

Knowledge Management as a Strategy & Competitive Advantage: A Strong Influence to Success (A Survey of Knowledge Management Case Studies of Different Organizations)

Muhammad Azam

Assistant Professor, Government Emerson College, Bosan Road, Multan, Pakistan

Ahmad Bilal Khilji

M.Phil Business Administration & Lecturer Institute of Social Sciences,
Bahauddin Zakariya University Multan, Pakistan

Waqas Khan

M.S. Commerce, Government College University, Faisalabad, Pakistan

Abstract

There has been a great deal of recognition in the business world that information and knowledge management can be vital tools in organizations. Knowledge management can be proven a competitive advantage of any organization. The rationale of this exploratory study is to investigate the link among knowledge management system & techniques and organizational success by using knowledge as competitive advantage. It is a qualitative research study of different case studies of the use of knowledge management as competitive advantage in different organization that leads to success. A total of 8 different organizations are studied and results propose that by using knowledge management as strategy and competitive advantage, these organizations earn high profit. And it has a great influence to success. Implication and Directions are also discussed together with limitation and suggestions for future research.

Keywords: Knowledge Management, Organization, Tacit Knowledge, Explicit Knowledge, KMS, KM Strategies, KM Technologies, Productivity, Competitive Advantage

1. Introduction

For the organizations, the most important priority is customer satisfaction to evaluate organizational performance and success. Employee interests and engagement play a very vital role in the customer satisfaction. And now a days, Knowledge based systems in the companies can play a vital role to that. This article is a survey of case studies of knowledge management systems in different companies with different businesses. We find many descriptions of such knowledge management systems in the research literature, but most of them deal with technical issues, few are dealing with how these systems work in the organizations, and few are about how to develop a influential knowledge management system and how it should circulate properly within the organizations. This is an attempt to systematically present published case studies of knowledge management systems that can be found in the research literature, and to analyze 1) What systems are in use in those companies, and 2) What is impact of such systems on organizational success? And 3) how knowledge management can be a competitive advantage and key factor to success?

First, we will briefly motivate the use of knowledge management systems in different companies, study of common issues, need for KM System and suggested improvement actions. We then go on to define what is meant by “knowledge” and “knowledge management”. Next, present and discuss eight case studies found in the literature. In the business environment, the evolution from data to information and from information to knowledge plays a leading role in shaping how organizations develop strategies and plans for the future.

In current business scenario, every employee in each and every organization is regarded as learner, and learning opportunities are provided for each and every single one of them to enhance their learning ability and knowledge; it is expected that learners will become autonomous and lifelong learners, critical thinkers, and knowledge-producers.

Every organization should become knowledge centric organization and should provide learning and development to employees, and adopt knowledge management (KM) systems for better performance. This will enhance organizational learning motivation and learning ability, as well as encourage them to share and disseminate knowledge, and undertake knowledge management.

A very few studies exist that deals with the knowledge management as competitive advantage in every sector of business administration. There are many people who don't know how to use knowledge properly and systematically and how it can be our competitive advantage till today. Previous work has examined mostly information technology, software development, knowledge management processes and strategies.

Most of research is conducted in understanding knowledge management system, process, strategies, its use with information technology, software development, health and psychology, and science, mostly in 1st world. But a very few studies exist in other business sectors especially in developing countries. So my area of special interest is to understand that how we can make knowledge management our competitive advantage and how it can be a part of our strategies and better utilization of knowledge to behaviors of employees imply best practices within the organization. To date, there is no research exists which get close all these studies together. We study 12 case studies of different business for better results and understandings.

1.1 Problem Statement

To find the relationship between knowledge management and organizational success. How different organizations use knowledge management systems as strategic tool and get competitive advantage?

2. Conceptual Framework

2.1 What is Knowledge?

It is a combination of data and information, to which is added expert opinion, skills, and experience, resulting in a valuable asset that aids decision making. In organizational terms, knowledge is generally thought of as being know-how, applied information, information with judgment, or the capacity for effective action. Knowledge may be tacit, explicit, individual, and/or collective. It is intrinsically linked to people. Knowledge is the result of learning and the process of identifying, creating, storing, sharing, and using it to enhance performance has always occupied man. Knowledge is something which only humans can possess. People know things, computers can't know things.

Traditionally, in many organizations, knowledge is seen as a personal possession. If you are a knowledgeable person, you have status and you are in demand. Knowledge gives you the ability to take action. Knowledge is based on experience, it requires information, and it involves the application of theory or heuristics (either consciously or unconsciously), and it allows you to make knowledgeable decisions. Knowledge has something which data and information lack, and those extra ingredients are the experience and the heuristics

Data are facts, and information is interpreted data. Knowledge is created and organized by flows of information, shaped by their holder. It is tacit or explicit.

2.1.1 Tacit knowledge

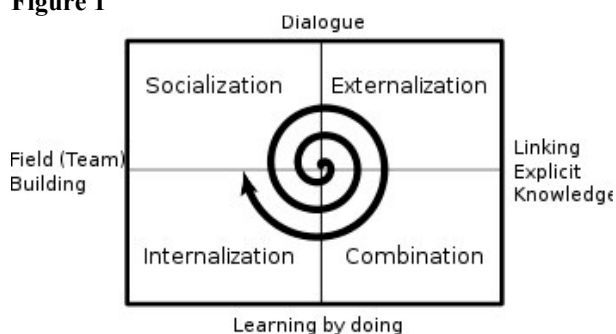
It is Non-verbalized, intuitive, and unarticulated knowledge that people carry in their heads. It is hard to formalize and communicate because it is rooted in skills, experiences, insight, intuition, and judgment, but it can be shared in discussion, storytelling, and personal interactions. It has a technical dimension, which encompasses skills and capabilities referred to as know-how. It has a cognitive dimension, which consists of beliefs, ideals, values, schemata, or mental models.

2.1.2 Explicit knowledge

It is codified knowledge that can be expressed in writing, drawings, or computer programs, for example, and transmitted in various forms. Tacit knowledge and explicit knowledge are mutually complementary forms of meaning.

A more philosophical (and positivist) view of knowledge is to see it as "justified true belief". We often divide knowledge into two types, tacit and explicit knowledge. By tacit knowledge we mean knowledge that a human is not able to express explicitly, but is guiding the behavior of the human. Explicit knowledge is knowledge that we can represent, for example in reports, books, talks, or other formal or informal communication. So when we later talk about computer systems for knowledge management, it is only the explicit knowledge that can be managed in these kinds of systems; the tacit knowledge remains in the people! Some claim that tacit knowledge can be converted to explicit through externalization, and from explicit to tacit through internalization. We also find conversions from tacit to tacit – socialization, and explicit to explicit – combination.

Figure 1



2.1.3 Knowledge in Organizations

A knowledge organization is a management idea, describing an organization in which people use systems and processes to generate, transform, manage, use, and transfer knowledge-based products and services to achieve organizational goals. Simard et al. (2007) described five functions of a knowledge-service organization:

- generate content
- transform content into useful products and services
- preserve and manage content to enable organizational use and external transfer
- use content to achieve organizational goals, and
- Transfer content externally, in the form of products and services.

Functions 1, 3, and 5 are essential and cannot be bypassed.

2.2 What is Knowledge Management

Knowledge management (KM) is about leveraging what is already known to work in order to achieve the greatest impact and improve outcomes. The explicit and systematic management of processes enabling vital individual and collective knowledge resources to be identified created, stored, shared, and used for benefit. Its practical expression is the fusion of information management and organizational learning.

KM involves the transformation of intangible, tacit knowledge (i.e., information in people's heads) into explicit knowledge (i.e., knowledge in a format that can be stored and shared with others). This graphic depicts the relationship between tacit knowledge and explicit knowledge. KM activities often involve capturing and organizing the explicit knowledge that organizations generate, in order to maximize the organization's effectiveness and efficiency.

The three main components of KM are: 1) people/culture, 2) process, and 3) technology. Many people focus on technology solutions when they think of KM. However, KM could not exist without the people and processes, for which technology serves as an enabling mechanism. KM processes can include creating, capturing, synthesizing, sharing, and encouraging use of available information.

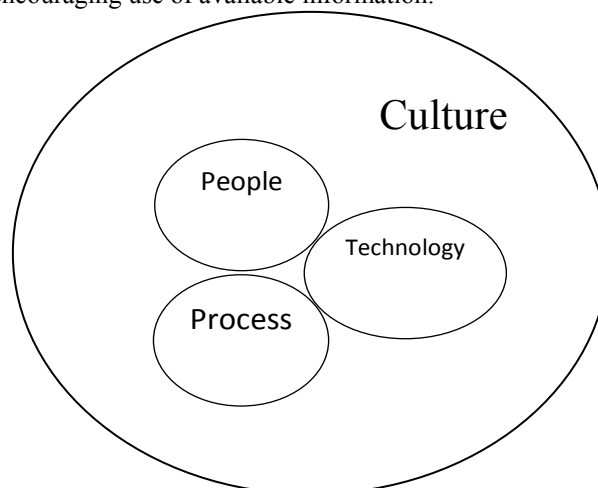


Figure 2

Knowledge management (KM) is the process of capturing, developing, sharing, and effectively using organizational knowledge. It refers to a multi-disciplined approach to achieving organizational objectives by making the best use of knowledge.

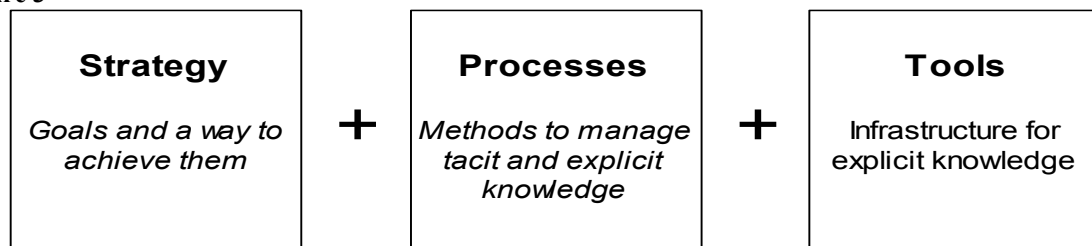
Many large companies, public institutions and non-profit organizations have resources dedicated to internal KM efforts, often as a part of their business strategy, information technology, or human resource management departments. Several consulting companies provide strategy and advice regarding KM to these organizations. Knowledge management efforts typically focus on organizational objectives such as improved performance, competitive advantage, innovation, the sharing of lessons learned, integration and continuous improvement of the organization. KM efforts overlap with organizational learning and may be distinguished from that by a greater focus on the management of knowledge as a strategic asset and a focus on encouraging the sharing of knowledge. It is an enabler of organizational learning.

2.2.1 Knowledge Management System

We can say that a knowledge management “program” or “system” in a company can consist of three parts; first an overall strategy for knowledge management, that is, what are the company goals, and how does it proceed to achieve them. Usually, the goals within software engineering companies are to develop software with less cost, or with a higher quality. But it can also be to make the work of software engineers easier. By processes we mean company activities in order to facilitate knowledge management. This will usually be methods for collecting and

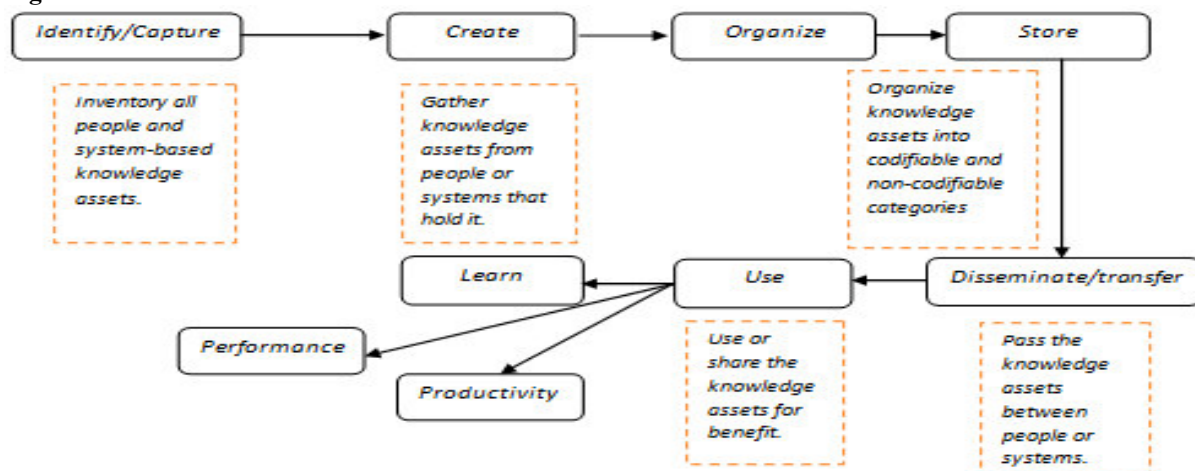
distributing knowledge, and can be activities of a separate part of the organization (such as an Experience Factory), project managers and software developers. A tool to support knowledge management is a software system where operational information, or “knowledge.”

Figure 3



2.2.2 Knowledge Management Process Model

Figure 4



2.3 KM Strategies

One strategy to KM involves actively managing knowledge (push strategy). In such an instance, individuals strive to explicitly encode their knowledge into a shared knowledge repository, such as a database, as well as retrieving knowledge they need that other individuals have provided to the repository. This is commonly known as the Codification approach to KM.

Another strategy to KM involves individuals making knowledge requests of experts associated with a particular subject on an ad hoc basis (pull strategy). In such an instance, expert individual(s) can provide their insights to the particular person or people needing this (Snowden 2002). This is commonly known as the Personalization approach to KM.

Hansen et al. propose a simple framework, distinguishing two opposing KM strategies: codification and personalization. Codification focuses on collecting and storing codified knowledge in previously designed electronic databases to make it accessible to the organization. Codification can therefore refer to both tacit and explicit knowledge. In contrast, the personalization strategy aims at encouraging individuals to share their knowledge directly. Information technology plays a less important role, as it is only supposed to facilitate communication and knowledge sharing among members of an organization.

Other knowledge management strategies and instruments for companies include:

- Knowledge Sharing (fostering a culture that encourages the sharing of information, based on the concept that knowledge is not irrevocable and should be shared and updated to remain relevant)
- Storytelling (as a means of transferring tacit knowledge)
- Cross-project learning
- After action reviews
- Knowledge mapping (a map of knowledge repositories within a company accessible by all)
- Communities of practice
- Expert directories (to enable knowledge seeker to reach to the experts)
- Best practice transfer
- Knowledge fairs
- Competence management (systematic evaluation and planning of competences of individual organization members)

- Proximity & architecture (the physical situation of employees can be either conducive or obstructive to knowledge sharing)
- Master-apprentice relationship
- Collaborative technologies (groupware, etc.)
- Knowledge repositories (databases, bookmarking engines, etc.)
- Measuring and reporting intellectual capital (a way of making explicit knowledge for companies)
- Knowledge brokers (some organizational members take on responsibility for a specific "field" and act as first reference on whom to talk about a specific subject)
- Social software (wikis, social bookmarking, blogs, etc.)
- Inter-project knowledge transfer

2.4 *KM Technologies*

Knowledge Management (KM) technology can be divided into the following general categories:

- Groupware
- Workflow
- Content/Document Management
- Enterprise Portals
- eLearning
- Scheduling and planning
- Telepresence

Groupware refers to technologies that facilitate collaboration and sharing of organizational information. One of the earliest very successful products in this category was Lotus Notes. Notes provided tools for threaded discussions, sharing of documents, organization wide uniform email, etc.

Workflow tools allow the representation of processes associated with the creation, use, and maintenance of organizational knowledge. For example the process to create and utilize forms and documents within an organization. For example, a workflow system can do things such as send notifications to appropriate supervisors when a new document has been produced and is waiting their approval.

Content/Document Management systems are systems designed to automate the process of creating web content and/or documents within an organization. The various roles required such as editors, graphic designers, writers, and producers can be explicitly modeled along with the various tasks in the process and validation criteria for moving from one step to another. All this information can be used to automate and control the process.

Enterprise Portals are web sites that aggregate information across the entire organization or for groups within the organization such as project teams.

eLearning technology enables organizations to create customized training and education software. This can include lesson plans, monitoring progress against learning goals, online classes, etc. eLearning technology enables organizations to significantly reduce the cost of training and educating their members. As with most KM technology in the business world this was most useful for companies that employ knowledge workers; highly trained staff with areas of deep expertise such as the staff of a consulting firm. Such firms spend a significant amount on the continuing education of their employees and even have their own internal full-time schools and internal education staff.

Scheduling and planning tools automate the creation and maintenance of an organization's schedule: scheduling meetings, notifying people of a meeting, etc. An example of a well known scheduling tool is Microsoft Outlook. The planning aspect can integrate with project management tools such as Microsoft Project. Some of the earliest successful uses of KM technology in the business world were the development of these types of tools, for example online versions of corporate "yellow pages" with listing of contact info and relevant knowledge and work history.

Telepresence technology enables individuals to have virtual meetings rather than having to be in the same place. Videoconferencing is the most obvious example.

These categories are neither rigidly defined nor exhaustive. Workflow for example is a significant aspect of content or document management system and most content and document management systems have tools for developing enterprise portals.

One of the most important trends in KM technology was the adoption of Internet standards. Original KM technology products such as Lotus Notes defined their own proprietary formats for email, documents, forms, etc. The explosive growth of the Internet drove most vendors to abandon proprietary formats and adopt Internet formats such as HTML, HTTP, and XML. In addition, open source and freeware tools for the creation of blogs and wikis now enable capabilities that used to require expensive commercial tools to be available for little or no cost.

One of the most important ongoing developments in KM technology is adoption of tools that enable organizations to work at the semantic level. Many of these tools are being developed as part of the Semantic Web. For example the Stanford Protégé.

3. Case Studies of Knowledge Management of Different Companies

Literature provides us little knowledge and information about the actual use of knowledge management. We here discuss eleven case studies, and examine what claims are made about knowledge management in each of them, and describe in what organizational setting each of the case studies were performed, how these organization actually use knowledge management, what is the importance of KM in these organizations, and how these organizations earn by using KM?

We here discuss case studies of Apple Inc, ATKINS, Toyota, Siemens, World Bank, BP Group, NASA Software Engineering Laboratory, WTIA, Coca-Cola, Nexgen, Telenor Telecom Software, & Ericson Software technology.

3.1 SIEMENS

Siemens AG is an electronics and electrical engineering company that conducts business in seven groups: Information and Communications, Automation and Control, Power, Transportation, Medical, Lighting and Financing and Real Estate.

3.1.1 Situation

Greater competitive pressure emphasized need to become more agile and specialized Knowledge initiatives were fragmented and driven by individual business units

3.1.2 Strategy:

The company's strategy to increase shareholder value included the following objectives:

- Drive to become a knowledge enterprise
- Expand knowledge creation and knowledge sharing processes
- Create visibility and structures for knowledge and sources of knowledge
- Avoid isolated knowledge management solutions
- Master knowledge security and risks
- Plan and acquire support for knowledge businesses

3.1.3 The strategy focused on 3 areas

- Creation of a knowledge management framework
- Mobilization of team members
- Changing the way of working

Technology was recognized as an enabler of knowledge management, not the focus of the knowledge management strategy

3.1.4 Actions

TOP+, a large scale change program was implemented to increase productivity, foster innovation and growth through internal benchmarking, sharing of best practices and competence building A virtual best practices team was established consisting of practice leaders, SMEs, knowledge brokers/managers and facilitators responsible for defining best practices within their business unit or function

3.1.5 New roles and functions were created to foster knowledge management

- Knowledge management Office: Corporate Knowledge Officer and Corporate knowledge management Program Manager
- Knowledge management Board: executive managers responsible for setting knowledge management direction, developing knowledge management methodology and processes and coordinating the knowledge management network
- Knowledge management Council: knowledge management representatives, including chief knowledge officers, for groups and regions

Communities of Practice (CoPs) were created as virtual learning organizations that enabled knowledge sharing and collaboration across groups or regions, essentially helping employees to "connect people to people" Siemens News Board was launched in 1997 to allow employees access to a fully integrated set of internal and external knowledge bases, collections in the corporate library, websites, newswires, discussion forums, email, and groupware

Siemens invested \$7.8 million to launch ShareNet, an internal website combining chat rooms, a database and search engine, to enable employees to share information and expertise with colleagues around the world In 1999, nearly 12,000 salespeople were using ShareNet, and it had a support organization responsible for monitoring the system and its content.

3.1.6 Technology

- Corporate intranet (ShareNet)
- Collaboration tools
- Knowledge bases
- Discussion forums

3.1.7 Benefits

- More customer focused, especially in value-added services and products with high knowledge content
- Annual spending on the knowledge management practice CoP averages about \$250,000 with a return on investment of \$10-\$20 for every dollar spent
- Increased shareholder value
- Increased sales using ShareNet by \$122 million
- More lucrative contracts won using ShareNet

3.2 BP DROUP

BP Group's business activities are organized into four main areas—upstream, downstream, chemicals, and gas and power - together comprising more than 150 autonomous business units. During the late 1990s, BP pursued highly successful merger-and-acquisition activities and is now combined with Amoco, Burma, Castrol and ARCO. In recent times BP has attempted to develop a business out of alternative and renewable energy – with a particular focus on solar energy. Its corporate branding emphasizes four core characteristics: progressive, green, and innovative and performance.

3.2.1 Strategy

In the mid 1990's BP embarked on knowledge sharing strategy built around the concept of the 'Virtual Team', which involved enabling geographically dispersed teams with a tool-kit of high technology enablers, including video-conferencing. The approach was formed in response to a restructuring of its upstream business from a centralized structure into smaller, more geographically dispersed units. Its pilot demonstrated:

- Radical change in workforce performance could be achieved through enabling 'Virtual Teams'
- The critical importance of fostering a culture of knowledge sharing throughout the organization
- The importance of embedding knowledge sharing into business process

Since the strategy was implemented, knowledge sharing and collaboration has become embedded across the organization as a strategic imperative.

3.2.2 Initiatives

- Central to the knowledge strategy are business change group-wide initiatives. Include in this is Drilling & Well Learning, Projects Excellence, Operations Excellence (OE), Green Operations to name a few, supported by an Intranet system known as the Common Operating Environment (COE)
- OE utilizes a knowledge portal serving an active global operations community of 1,000 – with regular contributions from all levels from technician to Vice President. The potential operations audience could be as high as 33,000
- Knowledge sharing in OE is further enabled by a best practice database as well as an active discussion board ('eClips') – with 94% of questions receiving a response

3.2.3 Leadership

Senior leadership committed to knowledge journey

- BP's senior executives have given high profile and consistent backing to the process of implementing knowledge management
- "Most activities or tasks are not one time events whether it's serving fuel at a service station or drilling a well -we do the same things repeatedly. Our philosophy should be fairly simple: every time we do something again, we should do it better than the last" – Sir John Browne, BP CEO

Mid-level leadership act as mentors

Mid-level leadership and 'excellence co-coordinators' track discussion threads on the 'e-Clips' knowledge management tool and crystallize these into knowledge assets by:

- Summarizing the know-how contained in the thread to date
- Wrapping up with a best practice final response

Communities of Practice

A key learning from BP's Virtual Teams initiative was:

- These units could be more creative and efficient through the sharing of knowledge and best practices
- Communities of Practice must be formed around areas of expertise to support real operational or strategic business needs

3.3 CULTURE

3.3.1 Common language and understanding around knowledge management BP has adopted a deliberate strategy to move away from 'Knowledge Management' The specific challenges faced by the sector in terms of capability over the long wavelength meant that the natural evolution for knowledge management was twofold:

- Firstly a focus on the individual – known as Organizational Capability. Secondly, a continued focuses on the management of knowledge across the individuals and teams – known as Organizational Learning.

One of the key focus areas BP targeted was the Manufacturing & Operations Base:

- To embrace and associate with the actual knowledge driven objective: in BP's case, they focused on one of the key area's of Operational Excellence. To gain all the advantages of their scope and scale by integrating technical, scientific, and commercial knowledge deeply and rapidly across the global enterprise.

3.3.2 Process

Operation Value Process

The OVP tool was developed to be a common process for Operational Excellence across business units by:

- Capturing 'best in BP' knowledge practices
- Identifying areas for improvement
- Providing assurance that performance gaps are closing

Every business unit benchmarks itself against:

- 6 enterprise-wide operational expectations
- 27 key practices which deliver the expectations
- 79 elements which break the expectations down into tasks

Process assessments are completed via the OE portal and assessed by an internal group of people called external Validators.

3.3.3 Technology

Knowledge management solutions used within BP Operations Group include:

- Proprietary, custom built web based portal
- Portal sits on a SQL server database
- MS Outlook and Web utilized for discussion groups : 'eClips'

The knowledge portal has now been re-used within:

- Petrochemicals Performance Community (400 users)
- Environmental Community (1500 user).

3.4 WORLD BANK

3.4.1 Situation

- World Bank wanted to enhance its ability to draw upon its unique development experience and knowledge and share it with clients to better fulfill its global mission of reducing poverty and improving quality of life in developing countries
- Like many organizations, World Bank had a strong information base, but was overwhelmed by the sheer volume of information contained in documents and within people's heads
- World Bank wanted to ensure quality in its content, ensuring trustworthy current sources
- Knowledge management momentum was built from a number of successful independent projects

3.4.2 Strategy

- World Bank president and knowledge management sponsor, James D. Wolfensohn, envisioned a "knowledge" bank to enable the company to play "a leading role in [a] new knowledge partnership"
- World Bank aspired to use knowledge management to increase employee effectiveness and efficiency across the organization
- Knowledge management would be rolled out in stages: The first focus was on making knowledge easily accessible to World Bank staff. Secondly knowledge distribution would be expanded to external clients and partners; and lastly external knowledge would be incorporated into its system, thereby defining itself as a clearinghouse for sustainable development knowledge
- World Bank defined four areas of knowledge management to be enabled: information, personal thinking, discussion and knowledge synthesis
- Appointed a role of program director for knowledge management to drive the organizational strategy and an institutional task force to define an implementation road map

3.4.3 Actions

- World Bank Initially identified 80 domains of expertise and built global "communities of practice" from informal communities around each domain to share information and build knowledge

- Each community was charged with establishing a help desk, creating an expert directory, gathering relevant project history including best practices and lessons learned, and setting up electronic bulletin boards with the help of a full-time knowledge manager and operational staff
- Dedicated knowledge management staff oversaw the development and establishment of an enterprise-wide integrated knowledge management framework and classification system
- World Bank leveraged experience and lessons learned from successful early initiative, Africa Live Database, used in daily work by economists to effectively gather and synthesize information
- World Bank shifted to a knowledge sharing culture by adding knowledge sharing to the personnel evaluation system and sponsoring a Knowledge Fair and Knowledge Sharing Awards
- World Bank rolled out its first knowledge management pilot program, Education Knowledge Management System (Eknowledge managementS) to facilitate knowledge synthesis and identify knowledge needs through an internal web site and Advisory Service that facilitated getting internal clients information they needed and recorded requests and answers
- Over 4% of the Bank's annual administrative budget is allocated to developing the knowledge management system and communities of practice

3.4.4 Technology

- Corporate intranet and extranet
- Collaboration tools
- Lotus Notes
- Help desk
- Fax/Faxback

3.4.5 Benefits

- Improved operational effectiveness
- Faster cycle time
- Better quality client services
- Enhanced relationships with clients, partners and stakeholders
- More satisfied employees

3.5 NEXGEN

Our client in this study is a well established hedge fund in the United States that has concentrated investments in a specific business sector. Their business growth and return on portfolio depends on making time sensitive, informed investment decisions. The company and its analysts rely heavily on extensive internal research and external data sources for compiling this information to make actionable decisions.

3.5.1 Business Problem

The Company struggled to consolidate all relevant information from various sources. They were dependant on internal studies, research, various analysis models and several external data sources that are required to make time sensitive trading decisions. This pool of heterogeneous data and knowledge was scattered throughout unfriendly internal systems and various external sources. The inability to find related information in an expedited manner was very costly to the company. Manual process of consolidating and organizing this data was prone to error and consumed valuable time.

3.5.2 Solution Strategies Through Nexgen Partnership

Nexgen was called in to analyze their internal processes and help them consolidate the vast amount of data to be easily accessible from a single knowledge interface. Nexgen together with the client's research team devised a plan to build a very structured knowledge management (KM) system to consolidate all the relevant data and index them to be easily searchable. Nexgen decided to take a modular approach in building the system by taking a multi phase development model.

- Enterprise email system is searched, indexed and cataloged for related email and attachments with tags and categories.
- Enterprise file servers are routinely searched, indexed and cataloged with tags and categories.
- Subscriptions to market data, events and news are integrated into the KM system.
- Target industry events and contacts are integrated into the KM system.
- Internally developed analysis models are integrated into the KM system.
- Implemented automation to apply these analysis models to cataloged information.
- Single point search function with features to choose resulting knowledge tree in multiple formats.

3.5.3 Results

The newly developed Knowledge Management System consolidated all legacy systems and external sources to provide a one-stop-shop for all relevant research and information. This greatly improved the time it took the

analysts for making informed decisions.

- System functions with very minimal administration.
- Automated targeted reports were introduced, based on market/industry events and triggers.
- Created a unified interface for all information and implemented a single-point search.
- Knowledge is now organized based upon applied business logic.

Company analysts are able to make informed decisions ahead of the competition.

3.6 *WTIA*

3.6.1 Challenge

The Washington Technology Industry Association (WTIA), formerly the Washington Software Alliance (WSA), is the largest statewide association of technology companies and executives in the world. With more than 1,000 member companies, the WTIA is instrumental in setting industry direction, facilitating expertise sharing, and advancing the economic value and global impact of technology companies doing business in Washington. The WTIA was using two separate file shares to store all documents and information for key business areas including memberships, events, marketing, and finance. The shares housed extensive content, but their deep file structures made it cumbersome for users to navigate and locate the information they needed. At best, users were lucky to "stumble" across relevant documents while searching through files. In an effort to improve information discovery and streamline operational efficiencies, the WTIA wanted to move from its existing document storage system to a more robust knowledge management solution that would make information more easily accessed, stored, indexed, and searched.

3.6.2 Solution

The WTIA looked to Allyis for help in developing an employee portal and knowledge management solution that would improve and encourage information sharing across their organization. With an existing technology infrastructure that included Microsoft Windows, Exchange Server, SQL Server 2000 and Internet Information Services 5.0 / 6.0, the WTIA was perfectly poised to implement a Microsoft SharePoint solution to address their information and knowledge management concerns. Allyis worked closely with WTIA management and IT teams to define how SharePoint would serve their immediate business, infrastructure, and technology requirements, while also providing an extendable infrastructure for their longer-term goals of improving business process efficiencies and organizational collaboration. Offering an integrated location for information access, valuable collaboration features, user-friendly content discovery tools like search and tagging, and robust document management capabilities including version control and management meta-data, SharePoint was the perfect solution for all the WTIA's needs. Once development of the knowledge portal was completed, Allyis provided training to ensure all WTIA personnel had an understanding of how to use and operate within the new portal. Training included key stakeholders and server administrator functional overviews, as well as training content for the employee base at large.

3.6.3 Key Benefits

Improved Knowledge and Information Discovery

Leveraging search, tagging, and a well thought out information architecture, WTIA employees are now able to find and access information and resources to do their jobs quicker and more easily than on their old file share system.

Extendable Platform

SharePoint offers the ability to broaden the platform's capabilities, integrate new systems, and expand the platform's functionality as the organization and its needs evolve over time.

3.6.4 Technologies Used

- Microsoft Office SharePoint Server 2007
- SQL Server 2007

3.7 *Telenor Telecom Software*

In an effort to reuse software development experience, Telenor Telecom Software, a company with 400 software developers in five geographical locations, decided to improve the estimation of software development effort, as well as risk management. To achieve this, they set up:

- An experience reuse process, with new and modified role descriptions.
- An experience database tool, available on the Intranet.
- Resources allocated for experience reuse and for experience database administration.

The experience database was available as an "expert system" which would ask you questions on the nature of a new project, and recommend an estimation model, based on data from earlier projects in the company. It would also give you information on company experts on estimation. This database was linked to a risk management module, which included risk factors found from interviewing experienced project managers. This

module consisted of a set of “best practice” processes, a tool to identify, assess and store risk factors, and a tool to visualize risk exposure over time. In addition to this, new roles for “experience database administrators” were set up – responsible for technical and editorial contents, as well as several roles for “process analysts”, responsible for analyzing information from processes such as the estimation process, project management process and the testing process.

Although the authors of the article acknowledge that the study was made too early after the initiative was introduced to draw firm conclusions, and that it was difficult to isolate the impact of their own work from other improvement initiatives in the company, they find several indications of improvement:

- The estimation accuracy improved, and estimation models were more widespread in use.
- The focus on experience based risk management increased in the projects.
- The organization accepted the need to collect and share experience.

3.8 *Ericsson Software Technology*

Ericsson Software Technology in Sweden have experimented with transfer of experience on a site that develops a wide range of software applications, having around 1600 employees who work in business units of 20 to 30 people. They develop software for telephone switches, base stations and mobile phone management systems. The company has formal communication channels such as meetings, e-mail and written reports, but wanted to establish a corporate culture that facilitate more oral communication of experience. Two organizational roles were invented: “Experience brokers” keep track of what other people in the company know, and match people who can have a benefit from talking to each other. “Experience communicators” help other people solve problems, by teaching them how to solve the problems on their own. The study reports that employees are more motivated when they know that there is a system for transferring experience that works.

3.9 *The NASA Software Engineering Laboratory*

The first implementation of an Experience Factory was at the NASA Software Engineering Laboratory. Experience in forms of cost data, process data as project methodology information and information on tools and technology used, as well as product data such as change and error information and results on static analysis on delivered code was collected, and used to develop predictive models and to refine the software processes that is used.

The results of this activity is reported as defect rates that went dramatically down (75% from 1987-91, and 37% from 1991-95); the cost of producing software went down by 55% from 1987-91 and 42% from 1991-95. Reuse was improved by 300% from 1987-91 and 8% from 1991-95. Finally, functionality was increased five-fold from 1976-92.

3.10 *Toyota’s knowledge management systems*

- According to analysts, Toyota’s success in both the local and global markets was based on its gaining a competitive advantage through implementation of innovative and path-breaking ideas on its production floors.
- Toyota production system (tps) worked on the basic idea of maintaining a continuous flow of products in factories in order to adapt flexibly to changes in demand.
- Tps linked all production activities to real dealer demand through implementation of kanban, jit (just-in-time) and other quality measures.

3.10.1 *Toyota wants to transfer knowledge of its production system to new employees*

Toyota typically selects a core group of two to three hundred new employees and sends them for several months training and work on the assembly line in one of Toyota’s existing factories. After several months of studying the production system and working alongside experienced Toyota assembly line workers, the new workers are sent back to the new factory site.

These repatriated workers are accompanied by one or two hundred long-term, highly experienced Toyota workers, who will then work alongside all the new employees in the new factory to assure that knowledge of Toyota’s finely tuned production process is fully implanted in the new factory.

Tacit knowledge approach- quality circles

At the end of each work week, groups of Toyota production workers spend one to two hours analyzing the performance and problems in quality or productivity. Each group proposes “countermeasures” to correct identified problems, and discusses the results. Through personal interactions in such quality circle group settings, Toyota employees share their ideas for improvement, devise steps to test new ideas for improvement, and assess the results of their tests.

Explicit knowledge approach

Documenting the tasks that each team of workers and each individual worker is asked to perform on its assembly lines. These documents provide a detailed description of how each task is to be performed, how long each task

should take, the sequence of steps to be followed in performing each task, and the steps to be taken by each worker in checking his or her own work.

3.10.2 Results

- (Innovative multi-purpose vehicle) project. In the summer of 2004 Toyota crossed the threshold to a new age of global production with the launch in Thailand of the hilux vigo pickup truck, available in standard cab, extra cab and double cab models. Toyota initiated the imv project to create an optimized global manufacturing and supply system for pickup trucks and multipurpose vehicles to satisfy market demand in more than 140 countries worldwide Toyota imv launch video.mp4
- Toyota introduces its optimized global manufacturing and supply system
- Crowd sourcing - a new initiative. Essence of crowd sourcing , the riddle of knowledge creation , radical innovation via illiteracy , end of an era – “engineering of the consent” , setting-up new dimension for mediocrity
- "Ideas for good": corporate crowd sourcing experiment comes to us from Toyota.
- Total human model for safety (thumbs)
- Hybrid synergy drive® (hsd)
- Solar powered ventilation system
- Touch tracer display
- Advanced parking guidance system (apgs) tps video

3.11 Coca-Cola

The coca- cola company founder (s) john s. Pemberton country of origin united states introduced 1886 area served over 200 countries flavors cola, cola green tea, cola lemon, cola lemon lime, cola lime, cola orange and cola raspberry. Employees are 92,400 and a serving per day is 1.6 billion.

Need of KM

The only way for employers to get to each of their performances is an improved technology in delivering to them proper knowledge management. Create the need for them to rely on the system so the industry attains an increase in profit and production. It provides employers and business owners to widen their understanding when it comes to managing their employees. It does not only mean the mere understanding of what they have to do for the company but it's more about providing them with the proper technology and help them enhance skills and become more of an asset to the company than a liability.

Initial set up of KM

- The company management has developed processes and structures which have enabled this effective performance. One key element of success is decentralization, which creates an environment where managers are given responsibility and are results driven. The policy of appointing local management wherever possible also helps the company best adapt to local conditions. The strength of a multinational company over a smaller company is the knowledge each part of the business has developed over time, which can be used by others in the organization. There are few formal mechanisms for knowledge management. The main tools used at coca cola are the intranet, the appraisal meetings/business reviews, and informal networks.
- It is understood that every framework developed by the company began as a thought in the minds of the employees. Thus, the coca cola company had flourished into a multinational corporation because of the tacit knowledge of the employees. The knowledge management of coca cola has a deep relationship with collaboration. It partake the nature of not just a system but a huge network where the people within the company can communicate with the company network based in a different country.
- This nature will help assess knowledge managers on how much information must the company need to further their endeavors of perfection and customer satisfaction. In executing their strategy, knowledge management is very useful because it serves as a pattern or guide where certain areas are marked as they deemed fit, or areas are being highlighted which they saw that needs for further improvement. It also serves as a strong pivotal point where company seeks assessment or gathers information to further expand the coca cola system.

Implementation of KM

Tacit knowledge among employees has helped the company create innovations in their products. All it takes is to exhaust ideas and knowledge within the workplace. In order that this knowledge may be properly organized and put into concepts, a good inter-personal relationship is essential that the tacit knowledge may be well put into conception. Output of which would very much depend on the needs of the employees which means that the decisions are for them to make on what technology to use. The strategy applied by the company is based from value chains and force models. These tools have helped the company maximize and guide them in their efforts to resolved future business reverses. And it is definitely very effective as the world has undergone a recession; the

coca cola company has stood still and still braving its way towards success and perfection.

Internal analysis of KMI

It is strongly suggested to take credit on every reviews being put under the company. This must not be taken for granted, but instead be recorded on the company database for future reference or as a guide to help develop a system to improve and at the same time would attend to the needs of the customers. The company is quite sensitive to culture and reputation both of the supplier and customer because of their pursuit of bringing brighter and better innovation to the public consumer. They also believe that feedbacks are created to meet the demands and needs of the customers.

The accounting system of the coca-cola company

There are three types of bottling relationships at coca cola: → bottlers that the company has no ownership interest; → bottlers that the company has a controlling ownership interest; → bottlers that the company has non-controlling ownership interest. Bottling partners are authorized to manufacture and package products. Being able to manufacture primarily is advantageous in the company's part in acquiring controlling interest in a bottling operation. By owning the controlling interest, the company helps in the improvement of their information system. This is when the accounting system and the need for such technology arise. The intranet system as part of the knowledge management guides very well the information system needed for accounting (the coca cola company, 2006).

Technology used

The intranet system is the use of latest technology into the company. The employees are helped not only in honing their skills but also helped the company improve better communication among bottling partners and the company itself. This intranet strategy will help improve the relationship of the bottlers because of the network created between them. Knowledge management will provide them with facts and points on how greatly serve customer satisfaction. The bottlers are they key source from which knowledge management can acquire data, since the bottlers know the community very much and they are considered as the basic unit of the whole coca cola system (1999).

The future of coca cola's success lies on improving their information technology. Through the advance electronic data interchange (edi) technologies which are implemented into the company's information system, the employees can easily access to the operational information, such as consumer information, sales, and promotions. This enhances the employees' knowledge and increases their responsiveness to the customers. This type of advanced enterprise content management technology enables corporations to repurpose valuable assets, as well as improve efficiency, speed, continuity and collaboration in a way that gives them a competitive advantage. To deliver an integrated digital library, coca-cola created an easy-to-use user interface that is sophisticated enough to communicate with the coca-cola company's various servers, databases, and existing archives. The user interface, for example, is simple enough to perform searches based on keywords. Users can easily search multiple repositories with one query and search actual content or words. They also can separate the actual object from the important metadata attached to it.

Success story of coca – cola KM

The coca-cola company and IBM create unique digital media management system of IBM and the coca-cola company announced that coca-cola is leveraging IBM's most advanced digital asset management technology to create a powerful resource for managing archival information. The new coca-cola digital media system makes a century's worth of corporate marketing and advertising icons available at the desktop through a worldwide internal network, allowing coca-cola employees to more easily access and use the material for future projects. This new system combines distinct libraries of text, still images and video to build an integrated digital archival library, which is then made available as a business tool to coca-cola associates in more than 200 countries. The new digital management system currently includes tens of thousands of video clips, photographs, and many of the coca-cola company's most famous marketing and advertising icons. The coca-cola digital archives are built on a foundation of IBM's content manager, lotus notes and lotus domino software. The growth of e-business is increasing the need for companies to manage and distribute digital content, including images, computer-generated output, business documents, and rich media. → in fact, studies show that; → more than 85% of today's business information resides in sources beyond traditional databases. → less than 5% of that content is digitized.

Revenue uplift through KM

Financial condition analysis according to gain (2004), a business expert, the coca-cola enterprises experienced their first annual profit since 1991. Their profit was 3.03€ million compared to a loss of 12.11€ million in 1994. Their three years of losses totaled over 151.37€ million with their largest in 1993 at 105.2€ million. Coca-colas sales volume increased for the second consecutive year with an 8% increase over 1994 totaling 176.19€ million. Their stock price nearly doubled over the previous year with a closing market price of 3.25€ in 1994 and a closing market price of 6.43€ in 1995. The earnings per share for 1995 were 0.01 per common share compared to a net loss of 0.36€ in 19. Throughout 1995 coca-cola also embarked upon and continued various programs to cut costs and increase revenues. The company succeeded, by decreasing their operating expenses by 4% in 1995.

Operating income was double 1994's at 45.64€ million and a 6.81€ million decrease was achieved in selling, general and administrative expenses.

3.12 *ATKINS*

ATKINS is Construction Engineering & Consultancy Organization in Dubai-UAE. It is multinational construction company that provides innovative solutions of leading architectural, engineering, planning, and consultancy projects. The aim is to make ATKINS a knowledge-based and knowledge-ready organization by bringing knowledge at users' fingertips, streamlining processes and making work easier and more efficient.

3.12.1 Business Needs

Regional project managers and senior executives required better means to bridge people with information to acquire easy access, people with people to share knowledge and people with business processes to have better productivity.

3.12.2 Solution

AXIS is developed as a new web portal based on Microsoft's' latest technology, SharePoint, as an efficient mean to mainly manage enterprise content and facilitate collaboration and the sharing of knowledge. Other technologies are employed to facilitate communication.

3.12.3 Benefits/Results

- Improved storage, organization and location of enterprise electronic content
- Enhanced business insight through better reporting
- Improved sharing of knowledge
- Enhanced employee collaboration
- Enhanced employee productivity
- Ensured consistency of documents and business processes

3.13 *Apple Inc.*

Apple Company established in 1976 launched apple-1. The first single board computer with a video interface and an board Read Only Memory. Apple knowledge management strategy is based on 4 phases: 1) infrastructure evaluation, 2) KM system, Design & Development, 3) Deployment, and 4) Evaluation.

Phase 1

Analyze exiting infrastructure and align knowledge management business strategy. Supportive business structure and Organizational IT Infrastructure means that they must collaborate with other excellent employees.

Phase 2

Design KM architecture and design

- Data warehouse, expert system, case based reasoning, effective leveraging of infrastructure is needed.
- Knowledge audit and analysis that identify strong knowledge asset for every department
- Design KM team which may include the expertise and project leaders of the organization
- Apple Incorporation may offer lots of positions especially in knowledge management area
- Create KM Blueprint and develop system as reference and benchmark and create vision focusing on innovation.

Phase 3

Deploy, using the result driven methodology and manage change and culture reward

Phase 4

- Looking at Apple performance, Apple is on the way the way to achieve Jobs' dream for them to become a "Digital Hub." The apple' revenue is \$170.87B.
- Without knowledge management, Apple' innovation would not be relevant, because the information would get out long before the product themselves do.

3.13.1 Apple Inc. KM Implementation

- Successful KM is anchored to collaboration and collaborating success. In 2006, Apple Inc. with Motorola device named ROKR.
- Establish knowledge management team, and experts
- Innovation, new ideas, and exploiting intellectual strength, Apple expertise workers in designing software and applications.
- Able to be adjusted in accordance to business situations or scenarios specially with current dynamic environment.

3.13.2 Knowledge Management Tools Used By Apple Inc.

- Data Warehouse: Multiple-Petabyte, Teradata
- Company Intranet: Allows employees to get data from desk
- Expert System: Siri, Voice controlled intelligent agent, users get fast, instant answers

4. Conclusion

Knowledge management is the process of capturing, creating, organizing, and sharing knowledge. The above discussion proved that knowledge management should be the part of strategy development. We have analyzed twelve case studies of knowledge management systems of different companies. We have found that approximately the all of them chose to set up an own department in the organization who are responsible for managing knowledge. Concerning the benefits on knowledge management systems, it is difficult to draw firm conclusions. The above analysis describe that knowledge can be a competitive advantage for any organization. Best utilization of knowledge leads to best performance, high productivity, high return, and success. Knowledge management is the strong key to success; it is driven from above discussion.

5. Further Work

After reviewing all case studies it is analyzed that knowledge management is a tool to success. There is a great interest of knowledge management in developing and productivity. From above case studies, a point is noted that knowledge Management effect cost. However, there is a great need for further research in relevant field. There is a need to establish an appropriate knowledge centered work environment. There will be a lot of effort needed to promote the idea of knowledge management. Knowledge management can be analyzed with customer satisfaction, loyalty, employee aspects as engagement, satisfaction, commitment etc. It can be analyzed with relevance of leadership, cost effectiveness, financial performance in many other field of life.

References

- R. Bhawe, N. C. Narendra, I. P. Pal, and S. Krishnaswamy, "A Product-Line Approach towards Developing Knowledge Management (KM) Systems," *to appear*.
- R. Feldmann, J. Münch, and S. Vorwieser, "Towards Goal-Oriented Organizational Learning: Representing and Maintaining Knowledge in an Experience Base," *Proc. of the The Tenth International Conference on Software Engineering and Knowledge Engineering, SEKE'98*, 1998.
- R. Bhawe and N. C. Narendra, "An innovative strategy for organizational learning," *Proc. of the World Congress on Total Quality*, 2000.
- Fullan, M. (2001). *Leading in a culture of change: being effective in complex times*. San Francisco, CA: Jossey-Bass.
- Hearn, P. (2002). *Introduction to KM in the public sector*. Retrieved March 23
- Ifrah, E. (2001). *Corporate portals require complete KM strategies*. Retrieved March 23, 2007, from www.kmworld.com/publications/whitepapers/portals/ennov.htm
- Yiu, D., Lin, J. (2002). *Sharing tacit knowledge in Asia*, KM Magazine. 5 (3).