and manufacturing resource planning which was now aided by Entrepreneur resource planning and SAP tools. Apart from these various data capturing, storing and disseminating technologies are used by the firm to strength the internal and eternal business process thereby ensuring enterprise wide integration.

Tighter Integration Across the Supply Chain

Due to cut throat competition prevailing in the market, firm prefer to outsource their business activities which enable tem to concentrate on core competency. Even though it benefits the firm to develop their core competency it limits the company when it comes to supply chain management.

Since the company outsource many of it internal business process across the world it is difficult to co ordinate and have a continuous supply of goods as it is very way to gain the customer satisfaction.

Therefore the organization is giving importance to supply chain Management as equal to Customer relationship Management.

Inducting and Retaining Talent

The information technology has evaded almost every aspect of business, but when it comes to Human Resource information technology contribution is very little. In knowledge management it is very hard to identify and retaining human talent as they are very valuable and hard to retain.

That's why the organization undertakes career development programs and allowing them to suggest ideas without restriction. This helps to develop close relationship between the employees and their bosses which makes them to motivate the employees which in turn results in high performance.

Rewarding Knowledge

Motivation plays a crucial role in the performance of the employee. The motivation helps to improve the productivity of the individual in the organization. There are ways of motivating an employee. One of them is rewarding the employees for the work performed by them. By doing so, they will have a sense of empowerment and they feel that they are important for the firm's growth.

In knowledge based organization the employees are known as intellectual capital, therefore it is very important them to retain them in the organization. It can be done by rewarding their knowledge. By doing so they will have further develop the ways to utilize their knowledge towards the growth of the firm,

In manufacturing industries, employees van be rewarded based upon the number of units produced by them.

But in knowledge based companies the rewarding is quite difficult because the performance of the employees can't be measured exactly. This is because they are qualitative in nature.

The top management must devise strategies on which basis the knowledge workers must be rewarded. They can reward employees by sharing and creation of knowledge individually or they can reward in groups for their team work. The reward can be either monetary or non monetary.

The monetary benefits include hike in their salary, bonus, incentives . . . The non monetary reward includes awards, social acknowledgement award, promotion, etc. The actions of knowledge workers unintentionally will bring benefits to the firms as well as to them.

Criteria for Rewarding Knowledge

The knowledge workers can be rewarded based on the following criteria:

1. Skill based
2. Performing diversified jobs

Skill Based Pay

➢ This method states that knowledge workers can be rewarded based upon the skill they possess.

➢ This means the way in which they utilize their knowledge for the benefit of the firm.

➢ Not only utilizing knowledge, it also includes knowledge generation, capturing, storing and sharing other employees and cross among functional departments also.

Performing Diversified Jobs

This is based upon the ability of the knowledge workers to develop knowledge among his peers and create a knowledge pool of employees. By doing so the job rotation is easy making all the employees skilled in all areas or departments of the organization.

Critical Areas of Performance

In the following areas we can observe the performance of the knowledge workers namely

1. Financial results
2. Performance for customers
3. Internal process
4. Innovation & growth

Financial Results

The financial status of the company tells us whether the organization is running under profit or loss. Therefore the knowledge workers can be rewarded based upon the financial benefits achieved by them for the company.

Performance for Customers

In today's' market, the customers is the king. The knowledge workers can be rewarded based upon number of the customers they acquired on behalf of the firm. Not only acquisition of customers but also how well they treat and conduct themselves towards the customers is also important.

Internal Process

This refers how knowledge workers carry out the following 3C's of knowledge management

➢ Culture
➢ Co-opetition
➢ Commitment

Innovation and growth:

The creation of knowledge and using them to create innovative services or products are taken as basic criteria in rewarding the knowledge of the employees

Methods Used for Rewarding Knowledge Balance Score Card Method

It is the most popular method used by much organization to measure the provenance of the employees. To put in a nutshell it is a managements system used to align business practices towards its strategy and monitor the performance of the organization. This method was devised by Drs. Robert Kaplan and Mr.David Norton. This term was coined in 90's but there was more similarity to the performance measurement carried by general electric in the year 1950.

The criteria used in this balances score card are listed below:

➢ The measures based on the perspectives like learning & growth, business process, financial customer perspectives

➢ How employees are tied to the above perspectives.

Learning and Growth Perspective

They emphasise that learning is very important for the knowledge based organization. The knowledge workers are repository of knowledge thereof they must always learn things that improve their knowledge. In this era, the knowledge becomes obsolete faster than technology.

So, not only the knowledge workers learn but they must also apply the knowledge in the activities carried by them. The mentors can be appointed within the organization to guide the knowledge workers in learning new things; they can also set metrics by which they can know where the employees lack in learning new things.

Business Process Perspective

This perspective deals with how a product or service is deliver to the customers. The business reengineering falls under this perspective. It deals with how fast and efficient the process scan be carried out by which goods or services can be delivered to the customers as soon as possible.

This perspective also deals with whether our products are satisfying the customer needs or do we produce products based upon the customer requirements or not. The metrics are set up the management to keep an eye over all the internal process in the firm.

The Customer Perspective

If the company doesn't produce products based upon the preferences of the customers, they will lose them. The customers will shift to another brand, which is a loss to the company. If the same pattern continues, then the firm can't survive in the market for the long run.

Therefore it is utmost important for the company to understand their customers and produce goods based upon their preferences. By doing so, customer will be satisfied and be loyal to the company. The company must also have additional feature top retain the customers in the long run.

The Financial Perspective

We can't discard the traditional financial methods to know the performable of the organization. The financial data are necessary for the firm and the mangers must always update them.

Then these data were analysed and the financial performance of the company can be calculated. The financial data must be accurate if not it will create a disaster in the financial measure of the company.

Based union the financial results, the management must take necessary actions to develop the company. Therefore it is utmost important for the company to understand their customers and produce goods based upon their preferences. By doing so, customer will be satisfied and be loyal to the company.

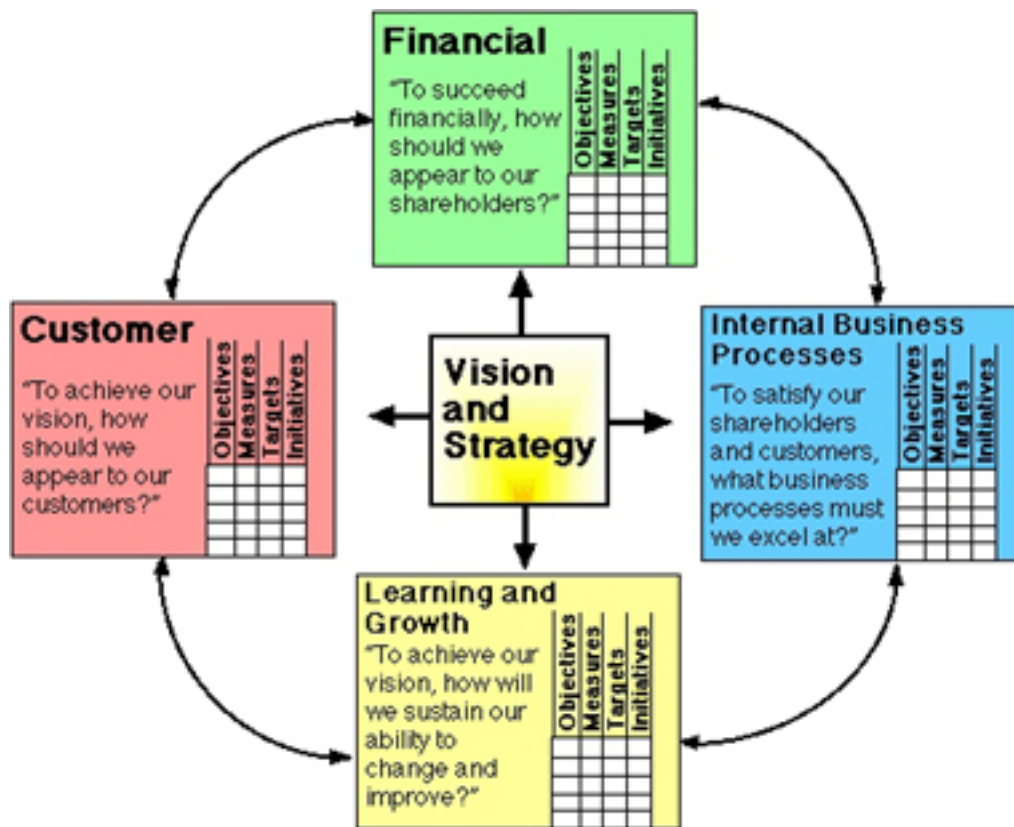The company must also have additional feature top retain the customers in the long run. The mentors can be appointed within the organization to guide the knowledge workers in learning new things; they can also set metrics by which they can know where the employees lack in learning new things.

Balance Score Card

(Adapted from Robert S. Kaplan and David P. Norton, "Using the Balanced Scorecard as a Strategic Management System," Harvard Business Review (January-February 1996)

Tie in Employee

All the above 4 perspectives are, measured against each individual of the organization and the individual performance is evaluated before rewarding the knowledge workers. It evaluates the employee's performance in a detailed manner which is apt for the knowledge based organization where knowledge is asset for wealth generation.

Benefits of Balance Score Card Method

➢ The entire organizational performance as well as individually performance is evaluated.

➢ The KRA's can be identified easily.

➢ The employees are not rewarded based on partial view they are rewarded based upon the comprehensive view.

> This method integrated the performance of employees at all levels of the organization.

> The company can understand their capabilities and their weakness and methods can be devised to reduce their weakness and improve their capabilities.

> The firm can understand the performance indicators at all levels of the organization.

Benefits of Rewarding Knowledge Workers

> The employees become self regulators. I.e. they don't need supervisor to supervise them.

> They perform their work beyond the work hours. They will not restrict themselves to the work hours.

> The knowledge are intrinsically motivated which is a positive sign in the development of their career as well as the organization.

> They help others and support their peers thereby smooth working environment is created in the organization.

> The individual productivity is improved when an employees is rewarded.

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Lesson 3.2 - Management of Retention in KBO

There is a saying that "getting good staff is only half of the bottle, the other half is to retain them" the above saying without any explanation emphasizes the need for retention of employees. Retention management deals with methods to retain the knowledge workers within the organization. I.e. the labour turn over is maintained at minimal level possible. We all know that employees are the source of revenue in 21st century. The knowledgeable employees are very scarce and hence they have high demand in the market. If our competitor offers better remuneration to our knowledge workers they will quit form our firm. Therefore it is equally important to retain knowledge workers and to train them.

The retention management can be defined as

"A systematic effort by employers to create and foster an environment that encourages current employees to remain at the same employer having policies and practices in place that address their diverse needs"

Workforce Planning for Wisconsin State Government

Drivers for Retention

The drivers for retention can be classified into 2 categories namely

1. HR practices
2. Employee beliefs and attitude

The HR Practices

This aspect deals with the following HR practices followed in the organization are not satisfactory to the employees.

Performance Management Practices

The employees feel that the performance appraisal carried by the management is not acceptable and they feel that their appraisal system is biased.

Professional Development Practices

The training & development provided to the employees is not sufficient and they feel that all the employees are not given equal opportunity for training & development

Management Support

The knowledge workers feel that the personnel executives are not supporting them in their endeavors. They employees feel that they are not treated with dignity and equality.

Social Responsibility

employees have a feeling that the company is not involved in social responsibility activities and the only thing concern to the organization is the profit and maximize the market share, which makes employees to have bad opinion about their organization.

Employee's Attitudes and Beliefs

This deals from the employee's perspective regarding their job nature and the esteem of the organization. The factors under this are listed below:

Pride in Organization

The employees are not very happy to inform others the name of the firm which they are employed. This in turn drives them to quit their organization. This may due to the mal practices carried by the organization. Example: Satyam Corporation.

Satisfaction with the Organization

The employee morale is very low and they are not willing to work in the organization. This results in less productivity and affects the quality of work performed by the employee. In this situation the employees decide to quit the organization.

Principles of Retention Management

Mr.David.J. Forrest in the year 1999 gave the below 5 principles of retention management namely

- Appreciation
- Value
- Responsibility,
- Good relationship,
- Trust,
- Success.

Principle I - Appreciation, Value and Trust

The foremost principle of retention management is that the knowledge workers must be rewarded for their work. The management must act in such a way that they feel that they are valuable for the growth of organization. This will help the employee to trust the organization. The appreciation, value and trust will develop the employee morale and binding to the firm.

Principle II – Development

The employee must be given opportunity to develop their skills. The development opportunities can be by sending them to training classes, making them to attend workshop, seminars, giving sabbaticals to pursue them special courses in the some reputed educational institute. By this the employee feels more loyal to the company.

Principle III – Responsibility

The knowledge workers must be given responsibility to perform a job. Most importantly they must allow executing their task without the intervention of other managerial personnel. This will help the employees to feel that they can execute even difficult task on their own. This will create a positive attitude in the minds of employee towards the firm.

Principle IV - Good Relationship

Good relationship is the string which holds the employee in the company. Knowledge workers are social being they need good relationship with their peers and superiors to have conducive work environment. If their cohesion with others in not good, they will feel isolated and this will lead them to quit the organization.

Principle V – Success

This is the ultimate fruit for any employees. It is hard to find someone who doesn't want success in their life. Therefore the knowledge workers wish to be successful in their career which can be achieved by promotion and awarding them rewards for their hard work. The organization must assure the employees that will ensure success in the employee's career.

Steps in Retention Management

Step I – Identification of the Target and Needs of the Employees

In this step the actual needs of the knowledge are identified. I.e. what they expect from the organization and what are their expectations regarding their work profile? Then the employees are paved in the job according tot he company strategy.

To be precise the employees must given a work profile so that it suites their profile as well as the firm's strategy.

Step II – Fluctuation Risk Analysis

In this step the management actually classify the employees under there categories namely key target retention group and second important

target for retention management and third group is to identify targets which are not necessary for retention management.

In multinational company during the management audit the employee are analysed for their potential and the profile of the job against the labour demand in the market. If they employee fall under the key target group they devise methods to retain the employees are they are highly demand in the market.

Example: people who are very skilled in handling critical situations.

If the workers fall under second target for retention management, this means they have demand but they available in medium scale. Therefore adequate importance is given to retain these kinds of employees.

Example: employees possess good communication skills

The final category employees are those who have less demand in the labour market and they are available in plenty.

Example: Unskilled labour.

Step III: Factors of Motivation

Motivation plays a vital role in retaining an employee. Therefore the organization must find the demotivate factors and eliminate them as much as possible. By doing so the employees feel motivated and they perform their job at their higher efficiency.

Step IV: Identification of the Targeted Measure

In this the key target personnel's for retention are targeted for HR managers and various motivational measures are carried out. There by the firm can understand how the employees are feeling demotivate and it can be avoided in the future.

Step V: Implementation of the Measures

Once the reason for demotivate are identifies, the organization must formulate ways to eliminate them. It can be done in the following ways:

The communication is carried clearly without any communication gap thereby they is no way the employees misunderstand the message convened by the management.

The transparency in performance appraisal and rewards can make employees trust the firm. The cultural practices and giving management support for worker participative management will help to motivate the employees to stay in the organization.

Step VI: Evaluation of the Implemented Measures:

The implemented measures for retaining employees are evaluated for their effectiveness once they were implemented. The two factors which plays crucial role in retention management is Human Resource Practices and how organization handles the retention management practices.

Practical Application of Retention Management

IBM is one of the Fortune 100's company which follows the principles given below for retaining their employees:

1. Global Retention Policy and Schedule Management

It is a single, cohesive retention management system with natively integrated workflows and analytics for information governance stakeholders.

2. Enterprise Records (formerly called File Net Records Manager)

Securely captures, declares, classifies, stores and disposes of electronic and physical records.

3. Enterprise Records Starter pack

Enables customers to more cost-effectively implement records management solutions.

4. Classification Module

Automates the organization of unstructured content by analyzing full text of documents and emails.

5. Content Collector

Controls information growth and redundancy, and reduces storage costs with integrated, extensible, modular content collection and archiving solutions

(Reference: http://www-01.ibm.com/software/ecm/records-retention/)

Self Assessment Questions

1. Explain the technology push for knowledge management.
2. Write short note on managing knowledge and organizational health.
3. Write short note on Rewarding knowledge.
4. Explain briefly about Retention management.
5. Explain briefly about balance score card method.

CASE STUDY

A PVC floor tiles manufacturing company was manufacturing flooring tiles in different textures and colours. However, all the colours were on darker side. Many enquires started coming for lighter colours. Some of the company's corporate customers started insisting on light coloured flooring tiles. After a careful analysis of the market potential for light coloured tiles. The company decided to get acquire the necessary technology for the same. Technical Director of the company went round the world and identified one useful technology. Tiles in different light colour shades were procured.

The company show cased them at a marketing conference arranged for the purpose. Market response was good. Negotiations were completed in a record time. Company's technical director and one of the senior

production engineers for deputed for in – plant training at collaborator's place. The plant was erected.

Trials were taken up. Flooring tiles in different bright colours were produced. Product was released into the market. Market response was again highly encouraging. Several metric tonnes of the product was manufactured and released to the market. The company was happy that it successfully introduced a new range of products with high market potential.

In less than a couple of months, volley of complaints started pouring from all the market segments. All the markets had one complaint namely the tiles would become ugly in a short span of use cycle. Market stopped lifting new product. The company had to stop themanufacturing the new product. Technical director was again rushed to the collaborator's place for detailed investigation. Tiles from different batch of production were sent to collaborative place. After detailed analysis the company had no other option; other than to re declare that there was nothing wrong with the technology and problem lies with use conditions.

Puzzled with the situation, the company puts its development technologist to investigate the causes for failure of tiles in Indian market. Dr. Murthy joined the company as a senior development officer. Fortunately for him, the company's dark coloured tiles were available for comparison. The one didn't generate complaints had a washed natural filler, whereas the other formula which rejected by the market had a processed synthetic filler or semi processed natural filler.

One had a plate like structure and the other one had a needle like structure. He next started examining tiles under electron – scanning microscopes. Both the tiles exhibited inter – molecular craters. No conclusion could be drawn. He then switched over to high resolution microscopes for examining tile surface.

New formulas exhibited inter – molecular craters and the other one showed smooth surface at similar magnification. Inter – molecular craters behaved as charge traps to hold static dust permanently to make the tile look ugly. Puzzle had been solved.

What was needed was addition of a charge equalizer or a charge distributor. However, high cost of charge distributor did not make the product competitive. The project was permanently abandoned.

Questions

- ➢ What are the various knowledge elements responsible for product failure in Indian markets?
- ➢ Which knowledge management principles get highlighted in this case?

Glossary Words

1. Retention
2. Rewarding
3. Audit
4. Repository
5. Dissemination
6. Millenium
7. Integration
8. Inducting
9. Retaining

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Notes

UNIT – IV

Learning Objectives

In this unit, the students will know the following:

➢ The importance of ICT's in KBO.

➢ HRIS,

➢ Performance management in KBO.

Unit Structure

Lesson 4.1 ICT's in HRM IN KBO

Lesson 4.2 Human Resource Information System (HRIS)

Lesson 4.3 Performance Management

Lesson 4.1 - ICT'S In HRM In KBO

The Information and Communication Technology (ICT's) play a crucial in the Knowledge Management. This is because they aid knowledge management to attain their end goals. The Information and Communication Technology can be defined as follows:

ICT's are technologies which allow/facilitate the management and / or sharing of knowledge and information. Thus the term covers an enormous diversity of heterogeneous technologies including computers, telephones, electronic mails, database, data mining systems, search engines, the internet and video conferencing techniques.

The ICT's have impact on knowledge management how message is communicated from one person to another and how strategy is linked with it. The below diagram will give a brief idea about characteristics of various communication mediums:

Medium	Communication Characteristics
Face – to – face interaction	Information rich (social cues such as facial expression, voice, gesture visible. Plus synchronous communication, potential for rapid high quality feedback/ interaction). Most relevant for sharing tacit knowledge Spontaneous / informal interactions possible when people geographically proximate. Conditions amenable to development of trust (other factors excluded) Expensive when people geographically dispersed.
Video conferencing	Information rich (social cues and virtually real time, synchronous medium) Expensive set up Set up time inhibits spontaneity
Telephone	Intermediate information richness (tone of voice conveys some social cues, but gestures expression invisible. Also synchronous, facilitating detailed, immediate feedback) Cost variable Spontaneous / informal interactions possible irrespective of geographic proximity. Can facilitate development of trust where face – to-face interaction difficult.
Electronic mail	Suitable for sharing of highly codified knowledge Relatively low information richness (all social cues lost) Inexpensive (cost unrelated to geographic proximity) Asynchronous with variable feedback speed Spontaneous /informal interaction possible irrespective of geographic proximity. Permanent record of interaction exists. Development of trust based on electronic mail alone difficult.

(Adapted from Knowledge management in organizations by Donald Hislop).

Relationship Between ICT's and Knowledge Management

According to Mr.Hendriks linking ICT's and knowledge management means combining numerous volume of data. This task of inter relating knowledge and ICT's is a difficult tack. He thought by challenging the assumptions of Knowledge management we can justify the link between ICT's and knowledge management. But when did so he found that it is not correct way to interlink ICT's with KM. Then after further research Mr.Hendriks suggest that the 5 dimensions can be used to explain the effect of ICT's over Knowledge management.

The below table explain the Divergent approaches to ICT enabled Knowledge Management.

Purpose	Empirical examples
Libraries of codified knowledge	The warehouse element of Pharmaco's knowledge management initiative which was searchable knowledge repository intended to improve drug development times by allowing pharmacists to gain quicker access to relevant knowledge. Knowledge repository used by technical support staff in a call centre environment.
Task related codified knowledge embedded in documentation and standard operating procedures	System to support work of engineers in a semi conductor fabrication equipment company. Siemens Sharenet System for sharing knowledge among sales and marketing.
Mapping of expertise	The employee expertise search facility of the knowledge management repository.
Collaboration tools to facilitate ICT – based communication and knowledge sharing	The 'cafe' element of Pharmaco's knowledge management initiative which was virtual forum intended to facilitate informal interaction and knowledge sharing. The communication tools and 'knowledge café' element of the knowledge management initiative aimed at facilitating rich and informal communication and knowledge sharing among globally dispersed IT staff.

(Adapted from Knowledge management in organizations by Donald Hislop).

The Sources of Knowledge Expertise

There are several sources from which company can acquire and utilize the knowledge. They sources are known as sources of expertise.

They are as broadly classified as:

1. Internal sources like IT departments, local team.
2. External sources like external vendors, consultant, partners and end users.

Internal Sources

a) It Departments

The staff in IT departments has technical knowledge and they understand the complex system and the networking technology across the company.

They also well versed with the infrastructure capabilities of the firm. They have knowledge about the issues in different platforms and limitations of the applications tools employed in the firm.

Apart from this, it is mandatory that the IT staff must have basic knowledge about their customers because the customer satisfaction is emphasized by the stake holders in every activity undertaken by the employee.

b) Extra Departmental Gurus

These are people from different departments. They promote laterality. The term laterality means the ability of the employee to relate the people from different departments cutting the physical boundary of their own department. The extra departmental gurus act like a bridge for diversified people in terms of skill, specialization and background.

They undertake their role as interpreter for this diversified people. These know other departments well than their own department and they act as unifying force thereby promoting the concept of synergy. They

are very creativity and behave rationally in the critical situations. These people are very important for the development of intellectual property and acquiring new skills & knowledge for the firm.

External Source

a)Consultant

Generally the firm doesn't have the required infrastructure and skills for completing their work. So they outsource those activities from consultants. The consultant is external people who are highly specialized in certain areas of management. They can bring balanced and unbiased performance.

They also possess limitations. They don't fit under the company principle and they lack the understanding about how functions are performed in the organization. This can be either turned as liability or asset to the organization base upon the consultant.

Therefore utmost care must be taken for selecting a consultant. The company must look for integrity, the past successful project of the consultants. The firm must also take into the account of the experience and whether they are working with our competitors or not. Another important aspect in consultant selection is to ask the opinion about them to the employees. This is Important because the internal team members must trust and work cordially with the external consultant.

The Knowledge Management Team

The formation of a knowledge management tam is very crucial for the successful implementation of Knowledge management. The team embers must possess adequate skills required to perform their job effectively. The KM professionals must know clearly what their roles are and what goals are.

TFPL is a research company situated in London who specialized in recuirtment, advisory and training services has worked with both private and public companies in London. This company has drafted the skill that is required for KM professionals. They are listed below:

- Understanding the KM philosophy and concept,
- Time management,
- Effective utilization of knowledge,
- Reasoning skills,
- Specialized in IT & dissemination technology,
- Problem solving skills,
- Learn from their mistakes and experience,
- Communication skills to improve their influence in informal groups,
- They must be flexible and adaptive to the environment,
- They must update themselves about the trends in the markets,
- They must possess leadership skills.

Mr. Goade in the year 2000 grouped the Knowledge management skills into 7 categories namely:

- Retrieving information
- Evaluating/assessing information
- Organizing information'
- Analyzing information
- Presenting information
- Securing information
- Collaborating around information.

Roles in Knowledge Management Team

i) Senior management roles like Chief knowledge officer, knowledge champion:

The Chief knowledge officer or chief learning officer plays major role right from taking initiative till implementation of knowledge management. They are the knowledge leaders who have rich experience in knowledge management.

The Chief knowledge officers and knowledge champion are responsible for promoting and taking initiatives in implementation

knowledge management in the company. These people are responsible for the following:

- ➢ Formulating knowledge management strategy,
- ➢ Promoting the importance of knowledge sharing,
- ➢ Handling Knowledge management operations,
- ➢ Maximize the ROI on knowledge, people, process and intellectual capital,
- ➢ Influencing change in the organizations,
- ➢ Creating a technical infrastructure to develop the sharing and creation of knowledge,
- ➢ Managing knowledge workers,
- ➢ Exploit the intangible assets like know how, patents, etc,
- ➢ Measuring the value of knowledge and KM practices to the organization.

The knowledge champions are assisted by many people in the organization. They are as follows:

I) Middle Management Roles Like Knowledge Manager, Team Leader, etc

The middle level managers are responsible for acquiring knowledge. They have to identify the latent potent knowledge hidden in the minds of the employees.

ii) Knowledge Navigators or Knowledge Brokers

These people are responsible for locating the knowledge in the organization. They study the entire process in the organization and they try to locate where the knowledge management can be implemented with much assistance and more talent.

iii) Knowledge Synthesizers

These people are responsible for recording and storing the knowledge. They are also known as Knowledge stewards as they take part in repository of knowledge/ information.

iv) Content Editors

The work of content editors is to document the knowledge form various research and knowledge based articles.

v) Web Developers

They are people who are specialized in intranets, electronic publishing and other computer related activities.

vi) Learning Oriented Role

These include the roles of trainers, mentors and coaches thereby helping the members to improve their skills and utilize their knowledge in an effective manner.

vii) Human Resource Roles

Their role is related to the develop program which encourages knowledge oriented culture and employee behavior.

The sample job description: Knowledge and information manager

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- ➢ Systematically recording and storing information and expertise
- ➢ Maximizing the usability and usefulness of the information.
- ➢ Providing leadership in the area of knowledge management for managing intellectual property.
- ➢ Promoting the meaning and purpose of information and knowledge sources to clients.
- ➢ Readily accessible for information and knowledge resources.
- ➢ Providing on Hands – on expertise required to manage organizational resources.
- ➢ The ability to manage knowledge and information via online database, collaborative technologies and web based services.
- ➢ Superior communication and relationship building skills.
- ➢ Oversee development and achievement of business objectives.

> ➤ Monitor and report on relevant activity levels in operational and business plans.

> ➤ Establish and maintain links with relevant internal and external environment.

> ➤ In-depth knowledge about computer and information technology.

> ➤ Strong planning and project management skills

> ➤ To assist in development of knowledge and information as a core business function for all business units.

KM Roles and Responsibilities Within the Organization

The various roles and responsibility of knowledge management within the organization irrespective of private and public organization is listed below:

➤ Designing information system

This includes the selection, designing and evaluating of information systems. The designing of data structures, interfaces, networking technology.

➤ Managing information system

This role deals with maintaining the integrity, quality, updating, modifying, currency of the data, improving the operations of the system.

➤ Managing information resources

In this we must devise methods to managing organizational information resources to support the organizational missions and formulating strategy to gain edge over competitors.

➤ Training

The activities like coaching, community of practice start up, mentoring, best practices, providing training support activities to improve the skill of knowledge workers.

> Serving as information agencies

The organization acts as information consultants, providing solutions to the problems faced by the customers, to give advice to their clients. They act on behalf of clients to gather and summarize the information providing competitive intelligence.

> Maintaining customer relations for information systems

They are intermediates between customer requirement and information system designers. They convert the customer requirements into a product / services.

> Knowledge management analyst

They act as an organizational information and analyst in designing corporate, organizational information, Knowledge management policies, maintaining proprietary information and mapping corporate intellectual assets.

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Lesson 4.2 - Human Resource Information System (HRIS)

The Human Resource Information System (HRIS) is known as "it is not technology, but the art of human – and humane – management. Mr.Kavanagh defined HRIS as follows:

"System used to acquire, store, manipulate, analyze, retrieve and distribute information regarding an organization human resources. An HRIS is not simply computer hardware and associated HR – related software. Although an HRIS includes hardware and software, it also includes people, forms, policies, and procedure and data".

The HR manager has to perform various activities like processing the data for operational and strategic operation of the company, to evaluate the effectiveness of the training program, to appraise the performance of the employees, to monitor the performance of the employees, to verify whether the recruitment procedures have carried out efficiently. The HR managers have to keep necessary documents for all these activity which takes lot of time.

The objective of HRIS is to provide accurate information to their end users. If computer is used for HR activities it will help the HR managers to eliminate the paper work thereby they can spend their time more productivity.

The automation has been made in rest of the departments like production, accounting when compared with HR departments. This is due to the fact that the complexity and the data required are very intensive. The software must also take into the account of their customers as the customer satisfaction is one of the important ways to survive in this competitive market. Therefore it is difficult to develop software assisting.

HR managers in their work. HRIS provides an optimal solution to above problems by providing accurate information according the timely requirements of HR executives.

Reasons for Implementing HRIS

The reasons for implementing HRIS in the organization are listed below:

i) Complete Information Source

The information regarding the employees including their database, their performance report, pay roll, their past performances can be obtained from HRIS. In other words it provides a complete and comprehensive view regarding the entire information about all employees in the organization.

ii) Improved Speed of Transactions

The HRIS doesn't need paper to complete a transaction. It is a paperless work. The information is earlier feed into the system thereby enabling transactions at a faster rate.

iii) Providing Edge Over Competitors

By enabling HR services combined with technology, the activities and the goals are achieved faster with much less time and resources. This provides an edge over the competitors which will help the firm to improve their market share

iv) Improving the Quality of Decision Making

The HRIS collects the information and process them accurately. Thereby providing timely knowledge to the top level management making the decision faster. More over the quality of such decisions will be good.

v) Projection of Employee Reports

As stated earlier HRIS maintains the reports regarding employee performance, payroll, training etc. The project the employee reports to the HR executives thereby they can take any remedial measures like training or rewarding time which will improve their job satisfaction.

vi) Moving towards Strategic HRM

The conventional HRM deals with processing of transaction related to human affairs. With the implementation of HRIS they transfer them towards the strategic HRM. The Strategic HRM focus on the including HR executives in the strategy formulation committee. By doing so the management can know the limitations involved while implementing the strategy.
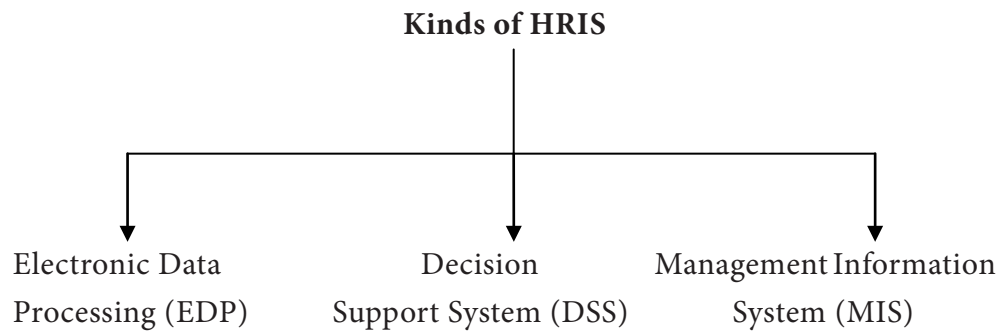
vii) Improved Efficiency

HRIS aims to develop and create the accurate information regarding the employees. The effectiveness of the HR administrative functions is improved as they are provided with reliable information, ultimately improving the efficiency of HR functions and their transactions

Obstacles in Successful Implementation of HRIS

It is evident that by introduction of HRIS will be beneficial to the organization. But the below obstacles will hinder in the successful implementation of HRIS

1. The support and commitment from the to management
2. The size of the organization
3. The Strategic intent of the organization like vision and mission statement.
4. The HR principles followed in the firm
5. The involvement of employees
6. The initiative ness taken by the mentors to educate employees regarding how to use   HRIS
7. How the management manage the change
8. The infrastructure and resources provided to the workers
9. How the employees cope with the change or will they resist the change
10. The competence level of the employees
11. The eagerness of the employees to learn new things

Kinds of HRIS

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Kinds of HRIS

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Electronic Data	Decision	Management Information
Processing (EDP)	Support System (DSS)	System (MIS)

Electronic Data Processing (EDP)

The EDP is used to store, transfer and retrieve the information for HR activities. The aim of EDP is to eliminate the paper work in the firm. It integrates the files for effective transaction processing and summarizing the reports to submit to the higher officials. It optimizes and schedules the processing of the transaction improving the performance of the system.

Management Information System (MIS)

The MIS is similar to EDP, but it focus on flow of information to middle level of management. The other function of MIS is to integrate the EDP with different departments of the organization. It also generate inquiry reports to the management

Decision Support System (DSS)

This aims at providing information to the top level management thereby assisting them to make a decision. The DSS doesn't take a decision but it provides necessary documents to the top level executives which assist them in taking accurate and more quality a decisions. DSS emphasis on flexibility, adaptation and quick response according to the nature of the situation.

HRIS Architecture

Single Tier Architecture

Single Tier Architecture is also known as The HRIS Dinosaurs. The name arrived because in earlier days these applications were used

by IT professionals. They used mainframe computers for processing the transactions.

This mainframe was developed by International Business Machines (IBM).the access to the main frame was done only by desktops. This is used for applications like User interface, data storage and application processing.

Two Tier Architecture

Two Tier Architecture is used once the Personal computer was largely used by the people in 1980. This is because people realized there is no need for main frame computers for HR transactions.

They thought it is possible with Personal computer and server it is possible to carry out HR activity, earning the name as Client – server architecture.
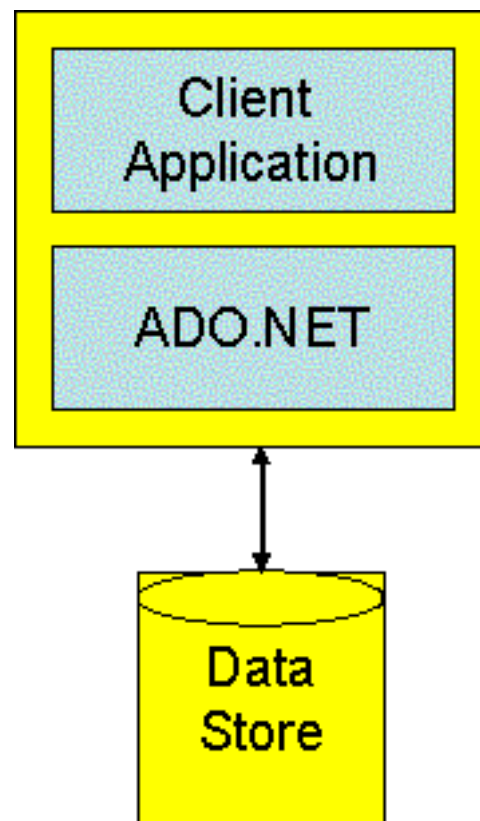
Two tier architecture

Three Tier Architecture

This is an expansion of Two Tier Architecture. In this the server has to perform two functions namely

1. The role as a database
2. To act as an application server

This architecture is used for user interface but is used more in the middle application server. The specialty of this three tier architecture is that they permit many users to access the database simultaneously. This is known as middleware, which implies the meaning of a software performing task between the clients and the database server.
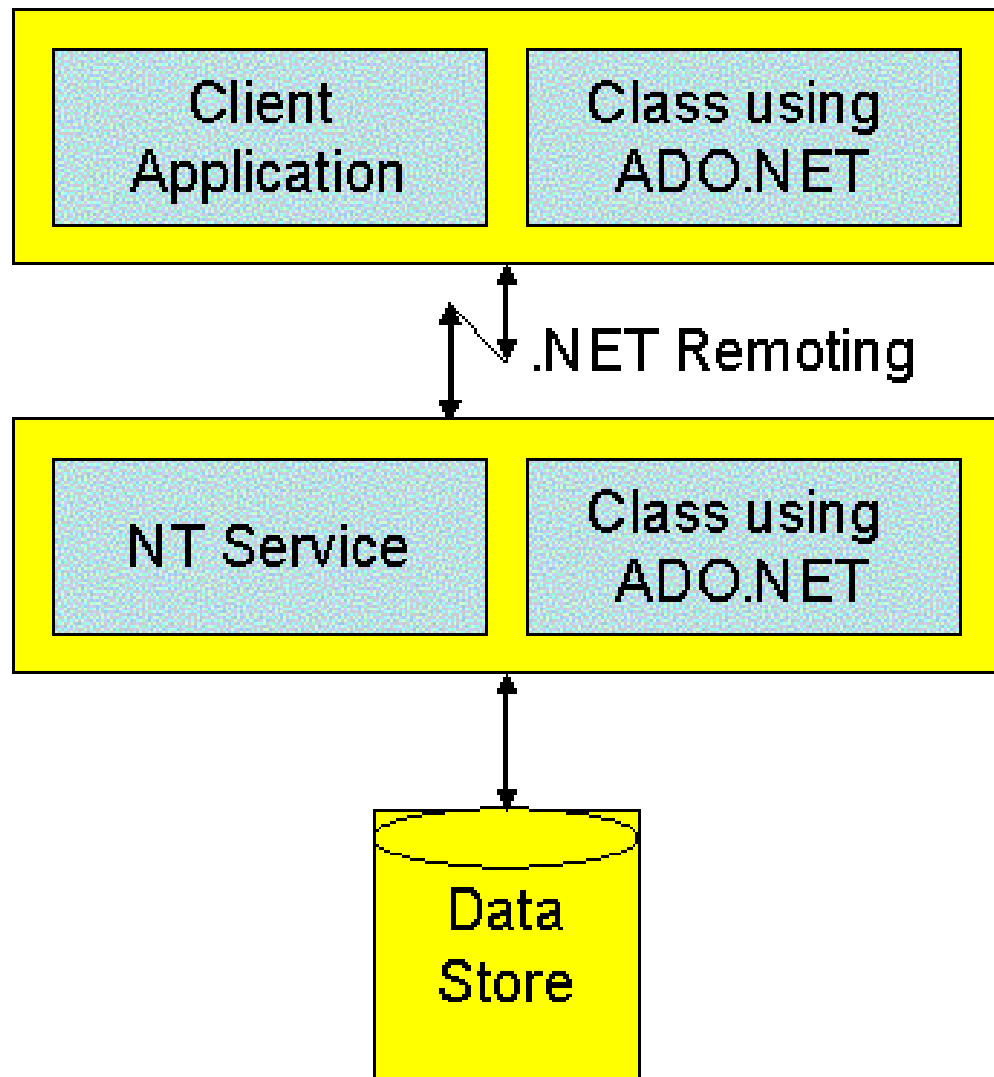
Three tier architecture

N Tier Architecture

This is further extension of three tier architecture. This is most complicated architecture than most of the architecture. The HR functions can't be performed alone. We need information from other departments in the organization.

For example if we work on pay roll of the employee means we must contact the accounts departments to check whether they have availed any loan or advance payment.

The aim of this architecture is to provide information to all users of the firm whenever it is required by them.
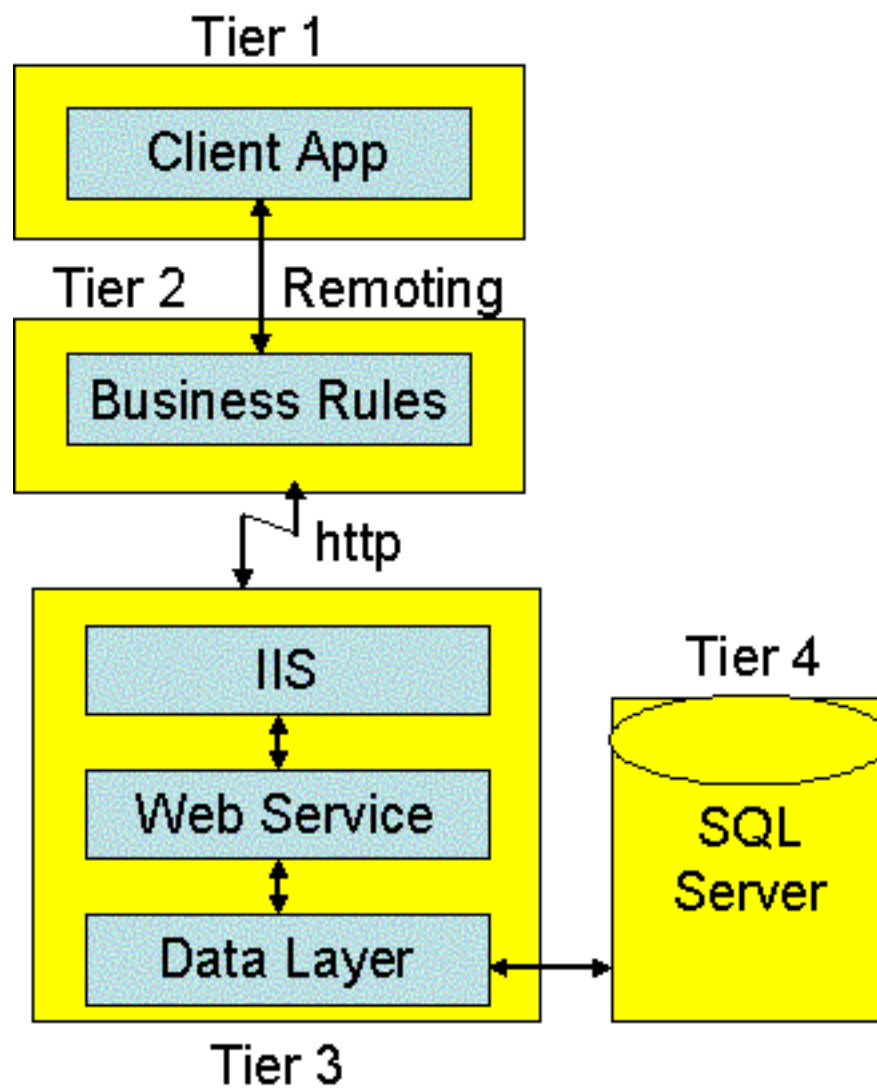
N tier architecture

Economic Justification of Investing in HRIS

Many people think that it is not wise to invest money in HRIS or automation of HR activities. The real fact is it is not so. The investment on HRIS can be justified based upon the two perspectives namely Risk avoidance and organization enhancement. With the aid of HRIS we can know about our employee performance, their productivity level and their strength and weakness. By doing so, we can devise training program to develop their ability. This helps the organization to convert their threats into opportunity.

The organization enhancement deals with the benefits obtained by the firm by implementation HRIS resulting in increase of revenue.

Before implementation in HRIS the companies can analysis the HRIS Cost benefit analysis. Mr.Micheal and Mohan developed the below table which deals with key and their descriptions related to HRIS Cost Benefit Analysis.

Key	Description
The objective is improving organizational effectiveness	The objective of any HRIS Cost benefit analysis is not to purchase specific hardware or software. The objectives are to improve organizational performance.
Be honest with yourself	Start each analysis with an open mind, not an investment to justify
Focus on functionality, not products	The analysis should focus on improvement in organization functionality that is to be achieved. Start with the functionality and let it lead to the product. Don't start with the product and attempt to identify ways to justify its purchase.
Estimate Benefits first	Examine costs only after you have completed the analysis of benefits.
Know your business	This means how really understanding what your business is and how your current process allows your organization to accomplish its objectives. Understand the dynamics of your current processes and where potential for improvement can be found

Develop the best estimate possible	Don't be overly optimistic or conservative. Develop the best estimate you can with the data available to you
Separate the Cost Benefit Analysis from questions of how best to justify a final decision	The questions involved in developing an accurate Cost benefits analysis and attempting to determine how best to justify are two separate processes. The latter involves choices about which sources of value should be included in the business case to be presented to decision makers. These are determined by the relative comparisons of costs with the magnitudes and types of revenue sources. The latter should be pursued only after a complete analysis has been accomplished.

Implementation Process of HRIS

Mr. Loyal L.Bryas and Lesile W. Rue formulated the following 14 steps in implementing HRIS in an organization listed below:

Inception of Idea

The changes in the organization happen because of the idea originated from some person. The person behind this must develop a report stating the need for implementing HRIS and what the necessary changes need to be made for implementing HRIS successfully.

Feasibility Study

The Feasibility study gives a detailed report whether the implementation of HRIS is practically possible. If so whether it is financial feasible or not.

Selecting a Project Team

If the feasible report is found to be satisfactory, then a team is formed. The team consists of HR executives who are very knowledge about the HR activities. They also consist of members from management information system, payroll and clerks.

Defining the Requirements

In this we have to define clearly what are work that has to done using HRIS. The important thing has to be considered in this step is to make sure that the objectives of the HRIS go hand in hand with company's objectives. This step also defines how and from whom the data needs to be collected, processed and stored.

Vendor Analysis

The vendor from whom the company needs to purchase the computer peripherals are to be analyzed in this step. The firm has n number of choices for vendors. Therefore they have to select the vendors based upon their past performance of the components supplied by them, the experience of the vendor, price and most importantly the quality of the peripherals supplied by the vendors.

Package Negotiation Contract

Once the vendor has been finalized, the negotiation takes place between the firm and the vendor. Then the contract is signed between both the parties which consists the vendors responsibility for the system peripherals supplied by the vendors.

Training

As soon as the contact is signed with the vendors, the project team is trained by the vendor regarding the instruction and how to use the HRIS. The project team members train the other employees in the organization in other departments regarding the do's & don'ts in HRIS.

Tailoring the System

The HRIS consists of many modules. Not all modules are required by the organization. The HRIS is tailor according to the firm requirement. There is a rule of thumb that don't modifies the vendor package, instead augment it according to the needs of the organization.

Collecting the Data

The data required for the functioning of HRIS is collected as per the instructions given by the vendor.

Testing the System

This is a trial method to make sure that the HRIS is functioning effectively. The output given by the HRIS is verified for its accuracy in the initial period after implementation the HRIS.

Starting Up

In this stage the HRIS is used to process the activity and generated reported are analyze. The maximum time is taken in this stage so that the employees learn in depth about the function and modules available in the software.

Running in Parallel

The old system is run parallel along with the new system. By this we can compare the outputs between two systems.

Maintenance

It is hard to expect the HR executives to feel comfortable with the new system. During this period the errors and adjustments are handled by the executives and they will feel very comfortable with the new system.

Evaluation

The HRIS is evaluated whether it is really beneficiary to the firm. This evaluation is done after a reasonable time after the implementation of HRIS.

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Lesson 4.3 - Performance Management

The performance management is an important aspect in knowledge based organizations. Only by this we can determine whether the implementation yields positive results for the organization. In performance management in order to determine the success of knowledge management, risks must be calculated and their counter measures must be planned to tackle the uncertainty. The risks are categorized as given below:

Customer mandate	Scope of the project Determination of requirements	**HIGH**
Environment	Execution	**MODERATE**
LOW	**HIGH**	

The above table takes 2 factors into consideration namely

i)   Level of Risk (High and low)

ii) Level of control (High and moderate)

Quadrant I - Customer Mandate

In this quadrant the project manager has high degree of control and the risk level is low. Therefore this quadrant doesn't require any counter measures.

Quadrant II: Scope & Determinants of the Project

This quadrant has high degree of risk and control by the project manager. The scope and the requirements of the projects developed by the

project members must be parallel as per the end users requirements. If so, then there is no risk involved in the project.

Quadrant III – Environment

We all know that we can't have entire control over the external environment. The risk level is also low as the environment does have less impact on the project developments as the project is based upon intellectual capital rather than machine and materials.

Quadrant IV – Execution

Even though the project planning is flawless, if it is not executed properly the project will be a failure and it will drastically deteriorate the goodwill of the company. Therefore utmost care must be taken for the execution of project to convert it into a successful one.

Metrics

"What can be measured is not always important and what is important cannot be always be measured"

➢   Albert Einstein

The term "Metric" is nothing but measurement of intangible assets like intellectual asset.

The Financial ROI can be used to measure the intellectual capital or to measure the knowledge generated from a knowledge workers. So the metric are used to measure them.

The Metrics can be classified unto two groups namely

Metrics

Traditional Metrics   Modern Metrics
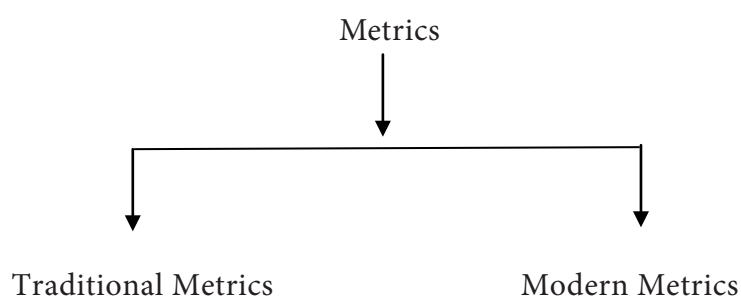
Traditional Metric – Tobin's q

The Tobin's q is used to measure intangible assets for a long period time. In this they measure the ratio between the firm's marker valuation and its cost of replacing its physical assets.

$$\text{Tobin's q} = \frac{\text{Firm's marker valuation}}{\text{Cost of replacing its physical assets}}$$

The limitations of Tobin's q

➢ There is no identification for knowledge development strategy
➢ It measures the intellectual health if an organization only for a given point of time.
➢ It don't pin point where the firm goes wrong
➢ Tobin's q doesn't highlight the firm where to focus for growth
➢ It doesn't say how to prevent imitation.

Points to Remember While Selecting a Metric

The organizations must remember the following points before selecting a metric:

i) don't use Many Metric

The organizations use many metrics to measure the past and present performance. They also use metric to evaluate the future opportunities available for them. The common mistake made by many organizations is that they focus too much on their past and quantity. But they really need to focus on the present and quality of the information rather than the quantity.

It is general thumb rule that a company can use 20 metric, beyond that it is not advisable. We think that bys using some metric will be perfect, but in reality they are not so. Therefore a good metric must be precise, measure the right things and practically applicable.

ii) Metrics used for Long Term Evaluation

Generally companies have long term goals and they use metrics to evaluate them. In such areas, the long term objectives must b formulated in such a way that the employees reap short term benefits also.

By formulating in such a way employee will be motivated to achieve the long term objectives. The metric used must measure today and it must also predict the future outcomes.

iii) Metrics those are Easy to Control

Always select a metric that is easy to control rather than choosing a metric that is hared o control. Because those metrics seems good in theory but it is not possible in reality. They are metrics should be achievable rather than formulating for namesake.

iv) Don't Neglect the Soft Results

It is well known that organizations give importance to financial results or hard results. But they need to give equal importance to soft results related to suppliers, managing people, and customers.

It is not advisable for the management to focus on hard results and expect low level managers to take care of the rest like financial success. This is due to the fact many research has proved that hard and soft measures go hand in hand for growth of the firm.

Measuring and Paying for Performance

Learning Objectives

- ➢ The important of relating kinds and levels of employer – provided rewards to kinds and levels of employee contributions.

- ➢ The problems related to measuring and rating employee performance.

- ➢ Motivation and its influence on employee workplace contributions and results.

- ➢ Merit pay and the critical need to relate pay to performance.

- ➢ The relationship between a number of critical government regulations and the measuring and rating of performance.

- ➢ The design of performance appraisal instruments.

- ➢ The development of a performance appraisal instrument(s) best suited for a particular organization

Pay for Performance in a Knowledge

Slightly more than a hundred years ago, large numbers of workers in the United States moved from agricultural jobs into industrial jobs. In the factories and mills, workers produced an easily observed and measured output by performing a limited number of actions, frequently repeated daily, if not hourly, on a sequential basis.

In these settings, industrial engineers were extremely successful in increasing output by relating employee pay to units produced. This factory work required limited database development and knowledge acquisition by workers, but placed significant demands on physical capabilities.

Now, in the first decade of the twenty – first century, factories and mills are providing employment for less than 20 percent of the U.S. workforce.

Many of the heavy physical jobs in these factories and mills have now been replaced by individuals operating keyboards that control computerized robots that do the heavy work and the repetitive exercises.

Although the great majority of workers are now finding employment in service – related organizations (banks; insurance companies; utilities; hospitals; transportation; food and lodging; local, state, and federal governments; schools),.

The differences between manufacturing and service industry jobs are becoming even more blurred because some of the most labor – intensive jobs today are found in service industries in which clerks sit at a terminal all day, entering data into a computer or manually reviewing, sorting, and filing forms.

These data entry and analysis jobs in service - sector businesses may be the factory jobs of the twenty – first century.

The Knowledge – Directed Worker

In conjunction with this transition form a manufacturing workplace to an office or service related work environment, the nature and king of assignments performed by many workers have changed and still are changing.

The term *knowledge – directed* or *gold – collar* worker is often used to describe modern – day employees. Instead of using physical strength within a restrictive motion – and – time – directed work environment, these workers must make much greater use of their intellectual faculties within a problem- solving, rather than performing mechanistic, repetitive work assignments.

An effective, knowledge of more different kinds of activities in order to make the correct decisions required in the performance of job assignments.

Because so much of the work goes on inside the brains of these knowledge – directed workers, it is difficult to identify, recognize, or quantity through observation the quality of their contributions or outputs. It is also difficult to determine with any degree of precision how many workers are required to produce a specific output. These definitional problems place more emphasis than ever before on the work to be done by each employee.

Barriers to Pay for Performance

A number of barriers block the design of incentives for these kinds of jobs. Some of the more critical are these.

1. The work of individual employees can vary significantly from day to day.
2. It may be difficult to observe a complete work cycle.
3. A number of activities may be performed once a week, once a month, once a quarter, or upon the occurrence of a specific situation.

4. The time required to perform an assignment might not be a good indicator of the importance of the assignment relative to all other assignments included within the jobs or of the knowledge and skills required of the jobholder.

5. An individual might interact with different employees or clients at different times to complete a work assignment, and the results achieved might depend directly on the cooperation and skill of the other employees or clients involved in the interaction.

These barriers limit the use of industrial engineering motion and time practices for designing pay – for performance programs for the knowledge – directed worker. Realizing this, by the 1950's, incentive plan designers began seeking assistance from behavioral scientist involved in developing motivation theories and concepts.

Modern Methods for Performance Management

The traditional method has many flaws to measure the performance. The modern method is used for performance management to overcome the limitations of traditional methods.

They are as follows:

1. Balance Score Card.
2. Benchmarking
3. House of Quality

Out of the three methods we have briefly discussed the balance score card method in the unit –II, so we will deal benchmarking and house of quality in this chapter.

Benchmarking

" Know the best to become the best "

- Hindu Proverb

In simple terms, benchmarking is the process of searching industry best practices. In other words, benchmarking is the process of compar-

ing oneself with the world's best practices. By comparing yourself with the leaders in the market we can know where we lag behind. This practice was first adopted by Xerox to find how Japanese companies can sell machines in less cost. It is a study in which the company study about similar or different companies how they adapt various methods for producing goods / services.

The Benchmarking is a kind of Knowledge management metric. It is of two types namely

1. Internal Benchmarking
2. External Benchmarking

Internal Benchmarking

In this process, we compare ourselves with some of our departments or units within the organization in the same region or other branches of the firm. By doing so, we can know how that specific unit is able to perform better than the other units and we can adopt the same practices throughout the firm uniformly.

External Benchmarking

When we compare with companies outside of the firm then it is known as external Benchmarking. We carry external Benchmarking to determine why we lag behind those companies.

The benchmarking carried by Xerox Company is an example for external benchmarking.

A) Non – Competitive Benchmarking

In this method, the companies measure themselves against the companies from different sector. For example if a car manufacturing company does Benchmarking against a textile firm then it is non competitive benchmarking. It is done to know the best methods and practices used in the industry irrespective of industry sector.

B) Competitive Benchmarking

IF a company compare themselves against the firm from the same sector, then it is known as competitive Benchmarking. This process aims at the study and the measurement of competitors without its cooperation.

Steps in Benchmarking

The following are the Benchmarking steps to fit better with knowledge management. They are as follows:

i) Determine what to Benchmark

The foremost step in Benchmarking is to decide what to benchmark. We can benchmark various criteria like

- ➢ Process
- ➢ Knowledge
- ➢ Products
- ➢ Services

The firm must decide what to benchmark and they must give valid reasons why they are doing so. While selecting what to Benchmark the organization must keep in mind the scope of benchmarking it. Once the company selected the area of Benchmarking they must shortlist the company to carry out the Benchmarking process.

For example the Accenture Company developed Knowledge Management Assessment Tool (KMAT) which is a Benchmarking questionnaire where responses given by a company can be compared against industry best practices.

ii) Form a Benchmarking Team

The firm has to set up a benchmarking team to carry out the Benchmarking process. This team is entirely responsible for the Benchmarking process. They are responsible right from collect the data and analyzing them and devising methods to reduce the benchmark gap.

iii) Collect the Data

The data from the competitors are collected either directly or indirectly. The direct method of data collection includes collecting data by questionnaire, interviewing the employees of competitor's firm, observe the methods followed by the competitors. The indirect method of data collection includes collecting data from magazines, publications and surveys.
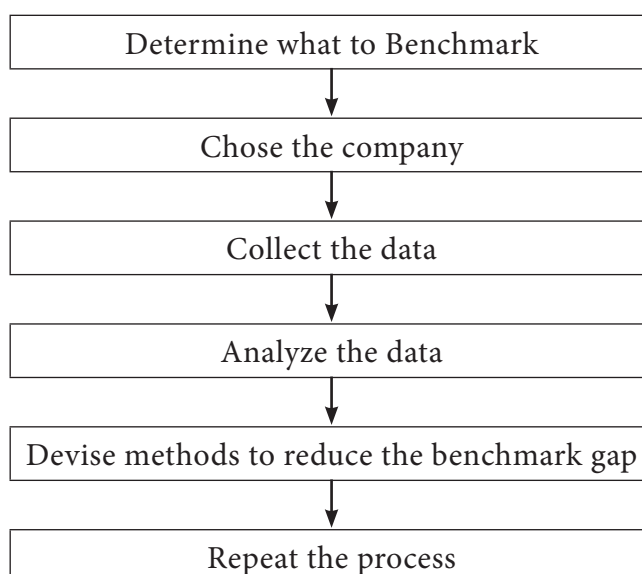
iv) Analyze the Data

The data that is collected is analyzed for its accuracy and reliability of the information and they are compared with the firm practices. The gap between the company and the Benchmarking Company is known as "benchmarking Gap".

v) Measures to Reduce the Benchmark Gap

The company must devise methods to reduce the benchmark gap thereby they can gain edge over their competitors and be the market leaders and improve their share in the market. The methods are implemented to reduce the gap between them and their competitors.

vii) Repeat the Process

Benchmarking process is repeated once again to evaluate whether the implemented measures has reduced the gap or not. The benchmarking process is given in the form of flow chart

```
┌─────────────────────────────────┐
│  Determine what to Benchmark     │
└─────────────────────────────────┘
                │
                ▼
┌─────────────────────────────────┐
│      Chose the company           │
└─────────────────────────────────┘
                │
                ▼
┌─────────────────────────────────┐
│       Collect the data           │
└─────────────────────────────────┘
                │
                ▼
┌─────────────────────────────────┐
│       Analyze the data           │
└─────────────────────────────────┘
                │
                ▼
┌─────────────────────────────────────────┐
│ Devise methods to reduce the benchmark gap │
└─────────────────────────────────────────┘
                │
                ▼
┌─────────────────────────────────┐
│       Repeat the process         │
└─────────────────────────────────┘
```

Benefits of Benchmarking

Tiwana has listed the following potential benefits of benchmarking:

- ➢ Overall productivity of knowledge investments
- ➢ Service quality
- ➢ Customer satisfaction an the operational level of customer service
- ➢ Time to market in relation to other companies
- ➢ Costs, profits and margins,
- ➢ Distribution
- ➢ Relationship and relationship management.

Limitations of Benchmarking

- ➢ The data collection is a tedious process
- ➢ The accuracy of the data can't be guaranteed
- ➢ The reliability of the data is not sure
- ➢ The cost of collecting data is quite expensive.
- ➢ The process suitable for one company may not be suitable to other firms.
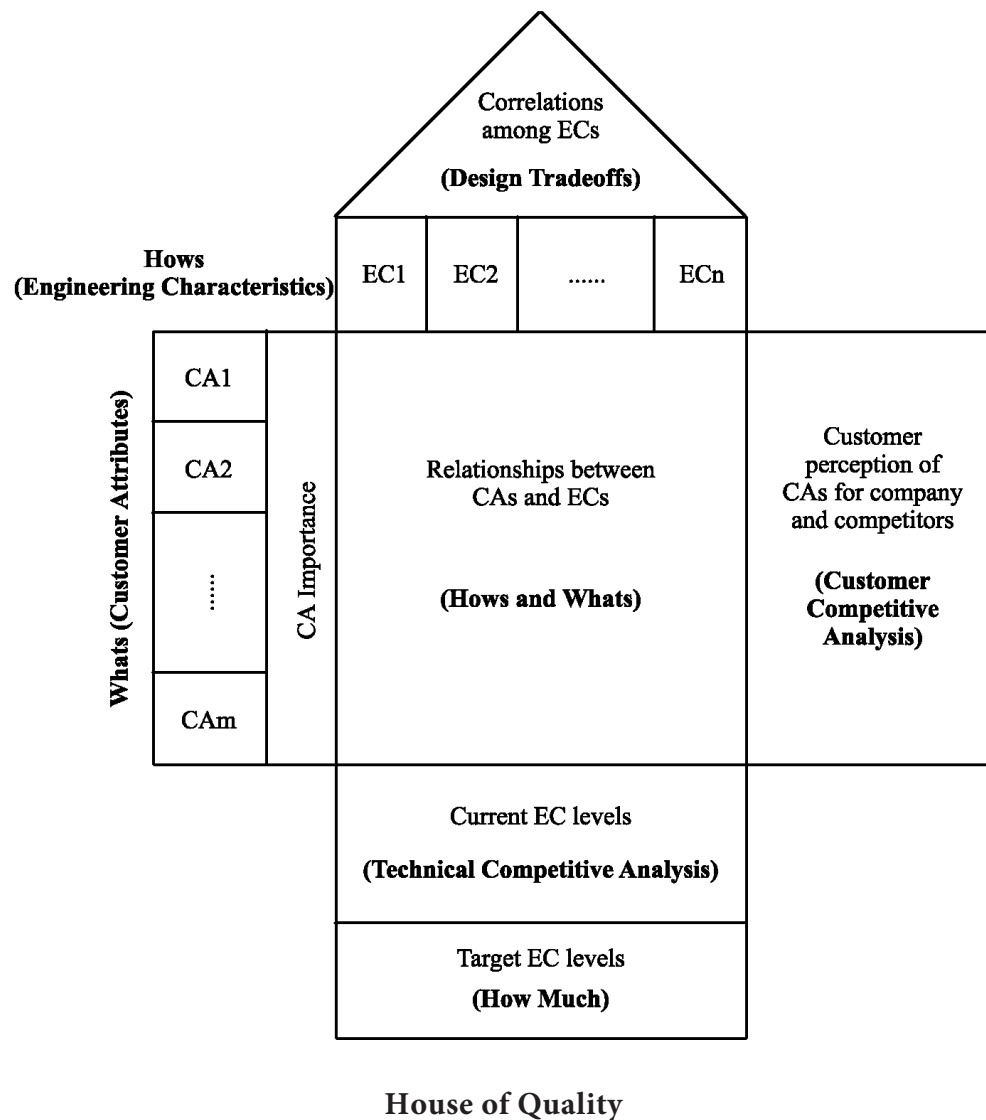
House of Quality

This concept was developed by Hauser and Clausing. They initially published their concept in the Harvard Business Review. The House of Quality aims to link the customer expectations with the internal business processes.

This is also known as Quality Function Deployment (QFD). The House of Quality is designed specifically to meet the requirements of the customers.

As you can see that the customer attributes (CA) are listed in the left hand side of the diagram. The internal business processes are listed in the top side i.e. engineering characteristics (EC). The relationship matrix between customer attributes (CA) and Engineering characteristics (EC) are stated in the centre of the diagram. The right hand side of the diagram represents the customer perception about the company and the competitors.

The house of quality diagram is illustrated below:

House of Quality

The top most triangle states the correlation among the internal business process or engineering characteristics.

For example let's take a motorcycle manufacturing firm for explaining the concepts of House of Quality

Customer Attributes (CA)

- ➢ Safety
- ➢ Cost
- ➢ Durability
- ➢ Storage

- ➢ Light weight
- ➢ Aesthetics
- ➢ Comfort
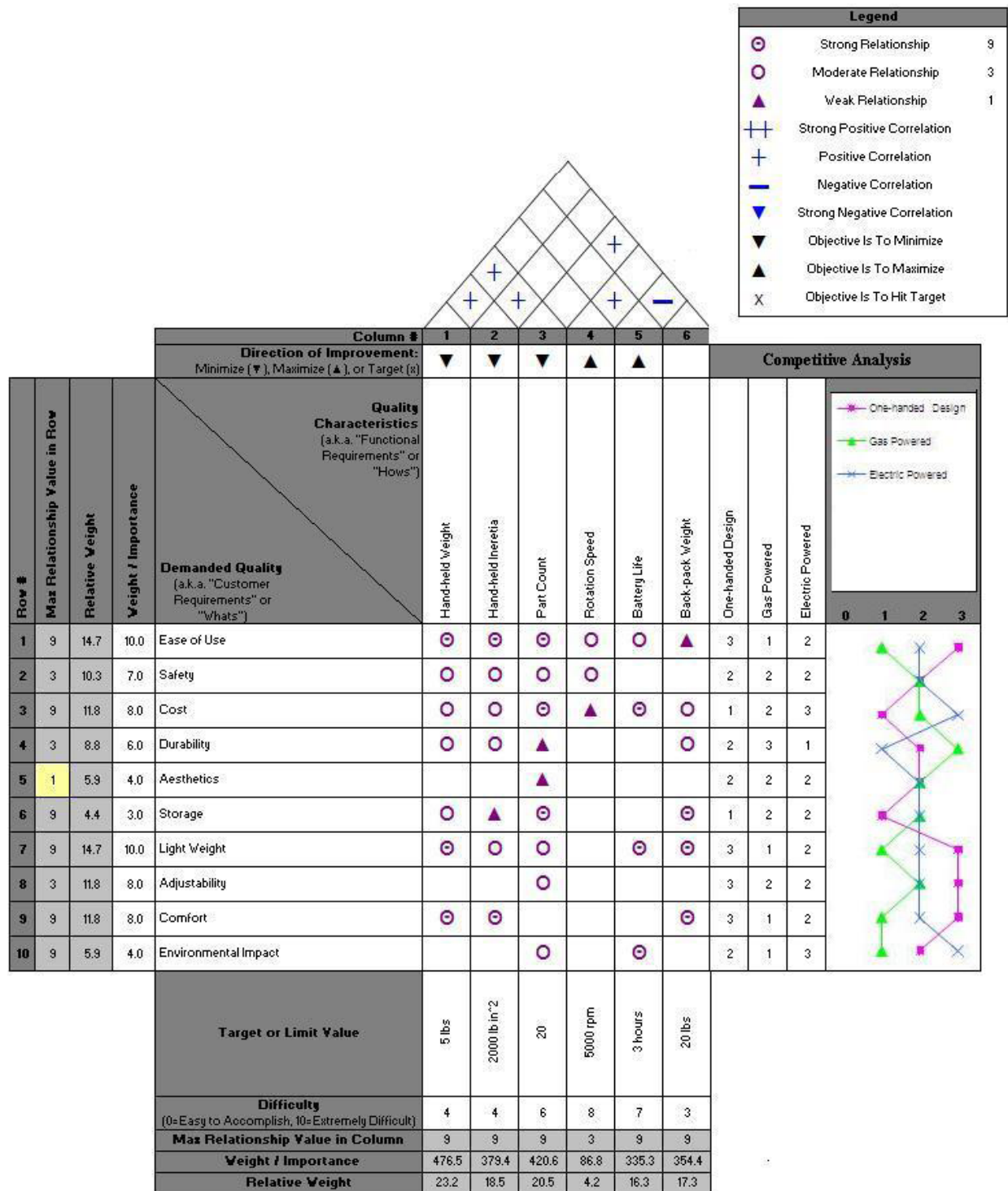- ➢ Environmental impact
- ➢ Adjustability

Engineering characteristics or Internal Business Process

- ➢ Rotation speed
- ➢ Hand held interest
- ➢ Battery
- ➢ Hand held weight
- ➢ One handed design
- ➢ Gas powered
- ➢ Part count
- ➢ Electric power

The interrelationship and the correlation of CA & EC are explained in the illustration next page:

The 188 page is the QDF diagram of American Supplier Institute

- ➢ 'N' numbers of software's were developed for the House of Quality. The most used software among them is QDF designer developed by Qualisoft Corporation. According to Skaridia's Intellectual Capital annual report the following are the indicators to analyze the knowledge management effectiveness:
- ➢ Employee Satisfaction
- ➢ Competence development expenses
- ➢ Number of Patents held by the firm
- ➢ Training expenses per employee
- ➢ Information gathering expenses
- ➢ Expense of reinventing solutions per annum
- ➢ Number of ideas implemented compare to those suggested
- ➢ Attrition rate of the employee.

Legend

Symbol	Meaning	Value
⊙	Strong Relationship	9
○	Moderate Relationship	3
▲	Weak Relationship	1
++	Strong Positive Correlation	
+	Positive Correlation	
−	Negative Correlation	
▼	Strong Negative Correlation	
▼	Objective Is To Minimize	
▲	Objective Is To Maximize	
x	Objective Is To Hit Target	

Column #				1	2	3	4	5	6	Competitive Analysis		
Direction of Improvement: Minimize (▼), Maximize (▲), or Target (x)				▼	▼	▼	▲	▲				
Row #	Max Relationship Value in Row	Relative Weight	Weight / Importance	Hand-held Weight	Hand-held Inertia	Part Count	Rotation Speed	Battery Life	Back-pack Weight	One-handed Design	Gas Powered	Electric Powered
1	9	14.7	10.0	Ease of Use — ⊙	⊙	⊙	○	○	▲	3	1	2
2	3	10.3	7.0	Safety — ○	○	○	○			2	2	2
3	9	11.8	8.0	Cost — ○	○	⊙	▲	⊙	○	1	2	3
4	3	8.8	6.0	Durability — ○	○	▲			○	2	3	1
5	1	5.9	4.0	Aesthetics —		▲				2	2	2
6	9	4.4	3.0	Storage — ○	▲	⊙			⊙	1	2	2
7	9	14.7	10.0	Light Weight — ⊙	○	○		⊙	⊙	3	1	2
8	3	11.8	8.0	Adjustability —		○				3	2	2
9	9	11.8	8.0	Comfort — ⊙	⊙				⊙	3	1	2
10	9	5.9	4.0	Environmental Impact —		○		⊙		2	1	3

Quality Characteristics (a.k.a. "Functional Requirements" or "Hows")

Demanded Quality (a.k.a. "Customer Requirements" or "Whats")

Competitive Analysis legend:
- One-handed Design
- Gas Powered
- Electric Powered

(scale 0 1 2 3)

	1	2	3	4	5	6
Target or Limit Value	5 lbs	2000 lb in^2	20	5000 rpm	3 hours	20 lbs
Difficulty (0=Easy to Accomplish, 10=Extremely Difficult)	4	4	6	8	7	3
Max Relationship Value in Column	9	9	9	3	9	9
Weight / Importance	476.5	379.4	420.6	86.8	335.3	354.4
Relative Weight	23.2	18.5	20.5	4.2	16.3	17.3

Notes

House of Quality — ASI - American Supplier Institute

Self Assessment Questions

1. Explain the Sources Of Knowledge Expertise.

2. What is Benchmarking?

3. Explain the steps in Benchmarking.

4. What are the Benfits of Benchmarking?

5. What are the limitations of Benchmarking?

6. Explain briefly about human resource information system.

7. What is performance Management in KBO?

CASE STUDY

Meddevco (name changed) is a large multinational corporation that operates in the medical devices sector. The firm employs around 33,000 people in five divisions and has operations in 120 countries. A total of 66% of the multinational's revenue is generated from products that are less than 2 years old and 80% of the employees are working on products that are not less than 2 years old. These figures illustrates the highly competitive and fast paced nature of the medical devices sector. This sector is also characterized by high levels of regulatory control and a need to comply with industry norms. Meddevco is headquartered in the United States and Switzerland.

The information needs of a firm of this size are substantial and it would be next to impossible to collect, store and analyze HR – related information without the use of fully integrated global HRIS. Moreover, the diversity of the workforce, the multiplicity of skills required in the different divisions and product lines and the pressure of compliance necessitate a perfectly orchestrated T&D effort. Needless to say, HRIS T&D application plays a major role in managing T&D function.

The firm uses an HRIS by PeopleSoft (now Oracle) to manage the majority of its global HR processes. The firm uses a number of different Payroll systems in Europe for compliance reasons.

All employees in the corporation have access to a company intranet called My Meddevco, which includes a learning portal that provides access to online training programs, which employees can use at work and home.

A number of years ago, the corporate made the decision not use the training module included in the PeopleSoft and opted for a training management system called SABA to co-ordinate and manage training initiatives; for example the recent rollout and training for the use of SAP (an ERP System) for production facilities was managed by SABA. In addition, the firm has recently commenced using the talent management module included in PeopleSoft to identify and track high performing employees for promotion. Every employee is required to complete an online talent

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profile, which is similar to an online CV and which can be updated by the employee.

The combination of the systems and applications and the careful analysis of HR information contained therein allow the organization to develop and implement a global T&D strategy. However the firm also faces some challenges arising from the use of these systems.

As the organization largely grows through acquisition, a legacy systems still co exists with the global HRIS among some of its subsidiaries. Data compatibility issues also derive from the use of SABA, which is not part of PeopleSoft. In addition the firm also using SAP, and it is questionable whether Oracle will support data exchanges with a system supplied by its Chief implementation process of the TMS, employees are reluctant to complete their talent profiles.

Moreover, the need to customize the HRIS locally to comply with national legislation in its subsidiaries further complicates the collection of transfer of data within the global HRIS.

The example of Meddevco illustrates how large organizations employ HRIS to manage their workforce and how they leverage HR development through the use of HRIS T&D applications, learning portals and specialized LMS. However, it is also apparent that careful planning is essential to avoid compatibility issues and to ensure a consistent global flow of HR and T&D related information.

Questions

1. What should Meddevco have done to avoid some of their problems?
2. How could Meddevco now solve the problems created by not involving employees during the implementation of the HRIS?
3. What else should Meddevco do now to improve the operations of their system?

****

UNIT – V

Learning Objectives

After learning this unit, the students will understand the concepts of

1. Artificial Intelligence
2. Expert system Development and knowledge management
3. Repository systems
4. Layers of artificial intelligence
5. Knowledge Repository

Unit Structure

Lesson 5.1 Technologies to Manage Knowledge

Lesson 5.2 Artificial Intelligence

Lesson 5.3 Knowledge Management, Artificial Intelligence, and Information Systems Issues

Lesson 5.4 Digital Libraries

Lesson 5.5 Knowledgde Discovery

Lesson 5.1 - Technologies to Manage Knowledge

The presentation of technologies is not exhaustive, but rather a starting point for the group to discuss how these emerging technologies could be used in the context of development policy training and knowledge management now and in the future. The document also tries to categorize individual technologies into technology trends or scenarios of technology development, rather than explain each of the application or technology separately. In addition, it is worth of mention, that this document is rather a "copy -paste" collection of ideas than a "scientific article".

Some strategic questions for the Knowledge Management sub-group:

➤ Should we focus on supporting other sub-groups/agencies in the use of different technologies or just develop ideas and leave the implementation for the groups/agencies themselves

➤ If supporting, should we develop extended Web based services for the sub-groups/agencies beyond the current website, or focus on supporting the use of the current web site.

➤ If developing new services, should we focus on technologies that can be put in use NOW (like installing a Wiki) or discuss and develop scenarios that can be integrated to the website later in the future.

So, if decided, one aim of the KM sub-group could be to discuss "knowledge support needs" of the development policy experts and future scenarios of the web site to be developed to serve these needs. Just to give an example, one scenario or a need for knowledge management systems in development work could be the following:

A development policy expert is **responsible of a certain sector of development policy and/or certain countries**. The person is supposed to **work together with similar experts** of other agencies, local authorities, local consultants and other stakeholder in the field. A challenge is to extend the knowledge support system from the office to other locations to work and travel.

How the new technology can assist the expert and help the person to learn from the other experts and manage with all the information that is available of the sector and the recipient countries at the same time when the person is visiting at project sites.

What kind of knowledge system could support this kind of expert? To summarize the needs of the expert are the following:

➤ ability to **search** relevant information for decision making/advise that is related to the sector and relevant countries (Semantic web)

➤ ability to **communicate and collaborate** with other colleagues (Web 2.0)

➢ ability to do all this while travelling and get relevant information related to the current **location** (mobile)

The categories of technologies that can help us to develop such a knowledge support system for development policy experts are introduced here as following:

➢ Web 2.0 technologies

➢ Semantic Web (Web 3)

➢ Ubiquitous technologies (mobile, wireless, pervasive, wearable, etc.)

Web 2.0

The phrase Web 2.0 can refer to a perceived second generation of web-based communities and hosted services — such as social-networking sites, wikis, and folksonomies — which aim to facilitate creativity, collaboration, and sharing between users. "Web 2.0 is a knowledge-oriented environment where human interactions generate content that is published, managed and used through network applications in a service-oriented architecture."

Technologies such as weblogs (blogs), social bookmarking, wikis, podcasts, RSS feeds (and other forms of many-to-many publishing), social software, and web application programming interfaces (APIs) provide enhancements over read-only websites. Train4Dev website fulfils the most of these requirements, except Wiki.

Web 2.0 websites typically include some of the features/techniques presented in the triangle:

At the base of the Web 2.0 triangle are the blogs – many companies/agencies having their principal officers run internal/external blogs. As an external tool that plugs into a corporate website, it is an excellent tool for thought leadership positioning. Another tool, that's fairly simply to integrate into an existing web presence are RSS feeds. These can be hooked up to dynamic sections like Jobs/Press Releases/ to good effect.

Moving up the ladder we come to networking tools. Networking can be tapped in two ways. The first and possibly the most rewarding is the creation of web communities. A Moderated community that can actually share members' experiences and data is a self sustaining web site. Plus it's a great platform to promote new ideas and products, for organizing user training and even for getting advance feedback for under-construction features.

Another interesting way of using networking is to create alumni online group of an institution/agency.

The next levels of services are built around bookmarking. In a social bookmarking system, users save links to web pages that they want to remember and/or share. Social bookmarking sites are popular and useful and they can be bent to a professional context.

Examples of social bookmarking sites:

Blue Dot, Bookmark Sync, Cloudytags.com, del.icio.us, Digg, Furl, GiveALink.org, Ma.gnolia, My Web. With bookmarking, collaboration kicks in and wikis are the next logical step. While it requires an application to house and manage the wiki, once this is set up, organizations will find that wikis are self sustaining without the overhead of separate teams that intranets normally entail.

The wiki is used for knowledge management, project information sharing, news and updates – users have rights for specific sections that they periodically update and each group maintains its own area. The wiki has since cannibalized some of the functions of the intranet and the knowledge management systems since it is always better updated.

Semantic Web (also called Web 3.0)

The Semantic Web will bring structure to the meaningful content of Web pages, creating an environment where software agents roaming from page to page can readily carry out sophisticated tasks for users. The semantic web provides a common standard (RDF) for websites to publish the relevant information in a more readily machine-process able and integratable form.

Semantic Web promises to make Web-accessible data more amenable to machine processing. The Semantic Web is about labelling (annotating) information so that computer systems (and humans) can process it more meaningfully. The semantics underlying such annotations usually come from ontologies, which encapsulate agreement among information creators and users with help from common nomenclature and the use of rich knowledge representation.

Just as the Semantic Web is beginning to empower and energize content on the Web, the underlying principles and technologies can energize and enhance the long-standing knowledge-management discipline. Several frameworks within knowledge-management theory set contexts for scientific debate.

Some emphasize the knowledge life cycle, others the knowledge product and many researchers have recently begun to emphasize the knowledge and social networking perspective, as previously described. The rapid adoption of Web 2.0 and Web 3.0 technologies adds to this picture a tight connection between knowledge management, social networks, and various implicit, formal, or powerful semantics.

The latest Semantic Web developments and insights in knowledge management challenge the new era of semantic-based knowledge-management systems. Semantic Web tools and applications contribute significantly to knowledge management's performance, providing a definition for flexible reference mechanisms to knowledge objects and knowledge contributors; integration of knowledge creation and use; integral human involvement in information- and knowledge-management activities; and a definition for and the exploitation of social networks, including social activities and context.

Lesson 5.2 - Artificial Intelligence

Introduction

Despite a long history of research and debate, there is still no standard definition of intelligence. This has led some to believe that intelligence may be approximately described, but cannot be fully defined. We believe that this degree of pessimism is too strong. Although there is no single standard definition, if one surveys the many definitions that have been proposed, strong similarities between many of the definitions quickly become obvious. In many cases different definitions, suitably interpreted, actually say the same thing but in different words.

This observation leads us to believe that a single general and encompassing definition for arbitrary systems was possible. Indeed we have constructed formal definition of intelligence, called universal intelligence, which has strong connections to the theory of optimal learning agent's.Rather than exploring very general formal definitions of intelligence; here we will instead take the opportunity to present the many informal definitions that we have collected over the years.

Naturally, compiling a complete list would be impossible as many definitions of intelligence are buried deep inside articles and books. Nevertheless, the 70 odd definitions presented below are, to the best of our knowledge, the largest and most well referenced

collection there is. We continue to add to this collect as In this section we present definitions that have been proposed by groups or organizations.

In many cases definitions of intelligence given in encyclopedias have been either contributed by an individual psychologist or quote earlier definitions given by a psychologist. In these cases we have chosen to attribute the quote to the psychologist, and have placed it in the next section.

In this section we only list those definitions that either cannot be attributed to a septic individuals, or represent a collective definitions agreed upon by many individuals. As many dictionaries source their definitions from other dictionaries, we have endeavored to always list the original source we discover further definitions, and keep the most up to date version of the collection available online. If you know of additional definitions that we could add, please send us an email.

Definitions

1. "The ability to use memory, knowledge, experience, understanding, reasoning, imagination and judgment in order to solve problems and adapt to new situations." All Words Dictionary, 2006

2. "The capacity to acquire and apply knowledge." The American Heritage Dictionary, fourth edition, 2000

3. "Individuals dicer from one another in their ability to understand complex ideas, to adapt electively to the environment, to learn from experience, to engage in various forms of reasoning, to overcome obstacles by taking thought." American Psychological Association.

4. "The ability to learn, understand and make judgments or have opinions that are based on reason" Cambridge Advance Learner's Dictionary, 2006

5. "Intelligence is a very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience." Common statement with 52 expert signatories [13]

6. "The ability to learn facts and skills and apply them, especially when this ability is highly developed." Encarta World English Dictionary, 2006

7. "... ability to adapt electively to the environment, either by making a change in oneself or by changing the environment or ending a new one intelligence is not a single mental process, but rather a combination of many mental processes directed toward elective adaptation to the environment." Encyclopedia Britannica, 2006

8. "the general mental ability involved in calculating, reasoning, perceiving relationships and analogies, learning quickly, storing and retrieving information, using language fluently, classifying, generalizing, and adjusting To new situations." Columbia Encyclopedia, sixth edition, 2006

9. "Capacity for learning, reasoning, understanding, and similar forms of mental activity; aptitude in grasping truths, relationships, facts, meanings, etc."

10. "The ability to learn, understands, and thinks about things." Longman Dictionary or Contemporary English, 2006

Knowledge Management and Artificial Intelligence in Customer Relationship Management

The main precondition of strengthening companies' market position and development of Competitive advantage lies in customer satisfaction. In order to establish an effective Relationship with customers, organizations must have qualitative customer knowledge that Implies not only structured data, such as historical data about a contact, account, etc.., but also Unstructured information such as letters and faxes from customers, as well as additional types Of information useful for marketing, sales and service activities.

In order to raise the Level of Customer satisfaction with products, services and even the company itself, it is necessary theta company provides high quality data, which includes its accuracy, relevance, timeliness, Safety and the possibility of their exchange and portability. It is noted in (Bottle, 2009) that the fulfillment of a CRM vision depends upon how well the knowledge is set on points of sail And customers points of access.

For these reasons, companies are increasingly turning towards Utilization of artificial intelligence and the development and implementation of expert systems for knowledge management.

Expert systems have the possibility of collecting, storing, organizing, interpreting and distributing knowledge to users at their access points in order to meet the goals of marketing, sales and service. As stated in (Duos, Kolbe, Salzmann & Brenner, 2005, pp. 167–178), initiatives and efforts

form and knowledge management are directed towards the same goal: achieving continual Improvement aimed at customers. This business orientation is named in literature as customer Knowledge management, and it is narrowed to the usage of knowledge FOR, FROM and ABOUT customers in order to enhance and improve all aspects of business and customer Relationships.

Knowledge About Customers

It includes basic information about customers, their Purchase history and tendencies, etc. Based on this kind of knowledge company will have Better understanding of customer's requirements and a possibility to meet their needs more successfully.

Knowledge for Customers

It is information customers require to interact with the Company, such as knowledge about sales, marketing, services and information about products.

This kind of knowledge is usually implicit because it relies entirely on the experience of Workers in sales or employees in marketing and services sector. Intelligent systems, especially Expert systems, successfully translate this kind of knowledge into explicit knowledge.

Knowledge From Customers

It is a feedback received from customers regarding products and Services and how they understand and perceive the shopping experience and it helps to enhance products and services. Knowledge management and customer relationship management are strongly supported by Artificial intelligence products because of their capability of reasoning, knowledge Representation and ontologism. In literature (Sibson, 2006), as basic tools for knowledge Management supports that are also widely used in the field of CRM, the following are cited: Expert systems, data mining and software agents.

They provide a way of automatic customer Guidance to the information, products and other resources that is adapted to their needs,

Location and/or preferences. For example, in the financial sector, financial institutions and Banks faced with uncertainty and competition often Use neural networks for better Understanding and usage of the data required for asset management, trade, credit card fraud Detection and portfolio management.

Expert Systems and Knowledge Management

Knowledge management comprises several basic functions: knowledge identification, Creation and its exchange. Once the knowledge is discovered and formalized, the company's Goal is to use such knowledge for business improvement, and to insure it – to retain the Knowledge in the realms of company. Many concepts of knowledge management are not new. Its roots can be found in the area of expert systems and artificial intelligence in general.

From The aspect of knowledge lifecycle, expert systems can be applied in all its three phases: Knowledge creation, knowledge transfer and usage of knowledge.

In each expert system is embedded in an appropriate manner a large amount of high-quality Knowledge of the problems from a certain domains of human activity, (Bosnia, 2006).Expert system, as an intelligent program, can then process embedded knowledge in order to Successfully solve problems from its field of expertise, in a way that would be considered Intelligent if the same problems would solve man. Knowledge implemented in an Situated in the knowledge base that is separated from the program that uses knowledge to Solve problems - so called inference engine.

Knowledge acquisition phase of expert system development process is directly associated with the identification of knowledge in knowledge management. Since developed expert Systems offer the possibility of formalizing and automating acquired knowledge they are used to retain the knowledge in the organization for its further usage after the domain expert is One.

Knowledge representation for knowledge management purposes is related to the Knowledge representation and methods and techniques of

coding the knowledge in the field of Expert systems. Thus, many aspects of knowledge management are derived from expert Systems and artificial intelligence domain which leads to a conclusion that expert systems should be an integral part of knowledge management systems. For example, the U.S.Department of Labor (www.dol.gov) is using for years a Web-based expert system as an Integral part of their knowledge management system. One of the functions of this ES is Determination of the benefits of war veterans (Liebowitz, 1998).

Expert systems can be used for job training, integration of different sources of knowledge, and solving interdisciplinary problems. Furthermore, their application provides consistency in decision making; they make expertise more accessible, and promote and improve the Exchange of knowledge. Expert systems are the ideal technology for formalizing existing Knowledge in the organization, for its preservation and documentation, especially in today's.

Business environment where organizations are often reorganized, number of employees is reduced and older and more experienced workers are gone due to different reasons. Therefore, Expert systems are very useful for building the institutional memory of the organization before intellectual capital is lost. Companies, faced with uncertainty, more often turn to artificial intelligence and expert Systems in order to develop knowledge management systems that could provide the basis for Sustainable future of a company and competence at all levels. In the area of finance, expert Systems are widespread, particularly in the credit process, tax planning, and financial diagnosis and building plans for banks. The authors in (Yang & Vásárhelyi, 1998, pp. 29–43) have identified areas of management of personal investments appropriate for development of expert Systems.

Tasks such as advising on the portfolio, financial projections, portfolio accounting, online help, selection of the forms for tax preparation, and tax consulting are just some of them.

Determination of financial situation by means of ratios and financial statements Analysis represents further areas of financial accounting for which expert systems are Developed and deployed. Port-Man (Chan, Dillon & Saw, 1989, pp. 87–96) is a banking expert system developed with the aim to improve consulting process on personal

investments. It accelerates consultations and standardizes advices of financial consultants.

The task of the systemic to choose a set of Banking products that will meet the clients' criteria of investing. The selected products are Ranked according to rates of return on investment and the degree of risk the problem of credit risk measurement is a particularly interesting field. Financial Institutions, banks, credit institutions, clients, suppliers and others have to predict the failure Of companies with which they are interested in establishing cooperation.

As stated in (Facchinetti, Borodin & Mast oleo, 2001, pp. 472), methods commonly used for this purpose are the econometric analyses that estimate the probability of clients' insolvency, but they do not distinguish creditworthy and non-creditworthy clients at a satisfactory level. The research was conducted in order to overcome the limitations of econometric models and resulted with fuzzy expert system for creditworthiness assessment. the ES results were compared to the Results obtained through econometric analysis conducted over the same data.

They came tithe conclusion that the fuzzy system offered better solution to this problem and also a better Measurement of the discriminate power of the model. The authors in (Grljević & Bosnia, 2010) presented another financial expert system which Assesses creditworthiness of the company.

Creditworthiness is based on a set of indicators that are grouped into five aspects: indicators of the incomes and expenditures structure, indicators of business efficiency, business profitability, solvency and leverage. Each of these groups of Indicators measure and evaluate different business aspects of the company, therefore expert System users also have the possibility to measure the quality of only one of the aspects Mentioned above.

In the sequence of this paper is illustrated, from the aspect of knowledge Management, one segment of an expert system for comprehensive creditworthiness Assessment: business efficiency expert system. Design and implementation issues of this Sear in more detail described in (Grljević & Bosnia, 2010, pp. 338–344).

Knowledge Management in Business Efficiency

Expert System

Business efficiency can be expressed as a level of savings in achieved business results, and as Such it measures the business success against the amount of inputted labor, fixed assets, Capital and services necessary for its achievement. To measure the efficiency, one has to consider both the current and the externalized labor – the elements of a work process. Furthermore, business efficiency shows the degree to which the set business goals are achieved, while the necessary resources for their fulfillment are saved up.

The business is run efficiently if the achieved outputs the result of economic disburses of assets, third-party Services, labor force, and if the produced goods can be sold at preset prices.

The increase of Efficiency is based on the sparse usage of assets and maximization of revenues. One aspect analyzed in this expert system is the global price parity, which can be calculated Sales revenue / (Expenditure1* (Operating expenditures + Decrease in inventory –

Increase in Inventory)/ (Operating expenditures– Expenditures of goods)) the higher this indicator, the better the credit rating. The threshold is 1. If the indicator is less Than 1, then the company is in a very bad situation, because its purchase prices are greater than sales prices.

Indicators used for business efficiency evaluation are the ratio of total revenues and Total expenditures and the ratio of operating revenues and operating expenditures. The higher these indicators, the better the business efficiency. The knowledge of human expert in some domain of expertise can be acquired by diversified Knowledge acquisition methods and techniques that assure its completeness, consistency, and Accuracy.

The knowledge of decision making process and key information necessary for Decision making and deriving conclusions are stored in ES's knowledge base, during acknowledge engineering process. As a result, one gets an organized, structured collection of Reasoning principles and rules, which is transparent, easy to follow and explain.

Also the Knowledge on possible outputs or system results – advices, suggestions, is incorporated into An ES's knowledge base. The above mention domain knowledge is acquired and structured in the knowledge base of Business efficiency ES.

An illustration of one excerpt from the business efficiency Evaluation ES, represented by production rules. Variable II0 denotes the ratio of incomes and Expenditures from the main business activity, variable II1 denotes ratio of total incomes and Total expenditures, while variable II2 denotes ratio of operating incomes and expenditures. II Group variable collects points that represent basis for estimation of business efficiency's business creditworthiness.

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Lesson 5.3 - Knowledge Management, Artificial Intelligence, and Information Systems Issues

Artificial Intelligence

On a theoretical level, **artificial intelligence (AI)** can be defined in many ways. John McCarthy proposed the term in 1956 to describe computers with the ability to mimic or duplicate the functions of the human brain.

Artificial intelligence systems are the people, procedures, hardware, software, data, and knowledge needed to develop computer systems and machines that demonstrate characteristics of human intelligence. The purpose is to replicate human decision making and so help an organization achieve its goals.

Nature of Intelligence

In order to develop machines with **intelligent behavior**, you must understand the characteristics of intelligent behavior. These are: Learn from experience and apply the knowledge acquired from experience. The ability to learn from experience must be programmed in, such as in chess games. While humans naturally apply what they have learned to other situations, this is difficult to program into computers. Handle complex situations. Even human experts make mistakes in dealing with the complexities of multi-faceted decisions, so imagine the difficulty in programming this characteristic into a computer. Solve problems with important information missing.

People have to deal with uncertainty and missing data constantly, and for an AI system, it is not acceptable to just say" insufficient data."Determine what is important. Human decision makers have to ignore unimportant data and base their decision on what is important, and this ability has to be programmed into AI. React quickly to a new situation. This is not the way computers generally work, so trick programming is

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necessary. Understand visual images. Think of how many visual images we must interpret in our daily activities, such as driving a car, or moving through a room. Machines that candor this must haven extension of understanding of visual images, called a **perceptive system**.

Process and manipulate symbols. People deal with symbols and three-dimensional objects constantly, but machines deal best with numbers, a problem that is being addressed but with limited success. Be creative and imaginative. Some people are able to turn negative situations into success stories by being inventive and creative. In the field of information systems and management, people are encouraged to look for innovative solutions to problems and not be held back by self-imposed constraints.

However, creativity and imagination, the capability of inventing something new, are not characteristics of machines or computers. Use heuristics. People develop rules of thumb developed from experience, mainly by trial and Error or even guessing. Some computer systems can do this today. The problem with all definitions of Aisha we cannot pinpoint what "human intelligence" is. To create computer systems that can simulate the reasoning process, we need to understand the exact process of human reasoning. Unfortunately, to date, the secret of how human beings think and reason has not been unlocked. Thus, no definition of artificial intelligence is yet satisfactory.

Intelligent Systems: Perspectives and Research Challenges

The branch of computer science known as Artificial Intelligence (AI) tries to narrow the gap. AI has been focusing on narrowing the gap between human brains and computers by endeavoring to develop machines with the ability to act intelligently. Sometimes, the brain does not do the action immediately but used its imagination. It selects a response rule and determines what situation results from the action. Then it selects again an action for this new situation and determines the probable result.

Thus it can choose not only one response rule but a complete plan of action. This allows us autonomously, interact naturally with their environment and the humans therein, and be adaptive to changing situations and contexts, including the user's preferences and needs.

Examples of such intelligent systems in operation today include mobile devices that can translate and interpret foreign languages, a social emotional not as an edutainment tools, systems that supports the selection, configuration, and operation of strategies and tools in the bioinformatics, and machines that can automatically analyze medical images such as CAT scans to discover tumors or bone fractures.

However popular attempts in creating intelligent systems are still largely restricted to systems designed for environments having limited scope and performing simple tasks. In the future, research efforts must be devoted to intense cognitive challenges which are measurable and scalable in open – ended scenarios under changing conditions.

Intelligence

We define intelligence as the competence of a system to achieve a target or sustain desired behavior under conditions of uncertainty. Our definition is fundamentally based on the phenomenon of intelligence in biological systems where, one can say that intelligence helps them to deal with unpredictable changes in the environment.

Intelligent behavior is demonstrated by artifacts and biological systems capable of achieving definite goals or sustaining anticipated behavior under conditions of uncertainty even in feebly structured environments, for instance, situation where an mobile robot must distinguish between a person and an equipment at a workplace in which it operates.

Feature	Capability
Adaptability	To achieve specified goals or sustaining desired behavior in an environment characterized by unpredictable external changes
Self – maintenance	To maintain its own state of operational readiness
Communication	To exchange information with other systems
Autonomy	To act independently from other systems, including human operators
Learning	Being trained to carry out certain tasks

Feature	Capability
Self – improvement	To improve its own future performance based on past performance combined with learning from other agents or human operators
Anticipation	To predict changes in its environment which may affect its operation
Goal – seeking	To formulate and modifying tactical sub – goals with a view to achieving planned goals
Creativity	To generate new useful concepts, theories, testing methods, and methodologies
Replication	To create replicas of itself

Intelligent behavior characterization

Intelligent behavior characterization architectures, even though it is often of the simulated variety. Intelligent behavior can be characterized by clearly identifiable features as shown in the Table. Lets us try to understand some of the ways AI scientists and engineers have organized their programs to achieve intelligent behavior.

Some of them were inspired mainly by engineering and computational considerations and some by cognitive science in its attempt to model psychological data.

Three Basic Functions

To exhibit autonomous intelligent behavior a machine must be capable of performing three fundamental functions named in as: Perception, Cognition and Execution see Fig.

The perception function provides information about the actual state of the system and its environment. The perception collects data about the world in which the system operates and processes collected data with a view to gathering reliable information take decisions on future system behavior.

The cognition function consists in planning an initiating the system's actions while taking into account information provided by perception.
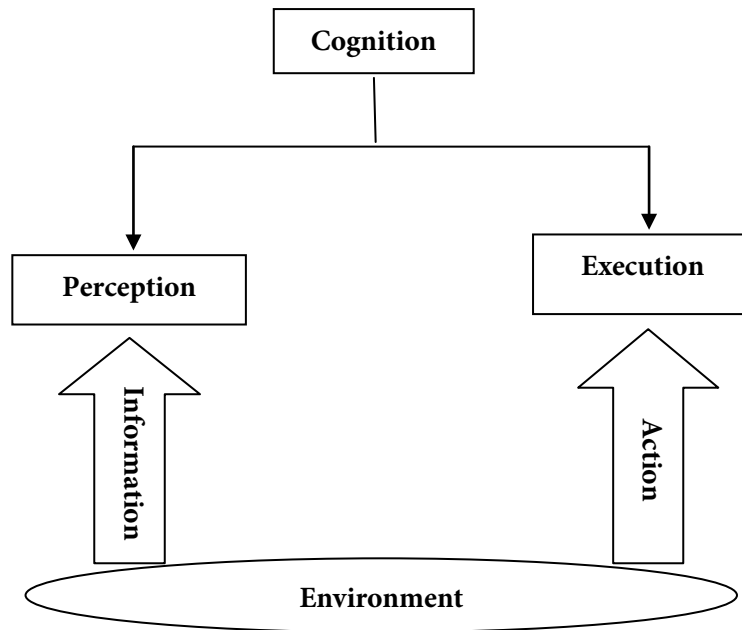
Functions that exhibit intelligent behavior

Functions that exhibit intelligent behavior is a centralized architecture with perception, cognition and execution functions implemented as separate but interconnected subsystems. However, from the engineering point of view a centralized architecture is not feasible.

For example, the complexity of a centralized perception subsystem for an intelligent workplace such architecture is not truly practical. Centralized architecture are on the way out even in decision support systems, which are less complex since they do not have to process sensory data.

The usual approach to reducing complexity is to adopt a multilevel hierarchical architecture with perception, cognition, and execution functions distributed at various levels of hierarchy. Many systems of this kind are under development.

The execution function has the role of initiating, controlling, handling, and terminating the system's actions, based on instructions received from cognition and perception systems.

Obviously there are many promising ways of organizing these functions to achieve autonomous intelligent behavior. Conceptually the most simple

Many systems of this kind are under development. However, hierarchies have a major disadvantage and that is their rigidity. Evidence is mounting that hierarchies are not suitable for environments characterized by frequent changes.

A number of very successful prototypes of intelligent systems have been constructed using the so – called layered architecture.

Intelligent Systems

Intelligent systems are concerned with the theories and techniques for building computer systems which exhibit some form of intelligent behavior. The area has had an active and exciting history and is now a relatively mature area of computer science.

Many of the research discoveries have reached the point of industrial application and products, and many companies have made and saved millions of rupees by exploiting the research results in this area. However, many challenging research problems remain.

From the perspective of computation, the intelligence of a system can be characterized by its flexibility, adaptability, memory, learning, temporal dynamics, reasoning, and the ability to manage uncertain and imprecise information. In general, intelligent systems have to deal with sources of uncertainty, such as the occurrence of unexpected events, and uncertain – incomplete, inconsistent or defective – information available to the system for the purpose of deciding what action to be taken next.

At large, AI comprises of two key direction.

➢ Humanistic AI (HAI) that studies machines that think and act like humans. HAI is the art of creating systems that perform functions that require intelligence when performce by people. It is the study of how to make computers do things at which, at the moment, people are better.

➢ Rationalistic AI (RAI) that examines machines that can be built on the understanding of intelligent human behavior. RAI is a field of study that seeks to explain and emulate intelligent behavior in terms of computational processes. It is the branch of computer

science that is concerned with the automation of intelligent behavior. Intelligent systems as seen nowadays have more to do with rationalistic than with humanistic. AI intelligent systems exhibit intelligent behavior as seen in nature as a whole. I addition, intelligent systems are motivated by the need to solve complex problems with improving efficiencies.

We distinguish between two classes of intelligent systems in the following table:

Class	Definition	Example
Intelligent decision support systems	AI programs that advise and support decision making via human – computer interfaces	Intelligent decision support in health care (e.g. ADEMA system for Asthma health care)
Intelligent machine systems	Machines and interconnected machines with embedded AI which are capable of operating autonomously	Intelligent robots, cognitive systems (e.g. Chiara – open source educational robot) as illustrated in the Fig.

Three – Layer Architectures

The constituents of intelligent system, Shakey, were organized into a three – layer (high - intermediate -, and low – level) architecture. The Shakey's programs and data can be assembled into levels. Shakey 's perceptual and basic (motor) programs were embedded in the low – level actions, whereas the intermediate – level actions combined the low – level ones in various ways to perform certain common tasks. The high level was in charge of planning and overall execution of plans.

Low Level

➢ The low – level actions (LLAs) use a short and fast path from sensory signals to effectors.

➢ Important reflexes re handled by this pathway.

➢ Stop, Servo control of motors and so on.

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Intermediate Level

- Combine the LLAs into more complex behaviors.
- Intermediate – level action (ILA)

High Level

- Plan is expressed as a sequence of ILAs along with their preconditions and effects.

In Fig. interaction among programs in these levels is illustrated by connecting lines.

Three – layered architectures, such as the one used by Shakey, are used in several robot systems. One example of a three – layered architecture is used in the German driverless "Seeing passenger car" described by Ernst Dickmanns et al.

Multi – Layered Architectures

As an alternative to the three – layered schemes, Rodney Brooks proposed architectures that controlled system actions in a way that reacted directly to changes in the environment without the need for planning. Initially called subsumption architectures, a way of decomposing one complex behavior into many ' simple' layers of increasingly more abstract behaviors.

Every layer can overrule (subsume) the decision of the overlaying layer. These architectures were later called behavior – based because they were composed of programmed robot behaviors.

The different behaviors are arranged in levels, each responsive to its own set of environmental stimuli and each able to control the system depending on the sensed situation. Resulting overall behavior of the system that is not explicitly represented in a computer system is known as " emergent behavior".

Shakey system
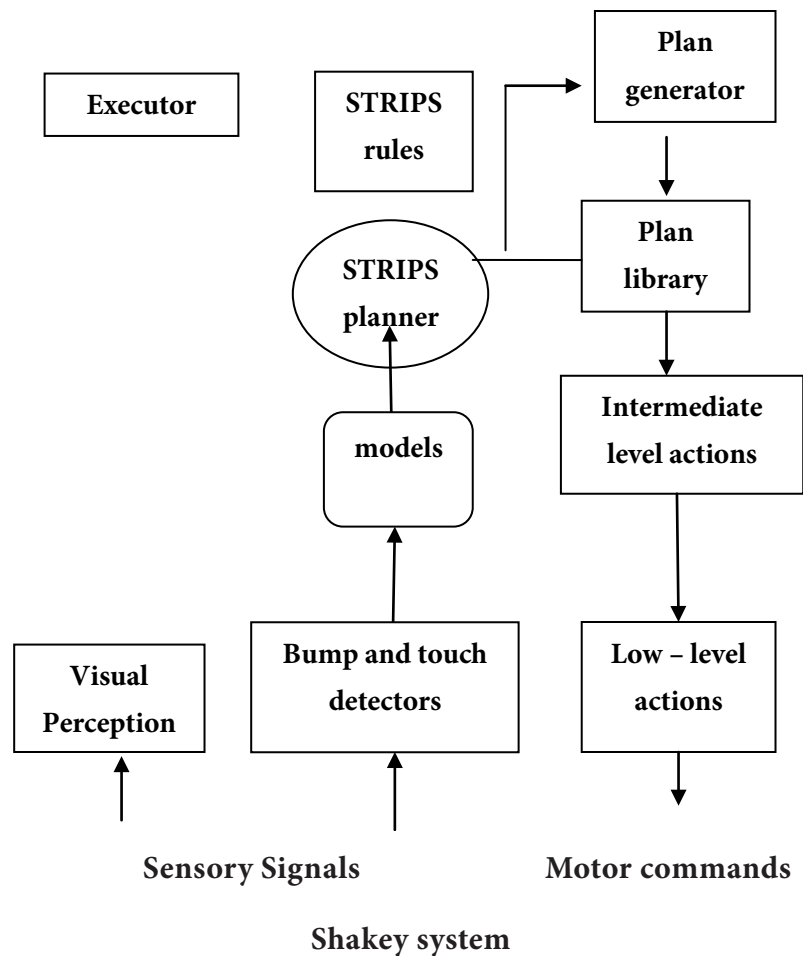
Common principles present in behavior – based architectures are shown in Fig.

Another popular way for achieving strategic behavior in behavior – based architecture is to couple a behavior – based component to a deliberative system. The deliberative system activates behaviors in a similar way to higher layers in multi – layered system.

There may be domains where hybrid systems are more suitable than pure behavior – based models and vice versa. A number of hybrid systems have been developed to overcome the perceived weaknesses of other architectures.

Most hybrid architectures divide the system into layers, generally one layer for high – level planning and another for handling the details of interacting with the world. The upper layer is usually a reactive planning and another for handling the details of interacting with the world.

The upper layer is usually a reactive planning system and the lower layer a reactive or behavior – based system. Hybrid systems, may in general, be more complex than multi – layered system because they require two different types of architecture whereas multi – layered system uses multiple versions of the one architecture.

The integration of two architectures implies that there will be issues to resolve in order to get effective behavior.

The Beliefs, Desires, and Intentions (BDI) Architecture

Michael Georgeff and Anand Rao have proposed perhaps the first agent architecture based on the philosophical concepts of beliefs, desires and concepts of beliefs, desires, and intentions. This architecture is proved to be the most durable agent architecture developed to date.

An agent 's beliefs represent its knowledge about its environment (including itself and other agents), usually expressed in some kind of logical language, such as the first – order predicate calculus. An agent's intensions represent those desires that the agent has actually chosen to begin to achieve. That is, it has begun executing a plan to achieve them.

BDI architectures, as distinct from behavior – based, reactive ones for example, explicitly represent beliefs, desires, and intentions as actual data structures.

Here, knowledge of the environment is held as beliefs and the overall goals are desires. Together, these shape the intentions, i.e. selected options that the system commits itself toward achieving.

One feature of Procedural Reasoning System (PRS), illustrated in Fig., is that the execution of a Knowledge Area(KA) may be interrupted by certain perceived situations (i.e. emergencies), giving it the ability to react rapidly to unanticipated changes in the environment.

Readers may refer to know more on how the architecture works.

**Architecutures for Agents Alliances**

An intelligent agent possesses some intelligence grounded on its knowledge base, reasoning mechanisms, and learning capabilities. Depending on the assignment of a particular agent, there are differences in types of information contained in its knowledge base. However, generally this information can be divided into two parts – *the agent's knowledge about its environments.* Intelligent agents exist in environments containing other intelligent agents, both humans and machines.
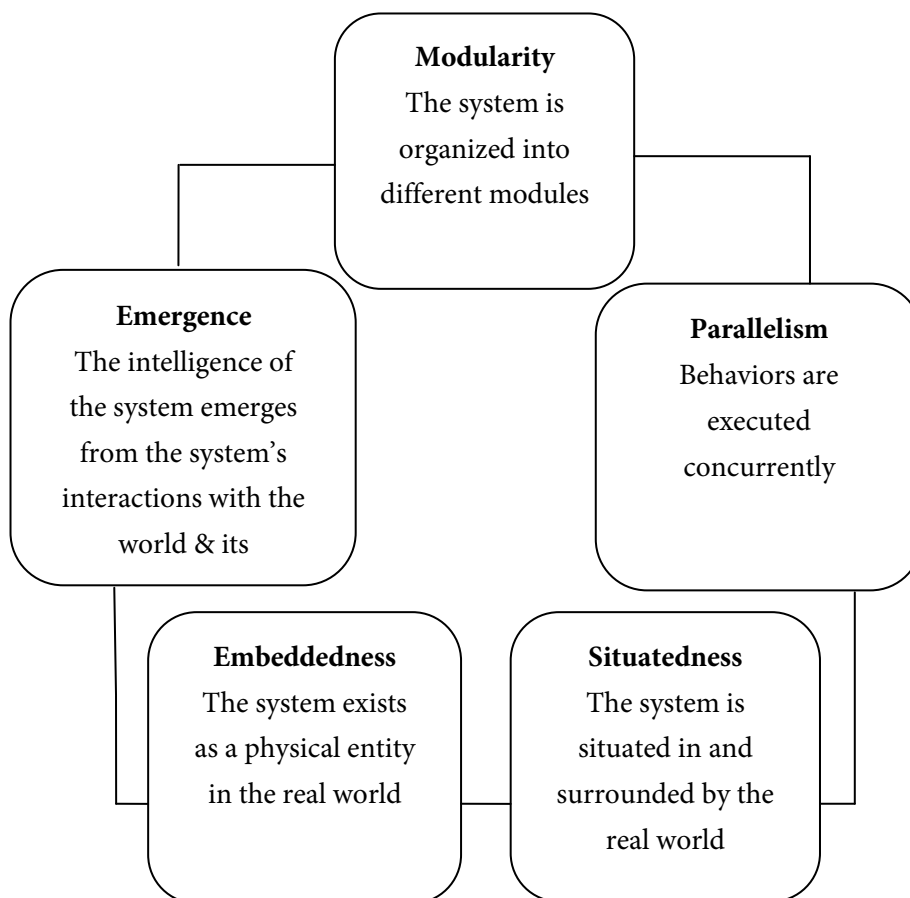
Fundamental principles in behavior – based architecture.

Many of these agents collaborate or complete in the performance of their tasks. Agents – to – agent communication strategies and multi – agent architectures have become important intelligent system topics.

A very attractive alternative is to assemble a system from a number of autonomous intelligent agents connected in a network and capable of collectively generating desirable system behavior,

Input

Beliefs **Interpreter** Knowledge Areas

Desires Intentions output
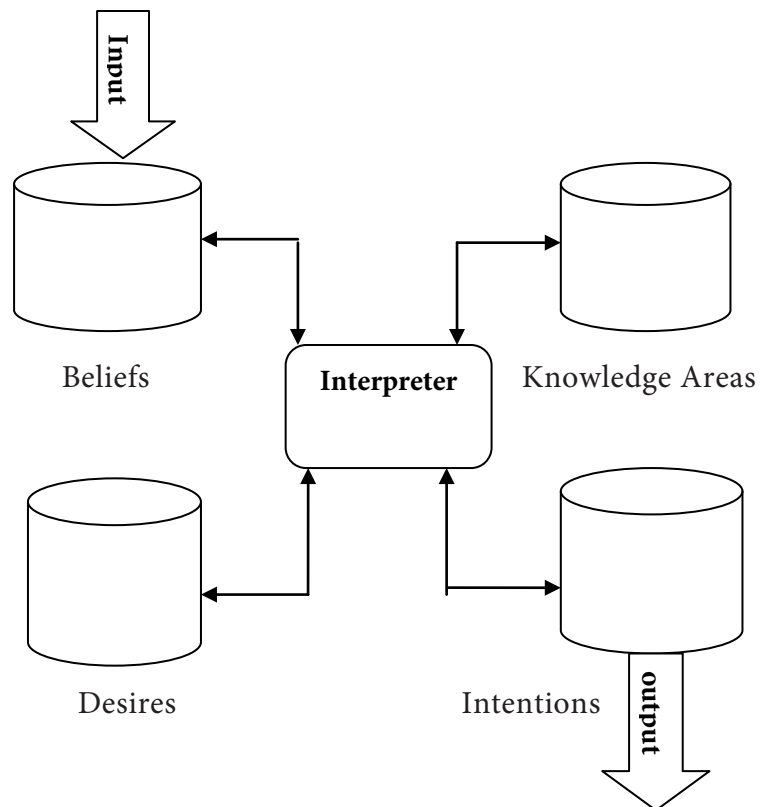
The procedural reasoning system

Intelligent agents may be designed to operate in collectives, organizations similar to colonies of ants, in which every constituent element obeys precisely defined rules of collaboration, or in societies, organizations similar to human societies, in which artificial intelligent agents negotiate, collaborate, or compete among themselves.

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Lesson 5.4 - Digital Libraries

Presents an overview of the status of digital libraries largely based on the papers in the *Communications of the ACM* April 1995 issue, which is entirely devoted to digital libraries, with additional notes and references to other sources. Highlights some of the projects underway for the creation or enhancement of digital libraries.

Full length feature articles in the special issue focus on conceptual and design aspects of digital libraries, role of digital libraries in teaching and learning, and the changes that digital libraries are bringing into information systems, brief descriptions of a few supporting technologies for digital libraries and several digital library projects and initiatives underway.

The column "Copyright and digital libraries", focuses on copyright and related legal issues that digital library developers and users need to take note of. The electronic publishing plans of the Association for Computing Machinery in response to the challenges posed by networked digital libraries are also described.

Emergence of Digital Libraries

The way we seek and access information is changing. For those using emerging information technologies (ITs), the change is quite significant and revolutionary. Advances in computers, communications and information access technologies, together with global level inter connectivity of computers and computer networks with Internet as the backbone, areenable in desk top, single window access to information stored on computers distributed around the world.

A wide variety of public domain (free) and commercial information sources are currently accessible on Internet, with new sources being announced frequently. These include bibliographical citation sand full text databases, table of contents of periodicals, electronic serials [1],

discussions fore, preprints, technical reports, directories, teaching and training material, data archives(software, numeric data, documents), library catalogues, campus wide information systems, companies and organizations, etc. Tools for accessing these information sources are themselves undergoing rapid improvements.

History, Definition and Perspectives

The issue opens with an introductory, overview article by guest editors Edward Fox *et al.* They provide the context for the articles that follow. It was fifty years ago in 1945, Vinegar Bush proposed development of the Meme (short form of * Memory Extender1), a desk size device that would provide linked, global access to multi-media knowledge resources.

There are already several electronic information access facilities setting the trend: libraries of different types, such as, computer code libraries, object libraries, image libraries, audio libraries, digital video libraries, libraries of databases, gopher space, World-Wide Web, CD ROMs, OPACS, etc.

This trend will continue, as digital storage costs decrease relative to the cost of library shelf-space, and as electronic services become more useful, affordable, available and usable. Other forces influencing the development of digital libraries include electronic publishing, desire for collaborative work, and the push to use new technologies. Why Digital library' and not electroniclibrary1? The guest editors note that there is a shift from the use of the term "electroniclibrary1 tithe term" digital library' perhaps because of the growing interest in digital networks, digital audio and digital video relative to electronic publishing.

Feature

User-Digital Library Interaction

Ramona Rae *et al,* in their visually very appealing article, *Rich Interactions in the Digital Library,* argue that conventional notions of information retrieval are inadequate to handle the kind of information work performed during actual work (physical workspace) and in interconnected digital library environments.

While work station environments equipped with current access tools and applications could be viewed as information workspaces, use of conventional retrieval interfaces limit the effectiveness of information access and the larger process of information work, because they view information retrieval as an isolated task in which the user formulates a query to a homogeneous collection to obtain matching documents.

The authors point out the involved in information use in both digital libraries and their physical workspaces(e.g. library services),indicate a number of areas where this view misses the reality of users doing real work.

Some of the findings are mentioned here:

1. *Interactive Query Refinement*

Users are often unable to formulate precise questions or express them effectively using conventional retrieval systems. Users often learn during the course of a session what they are trying to ask and how to ask for it.

2. *Source Heterogeneity*

Users often access multiple sources with differing characteristics of content, form, and provenance, where each source has its own methods of access with differing functionality. Understanding these characteristics is an important part of a user's activity.

3. *Parallel, Interleaved Access*

Users often switch among sources with slow or variable response. Though users may want to interleave access operations and then track their progress, current systems are weak in their support for this purpose.

4. *Larger Work Process*

Information access is usually intertwined with other parts of the overall work process, for example, analysis of the results. Users switch among different techniques for searching or browsing sources and visualizing or utilizing results.

Repository

Expert systems are particularly useful in the following areas:

Strategic Goal Setting

Top decision makers can use expert systems to explore possible strategic goals.

Planning

Expert systems assist decision makers to assess the impact of strategic goals and Objectives.

Design

Some expert systems have been developed to assist in designing new products.

Decision making

Expert systems assist in possible alternatives and in approaches to decision-making.

Quality Control and Monitoring

There are several ways in which expert systems can help in both monitoring and suggesting solutions.

Diagnosis

Diagnosis often results from monitoring, as an expert system analyzes the results of Monitoring and suggests possible causes of problems.There are literally thousands of Ubuntu programs available to meet the needs of Ubuntu users. Many of these programs are stored in software archives commonly referred to as *repositories*. Repositories make it very easy to install new software onto Ubuntu using an Internet connection, while also providing a high level of security, as each program available in the repositories is thoroughly tested and built specifically for each version of Ubuntu.

The Ubuntu software repositories are organized into four separate areas or "components", according to the level of support offered by Ubuntu and whether or not the program in question complies with Ubuntu's.

The repository components are:

- ➢ **Main** - Officially supported software.
- ➢ **Restricted** - Supported software that is not available under a completely free license.
- ➢ **Universe** - Community maintained software, i.e. not officially supported software.
- ➢ **Multiverse** - Software that is not free.

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Lesson 5.5 - Knowledgde Discovery

The new source of wealth is knowledge, and not labor, land, or financial capital. It is the intangible, intellectual assets that must be managed.

The key challenge of the knowledge-based economy is to foster innovation.

Definitons

- ➢ Designing and installing techniques and processes to create, protect, and use known knowledge.

- ➢ Designing and creating environments and activities to discover and release knowledge that is not known or tacit knowledge.

- ➢ Articulating the purpose and nature of managing knowledge as a resource and embodying it in other initiatives and programs.

Kinds of Knowledge Discovery

Knowledge is intangible, dynamic, and difficult to measure, but without it no organization can survive.

- ➢ Tacit: or unarticulated knowledge is more personal, experiential, context specific, and hard to formalize; is difficult to communicate or share with others; and is generally in the heads of individuals and teams.
- ➢ Explicit: explicit knowledge can easily be written down and codified.

Types of Knowledge Discovery

- ➢ Competency Management
- ➢ Knowledge Sharing
- ➢ Competitive Knowledge Management

Knowledge Discovery Enablers

- Leadership
- Knowledge champions, such as CKOs
- Culture
- Access
- Technology

Knowledge Process Outsourcing

- Knowledge Process Outsourcing (KPO) is outsourcing of knowledge Intensive business processes that require specialized domain expertise and advanced analytical skills. Being a recent development in the world of outsourcing, the definition and scope of a KPO firm differs across the industry.

- A KPO firm can be differentiated from BPO companies in the following ways:

- KPOs require substantially more domain expertise and advanced analytical skills as the nature of the work is judgment-based and more complex compared to BPO, which is process oriented.

- Due to different skill set requirements in KPO and BPO, professionals in the KPO space can generate more revenues for the firm.

- The size of a KPO project is typically smaller by a factor of 5-10 than a corresponding BPO project.

- A typical KPO firm provides research and analytical expertise in one or more of the domains depicted in the following figure:

Verticals Served by the KPO Industry

Players in the KPO industry can be broadly classified as:

- Integrated service providers: Provide research services for multiple verticals.
- Pure-play firms: Provide research services for a specific vertical.
- Captives: In-house research centers

The challenges in KPO

KPO delivers high value to organizations by **providing domain based processes and business expertise** rather than just process expertise. These processes demand **advanced analytical and specialized skill of knowledge workers** that have domain experience to their credit. Therefore outsourcing of knowledge processes face more challenges than BPO (Business Process Outsourcing). Some of the challenges involved in KPO will be **maintaining higher quality standards, investment in KPO infrastructure, the lack of talent pool, requirement of higher level of control, confidentiality and enhanced risk management.**

Comparing these challenges with the Indian IT and ITES service providers, it is not surprising that India has-been ranked the most preferred KPO destination owing to the country's large talent pool, quality IT training, friendly government policies and low labor costs."KPO (knowledge process outsourcing) allows organizations to do fairly complex operations and get the benefit of time to market," said Rites Inane, head of global sales at Progeny, a business process outsourcing subsidiary of Infosys Technologies based in Bridgewater, N.J. "(It allows firms) to derive operation efficiency where they do the task while transforming the way they doo the task itself."."Knowledge services is an area where we are seeing a lot of demand and continuous growth," Idnanisaid.KPO services are much more research and analytical intensive, he added.

For example, unlike traditional outsourcing, KPO focuses on research for front office type activities such as financial planning, credit, quantitative and fixed in come research, Inane told UPI.

KPO Outsourcing Benefits

➢ All employees hold professional or post graduate degrees in various subject streams
➢ Top notch infrastructure
➢ To work with a variety of data formats and sources
➢ Transformation of data into knowledge
➢ Creation of defensible intellectual property
➢ Stringent processes are followed to ensure consistency

- ➢ Strong Domain expertise in business and STM (Scientific, Technical, Medical)

- ➢ Like BPO here also India might face some competition from Russia, Canada, China and Israel.

- ➢ A lawyer to writing patent application in India could be 50 per cent cheaper in India than thus. India has huge potential resources with lots of chartered accountants and skilled lawyers,"

- ➢ First of all, the concept of a pool of specialized professionals available is a major advantage.

- ➢ The key to success in this is that as with all outsourcing, is communication. The people hirer needs to know exactly what's expected of them.

- ➢ Karan Karmic, President of India's National Association of Software and Services

Innovation Clusters

1. The Nature and Significance of Innovation

Innovation is important both as an activity in its own right and as a spur to economic development –and competitiveness – generally, but it can be argued there is, at thievery least, a lack of agreement in the academic literature about what innovation is; about why, where, and how it takes place; and about what precise forms it assumes at the local level (Adult, 1986; Sternberg, 1996; Cast ells and Hall, 1994; Iverson, 1999).

These differences matter both in terms of achieving a basic understanding of the phenomena of innovation, but also in terms of devising policy measures to actively promote the process of innovation at the local level, which many cities, regions and countries are currently actively attempting to do in the UK, across Europe, and around the world. There are therefore potentially important applied policy implications of the social science studies for whether, and how, innovation can be systematically fostered (Atkinson, 1994; Department of Trade and Industry, 1998; European Commission,1994, 1995).

But, as we have just noted, innovation is easier to describe than it is to systematically analyze, and easier to analyze than it is to effectively promote.

Part of the problem, of course, is the imprecise way in which the activity of innovation itself is conceptualized. To achieve more precision, the logic of analysis suggests that innovation should be should be systematically analyzed and then divided into rough categories to produce a working taxonomy based on a number of key dimensions. Major part of the purpose of this paper is to develop such a working taxonomy.

It should be stressed from the outset however that innovation is not an isolated event –it is dependent both on its corporate, temporal and its spatial context for expression. If fact it could be argued that the study of the innovative context has gone through aeries of stages. Initially, it was seen largely as an activity carried out by individual innovators - in effect, commercially successful inventions and inventors - such as Goodyear's vulcanization of rubber; or Benda's development of the air brake; or Shockley's creation of the transistor. Further, these innovators often worked within single firms – alone, or in small groups. The basic unit of analysis at this stage waste innovator, or the innovator-within-the-firm.

More recently however, it has become increasingly accepted that as commerce and technology have become more complicated, so the process of innovation has, itself, become more complicated – and more spatially extensive – and the analysis of the innovative process entered a new phase.

Currently, the process of innovation is now normally seen as a collaborative rather than as an individualistic activity and this innovative collaboration often have a significant multi-team, and, indeed, a multi-firm dimension. As a consequence of this collaborative style of working it is increasingly recognized that there are important spatial aspects to the process of innovation –ranging from the production arrangements of Small and Medium-sized Enterprises (SMEs) within local innovative areas, to the global trading activities of the very large Trans-National Corporations (TNCs).

One currently prevailing view is that the basic unit of assessment of innovation is cluster of inter-acting firms operating, often in a particular

industry, within fairly small spatial compass and the firms are 'embedded' in their local area inters of production linkages including their workforce and communication flows. For example, over the past two decades, agglomerative clusters of innovative firms have been identified in a number of different countries, and the firms within them are engaged in a wide variety of economic sectors ranging from high technology, such as pharmaceuticals, computers, scientific instruments and cellular phones, to much more traditional forms of manufacturing such as automobiles, clothing and shoes. In many, if not most, cases the firms interact with each other inters of labour supply, access to common (tacit) knowledge, producer-supplier linkages, access, venture capital provision, or some combination all of these factors(Scott, 1990; Sternberg, 1996; Keble and Wilkinson, 1999).And yet there is increasing evidence that not all innovative firms work in this way.

It's becoming increasingly evident that there are Substantial variations in the internal structure of these agglomerative clusters – some are highly integrated in production terms; others are not; some undertake joint marketing and some do not. On closer examination apparently homogeneous clusters do, in practice, exhibit a good deal of heterogeneity in terms of their organizational arrangements (Rabellotti and Schmitz, 1999).

In the past few years it has been suggested that there are different types of innovative clusters and that some of these clusters, at least, contain firms which although they are located relatively close together in spatial terms have no, or very limited - linkages of any type with other local innovative firms – or with the areas they are located within. They are not so much embedded in their local areas as weakly attached to them, or simply located within them. Further, some of these firms are extremely small and in these micro-firms the importance of the individual innovator and the innovator within-the-firm has begun to re-assert itself (Hart and Sammie, 1997).

We will examine these different types of innovative cluster later in this paper, but first we need analyze more closely what innovation itself means. Briefly, innovation has-been described as, 'the commercialization of creativity' (Sammie and Hart, 1999, p.447). But a more extensive definition is required for our purposes in this paper. In our previous, published UK Economic and Social Research Council (ESRC)-sponsored papers on this

topic, our starting point has been the definition of innovation which has been adopted by the European Community (EC), and which has been widely accepted by others.

Four explicit, and one implicit, aspects of the definition of innovation are important toes. In terms of the **explicit** dimensions:

➤ Firstly, innovation is a *commercial* concept not simply a technological, or even an intellectual property one. However novel an innovation is, unless firms are able to successfully exploit their innovation in commercial terms it is not relevant for our present purposes.

➤ Secondly, there are *degrees* of innovation. The innovative process can involve the creation of completely new products or services or, more commonly, simply the improvement of existing products and services. Innovation can thus be radical or incremental in character.

➤ Thirdly, *whatever* the degree of innovation it normally arises because individuals working in groups have learned from each other how new or improved goods and services can be created and commercially exploited.

➤ Fourthly, the basic unit of innovative process is not necessarily an individual, or even an individual firm working in isolation, it is a **network** of individuals, or firms, working together to produce the innovation.

➤ Finally and in some ways most importantly, the **implicit** dimension of the Redefinition is that while the definition is a generally a useful one for research purposes it says nothing about how innovation – or more properly the innovative process - disarrayed in spatial terms. The statement, 'Innovation is a result of an interactive learning process that involves often several actors from inside and outside the companies', says nothing about **the spatial location** of these individuals – they maybe next door, literally or metaphorically, or they may be a world away given modern production mechanisms. These mechanisms range from local systems such as Just-in-Time Delivery (JIT) and Flexible Specialization (Flex Spec), to simultaneous global production by TNCs at a dozen different sites – or even some combination of these different local/global

mechanisms (McCann and Singleton, 1996; Pore and Sable, 1984; Amen and Thrift, 1994).

The spatial dimension is important because we know that certain areas are more innovation-rich than are others, but it does not therefore logically follow that all of these clusters are highly integrated, or even interactive, in terms of either traded, run-traded components of innovation. Just as there are different degrees of innovation– ranging from radical to incremental - it is possible to hypothesis that there are different types, and, indeed, degrees of the spatial arrangement of innovation.

In short, our central hypothesis is that there are several different types of innovative clusters; that they need to need be more systematically analyzed; and that the spatial dimension is highly significant in this context in determining how these clusters operate. Our concern in this paper is to examine, based on theoretical contributions and case studies, what might be called the Areal Distribution of Innovation or, Adamant to attempt to produce a rough taxonomy of the different kinds of the identified clusters to determine more clearly in what ways they are the similar, and what ways they differ from each other, using a number of different operating criteria.

2. *ADI*: Spatial Strategies for Dealing with the Process of Innovation

The whole subject area relating to agglomerative clusters of innovation is complex and is becoming more so as the number of individual case studies of the topic continues to grow. In some cases in the literature, the same terms are used to mean different things, or different terms are used to mean the same thing. Clarity is required if we are to learn more about this important area both for academic and for policy-making purposes. As we suggested at the outset, innovation is important in its own right but the ADI is also closely related to another current, major economic concern - the whole issue of competitiveness.

Most developed countries are seeking to increase the competitiveness of their economies and the process of promoting innovation is viewed by both governments and by academics observers as central tithe task of fostering it (Porter 1990; Atkinson 1991; European Commission 1994, 1995; Camano 1991; UK Department of Trade and Industry 1998).

But the attempt to foster competitiveness through innovation has a paradoxical character. The process of innovation, by definition, involves firms engaging in activities involving risk and uncertainty, and yet it is well known that firms normally seek to avoid precisely this type of behavior because of the difficulties, and possibly even dangers, to the firm which it entails. As Schumpeter suggested, innovation, 'strikes not at the means of the profits and outputs of the existing firms, but at their foundations and their very lives'(Schumpeter, 1943; quoted in, Sammie, Wood, Hartland Sennett, forthcoming 1999).But firms seek certainty in their operating environments for profit and planning purposes (Cert. and March, 1963). Therefore, at the heart of competitiveness there are dynamic tensions which turn on the nature of the innovative process itself.

On throne hand, because firms compete with each other and because this competition increasingly involves introducing technological innovation – i.e. developing new products or services with a technological content - uncertainty in the marketplace about the future is increased. Innovation is fundamentally de-stabilizing and the more radical the innovation the more de-stabilizing it is.

On the other hand, companies are continuously responding to innovations – either their own, or those introduced bother firms – but they must also seek to achieve some form of stability so that they can continue to pursue their short-term and long-term profit and production targets.

We will contend in the remainder of this paper that space, as well as organization structure has a role to play in seeking to balance these conflicting elements. The Areal Distribution of Innovation is, of course, heavily influenced by this balancing paradox. ADI is not a new issue but it will be contended in this paper that its organizational shape has changed over time and that it currently assumes a number of quite different forms at the local level, partly as a result of seeking to deal with the paradox of innovation. However, the basic significance of innovation *per se* in fostering economic growth is unquestioned – and has been for some time. Sixty years ago Schumpeter, in a memorable phrase, called innovation, 'creative destruction' (Schumpeter 1939). Freeman has also commented on the crucial importance of fostering commercial change. He stated simply, 'not to innovate is to die' (quoted in Waver and Stem 1999, p.391).

Innovation is central to competitiveness, and innovative products, and services can change whole production chains, working methods, and consumer life-styles, often in ways not foreseen when the innovation first reached the market. The growth of entertainment and commercial activities centering on the world-wide web provides a case in point.

In theory, there are a number of different strategies available for managing the processor innovation and most of these strategies have a spatial/vocational component. One approach is to promote commercial creativity internally – but also to seek to anticipate the cumulative consequences of innovation by other firms and organization which impact on the individual firm's operating context, including its spatial context by some form of forward planning to seek to create certainty can be achieved. Clearly one of the key issues for firms is how to manage not simply individual innovations but the process of innovation itself.

These strategies have usually had a spatial dimension and it is possible to identify number of different ADI configurations. For example there is a strategy which might be term 'Macro-Globalization'. This means, simply those very-large firms in particular countries such as America or Japan extended their activities throughout the world. These large firms grew larger and created Trans-National Corporations in the 19th and for a large part of the 20th centuries.

These TNCs sought to increase both the total amount of their market quantity and their market share by mergers and by globalizing their activities – and by globally promoting their own innovations (Porter 1990; Mainland Thrift 1994).

This globalization allowed the firms to partly internalize the market on a very broad spatial scale and thus reduce both uncertainty and costs. In some cases there was also a policy on the part of some of these firms, to pursue vertical integration within their economic sector to give the firms greater control of their raw materials, and ultimately of their customers by purchasing their suppliers and their.

But is has become apparent over the past two decades at least that there are other quite different ADI approaches at work as well by TNC firms across the globe. Large firms have been engaging in a process of

'down-sizing' or, more euphemistically, 'rightsizing', and reducing the number of their work force and concentrating on their core business while contracting out peripheral functions.

This vertical disintegration approach by global firms has taken place throughout the 1980s and '90s and is seen as a means of cutting costs and promoting efficiency (Amen and Smith 1991; Sadler1999).

But there has also been another completely different way of seeking to increase efficiency; deal with uncertainty; and promote innovation at the local level which has-been in existence for some time – but which has become particularly important in the social science literature over the last decade or so - and which might be described as horizontal integration.

Horizontal integration refers to local clusters of firms which work closely together in a number of economic, social and knowledge-based ways in the innovative process. The description of these clusters use words and phrases which are often borrowed from other disciplines including economics, business studies and most importantly, geography (Gordon and McCann, forthcoming 2000).But in the case of many of these areas the terms employed relate more to what might be called the **geology of innovation** rather than the geography of innovation.

For example, geological terms commonly employed in the literature include: clusters of interacting firms which are embedded in their local areas in terms of their workforce and their use of indigenous information sources, and as a result, create agglomeration economies. These borrowed geology terms are important because they reveal particular way of conceptualizing clusters. While it is undoubtedly true that such integrated clusters exist it would be wrong to assume that they exhaust the universe of discourse on this topic. In the next section we will begin to analyze the different shapes that innovative clusters can assume.

3. Types of Local Innovative Clusters and Their Internal and External Relationships

By building on our own earlier research work on this topic (Hart and Sammie, 1997); and the work of others (Sternberg, 1996; Gordon and McCann, forthcoming, 2000); it's at least conceptually possible to begin

to construct taxonomy of clusters by beginning to identify key types of innovative local areas based on a number of performance characteristics, or dimensions. The most basic, common characteristic of all of these areas is that particular types affirms are located in relatively close physical proximity to each other, i.e. they form agglomerative economic clusters, or spatial concentrations.

But once one has said this one has not said a good deal - there are different types of agglomerative clusters. Income cases – but not all – these clusters are innovative inters of producing goods or services, or both. The generic title for these areas are agglomeration economies based on the observations of Weber, Marshall and Schumpeter who suggested that firms locate together to reduce transaction costs, to increase flexibility and to achieve maximum information flow (Weber 1909; Marshall, 1925; Schumpeter, 1934;Krugman, 19Another way of describing these areas are that there are flexible local production systems which employ different forms of social capital, including information and communication linkages, to create highly-articulated producer and supplier market networks. The Webber an 'ideal type' of the model has been described as the Local Production Network Paradigm (LPNP) (Sammie and Hart1999).But it is becoming increasing apparent as the number of case studies continue to grow that this overall ideal type needs more careful analysis.

One way of approaching this analysis and building taxonomy is by using basic Set Theory. Within the over all agglomeration economy, or LPNP, main set, it is possible to theoretically identify at least three sub-sets which have been widely discussed in the literature.

Types

They are:

- ➢ Type **A – Cohesive Clusters**
- ➢ Type **B – New Industrial Districts**
- ➢ Type **C – *Innovative Milieu***

The Set Theory notation for this is: Types A, B, C É (are contained within) the Agglomeration Economies/Local Production Network Paradigm Set – that is, the three sub-sets share common elements of the

main set. We will briefly review the operating characteristics of each of these sub-set types and give examples of industries and areas where they operate for illustrative purposes.

Type A – Cohesive Clusters

The analysis of clusters relates, unsurprisingly, tithe period of time when they were identified and the type of industries which were prevalent at the time. What might be termed Cohesive Clusters are the oldest types of areas under examination here. The operational characteristics of these agglomerative economies were mentioned by Weber (1909), and Marshall (1925). Cohesive clusters are groups of firms which initially located together o reduce costs. Weber's logic was that entrepreneurs would locate in areas of Least cost with regard to factors such as transport and labour and therefore benefit from economies of scale. He assumed that transport costs are function of weight and distance.

The concern was to keep the costs of movement associated with material assembly, and subsequent distribution to the market, to a minimum. In the latter part of the 19th century and the beginning of the 20th, manufactured goods were often heavy – i.e. there was a low value-to bulk ratio – and therefore transport costs were an important factor in verall production costs and the major markets were usually domestic and often associated with urban areas. At the same time Weber, and later Marshall, argued that as goods became more sophisticated labour costs would form a higher proportion of the overall value of the product and therefore access to pool of trained labour would become another key priority for entrepreneurs. If the point was reached where the labour costs outweighed the transport costs then the rational entrepreneur would base on labour cost reduction? The situation was dynamic and over time as production changes continued to occur important factors relating to economies of scale developed. These were: the creation of internal production linkages; bulk buying and selling to reduce the levels of stock held by individual firms; increases in information flow between firms and infrastructural advantages. Thus the concept of the Cohesive Cluster grew and developed over time. In the case of most of the companies involved were there was a high degree of inter-dependence in terms of production linkages but without any overall direction by any single firm because most of the firms were small and medium sized (SME) enterprises.

Their method of operation in the cluster was rather like Adam's Smith's concept of the 'hidden hand' where each individual seeking to maximize their own self-interest haste inadvertent, but beneficial effect, of economically advantaging everyone. In their ideal type form they are a working model in miniature of the principles of neoclassic economics with many buyer and sellers, none of whom is large enough to control price, and free flows of information which is feed into the production process. Cohesive Clusters were often located in urban, including inner city, locations, such as the Jeweler Quarter in Birmingham, or the Hackney area in London.

Their method of dealing with the threats posed by innovation were too be extremely flexible inters of rapidly responding to change in the production of new products and they drew on the abilities of highly-skilled local labour force. They tended to specializing industries such as fashion items, reproduction furniture, and printing – all of which required the capacity for quick change production.

The Clusters were inter-active inters of their internal trading relations but they also very open in terms of the membership of firms within them. There was both easy entrance and easy exit to the production cluster.

The main economic advantage has traditionally been described as 8the reduction of 'transaction costs' particularly transport costs. But there is an other reason forming this type of cluster as well which relates to the risks and uncertainty associated with the innovative process itself. By working together in a flexibly interactive way firms in this cluster could reduce risk by spreading it between and among them – in effect, by syndicating it.

Type B – New Industrial Districts

New Industrial Districts are the second type of cluster under consideration here. They differ from the previous example in several ways but they share the fact that their description relates to the period of time when they were identified and the type of industries which were prevalent at the time within them.

New Industrial Districts tend be knowledge-based – that is they often have a high proportion of companies in high tech sectors such as computing, Information Technology (IT) and micro-electronics. They rely extensively on R&D for the creation of new products. They tend to be located on the fringe of urban areas or even at some distance from them - examples include Silicon Valley in California and the M4 Motorway Corridor in Britain (Hall, Breheny, McQueen, Hart,1987; Scott, 1990; Stopper, 1993).In contrast with Type A clusters, New Industrial Districts produce goods with are relatively small and light in weight and therefore have a high value-to bulk ratio and, as consequence, transport costs are not a major concern for entrepreneurs in location decision terms. Transports *costs* are not a major concern but transport *speeds – and reliability of delivery – are*. The types of goods produced in these clusters are urgently required throughout the world by customers and they need to be rapidly produced and shipped –often by air to global markets. Speed, in general, is an important concern in the New Industrial Districts and there is constant concern about being overtaken by innovations produced by competitors so the pace of fostering innovation is brisk.

The employees in these firms are not simply highly-skilled, a substantial proportion are highly-educated scientifically and technologically. Thus in terms of transaction costs information and dependable high-speed transport links are key elements. Again in contrast with Type A clusters, Type B clusters are composed of a range of different size firms, from Trans-Nationals to SMEs. The large firms form, often, long-standing relations with their smaller suppliers and they work jointly on projects –income cases with time horizons of decades. These relatively stable supply chain sallow firms to deal with the threats posed to them by the innovation process by seeking to control change through established long-term planning and production arrangements in what might be described as a 'closed club'. Finally, although they are called 'new' industrial districts many have been in existence for 30 years and more and are now better described as mature rather than recent.

Type C Innovative Milieux

The description of the third type of cluster is largely based on the work of the group of researchers called *GREMI* (*Grouped de recherché euro peen sure les milieux innovators*) which emphasized the importance

of social capital in promoting innovation (Adult, 1986; Camano, 1991; Maillot, 1995). In the *innovative milieux* 9socialnetworks were established between individuals within firms and between individuals indifferent firms. These networks were based on experience of working together in the past and therefore trust bonds within the network were created.

This type of cluster tends to be located inurbane areas where established relations between firms and individuals have existed for some time.

As Capello has noted, 'Cumulative and collective learning processes enhance local creativity and innovative output, through the informal exchange of information and specialized knowledge' (Capello, 1999, p.9). Learning takes place in a variety of ways with individuals in different firms exchanging information or individuals moving from one firm to another. Examples of *innovative milieu* clusters include Emilia-Romagna and parts of North east Milan. Firms in this type of cluster are willing to jointly pursue common goals on innovative projects which may involve risk. There are many parallels between the *innovative milieu* cluster and the Cohesive Cluster which was mentioned earlier. Both are largely based on small and medium sized firms within urban areas who rely heavily on the skills and knowledge of common workforce which, in turn, means the firms are deeply 'embedded' in their locale. There are also importance differences as well. The Type C Clusters actively seek to promote innovation rather than simply rapidly responding to it and actively work together to promote common, medium and long-term innovative goals.

The firms in the Type C cluster respond to the threats posed by the innovative process once again, by seeking to spread the risk through active andcontinuing syndication of their production arrangements. Table on page below summarizes the main characteristics of the three types of clusters which we have just briefly described but it also introduces a fourth type of innovative area which displays characteristics which are different from the previous clusters.

Type of cluster is the most recently described in the literature and its characteristics raises questions both about conventional agglomeration economics, *perse*, and about current national and European Union policies for promoting innovation.

We will call it for the purposes of this paper,: Type D – Proximity Clusters – and we will briefly describe it below.

Type D – Proximity Clusters

In each of the three types of cluster mentioned earlier considerable emphasis has been placed on internal linkages of various types between and among the firms and individuals involved in the innovative process. These linkages include both traded and un-traded relations and relate to social capital (a skilled and knowledgeable workforce); physical capital (effective transport and communication systems); and financial capital (funding through the firm's own resources, venture capital or public grants and loans). The firms are acting as a Local Production Network (LPN).There are also close linkages between the workforce of the producer firms and their local Area, to the extent that they the firms are described as 'embedded' within it. Proximity Clusters, on the other hand, work in a completely different way.

They exhibit a great degree of internal heterogeneity in terms of their production organisational arrangements, rather than cohesiveness (Hart and Sammie, 1997; 10Rabellotti and Schmitz, 1999; Capello, 1999). On the basis of a number of growing numbers of publications, it has been discovered that within overall innovative areas such as the county of Hertfordshire immediately to the north of Greater London, there are innovative clusters which are not agglomerations in the way the term is used conventionally. That is, innovative clusters have been identified and examined empirically which have extremely limited linkages of any type **within** the cluster area but often have extensively linkages outside of it.

These proximity clusters are so called because they are located in relatively close spatial relationships with each other but do not form the kind of Local Production Network which the previous three clusters exhibited in different ways.

They are not so much embedded in an area but weakly attached to it. As we have already noted, the concept of agglomeration in the economic literature is borrowed from geology and means that the various elements – in this case firms –interact and are inter-linked - with each other.

They are effectively fused together inters of their production operations. But in the case of Proximity Clusters perhaps abettor geological analogy would be a conglomeration – a set of identifiably distinct elements contained within a larger body – rather than an agglomeration. In the former case, the individual innovative firms are near each other but usually do not have continuing and systematic linkages between them.

It is rather like the distinction illogic between correlation and causation - because events occur together it does not necessarily follow that activity A**ccuses** activity B, they might simply happen at the same time and the two events are coincidental rather than effectively co-ordinate.

Proximity clusters typically occur outside major conurbations and at least in the Hertfordshire example contain a number of very small 'microforms'. In these micro firms the importance of the individual innovator has begun to re-assert it self as it did in the 19th century.

The firms are highly innovative and develop specialist products which they sell all over the world. Often it is the continuing client of the firm – in many cases intermediate buyers such as health services, or defense organizations -who seek to promote innovation rather than simply the firm on its own.

In this case the innovative process is more influenced by 'demand-pull' rather than 'technology pushes'. In terms of set theory there is a disjuncture between the agglomeration economies/local production network set and sub-set Type D –it belongs in a different set.

Self Assessment Questions

1.` What are the technologies used in managing knowledge?
2. Define artificial intelligence.
3. What do you mean by digital library?
4. Define repositories.
5. What do you understand by KPO?

CASE STUDY

The "Living" Room: A Case Study in Artificial Intelligence, Collaborative Systems, and Language Understanding:

The autumn evening bloomed. Kate sat back down at her desk to work, but she wasn't quite ready to begin. She still wasn't used to living on campus. At Preview Day in May the Admissions Office had shown a video of the new dorms, but Kate's building hadn't been scheduled for completion until June and so none of the incoming students really knew what the rooms would be like when they sent in their housing contracts. The dorm brochure made it sound like the place was designed and built by the M.I.T. Artificial Intelligence Lab rather than a housing contractor

"For over 50 years," the brochure read, "computation has centered on machines and not people. Now, the future is upon us. Computation is human-centered and ubiquitous. It handles our goals and needs and helps us to do more while we actually do less."

Why were they hyping these dorms so much, Kate had wondered at the time. It wasn't like the incoming freshmen had a lot of housing choices. The brochure continued, "Our students no longer need to carry around their own computers and iPods. The configurable generic devices in their clothes can easily communicate with those embedded in the dorm environment. And," the brochure promised, "students will be able to communicate naturally with their rooms, using speech and gestures that describe what they intend, and leave it to the computer to carry out their will."

"Ah," Kate mused, "if only the room would write my term papers. When Kate finally moved into the new dorm that fall, she hadn't expected to feel comfortable in a room that could converse with her. But it seemed so warm and friendly that Kate finally named the room "Alice" and began to chat with the room on a regular basis.

"I went to see DaVinci Code with Marty and Cosmo last night after we exhausted ourselves at ultimate Frisbee. Incidentally, Marty still has extra tickets for Disneyland."Kate sipped her tea and stared at her books. "It's too warm in here," she complained."Kate, the room temperature is 74

degrees," Alice responded. "You had a cold last month. Shouldn't we leave it as is? We don't really want you to catch a cold with that environmental science class field trip to the hospital coming up next week.""Don't mother me tonight!" Kate retorted. Occasionally Kate appreciated having Alice act like a parent. She missed having her family around to cheer her on and help her stay on track. But tonight she was feeling cranky. "Just turn it down! You know its germs and not a slightly cool room that causes colds. As long as you aren't contagious, I'll be just fine with a cool room!"Alice chuckled. "OK, you called my bluff. The university's AC standard for energy conservation is 72. Do you want to go with that, or override and set it to 68?""OK, OK, OK, I'll try 72. But if I'm still too warm after 15 minutes, make it lower."Kate had to admit that the conservation measures were in place for a good reason and generally she wanted to support the initiative, but tonight she just wanted to be cool enough to be motivated to crack the books. And she did not want to be excluded from the field trip. After a few moments the air conditioning clicked on and the room began to cool down. Alice made a note not to use the cool-temperature/cold line again, at least for a while. After 15minutes, Kate was at work and apparently comfortable with the room at 72 degrees, so Alice left the thermostat setting there.

A few days later Kate plopped onto her bed. "I'm bored," she grumbled. "And tomorrow's going to be another boring day. I hate being stuck in the dorm over the weekend.""Kate? Kate?" Kate heard Alice's voice calling her name. She still wasn't quite comfortable with the room. Keeping track of her. "Marty has extra tickets to Disneyland. You could ride down there with her and have some fun. Or maybe you could play Frisbee and see another movie with Marty and Cosmo.

Questions

1. What would cause Kate to consider the room warm and friendly?

2. What role does the word "incidentally" play in the conversation Kate had with Alice?

3. What does "incidentally" refer — a break in the previous conversation or the sentence it is in?

4. When Kate complains about the temperature in the room, the room interprets the complaint as a request to adjust the thermostat setting

on the air conditioning unit. What knowledge and reasoning are needed for the room to respond appropriately to Kate's declaration?

5. Kate and Alice engage in a brief argument about the room temperature. What does Alice need to know about the structure of arguments to be able to respond appropriately?

6. List the associations Alice needs to make in order to suggest a trip to Disneyland or Frisbee and the movies.

Glossary Words

1. Collaborate

2. Semantic

3. Blogs

4. Intelligence

5. Cognition

6. Perception

7. Execution

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