

Implementation & Management Of Knowledge In Indian Engineering With Approach Of Interpretive Structural Modeling Methodology

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ABSTRACT:

Knowledge management (KM) has emerged as an integral part of business strategy. Many business organizations have adopted KM and many are in the process of its implementation. KM implementation is adversely affected by few factors which are known as KM barriers. The objective of this research is to develop the relationships among the identified KM. Further, this paper is also useful to understand and identify those barriers which support other barriers. The interpretive structural modelling (ISM) methodology is used to evolve mutual relationships among these barriers. KM barriers have been classified, based on their driving power and dependence power. The objective behind this classification is to analyze the driving power and dependence power of these barriers. ISM technique has been applied to develop hierarchy of the identified KBMs.

KEYWORDS: Random Index (RI), Interpretive Structural Modelling (ISM), Consistency Index (CI), Consistency Ratio (CR) Cross-impact matrix multiplication applied to classification

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I. INTRODUCTION

Researchers have been charmed by KM and its implementation. The structure of knowledge resources has raised the graph of business organization for competition in various industries. With the result a healthy atmosphere has been formed to utilize KM in creating quality production and develop quality services. Now KM cannot be ignored and avoided in industrial organization. Rather, it is a dire necessity. Only then it can be effective (Singh and Kant, 2007).

To deal with its people or to operate processes, technology and structure through different ways results are achieved by creating, sharing and applying knowledge (Bhall, 2001) KM helps to create and maintain organization by generating increasing returns and continuing advantages (Chandran and Raman, 2009, chase 1997).

It is difficult to take decision in business organization if there is excess of information but lack of knowledge (Naishitt, 1984). Then there arises the basic question – ‘what is knowledge?’ and in trying to answer it we feel that knowledge is not merely data and information. The terms data, information and knowledge are frequently used for overlapping concepts. The main difference is in the level of abstraction being considered. Data is the lowest level of abstraction, information is the next level, and finally, knowledge is the highest level among all three (Beynon-Davies, 2002). Data on its own carries no meaning. For example, the height of Qutub Minar is generally considered as “data” a book on Qutub Minar is a book on geological characteristics of the Qutub Minar may be considered as “information”, and a report containing practical information on the best way to reach Mt. Everest peak may be considered as “knowledge” (Beynon- Davies, 2009).

Currently, there seems no consensus on what knowledge is. Over the millennia, the philosophies of each age have added their own definition of knowledge. The definition that seems to most useful is as follows: “Knowledge is understanding the cognitive system processes. It is a construction that is not directly observable. It is specific to and residing outside the cognitive system that created it. Information, not knowledge, is communicated among cognitive systems. A cognitive system can be human, an organization, a group, a computer, or some combination”(by R. Gregory wenig, 1998 in Dave, 2002). ‘Knowledge’ in corporate sector usually belongs to the individual and not the company. Employees of any organizations contain the knowledge regarding all the practices and business processes of the origination and this knowledge can be tacit and explicit both. Explicit knowledge comes in the form of books, documents, white paper, policy manual and databases

while tacit knowledge is normally hard to code and can be found in the minds of employees, experience of customers and memories of past vendors. Capturing this knowledge is significant to a firm's success with respect to being a responsive company in the rapidly changing market Place (Carlson, 1999).

Tacit and Explicit Knowledge

Tacit knowledge is able to understand and hard to define, that is based on experience. That Knowledge is personal in nature and deeply relates to action, commitment and involvement.

Tacit Knowledge is valued source of knowledge and increase the growth of any organization in all direction. If Tacit Knowledge is not focused it will reduce capability innovation and competitions.

KMBs have a very hard time handling this type of Knowledge. An I.T system relies that which is difficult for the Tacit Knowledge holder.

Imagine if you are trying to write an article that would convey. How one reads facial expression. It can be clear early seen that it would be very difficult to know something without conscious reason to understand things gathered from years of experience and practices. Virtually all practitioners rely on this type of Knowledge. It would be very difficult for him to codify his knowledge into a document that could convey his know-how to a founding. This is the reason why experience in a particular field is highly accepted in the job market.

Tacit knowledge is found in: the minds of human team member. It includes cultural beliefs, values, attitudes, mental models, etc. as well as mastery, power and expertise (Botha et al 2008). On this site, I will generally limit tacit knowledge to knowledge personify in people, and refer separately to personify knowledge (as defined below), whenever making this distinction is relevant.

Knowledge Management

Knowledge management is essentially about getting the right knowledge to the right person at the right time. This is itself may not seem to complex, but it implies a strong tie to corporate strategy, understanding of where and in what forms knowledge exists, creating processes that span organizational functions, and ensuring that initiatives are accepted and supported by organizational members. Knowledge management may also include new knowledge. It is important to remember that knowledge management is not about managing knowledge for knowledge's sake.

In the rapidly changing global business, KM has emerged as an essential part of business strategy. Many business organizations have implemented KM and many are in the process of its implementation. It is also one of major attraction among the researchers and practitioners. The business organization was more concerned about building the knowledge assets for their competitiveness. KM effort is no longer merely an option but rather a core necessity for organizations anywhere in the world, if they have to complete successfully (Singh and Kant, 2007; Singh and Shankar etc. 2006)

The overall objective is to create value and to grip, improve, and refine the firm's competences and knowledge assets to meet organizational goals and targets. KM also facilitates flow of knowledge and shearing to improve the efficiency individuals and hence the organization (Singh and Kant, 2008).

Knowledge Management Implementation Barriers

The above outline seems a kind of 'ideal' process- which may appear rather mechanistic and per-haps even inexperienced. In reality, working with people is never like a control loop that entails simply scrutinizing problem areas and then re-adjusting these for change. The knowledge management literature identifies a variety of factors that may influence KM implementation in organizations. These are known as Knowledge Management Implementation barriers (KMBs). Firms have invested heavily in KM with the aim to build a knowledge capability and use it to achieve a competitive advantage. Research has shown, however, that not all knowledge management projects succeed. Some studies report that about 84% of knowledge management projects fail (Ben Moussa, 2009). The basic reasons behind this are the neglected barriers which hinder in successful KM implementation. There are many factors that adversely affect the success of KM implementation in the organization, known as KM barriers. These may be internal and external type barriers.

Internal barriers originate from organization cultures, organization structures, etc. The second group of barriers is outside the immediate control of the organization (Singh and Kant, 2008; Zyngier, 2002). These barriers turn the KM into a very challenging task to do. A barrier can be considered to be everything related to human, organization and technological issues that obstruct the intra and inter organizational management of knowledge. Brandt and Hartmann, 1999 classify the KMBs in three basic forms (TOP) such as-technology, organization and people.

II. RESEARCH PROBLEM, AIM AND OBJECTIVES

Knowledge management by resolving the issues evoked by its implementation barriers have become an exigent task in present developmental circumstances when size of data increase exponentially day by day. Companies often try to tackle their KM problems by buying and implementing costly and complex software tools without having a proper knowledge of different barriers arising out according to their organizational setup and thus proposed solution are often rather complex and dominated by information technology. Majority of the organization in Indian engineering industry are also confronting with the same problem and don't have proper guidance and knowledge to manage its intellectual assets. The organizational processes and the way the employees communicate and operate through the social processes of collaborating needs more attention; and thus identifying the most important KMBs becomes necessary to facilitate an effective KM initiatives.

The aim of the present work is to identify the prominent KMBs according to their driving and dependence power for effective KM implementation and to develop a hierarchical model as per its effectiveness in the context of KM. This work would identify those KMBs which are most effective for the KM implementation and which should be tackle more efficiently for a successful KM implementation in Indian engineering industries.

The objectives of the present work in support of research aim are follows:

1. Identify and recognize the Knowledge implementation barriers (KMBs) in Indian Engineering industries.
2. Apply Interpretive Structural Modelling (ISM) approach in order to develop a hierarchy of identified KMBs and categories than according and dependence power.

III. KNOWLEDGE MANAGEMENT IMPLEMENTATION BARRIERS

Barriers which hinder organizations to implement KM have identified from various authors who have researched and written on this issue. Chase (1997) divides the barriers to KM into two classifications 'soft' and 'hard'. Organizational culture is seen as the biggest barrier for creating a knowledge-based organization under the category of 'soft' issues. Others include lack of ownership of the problem, lack of time, organizational structure, top management commitment, rewards/recognition, and emphasis on the individual rather than team. Amongst the 'hard' issues, information technology (IT) is a major barrier for creating the knowledge- based organization.

Further, non-standardized processes, staff turnover and physical layout of workspaces are also seen as barriers for KM implementation. According to the Fraunhofer Stuttgart study, scarcity of time and lack of awareness about KM are the most important barriers to implementation (Bullinger et al. 1997). Miles et al, 1998, found that motivation and reward as main barriers.

According to him, it requires trust that distribution of their rewards from the outcomes will be exercises of joint responsibility with volunteerism suggesting at least major elements of joint responsibility with volunteerism suggesting at least major elements of freedom and equality.

While pieces of this notion have begun to achieve recognition, most organization theorists have not yet linked this element to organizational design in economic enterprises. In the study of Jager and Straub (1999), respondents felt scarcity of time lack of awareness, and lack of top management support were the most important barriers to KM whereas too much effort of funding, organizational infrastructure, employees unable to share knowledge were the least Important barriers.

Bollinger and Smith (2001) have classified the barriers into three broad perspectives.

1. Organizational,
2. Group,
3. Individual.

The barriers from an organizational perspective include time-consuming, labor intensive, costly to build knowledge base for the, people who are busy, KM may involve additional work, limitations to KM technology, temporary project teams difficult to track, information overload, and workers see no benefit to system difficult in codifying tacit knowledge, and proliferation of jargon.

The barriers from a team perspective include reward for individual effort encourages hoarding of knowledge, fear of recrimination and criticism for peers and management, lack of respect for other disciplines, and lack of trust and common goals.

The barriers from individual perspective include reluctance to share information, knowledge regarded as a source of power, advancement, or reward, competition among professionals, reward for expertise, sense of worth and status, and fear of diminished personal value if knowledge is shared and is based on lessons captured from leading organizations.

Zyngier (2002) classified the barriers of KM strategy implementation into two types;

1. Internal
2. External

Internal barriers originate from organizational cultures, structures, etc. The external barriers are outside the immediate control of the organization. The greatest internal barrier is described by the respondent as the management culture of the organization. The other internal barriers to the success of a KM strategy in the organization include philosophy of KM not being well understood, the need for the development of criterion for KM, organizational leadership that is not prepared to back KM, difficulties of quantifying the outputs of a KM strategy as ROI, the scalability of strategies, limited time available for planning and implementation, and limited technology available for implementation. The external barriers include the impact of economy, political and socio-cultural environment, and distant or foreign control of the organization that does not consider the culture of the organization.

According to Bures V. (2003) organizational culture and motivation are the key barriers for knowledge sharing and implementation. The main individual barriers we can identify are:

- 1) Loss of power- By providing knowledge (about customers, competitors, suppliers etc.) to the colleague the exclusivity of influence is reduced which can ensure some certainty of work or respect. "Knowledge is power".
- 2) Fear from revelation- by providing knowledge we show, that this knowledge has a value. If this assessment is not shared by other repository users, embarrassment may happen;
- 3) Uncertainty- especially younger and less experienced employees can feel uncertainty, because they cannot judge if their working results represent valuable knowledge for others. It may be difficult for junior staff to estimate the worth of their knowledge for other members of staff or the company as a whole;
- 4) Illusion of reward deprivation- some employees see in knowledge sharing the way how they can lose their work rewards, because they give their knowledge and experience to someone.

In 2005, Kuan Yew Wong proposed critical success factors for small scale industries are management leadership and support, culture, IT strategy and purposes, measurement, organizational infrastructure, processes and activities, motivational aids, resources, training and education. Further they have also described the reasons for not practicing KM in the organization. Almost half of the respondents were either unsure of its potential benefits or had never heard of it. These reasons point towards the fact that organizations still lack a sound conceptual foundation for KM. The other reported reasons for not using KM include lack of human resources, lack of time, lack of understanding, lack of financial resources, not interested needed, and lack of support from top management. As it is evident, different sets of critical sets of critical success factors have been put forward by different authors. In spite of this they can possibly be grouped in to a number of generic factors such as management leadership and support, culture, technology, strategy, measurement etc.

According to Hase et al 2006, it is well know that perhaps the greatest barrier to knowledge sharing is dysfunctional behavior on the part of individuals and organizational culture (Skyrme 1997;D Long & Fahey 2000). Certainly Knowledge management practice depends on a high level of good will and trust. Many people consider the value of knowledge as stock rather than flow.

Singh and Kant (2007) identified nine barriers for successful implementation of KM. Lack of top management commitment, lack of processes, and lack of organizational structure were treated as key KM barriers. The other identified barriers in the success of KM in the organization include lack of technological infrastructure, lack of organizational culture, lack of motivation and reward, staff retirement, lack of ownership of problem and staff defection. Singh and Kant 2008 identified twenty critical KM implementation barriers. These barriers were lack of top management commitment KM is not well understood wear the most critical barriers whose driving power was very high and dependence power was low. In his model these two barriers were at the same level and at the top hierarchy. At the second level lack of financial resources and km is not integrated in business process is at the second level of hierarchy. Lack of methodology, lack of organizational structure and lack of technical infrastructure are at the same level but at the next level. According to Singh and Kant; information over-load, lack of ownership of KM problem and difficulty in codifying tacit knowledge have low driving power and high dependence power so these barriers should also be considered as critical barriers. These KMBs are the major problems of the KM implementation and lack of sufficient KM expertise might be the root cause for this.

Ben Moussa in 2009 identified several inter-related barriers impede KM initiatives and make it difficult to realize the full value of those efforts,. The first involves the organizational areas of planning, enabling and inspiring. The second type of barriers is more personal, and relate to the distinct attitudes and behavior held by users when adopting knowledge management systems

Existing KM research document a number of planning related barriers to successful implementation of KM projects. One major barrier is linked to the lack of or poorly defined goal of KM initiatives. In planning the KM implementation, the initial step is to set the goals and understand the drivers for the knowledge management initiative. If adequate planning is an essential step for ensuring the success of KM initiatives, then information technology is a fundamental enabler for knowledge management. An information system can provide instant,

integrated, or even smarter interface platform to make knowledge management much easier to employ (Zyngier, 2002).

Karbag (2010) identified four critical barriers (Management support, Motivation, Measurement and content quality, Knowledge management system quality). Most KMBs belong to the human sector. It is important to note that the human range for a successful implementation of knowledge management. With respect to the critical barrier factors “lack of organization and knowledge culture”, “lack of culture trust and transparency” and “lack of culture openness” seem to be of maximum weight which exclusively belongs to the human range. Consequently, human and corporate culture plays a dominant role for the implementation of knowledge management.

Herrmann in 2011 identified the barriers for KM and categories them in different categories.

1. Barriers in Technology
2. Barrier in content
3. Barriers in Routines and Procedures
4. Barriers in organization
5. Barriers in Personnel

IV. IDENTIFIED KNOWLEDGE MANAGEMENT IMPLEMENTATION BARRIERS

Lack of top management commitment

Top management is responsible for each and every activity at all the levels of the organizations. It is instrumental in development of organizational structure, technological infrastructure and various decisions making processes which are essential for effective creation, sharing and use of knowledge. Effective knowledge creation and sharing require long term commitment and support from top management in recruitment and retention of right people (Brannnd A, 2004). Lack of top management is the most critical barrier for a successful KM implementation, particularly in knowledge creation and sharing (Chong and Y Choi, 2005). It is also responsible for identifying organizational strength and weaknesses as well as analyzing the opportunities and threads in the external environment. The top management has to conceptualize a vision about what type of knowledge should be developed and used into a management system for implementation (Nonaka, 2004).

Lack of technological infrastructure

As most of the issues of KM are culture based, the role of technology can't be overlooked. Lack of technological infrastructure (TI) is one of the barriers in implementation of KM. TI provides a stronger platform to KM and enhances its impact in an organization, by helping and leveraging its knowledge systematically and actively. The wide varieties of technology such as business intelligence, knowledge base, collaboration, portals, customer management systems, data mining, workflow, etc. support KM activities and the selection of appropriate technology improves the performance of businesses (Wilson, 2002). TI enables collecting, defining, storing, indexing and linking data and digital objects in order to support management decisions (Lang, 2001). It is able to overcome the barriers of time and space. It also serves as a repository in which knowledge can be reliably stored and efficiently retrieved. (Shing and Kant, 2008).

Lack of methodology

KM is a group of clearly defined processes or methods used to search important knowledge among different KM operations. Despite top management commitment, Organizational structure and technological support, KM may fail due to lack of methodology. Successful KM implementation requires a set of methodology (Ravi et al, 2005). Methodology defines each and every activity which is going to be held during the KM implementation. It is necessary for enhancing KM implementation. Many authors have suggested the step-by-step methodology for KM implementation. But even through, when it comes to real implementation, they fail.

Organizations have to understand those guidelines and transfer them according to their context. (Singh and Kant 2007)

Lack of Organizational structure

Business organizations should adopt an organizational structure (OS) which matches and supports its strategy. OS includes division of labor, departmentalization and distribution of power which is necessary to support the information and decision process of the organizations.

It is defined as the specification of jobs to be done within an organization and the ways in which those jobs to relate to another. (Ebert and Griffin, 2002) There are two types of organizational structure; one is bureaucracy and the other is task force. Bureaucratic structure hinders the flow of knowledge, hence it should be discouraged. Task force structure is flexible and adoptable which brings a team or group together to deal with problems (Bollinger 2001). Os needs to support the knowledge for the successful implementation of KM in the

organizations. It must be capable enough to administer the knowledge related activities. Creating an organizational structure to manage knowledge is by no means enough for the success of KM, but it is an important ingredient of success (Bullinger 1997). Lack of organizational structure can discourage the KM activities which certainly hinder the prospect of KM in the organizations.

Lack of Organizational culture

Organizational culture defines the core beliefs, value norms and social customs that govern the way individuals act and behave in an organization. It is the sum of shared philosophies, assumptions, values, expectations, attitudes, and norms that bind the organizations together.

Lack of organizational culture is a key barrier for successful implementation of knowledge management in an organization. Organizational culture is the largest barrier in creation of a successful knowledge based organization (Lang, 2001). Culture considers the multiple aspects mainly collaboration and trust. Trust is one of the aspects of the Knowledge friendly cultures that foster the relationship between individuals and groups, thereby, facilitating a more proactive and open knowledge sharing. Absence or minimal level of collaboration hinders the transfer of knowledge between individuals as well as of the groups

Lack of Motivation and reward

Organizational goals can't be achieved unless organizations integrate the concept of motivation and rewards to its employees. Motivation can be provided through recognition, visibility, and inclusion of knowledge performance in appraisal systems and incentives (Singh and Kant, 2007; Yin et al 2006). The motivation could be either intrinsic or extrinsic. Rewarding and recognizing employees with tangible form for their knowledge. One of the examples of motivation and reward system practices by Bharti Cellular Limited is of knowledge-dollar (K\$) scheme, under which employees earn points or K\$s every time when they share new knowledge in an organization knowledge base or every time they replicate or apply knowledge shared by others. Lack of motivation and reward system is also a barrier because it discourages people to create, share, and use knowledge. Without the establishment of organizational reward and recognition system, it is very difficult to align the KM and business needs of the organizations (Lin and Shu-Mei, 2005).

Staff retirement

Staff retirement is the major barrier in the KM implementation. Many organizations are facing lot of problems due to expertise retirement (Lin and Shu-Mei, 2005). If any employee retires from his/her job, it is very difficult to get a substitute of that level. His experience and expertise will be lost by the organizations. Organizations need to focus on knowledge retention and its transfer into their business process management. According to Accenture, one out of four Organizations makes no effort whatsoever to capture the workplace knowledge of retirees, and a further 16% of organizations expect retirees to have an informal chat with colleagues before leaving. That's more than 40% of the organizations have no formal processes for retaining expertise.

Lack of ownership of KM problem

Lack of ownership of problem is another issue which proves to be a barrier for KM implementation (Singh and Kant, 2008). Due to the lack of ownership of problem, no employee is ready to take up the jobs unless it has been properly assigned. This situation is basically due to absence of culture in the inefficiencies. Davenport (1997) emphasized the importance of financial commitment to KM practices, which in many cases can be expensive. Hence, adequate support knowledge flows and collaboration need to be allocated.

Staff Defection

Increasing Staff defection rates are mainly due to demand for sound trained and skilled personnel. Lack of motivation and reward also contributes in the staff turnover. It has much influence on KM implementation. The loss of knowledge through staff defection is a critical driver of KM. A knowledge management program fails due to staff defection and brings instability to the organization. Organizations have to formulate successful strategies for minimizing the staff turnover (Riege, 2004). Staff defection affects the organization in many ways. One of which is used in its day to day business. If any employee retires from his/her job it is very difficult to get a substitute of that level. His/her experience and expertise will be lost by the Organization. According to one researcher working in this field explains that 40% of organizations need to focus on this issue (Riege, 2005; Lemken a Kahier, 2005).

Difficulty in codifying Tacit Knowledge

Due to the nature of tacit knowledge, it is not a simple process that can be easily captured or mapped out in a knowledge system. This type of Knowledge must be extracted from organizations. Employees are not ready to take the responsibility of unassigned jobs. This situation makes difficult to nurture the KM implementation in the organizations.

Information overload

Davanport and Prusak (1998) directed to the amount of time spent on setting up (capturing the information) and maintaining the information stored in a KM system. The available to employee is limited to such an extent that they do not have enough time to capture the relevant information correctly (Tiwana,2002) not enough time to identify people that need access to the relevant knowledge and enough time to share the information with other employees. Nonaka and

Takeuchi (1995) explained in the time constraints elements through the argument that people spend their time on activities that relate directly to their predefined function in an organization.

The ideal situation can be found where employees are employed in the function of KM and their job descriptions are directly related to activities within the KM process. If this is not the case, people, who do not feel responsible for the task of KM, will be responsible for the activity. In such instances the process of KM will be seen as additional work (not Part of their predefined function within the organization). This will result as an inefficient KM system.

Intolerance of failure

Another potential barrier is managers' tolerance towards employee making mistakes and learning from them. De Long and Fahey (2000) concluded that capturing, evaluating, and learning lessons from past mistakes affects best practices in future. However, rather than recognizing and correcting mistakes, they all too often are covered up, blamed on others explained away, punished or ignored. It seems that the national culture can be a Limiting factor in learning from actions, for instance, whilst many Russians do not talk about problems and mistakes outside their workplace.

Fear of losing personal values

Information or knowledge power inequalities in status and perceived lack of job security can also be potential barrier. In olden time profitability was reflected by an organization output.

Knowledge hording rather than sharing was believed benefit carrier advancement. Sharing of knowledge often was regarded as weakling an employee's corporate position power or status within the company. Even today there often is a fear among the employees that sharing knowledge reduces job security because people are uncertain about the sharing objectives and intent of their senior Management. Also lower and middle level employees often holed their knowledge intentionally expecting that their supervisors may not promote them if they appeared to be more knowledgeable than them. (Du Plessis, 2008)

Lack of time

One of the biggest barriers to success is when staff member complains that they do not have enough time to do KM. This is mostly based on the perception that KM is something "extra" that they believe they need to do something that is integrated in their daily work environment.

People's perception need to be changed for them to see that KM is a part of their daily work routine and not something extra that they do, They should be able to see the value added from the activities that they participate. Time is Problematic area or barrier where staff members are measured on the no. of hours they deliver in respect of out puts such as in the world of account, lawyers and engineers. For them time is money and it is difficult to change the perception that KM can make them work stronger, and faster, even if they do spend some time on it. (Du Plessis, 2008)

Lack of sufficient KM expertise

Several companies noted a lack of organizational knowledge to identify and implement projects consistently and at scale. This challenge can manifest itself in a number of ways, from a lack of knowledgeable staff to collect and analyze energy data, to employees who don't comply with energy efficiency initiatives. Some companies also noted that their staff struggled to stay current on the emerging technologies, standards, and practices that enable the performance of an organization (Nonaka and Takeuchi 1995).

Lack of respect and trust among employees

It is impossible to share knowledge without mentioning the word 'trust'. Most people are unlikely to share their knowledge without a feeling of trust. Trust that does not misuse their knowledge is accurate and credible die to

the information source. A detailed assessment of the quality of external tacit or explicit knowledge is often impossible due to source and time constraints. It is mostly in the informal networks that people trust each other hand collaborate actively and willingly-sharing activities can never be supervised nor forced out people but the level of trust between a company, its sub units and its employees seems to have a direct influence on the knowledge. Thus the amount of knowledge sharing is increased.

V. METHODOLOGY

Here we outline the timeline for the completion of various aspects for the project. The schedule is set so that the project is completed in phases.

Phase I

In phase 1 we have contact various college students and management faculties to study the nature of knowledge in engineering colleges. And with the help of internet and contacting various analysts, we have concluded that there are various causes to downfall of knowledge in engineering industries.

Phase II

Firstly I have selected the reference engineering college to implement my ISM methodology for which we have selected my own university and after that we have started finding various points to increase the efficiency of this model. But before started to find these points it is necessary to select those points which solely depend on lack knowledge model.

Phase III

After calculating and studying all these points we implement our ISM methodology to simulate these problems.

VI. ISM METHODOLOGY AND MODEL DEVELOPMENT

It is usually felt that individuals or groups come across difficulties in dealing with multifaceted issues or systems. The intricacy of the issues or systems is due to the occurrence of a large number of elements and interactions among these elements. The ghost of directly or indirectly related elements difficult the structure of the system which may or may not be articulated in a clear fashion. It becomes difficult to deal with such a system in which structure is not clearly defined. Therefore, it necessitates the development of a methodology which aids in identifying a structure within a system. Interpretive structural modeling (ISM) is such a methodology (Attri et al., 2013).

ISM is a fixed methodology for identifying relationships among certain items, which define a problem or an issue. This approach has been increasingly used by various researchers to represent the interrelationships among various elements related to the issue (Attri et al., 2013, Sage, 1997). ISM approach use with an identification of variables, which are important to the problem or issue. Then a contextually relevant subordinate relation is chosen. Having decided the contextual relation, a structural self-interaction matrix (SSIM) is developed based on pair wise comparison of variables. After this, SSIM is converted into a reachability matrix (RM) and its transitivity is checked. Once transitivity embedding is complete, a matrix model is obtained. Then, the partitioning of the elements and an extraction of the structural model called ISM is derived.

It is interpretive as the judgment of the group decides whether and how the variables are related. It is structural as on the basis of relationship, an overall structure is extracted from the complex set of variables. It is a modeling technique as the specific relationships and overall structures are portrayed in a graphical model (Sveiby, 2003, Singh and Kant, 2008).

The various steps involved in the ISM technique are:

1. Identifying elements which are relevant to the problem or issues (this could be done by survey);
2. Establishing a contextual relationship between elements with respect to which pairs of elements would be examined;
3. Developing a structural self-interaction matrix (SSIM) of elements which indicates pair-wise relationship between elements of the system;
4. Developing a reachability matrix from the SSIM, and checking the matrix for transitivity. Transitivity of the contextual relation is a basic assumption in ISM which states that if variable 'a' is related to 'b' and 'b' is related to 'c' then 'a' is necessarily related to 'c';
5. Partitioning of the reachability matrix into different levels;
6. Based on the relationship give in the reachability matrix, drawing a directed graph, and removing the transitive links;
7. Converting the resultant diagraph into an ISM-based model by replacing element nodes with the statements; and

8. Reviewing the model to check for conceptual consistency and making the necessary modification.

VII. DEVELOPMENT OF ISM MODEL

Total eleven levels have been found for sixteen KMBs. From these results ISM model has been generated by replacing nodes of the elements with relationship status shown in final reachability matrix after removing the indirect links.

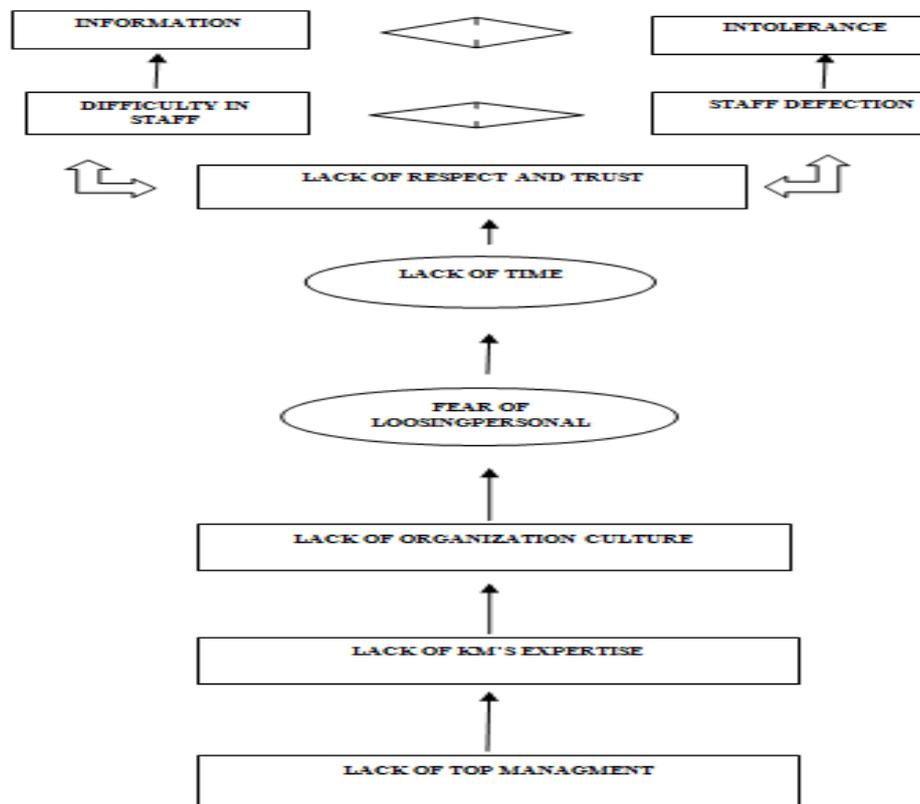


Fig- ISM Model

VIII. CONCLUSION

For any organizations to achieve continuous growth in their business, KM is needed to become an integral part of the day to day actively. By using KM identify the important KMBs and to analyze the mutual effect of KMBs in the KM implementation. This study categorize the important KMBs and to analyze their effects on the KM implementation. This work find that, lack of top management commitment and km is not well understood is the most important barrier due to its high driving power and low dependence among all the identified barriers.

Autonomous barriers absence in this study show that all the identified barriers influence the process of successful KM. By this suggested that management should pay serious attention to all KM barriers according to their driving power. The barrier lack of motivation and lack of time are in the linkage barrier cluster which has high driving and dependence power. So there barriers need more attention.

A key of this research is that along with a lack of top management commitment, KM is not well understood which creates a significant barrier to implementing KM. In the industries eliminating the identified KMBs find sustainable benefits through the continued creation of knowledge management. Hence, such organization must take these KMBs in to account in order to exploit the advantages of KM. It is necessary for the top management to devise an improved; organization centric KM tactic to minimize the effect of identified KMBs. Priority should be given to those KMBs possessing higher driving power in the Interpretive structural modelling. Analytical hierarchy process has been applied to validate the Interpretive structural modelling model according to their rank. In this rank calculation three judges are used. The results of this study can help in the strategic and tactical decision for an organization to move from traditional system to KM system. The main strategic decision relies on the commitment of top management for the adaptation of KM. Once the top management commits itself it will help the organization to implement the KM and the firm can sample some strategic and tactical benefits such as: better competitive edge, ability to introduce new products faster to the market, improved working conditions and improved ability to design or process changeover with integration of technical

infrastructure system. It is essential for the top management to formulate a better, organization centric KM strategy to minimize the effect of these KMBs.

IX. LIMITATION OF THE STUDY

ISM is able to develop theoretical model only through managerial techniques such as brainstorming and group techniques. It is subjective and does not rank the barriers according to their relative impact. The contextual relationships among the KMBs depend on user's knowledge and familiarity with the organization and its operation. So, personal bias might influence the final result.

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