

DESIGN AND DEVELOPMENT OF KNOWLEDGE MANAGEMENT FRAMEWORK FOR QM IN HEALTHCARE SECTOR: QUALITATIVE ANALYSIS OF KM PERSPECTIVES

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ABSTRACT

Measurement, analysis and management of knowledge are assumed to be one of the critical success factors for sustained quality management through continuous improvement. The present study tries to examine the effectiveness of existing knowledge management and information analysis systems from the standpoint of middle level healthcare employees in Kerala. Using convenient sampling technique, the participants for the study are selected from hospitals that are implementing Quality Management initiatives. The results revealed that the hospitals understudy does not have policy driven standardized system for knowledge management, though knowledge acquisition is actively done. The major obstacles to effective knowledge management is the absence of an integrated system, lack of KM training, absence of information audits, over emphasize on formal proofs and absence of appropriate follow up or analysis of the data collected. The paper proposes a Knowledge Management framework for successful quality management, designed and developed using mind mapping tool.

Keywords: Healthcare Sector, Information analysis, Knowledge management framework, Quality Management.

INTRODUCTION:

In the global arena of cut throat competition, every industry irrespective of its functional domain now focus on sustained quality improvement and management. It has become evident that, sustained progress in quality of service and delivery is crucial in satisfying the stakeholders, whether it's the customers or the employees or the investors. The healthcare sector in Kerala is rapidly evolving with increasing demands on service quality and customer care. The managements are forced to progress with clear targets on of quality improvement and regular up gradations. A well-integrated knowledge management and information analysis system on which the top management can rely on without doubt is one of the key elements for sustained quality initiatives and continuous improvement. The initiatives towards quality improvement can be successful only with rightly informed decision making, thus information is the key factor. (Terziovski et al., 1996).

A Quality Management system is believed to be a framework that documents, measures and analyses facts and figures with the aim of achieving and improving the quality goals (Amir H., et al, 2017). In quality management systems, the documents are used to describe the systems and show its entirety. Formal documentation of team activities and solutions can promote communication and understanding of continuous improvement achievements. While implementing knowledge management a comprehensive framework with systems thinking that can highlight the factors resulting in for success or failure is required (Alavi & Leidner, 2001) This paper is an attempt to evaluate how effectively the hospitals in Kerala implementing quality management initiatives have initiated Knowledge management practices. The study will also bring light on awareness of hospitals under study on the importance of knowledge management for successful quality transformation and continuous improvement.

Mind mapping tool, Freemind was used to design and development the knowledge management framework. Mind mapping is basically a method of structured thinking, in the form of visual presentations. The inputs from literatures, theories, analysis of different models and the findings of the study was put together into meaningful fashion by organizing the determinants, establishing the relationships and designing the levels using the mind mapping tool. Freemind is a Java based mind mapping tool used mainly as hierarchical editor. The rather complex diagram developed by Freemind was modified into the proposed framework pattern.

STATEMENT OF THE PROBLEM:

The healthcare sector in Kerala has implemented quality management initiatives and has initiated knowledge management systems as a necessity. The initiation of information systems can be viewed more as a proof for quality certifications than as a means for long-term success and sustained development. Though the process of knowledge management is initiated by the top management, the success of the process solely depends mainly on the middle level employees. They play a major role in acquisition and assimilation of knowledge. The paper makes an attempt evaluate whether the effectiveness of Knowledge Management system existing in the hospitals is proficient enough to support the Quality Management Initiatives. It also tries to identify the areas of ineffectiveness and troubles. The researcher proposes a Knowledge and Information analysis framework for quality management in healthcare sector.

BACKGROUND OF THE STUDY:

The different theories and researches on Quality Management have indicated that sustained quality management is only possible through a long-term approach to success, which is based on continuous improvement and consistently exceeding customer expectations. The two widely accepted quality Gurus, Joseph Juran and Deming advocated the statistical analysis for continuous improvement. The quality awards like Malcolm Baldrige National Quality Award also highlights the importance of measurement, analysis and knowledge management. Even then, the number of literature and researches done showing the role of information systems in quality improvement is limited (Davenport, 1993). In Kerala context, the number of studies on quality management in healthcare sector and studies to elaborate the importance of knowledge management for TQM is limited.

LITERATURE REVIEW & THEORETICAL FRAMEWORK:

Quality Gurus on QM and KM:

Jospeh Juran's 10 steps to quality improvement highlight the importance of continuous improvement and use of reliable data for strategic decision making. It can be understood that, 7 steps directly depend on information and knowhow about the organization. "Build awareness of opportunity to improve", "Set-goals for improvement" and "Organize to reach goals" depends the past records and data. "Report progress", "Communicate results" and "Keep score" speaks about how the data needs to be processed, analyzed, assimilated and stored. "Maintain momentum by making annual improvement part of the regular systems and processes of the company" is the future focused knowledge management.

Deming cycle which is also known as the Wheel of Continuous Improvement is also profoundly based on information and knowledge. "Plan" includes evaluating the present scenario, analyzing information and develop improvement plan and all depends on the past records of activities and available resources. "Do" and "Check" stage of experimenting and analyzing alternatives is all about acquisition of information on the activities and evaluation of the same. The final stage "Act" also looks for regular reporting and recording of activities.

Dr. Shewhart's "control charts" and "statistical approach to quality control", Dr. Ishikawa's Ishikawa diagram and the philosophy of total quality, Dr. Genichi Taguchi's "Taguchi methodology of robust design" and the concept of "designing in quality" and Philip Crosby's "quality is free" concept and the idea of "zero defects" are also quality management ideologies that highlights the importance of information and knowledge management (Bendell, T., et al, 1995)

KNOWLEDGE MANAGEMENT CONCEPT AND MODELS:

Knowledge Management is concept that has gained wide ranges of definitions, conceptual understandings and frameworks. It is a set of process that helps in creating, evaluating, utilizing and sharing of knowledge which is essential for creating competitive advantage, to explore new opportunities and for any kind of advancements. Today's management has recognized the importance of intellectual capital and the availability of actionable knowledge. The term knowledge itself is defined in many different ways. Nonaka and Takeuchi (1995), have classified knowledge as explicit and tactical knowledge. He also proposed a SECI model, four phases of knowledge management interactions namely, Socialization, Externalization, Internalization and Combination. The paper discusses more about explicit knowledge that is stored in papers or in mechanical devises. The knowledge management model proposed by Wig, 1993, advocated a four-step process of creation, manifestation, use and transfer. This model categorizes knowledge as Factual, Conceptual, Expectation and methodological. Another model on knowledge management showed a six-step process of Acquisition, Indexing, Filtering, Linking, distributing and Application (Alavi & Leidner, 1999). Apart from the regular activities of knowledge management process, the other factors like culture, psychological forces, functionality and architecture also act as a backbone for the success of knowledge management. The importance of a collaborative environment for knowledge management and approaching it from a holistic point of view is highlighted in many researchers (Diakoulakis et al., 2004, Kulkarn et al., 2006 & Lee, M. R., & Lan, Y. C., 2011)

OBJECTIVES OF THE STUDY:

1. To evaluate the effectiveness of Information Analysis and Knowledge Management systems in the hospitals
2. To evaluate the Knowledge management process
3. To assess the efficiency of knowledge management enablers or preconditions

RESEARCH METHODOLOGY:

Sample Design:

The population for the research is the middle level healthcare professionals working in hospitals in Kerala which has started the quality management initiatives. The hospitals implementing quality

management initiatives were selected based on convenience and one third of the population was selected through convenient sampling.

Data Collection and Analysis:

The data was collected using structured questionnaires. The questionnaire was created on the knowledge management constructs selected from the different knowledge management models and literature. The variables used in the questionnaires pertain to two aspects: first to evaluate the knowledge management process based on Knowledge Acquisition, Knowledge analysis & interpretation and Knowledge Dissemination & Application, secondly two constructs to evaluate the Knowledge Management Enablers / Preconditions namely “system design & architecture” and “infrastructure & technology”. Each construct was further detailed as sub variables and the questions were framed based on the same. Five-point Likert scale was used for the survey.

Statistical analysis of data was done using mean and standard deviation measures in SPSS – 17.0.

Analysis of Qualitative Data:

Qualitative researches are generally concerned about feelings, opinions, experiences and social phenomenon. Qualitative data analysis is all about uncovering and the process of defining, organizing, mapping, explaining, exploring and generalizing the data collected. Rather than using single method, it takes district approaches towards describing the phenomenon to create deeper insights into the topic under study.

RESULTS:

Effectiveness of Knowledge Management Process:

The first phase analyzed the effectiveness of knowledge management process in the hospitals under study. The results of the analysis are listed in the below table as mean score after analyzing the responses of the healthcare professionals, given as Strongly Disagree – 1, Disagree – 2, Neutral – 3, Agree – 4 and Strongly Agree – 5.

Table 1: Effectiveness of Knowledge Management Process

Knowledge Management Steps (Mean Scores)	Mean	S.D.
Knowledge Acquisition	3.45	1.33
1. Information on patient experience with the hospital	3.13	1.23
2. Employee performance measurement	3.02	0.87
3. Employee satisfaction surveys & grievance documentation	2.56	0.99
4. Process & task documentation	4.56	1.45
5. Documentation of errors, accidents, delays or hindrances	3.98	0.57
Knowledge Analysis and Interpretation	2.75	1.55
1. Reports & documents evaluation	2.55	1.38
2. Patient Complaints and suggestions evaluation	3.87	0.98
3. Employee Performance & grievance analysis	1.11	1.56
4. Errors and problems evaluation – cause & effect	3.25	1.22
5. Benchmarking with the standards and expectations	2.99	1.33
Knowledge Dissemination and Application	2.38	0.56
1. Employee performance counseling, setting KPIs & KRAs	2.44	0.98
2. Corrective actions, training and rewards	2.35	1.24
3. Feedback on customer experience and expectations	3.00	1.67
4. Identification of leading and lagging measures	1.35	1.41
5. Data and Information availability	3.01	1.71

Note: Mean score acceptable: 3.00 – 5.00 (Liker scale of values 1-5)

Source: Primary data collected by the author

Based on the results in table no.1, Knowledge Acquisition phase which is more about basic documentation, records and reports, has an acceptable mean score of 3.45. Process and task

documentation has the highest mean score making it evident that every middle level employee documents their daily tasks regularly. In knowledge acquisition step, only Employee satisfaction surveys & grievance documentation has an unacceptable mean score of 2.56.

The knowledge analysis and interpretation phase of knowledge management’s mean score is not in the acceptable range. Among the stages in knowledge analysis, Patient Complaints and suggestions evaluation and Errors and problems evaluation – cause & effect has a mean score of 3.87 and 3.25 respectively. It shows that the majority of the hospitals have taken measures to analyses patient’s responses and the reasons for errors or mistakes. Employee performance and grievance analysis has the lowest mean score (1.11), indicating that the hospitals utilization of information on employees was not effective.

Knowledge dissemination and application phase’s mean scores are also below the acceptable range (2.38), indicating that the knowledge collected and analyzed is not properly used and shared. Identification of leading and lagging measure has the least mean score of 1.35 indicating that the knowledge was not positively used for continuous improvement and growth. Feedback on customer complaints and Data and Information Availability has an acceptable mean score, 3.00 and 3.01 respectively.

Efficiency of Knowledge Management Enablers / Preconditions:

The second phase analyzed the effective implementation and use of knowledge management platforms, “system design & architecture” and “infrastructure & technology”.

Table 2: Efficiency and Employment of Knowledge Management Enablers

Knowledge Management Enablers (Mean Scores)	Mean	S.D.
System Design and Architecture	2.79	1.66
1. Culture – Exploring, Learning and Developing	2.98	1.56
2. Policies, and Procedures on Information flow	1.87	1.91
3. Systematic and Structured flow of information	3.59	1.11
4. Role clarity and Protocols for knowledge management	2.28	0.44
5. Cross checking, KM Audits and Inspections	1.27	1.55
Infrastructure & Technology	3.01	1.45
1. Database structures – Storage	3.99	1.26
2. Collaborative IT systems – sharing platforms	2.39	0.71
3. Data warehouses and Data Mining – search for inf.	3.87	1.31
4. DSS * or CMS* or DMS* or similar platforms	3.55	1.29
5. Cross functional teams & KM training	1.28	1.35

Note: Mean score acceptable: 3.00 – 5.00 (Liker scale of values 1-5)

*DSS – Decision Support Systems, *CMS – Content Management Systems

*DMS – Document Management Systems, Source: Primary data collected by the author

The mean scores in Table No.2 reveal that the knowledge management enablers employed by the hospitals are effective to some degree. System design and architecture mean score is 2.79, which is not in the acceptable range. The absence of cross checking, KM audits and inspections (Mean score - 1.27) and Policies, and Procedures on Information flow (Mean score – 1.87) contributes mostly to the lower mean score. The second knowledge management enabler, Infrastructure and Technology has just managed to come within the acceptable mean score (3.01). Absence of cross functional teams and training for knowledge management (Mean score – 1.28) has the lowest score. The presence of database structures (Mean score -3.99), Data warehouse and data mining (Mean score – 3.87) and DSS or similar platforms (Mean score – 3.55) are accepted scores.

DISCUSSION:

Every hospital under study has initiated quality management, though the level of implementation is different. Theory and Literature shows that information analysis and knowledge management is a mandatory phenomenon for effective quality management.

Knowledge Management Process:

By evaluating the results shown in table no.1 it can be seen that all the steps in Knowledge Management process are not positively implemented in the hospitals under study. Among the three steps in knowledge management, Knowledge Acquisition is the step that has an acceptable mean score. This step is basically the daily reporting and documentations, which is the tangible proofs required for any quality certification. It is evident that the hospitals have taken measures to have sufficient documents and proofs for quality certification. All the steps in knowledge acquisition, except survey on employee satisfaction and grievance documentation are effectively done in the hospitals. Interestingly, the documents on employee satisfaction are not usually demanded for quality certification.

Knowledge analysis and Interpretation is at a lagging stage in the hospitals under study. In many of the cases, the employees do not know how and where the data collected from them and by them is used. The data collected is merely stored as raw data for quality certification audits and is not processed or used sometimes. Every hospital under study had patient compliant and suggestion boxes in every nook and corner. Upon observation and personal interactions, it was evident that only few of the boxes were regularly checked and the patients does not believe in the suggestion systems, but only in making face to face complaints. Actual analysis and interpretation happens only when there is a serious complaint or in case of an error or accident. Regarding the evaluation of data on employee performance, satisfaction and grievances, it happens only at the documented level. The hospitals clearly follow experience based progression and a special reward for performance is absent, so the data collected on the employee performance mostly remain in papers.

Knowledge Dissemination and application is also not effectively practiced in the hospitals under study. Employees are informed in case of any complaint from the patients but regarding their performance or on the reports submitted about the work processes or on the leading lagging parameters no input is given to the employees. Since knowledge analysis is not effectively done, proper dissemination of knowledge cannot be expected.

Knowledge Management Enablers:

The knowledge management enablers were evaluated based on two constructs, namely system design and architecture and infrastructure and technology. The result of table 2 reveals that though the hospitals have not implemented a proper system for Knowledge Management they have made investments on infrastructure and technology. It is contradictory that, when culture, presence of policies and procedures and role clarity and protocols for KM got a mean score which is unacceptable, Systematic and structured flow of information has an acceptable mean score. Considering the fact that the hospital started knowledge management practices recently as part quality management, it can be assumed that information gathering may be happening in the hospitals without strict guidance or systematic procedures and protocols, as a necessity or a requirement without recognizing its importance. The results of the Knowledge Management Process evaluation support the assumption. The least score of cross checking, KM audits and inspections shows its absence and it places a question mark on the credibility of the information and knowledge.

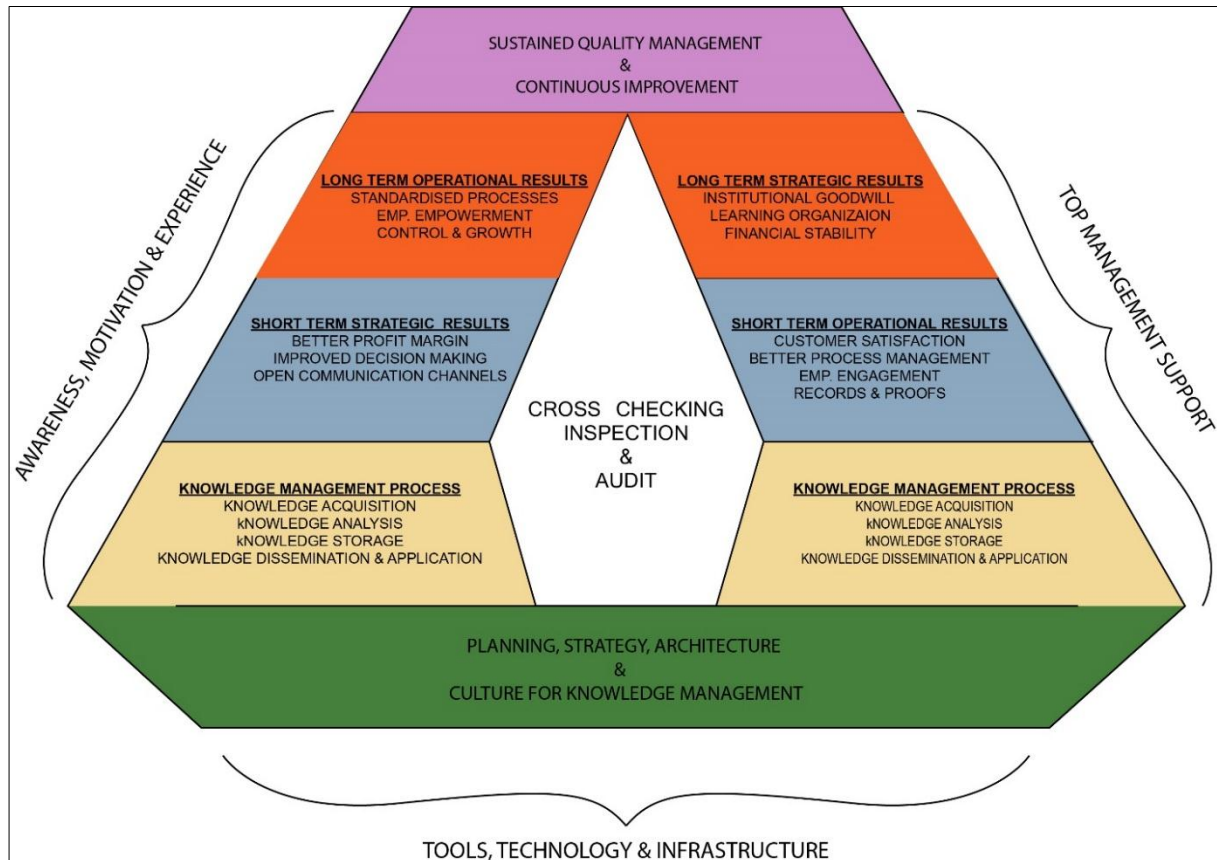
The second enabler, Infrastructure and technology have a higher positive response, except cross functional teams and KM training. The management has taken measures to bring in technological up gradations and infrastructural changes to support the process. The absence of training and integrated systems across department must have made it burdensome to the employees. This particularly seems true while taking into consideration that upon personal discussion with some of the respondents, they even mentioned documentation and reporting process as an additional burden and a hindrance to the regular duties. The personal discussions also showed that even now many of the highly experienced employees still does not

believe in recording of information, this definitely can become a serious problem and challenge to the sustainability of quality management initiative. The technological changes must support manipulation and detailed analysis to fulfill strategic requirements at different levels (Zahedi, 1998)

Proposed Knowledge Management Framework for QM:

To implement knowledge management and information analysis in a sustainable manner, a practicable framework is mandatory. Based on the learning from the study, literature and theory a framework for Knowledge Management is designed and developed using mind mapping tool.

Figure 1: Knowledge Management Framework for Quality Management



Source: This frame work is created by the Author

The knowledge management must start by incorporating it into the culture of the institution, followed by planning, strategy and architecture development for the system. Until the new system becomes part of the institutional culture a comprehensive approach will not be possible. The second step is the knowledge management process – acquisition, analysis, storage, dissemination and application. The steps in the process can be customized according to the nature and structure of the organization. In the initial stages of knowledge management implementation, chances of chaos and confusions are possible. Next stage, the institution must initiate evaluating the short-term results both strategic and operational. Without analyzing the results, the effectiveness of the system cannot be evaluated. Ones the short-term results are standardized and become repeatable; the institution can start looking at the long-term results – strategic and operational. The impact of the above outcome will be sustainable quality management and quality improvement. Every stage of knowledge management needs to be enhanced through proper tools, technology and infrastructure, employee awareness, motivation and learning and continuous top management support.

CONCLUSION:

The present era is the time of massive changes in patient view points on healthcare services, from low cost expectations to high quality service even at higher costs. Such state of affairs has forced the hospitals to make changes in their operational activities. The key finding of the study was that the knowledge management practices are not integrated and not driven by written policies, procedures or protocols. It is to be noted that the hospitals under study has implemented quality management systems within the last 5-8 years. Majority of the hospitals followed the knowledge transfer process through word of mouth and experienced guidance. The practice of documenting, analyzing and storing it for dissimulation was thus rather new. The effectiveness of knowledge acquisition phase makes it evident that the hospital does not look for a sustainable quality management but for short term benefits. Despite the pressure to become a knowledge driven organization, the top managements are not successful in accomplishing the transformation for knowledge management. What is essentially required is a comprehensive change and mindset transformation from top to bottom. The top management must demonstrate the importance of knowledge management through better systems and KM education.

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