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Knowledge Management

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Abstract*:* Knowledge Management is the key to survival of organizations in such an advanced economy. This paper highlights the importance of Knowledge Management by use of integrating knowledge management into Manufacturing and Quality Management thereby reducing costs, improving quality and overall process in order to ensure optimum utilization of available resources. Various techniques such as Six Sigma, PDCA, and DMAIC have been discussed in this paper with integration of Knowledge Management for ensuring better implementation and improved quality practices

Key words: Knowledge Management, Quality Management, Six Sigma, Cost of Quality.

INTRODUCTION

As markets have become global, more and more manufacturing companies achieve global operations through various strategic business alliances including joint ventures and outsourcing, etc. Since manufacturing has become global to address the needs of the global market, companies take advantage of advanced information technologies in achieving their global supply chain. It is also important to see to what extent this has been used to facilitate innovation and knowledge diffusion along the supply chain for an ultimate improvement of productivity and quality and in turn manufacturing organizational competitiveness. Without the integration of people and information technology/information systems (IT/IS), it is very hard to achieve any significant improvement in organizational performance (Gunashekaran and Ngai, 2007).

Knowledge has been recognized as the key resources of business survival and success in knowledge economy (Bennet and Bennet, 2000). The capability to create and utilize knowledge into business processes and product/services enable organizations to achieve superior performance (Teece, 1998).

The major business drivers behind today's increased interest in and application of KM lie in four key areas (Dalkir, 2005)

1. Globalization of business. Organizations today are more global— multisite, multilingual, and multicultural in nature.
2. Leaner organizations. We are doing more and we are doing it faster, but we also need to work smarter as knowledge workers, adopting an increased pace and workload.
3. "Corporate amnesia." We are more mobile as a workforce, which creates problems of knowledge continuity for the organization and places continuous learning demands on the knowledge worker. We no longer expect to spend our entire work life with the same organization.
4. Technological advances. We are more connected. Advances in information technology not only have made connectivity ubiquitous but have radically changed expectations. We are expected to be "on" at all times, and the turnaround time in responding is now measured in minutes, not weeks.

To transmit the right knowledge to the right people at the right time, knowledge retrieval is the major part of knowledge management. The next generation of enterprises should be in a position to make use of information and extract knowledge from information system and the business environment to maximize their return and reuse knowledge for innovation (Davenport and Prusak, 1998). Gourlay (1999), outlined five possible reasons, why organizations embark on KM programmes:

1. Lost knowledge after downsizing organizations have slowly awoken to the fact that knowledge is a human asset and that it is knowledge, not information, which is the primary business asset.
2. The 'customer interface' employees have information on customers for example, sales persons or delivery drivers visit customers on a regular basis, and therefore are in a strong position to build good relationships and gather useful information about customers.
3. Pressure to innovate to gain competitive edge in the aftermath of a corporate merger.
4. Information and communications technologies advances phenomenal advances in systems and software provide endless opportunities to utilize available data managed within KM settings.

To achieve a competitive advantage, organizations have recently adopted Six Sigma initiates and Knowledge management Systems. KM could enhance the effectiveness of quality initiatives through the decision support system (Gowen III et al., 2008).

High-performance organizations are characterized by: (i) core competence, networks and cooperation (ii) process orientation (iii) free margins (iv) learning organizational structures and (v) knowledge management and information technology. Knowledge management has now been established as a competitive strategy that can give multiple advantages to a company. One of the advantages of KM in manufacturing is training. Training in both the short- and long-term can have positive effects on the performance of a

company. Knowledge server allows access to information at all levels of an organization and provides a vehicle for people to improve themselves in a formal and informal way. It can reduce the amount of structure required, eliminate excuses and de-politicize the organization while empowering people to learn on their own (Muscatello 2003).Companies realized the importance of timely and shared information being available for making more informed and right decisions. Manufacturing is important to generate jobs and even develop services; therefore, KM is essential for the productive and competitive management of manufacturing industries (Gunashekaran and Ngai, 2007).

Newman (1992) explained conversion from data to information and then, knowledge as shown in figure1. The basic building block of knowledge is data, the processing of data resulting in information, and as a consequence of processing information knowledge is derived. Knowledge is the next natural progression after information; that is, a higher order than information as shown in figure1.

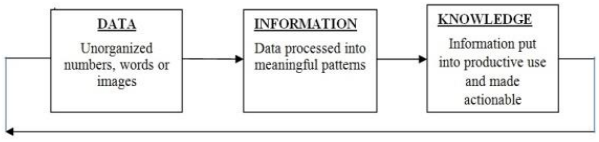

Fig 1: Figure Conversion from Data to Knowledge

Grey (1996) noted that knowledge is the full utilization of information and data, coupled with the potential of people's skills, competencies, ideas, intuitions, commitments and motivations. Knowledge is people, money, leverage, learning, flexibility, power, and competitive advantage; it is stored in the individual brain or encoded in organizational processes, documents, products, services, facilities and systems. It is the result of learning which provides the sustainable competitive advantage. On the other hand, Zack (1998) added that knowledge is that which we come to believe and value, based on the meaningfully organized accumulation of information (messages) through experience, communication or inference. Davenport et al. (1998) defined knowledge as "information combined with experience, context interpretation and reflection. It is 'high-value' from information that is ready to apply decisions and actions". People gain or create new knowledge from numerous activities.

1. Firstly, action-based learning that involves working on problems, and implementation of solutions.
2. Secondly, systematic problem solving, which requires a mindset, disciplined in both reductionism and holistic thinking, attentive to details, and willing to push beyond the obvious to assess underlying causes.
3. Thirdly, learning from past experiences, which reviews a company's successes and failures, to take the way that will be of maximum benefit to the organization.

Knowledge management, which consists of create, storage, retrieval, transfer and reuse of knowledge has become an important approach to improve the competitive advantage of enterprises (Albers and Brewer, 2003). Seubert et al. (2001) have classified KM into two primary types namely; Tacit Knowledge and Explicit knowledge.

Tacit knowledge resides in our mind and cannot be easily shared or it is difficult to communicate with others. Nonaka and Konno (2000) add that tacit knowledge is deeply rooted in an individual's actions and experience, as well as in the ideals, values, or emotions he or she embraces. It has two dimensions: the first is the technical dimension, which encompasses the kind of informal personal skills or crafts often referred to as "know-how." The second is the cognitive dimension. It consists of beliefs, ideals, values, schemata, and mental models. While difficult to articulate, this cognitive dimension of tacit knowledge shapes the way we perceive the world.

While explicit knowledge can be purchased, stolen, or re-invented, trust, and curiosity are key words in KM. Hubert (1996) said tacit knowledge is the skills and 'know-how' which reside in our mind that cannot be easily shared. On the other hand, Snowden (2000) defines tacit knowledge as something that is simply known, possibly without the ability to explain. He also added that the act of sharing tacit knowledge always creates something new. This is unique, the machine of innovation, and capable of real-time reactivity in decision-making.

Snowden (2000) defined explicit knowledge may be stored as a written procedure in a manual or as a process in a computer system. The documented procedure of a lesson-learn workshop, the written-up comment of an economist examining a set of financial data, minutes of a meeting, a chain of e-mail correspondence, are all examples of explicit knowledge that we use to support or to make decisions and exercise judgment. Nonaka (1994) proposes four modes of transferring knowledge:

1. Socialization (tacit to tacit), through coaching and on-the-job training.
2. Internalization (explicit to tacit), learning from the analysis of explicit knowledge.
3. Externalization (tacit to explicit), the articulation of tacit knowledge into procedures or reports that attempt to document experience in context.
4. Combination (explicit to explicit), the combination several elements of explicit knowledge into summary reports.

Davenport and Prusak (1998), suggest five types of knowledge that correspond to the source of each:

1. Acquired knowledge comes from outside the organization.
2. Dedicated resources are those in which an organization sets aside some staff members or an entire department (usually research and development) to develop within the institution for a specific purpose.
3. Fusion is knowledge created by bringing together people with different perspectives to work on the same project.
4. Adaptation is knowledge that results from responding to new processes or technologies in the market place.
5. Knowledge networking is knowledge in which people share information with one another formally or informally.

Managing it by using Deming's Plan-Do-Check-Act (PDCA) cycle is suggested here. With the variations made in terms of the actual activities to be done, four steps that will allow for KM to become an integral part of an organization's quality strategy are shown (Kwang et al., 1999).

1. Capturing or creating knowledge (plan): A variety of knowledge repositories offer ways to capture knowledge from external sources (competitive intelligence, vendor

comparisons and analyses); structured internal sources (marketing reports, customer profiles); and unstructured internal sources (meeting minutes, lessons learnt).

2. Sharing knowledge (Do): Using electronic as well as hard copies as a communication tool, as well as through informal or formal discussion groups to aid sharing of knowledge.
3. Measuring the effects (Check): Using outcome measures to track the success of the above activities. This will be described in more detail in the following section.
4. Learning and improving (Act): Hinging on the TQM philosophy of continuous improvement, the measures above will lead the organization towards further efforts to better the scores.

Knowledge resources include human capital, structure capital and customer capital. KM activities include initiation, generation, modelling, repository, distribution and transfer, use, and retrospect. Knowledge Management is influenced by (1) Culture (2) Leadership (3) Measurement (4) education (5) Reward and Incentive system (6) Organizational adaptability (7) Values and Norms (8) Technology (Lai and Chu, 2002). A cross-industry benchmarking study was led by APQC's president O'Dell and completed in 1996. It focused on the following KM needs: 1. Knowledge management as a business strategy. 2. Transfer of knowledge and best practices. 3. Customer-focused knowledge. 4. Personal responsibility for knowledge. 5. Intellectual asset management. 6. Innovation and knowledge creation (APQC, 1996).

INTEGRATED APPROACH OF KM

COST Model:

KM is of growing interest in today's business. As the importance and effects on quality of KM are realized, more businesses are implementing KM activities. The method of analyzing the different elements to be measured is proposed here as the COST model, shown in fig 2. In essence, there are four perspectives to look at (Kwanget al., 1999):

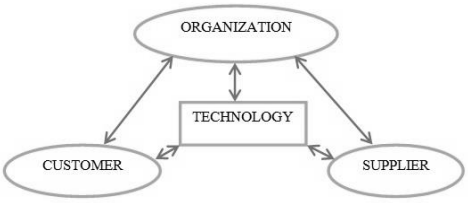

Fig 2: COST (Customer, Organization, Supplier and Technology) Model

The COST model forces practitioners to think about the links between the working functions of an organization. It also puts the technological perspective in its proper place, namely that it is only an enabler to organize and disseminate information. Hence, by managing it well a company would have invested in a cooperate culture which encourages customers, employees and suppliers alike to embody their skills in a pool of knowledge which can be utilized to deliver the perfect quality product and services which provides for a truly delighted customer experience.

Quality Management /KM:

Traditional quality management systems do not provide sufficient knowledge management and knowledge creation opportunities for manufacturing firms to stay competitive in today's fast paced, unpredictable, complex, and rapidly changing global business environment. The world's body of knowledge does not include a quality management strategy where KM is integrated in QM (Garstenaueret al., 2004).

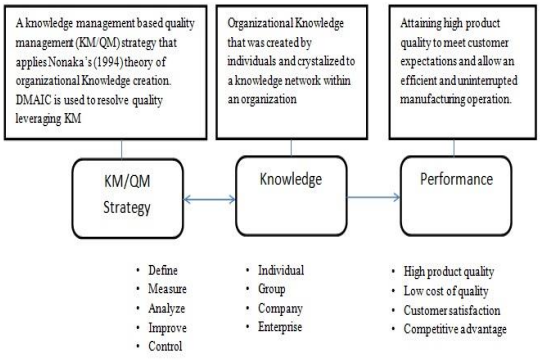

Fig3: Framework of KM/QM strategy
Source: (Garstenaueret al., 2004)

The results demonstrate that manufacturing companies which implement a KM/QM strategy can have significantly higher product quality than, similar companies without a KM/QM strategy. The research also demonstrates that a KM/QM strategy contributes significantly and positively to product quality over KM/QM strategy application time, indicating quality improvements over time.

Quality is more than the fulfillment of client requirements and expectations. It is not just providing the client required deliverables; rather it's the delivery of a complete body of work that is more useful to the client than what they expected. To fulfill this vision, we must continuously improve our own processes to maintain the highest level of quality in every product and solution we deliver. Integrating our knowledge management (KM) concepts, strategies, practices and quality management (QM) have significantly higher product quality (Lyons et al., 2008).

Knowledge Management and Six Sigma:

Six Sigma team provides a good opportunity to improve the knowledge integration process. Positions like Champions or Black belts constitute a specific contribution of this methodology, which assigns leadership roles and responsibilities in improvement teams. For example, 'Black belts' are responsible for putting projects into action, providing training, and leading team members. Six Sigma team managers should try to make the most of their team me members to enable teams to achieve the most beneficial solutions for the organization. To this end, Six Sigma team managers are trained to use a wide range of tools and techniques to increase team member's involvement and this methodology has a whole infrastructure to increase the participation of team members (Guiterrez et al., 2015).

Six Sigma initiatives have proven to be an effective technique for improving quality in manufacturing. Similarly, the importance of knowledge management has grown considerably in recent years and has emerged as a major source of competitive advantage for manufacturing firms. Six Sigma leading, to improvements of quality programme, results leads increase in sustainable competitive advantage.

The results of hierarchical regression analysis demonstrate that knowledge management does ameliorate the success of Six Sigma initiatives, specifically for knowledge dissemination and responsiveness (Gowen III et al., 2008). Dasgupta (2009) through his statistical knowledge has proposed a unified framework for achieving improvement and control of processes with categorical responses during implementation of Six Sigma. On the other hand, Stevens (2006) studies how knowledge management concepts such as mentoring, experts and expertise, and communities can be leveraged to impact a Six Sigma deployment. Gopesh (2006) investigates how knowledge creation activities used in Six Sigma team project impact project performance. This study concentrates on knowledge creation at project level and restricting the scope of Six Sigma practices to application of both tools and technique for Six Sigma project success. The survey results indicate that socialization and internalization significantly impact the Six Sigma project success.

Sin et al. (2010) conducted to test the model linking knowledge creation process in Six Sigma practices to organizational performance through mediating effect organizational knowledge creation. Overall, the study's results show that process improvement through Six Sigma projects involve the creation of knowledge. Knowledge creation is also significantly explained by practices for conversion of explicit knowledge to tacit knowledge (internalization) pointing to the criticality of training of employees for transfer of knowledge gained from project execution to routine process implementation through learning by doing and also lesson learned sharing. Because new knowledge creation has a significant effect on firm performance and potentially on long-term survivability, it is important for us to better understand how to develop and leverage this capability. Specifically, knowledge creation has direct positive impact on customer, internal business process, employee learning and growth and indirect positive impact on financial.

Organizations initiating an intensive programme like Six Sigma usually have to buy the knowledge and make costly consultancy investments while deploying the programme all through the organization. They also need to define new roles and try to manage projects systematically in order to increase the benefits of the methodology. The need for an infrastructure to maximize the benefits and to internalize the methodology emerges eventually (Aksoyet al., 2003).

Organizations, which decide to initiate a Six Sigma programme, need to acquire and internalize the programme knowledge, in addition to creating, using and sharing the knowledge created through improvements. A methodology, namely Knowledge Focused Six Sigma (KFSS), designed in accordance with critical success factors for Six Sigma deployment and reinforced with knowledge management principles, becomes a necessity for a winning programme. KFSS methodology, designed to enhance the deployment and increase the benefits of the programme, also allows the organizations to assess their Six Sigma Intellectual Capital because with Six Sigma, there are not only financial benefits and number of belts, but also the organization's intellectual capital increases. KFSS also helps organizations calculate their Six Sigma intellectual capital, which gives an idea about the knowledge focus during deployment. Six Sigma intellectual capitals allow organizations to identify areas for improvement and make comparisons among different business units or within a time span (Aksoy and Dinçmen, 2011).

Park et al. (2009) proposed a new paradigm of Six Sigma is emerging. A new paradigm of Six Sigma called Knowledge-based Digital Six Sigma (KDSS), which is based on DT and KM, is proposed. As shown in figure 4, there are some differences between Six Sigma and KM. However, there also exist some areas of intersections such as data acquisition and utilization, data analysis, generation of information, and so on.

Fig 4: Knowledge-based Digital Six Sigma

In KM, a good process flow of improvement activities is the CSUE cycle as shown in figure 4. CSUE means creating and capturing; storing and sharing; utilizations; evaluation. As explained previously, the well-known process flow of improvement activities in Six Sigma is MAIC (Measure, Analyze, Improve and Control). The 'define' (D) phase can be used in front of CSUE and MAIC. However, 'define' is omitted here. The CSUE and MAIC cycles can be inter, mixed in order to create an efficient cycle in KDSS. One way is to use the MAIC cycle in each step of CSUE, or to use the CSUE cycle in each step of the MAIC cycle. We believe that CSUE and MAIC are complementary to each other (Park and Antony, 2008).

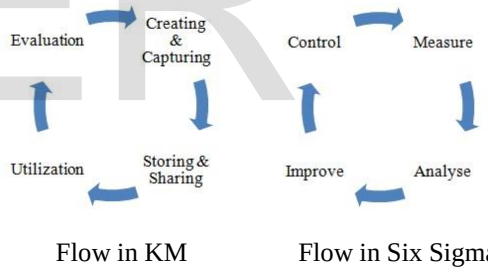

Fig 5: Process flow of improvement activities in KM and Six Sigma

The function of KM is different than Six Sigma. The aim of KM is to assure that correct data and knowledge drift to the correct target set of people at the correct time so they make choices. Some of those decisions are going to be about developing a procedure, but the functioning of KM is not the same as process development. The key constructs in our conceptual framework are (Gowen III et al., 2008):

1. Six Sigma initiatives
2. Knowledge acquisition
3. Knowledge dissemination
4. Knowledge responsiveness
5. Quality programme results
6. Sustainable competitive advantage

The above mentioned frame work results implementation of knowledge management could enhance the success of Six Sigma programmers beyond that of employing only Six Sigma Practices.

Knowledge Management and Cost of Quality:

From the perspective of quality costing, the key knowledge conversion processes would be externalization tacit to explicit and combination explicit to explicit. An integral feature of these conversion processes would be the use of Ontology to standardize the language and terminology of quality costing and capture knowledge.

According to Neches etal. (1991) Ontology is an important discipline that has a huge potential to improve information organization, management and understanding. It has a crucial role to play in enabling content based access, interoperability and communications. Prote´ge´-2000 was chosen for the application to quality costing. Prote´ge´-2000 is described by Grosso et al. (1999) as an ontology-development and knowledge-acquisition software tool that is designed to make it easier for experts to maintain and edit knowledge bases. For the purpose of developing the quality costing ontology (QCO), PAF models , where in the literature such as the model proposed by Harrington (1987), where he has compiled a list of typical cost elements, identifying 101 prevention costs, 73 appraisal costs, 139 internal failure costs and 50 external failure costs. Initially, this model looked like a valuable resource that could be used for developing the ontology. The main aim of developing the ontology is to support the collection of quality costs.

The ontology will cover the domain of quality costing using the PAF categorization of quality costs. The QCO will be used in the following ways (Eldridge et al., 2006).

1. To help identify quality costs to provide a scoreboard for cost control and identify opportunities for improvement;
2. To help collect quality costs, by removing the difficulties associated with collecting quality costs such as: confusion because of the great amount of data involved in calculating quality costs and the lack or loss of information and data needed, for calculating quality costs.
3. To share common understanding of quality costing among people or software agents.
4. To separate quality costing domain knowledge from the operational knowledge;
5. To measure quality costs because it is an essential step for achieving competitiveness because these costs are strongly related to the company's annual revenue.
6. To track, organize and analyze quality costs; and to be used in a knowledge management system that supports quality costing.

The COQ is just one approach that could be integrated into an organization's KM system for quality management.

Statistically, Six Sigma means 3.4, defects per million opportunities whereas in management terms Six Sigma is an improvement methodology, which aims to reduce the cost of poor quality and increase profitability by exceeding customer expectations through focusing on the effectiveness and efficiency of the processes. Six Sigma leads to a cultural, transition as, it underpins solving problems by means of data driven scientific tools. Naturally, organizations deciding to start a Six Sigma programme need to acquire the knowledge about the tools and create a suitable environment for the cultural transition. The successful implementation of Six Sigma is highly dependent upon getting the right knowledge to the right people in the right sequence at the right time. As the organization goes about initializing the vision and purpose of Six Sigma, the presence or absence of key knowledge again plays a critical role (Harry, 2001).Quality and profitability through Six Sigma is achieved by 'belt' projects focusing on process improvement. Storing, sharing and re-using this improvement knowledge will increase the speed of transition and multiply the benefits of the programme (Aksoy et al., 2003).

KM and Manufacturing:

The major competitive advantage for a cooperation lies in the cooperation's Knowledge and therefore knowledge management has become a critical issue (Lai and Chau, 2002).Since Manufacturing has become global to address the needs of the global market, companies take advantage of advanced information technologies in achieving their global supply chain. It is also important to see to what extend this has been used to facilitate innovation and knowledge diffusion along the supply chain for an organizational competitiveness. The frame work, of KM for manufacturing, developed by Gunasekaran and Ngai (2007) as shown in table.

Table 1: Frame work for KM for Manufacturing
Source: Gunasekaran and Ngai (2007)

Major Function in Manufacturing	Sub-Functions	Strategies/Techniques/Tools
Design and Engineering	Strategies Techniques	Concurrent Engineering , design for quality , design for manufacturing Quality Function deployment , Taguchi's Robust design, product data Management
Production	Tools Strategies Techniques	CAD , rapid prototyping, Virtual prototyping Supply Chain, Just in Time, Virtual Manufacturing, TQM MRP, ERP,DSS,KBS,FMS,CIM,QS 9000
Distribution	Tools Strategies Techniques	3PL, web – based logistics information system MRP II , Enterprise Resource planning(ERP), Electronic Data Interchange (EDI), E- Commerce (EC), E- Procurement(EP), Radio frequency Identification (RFID) , Personal Digital Assistance (PDA), Palm
Information technology /Systems	Tools Strategies Techniques	Business to business (B2B) , Business to Consumer(B2C), Business to administration(B2A), Radio frequency Identification(RFID), Internet-enabled Supply chain, Customer relationship Management (CRM), Internet , Electronic data Exchange (EDE), Electronic data Interchange(EDI), Enterprise Resource Planning(ERP),World wide web(WWW), Internet, WWW, groupware , shareware, Personal data Assistance (PDA)

Benefits

The table illustrates the various authors mentioned benefits of Knowledge Management.

Table2: Benefits of KM

Authors	Benefits
Skyrme (2001)	1. Faster and better solution to customer problems. 2. Improved innovation and new product development.

	3. Early warning of potential market changes. 4. Identify new business opportunities through better (KM). 5. Minimizing of duplication of effort and loss of knowledge following organisation restructuring. 6. Improved alignment between business strategy and technology infrastructure for knowledge sharing and development.
Kwang et al. (1999)	1. Reduces the loss of intellectual capital from employees who leave 2. Reduces the cost of development of a new product/services 3. Increase the productivity of workers by making knowledge accessible to all employees. 4. Therefore increasing employee satisfaction
Dalkir (2005)	For the individual, KM: 1. Helps people do their jobs and save time through better decision making and problem solving. 2. Builds a sense of community bonds within the organization. 3. Helps people to keep up to date. 4. Provides challenges and opportunities to contribute. 5. For the community of practice, KM: 6. Develops professional skills and Promotes peer-to-peer mentoring. 7. Facilitates more effective networking and collaboration. 8. Develops a professional code of ethics that members can follow. 9. Develops a common language. 10. For the organization, KM: 11. Helps drive strategy and Solves problems quickly. 12. Diffuses best practices. 13. Improves knowledge embedded in products and services. 14. Cross-fertilizes ideas and increases opportunities for innovation. 15. Enables organizations to stay ahead of the competition better. Builds organizational memory.

KM IMPLEMENTATION STEPS

Knowledge management is a complex activity that cannot deliver business impact without a concrete plan. Table summarizes the diverse perspectives on Roadmap for implementation of KM of some authors.

Table 3: KM Implementation steps

Authors	Steps
Morrissey (2005)	1. Asses What Knowledge is Required 2. Assess Degree of organization sharing and Retention 3. Obtain Senior Management Support 4. Design Integrated System of Tools and Technologies 5. Design Incentives for Use 6. Measure Impact 7. Promote and Advertise Success
Tiwana (2000)	1. Analyse the existing infrastructure 2. Analyse the existing infrastructure 3. Align KM and Business strategy 4. Design the KM Infrastructure 5. Audit Existing Knowledge and assets and systems 6. Design the KM team and Create the KM Blueprint 7. Develop the KM System 8. Deploy using the results driven incremental methodology 9. Manage change, culture and forward structures 10. Evaluate performance, measure ROI and incrementally refine KMS

There are several definable problem areas that have contributed to the failure of KM initiatives. There are the problems that should be avoided in implementing KM solutions (Sharp, 2006).

1. Lack of senior management support: As for any major project, support in the boardroom is essential.
2. Project scope too large for available resources: Budgeting of finances and other resources is important
3. Poor internal communication: Outside consultants may require change the corporate culture.
4. No preparation for a knowledge culture or the incorporation of knowledge processes. Good planning and careful preparation are required for a successful KM solution.
5. Lack of motivation/incentives program: Employees need encouragement.
6. Challenging software with poor vendor support. Improving evaluation processes for vendor products can fix this problem.
7. No real timetable: Careful planning and establishment of schedules are required.

CRITICAL SUCCESS FACTORS

KM is of growing interest in today's business. With the importance of KM being realized, businesses are viewing KM as a critical success factor in today's dynamic borderless society. Making knowledge available to the right people at the right time is crucial for building and sustaining an organization's competencies. For any business, there are a limited number of areas in which satisfactory results ensure successful competitive performance, and those areas are typically referred to as CSFs. (Alazmi and Zairi, 2003). Table 4 summarizes the diverse perspectives on CSFs of some authors.

Table 4: Critical success factors (CFS)
Source: Alazmi and Zairi (2003)

Authors	CFS
Choi (2000)	1. Employee training 2. Employee involvement and Teamwork 3. Employee empowerment 4. Top-management leadership and commitment 5. Organization constraints 6. Information systems infrastructure. **7.** Egalitarian climate, benchmarking and Knowledge structure
Skyrme (2000)	1. Clear and explicit links to business strategy 2. Compelling vision and architecture

	3. Knowledge leadership and champions 4. Systematic knowledge processes (supported by specialists in information management but close partnership between users and providers of information). 5. Well-developed knowledge infrastructure (hard and soft). 6. Appropriate bottom line measures. 7. Creation of culture that supports innovation, learning and knowledge. 8. Technical infrastructure that supports knowledge work.
Heising (2001)	1. Store experiences from experts. 2. Exiting e-mail culture (culture corporate). 3. IT director business-focused and business process-oriented. 4. Integrated among KM processes (create, store, distribute, apply knowledge). 5. KM tasks must be combined with daily work tasks and integrated 6. into daily business processes

CONCLUSION

1. Knowledge resources include human capital, structure capital and customer capital.
2. Knowledge management, which consists of create, storage, retrieval, transfer and reuse of knowledge has become an important approach to improve the competitive advantage of enterprises.
3. KM improves decision making, increased productivity, and foster innovation, minimize reinvention and duplication, accelerate staff development.
4. COST encourages customers, employees and suppliers alike to embody their skills in a pool of knowledge which can be utilized to deliver the perfect quality product and services which provides for a truly delighted customer experience.
5. KM/QM strategy contributes significantly and positively to product quality over KM/QM strategy application time, indicating quality improvements over time.
6. Organizations, which decide to initiate a Six Sigma programme, need to acquire and internalize the programme knowledge, in addition to creating, using and sharing the knowledge created through improvements.
7. Quality Cost Ontology (QCO) is just one approach that could be integrated into an organization‘s KM system for quality management. The QCO is a method that can used to embed quality costing knowledge within organization.
8. KM provides faster and better solution to customer problems.

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