Knowledge Management in Multicultural Hospitals: Proposition of New Framework for Performance Improvement.

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Abstract

Hospitals are knowledge-centered and knowledge-driven environments that depend on evidence-based methods for treatments and diagnostics. Evidence-based diagnosis harnesses both tacit knowledge of clinicians, as well as explicit knowledge that is taught, and is also highly dependent on knowledge sharing among clinicians and hospital administration. In general, hospitals are composed of fragments of specialized knowledge centers which need to be integrated to become innovative and deal with external influences such as patients demand for quality treatment, changing epidemiology, globalization and changing technologies. New knowledge is created through human interaction and practices of sharing. Cultural differences in organizations are one of the factors that can impede knowledge sharing processes, which negatively affect KM practices. Technology can facilitate the accuracy of KM and enable effective use and application, particularly in a knowledge rich, knowledge driven environment such as a hospital. In this chapter, the important role KM plays in organizational performance of hospitals is evaluated. Value creation, accuracy and integration of tacit and explicit knowledge are discussed in relation to multicultural organizational hospitals. The important role technology plays in multicultural hospitals in order to standardize knowledge, enable access and application of knowledge are discussed. A case study to illustrate some of the theories highlighted in the chapter is introduced to verify some of the concepts that are highlighted.

Keyword: Information technology; knowledge management framework, value chain analysis.

Introduction

Organizations are challenged with preserving their intellectual capital and well and promoting best practice among their employees. The largest barrier and challenge to knowledge management initiatives is technology acceptance and use. In most organizations, knowledge is distributed in discrete units comprised of communities of practice characterized by high levels of shared knowledge yet need to integrate their knowledge as an organizational wide asset. Interaction among individuals between

communities of practice is required for knowledge to be transferred and for new knowledge to be created. Information technology provides the infrastructure that can enable knowledge flow through improve social interaction on the range of technological tools such as GroupWare and databases that enable the storage and access of knowledge. Therefore, IT increases organizational capability in the storage of this knowledge. Based on Nonaka (1994)'s SECI model, knowledge is created through the conversion and combination of tacit and explicit knowledge. Through employee experiences with their work process, tacit knowledge is created and exchanged to others in the same communities of practice, and through its storage, it becomes explicit. The combination of these two knowledge types leads to the creation of new tacit knowledge. Information technology is integral to all these aspects of knowledge. Therefore, the effective use of information technology can lead to the best utilization of organizational knowledge and its interpretation and application to correct contexts so as to affect competitive advantage. This competitive advantage requires that organizational knowledge be aligned to organizational strategy; which in turn affects organizational performance.

The key measurements of organizational performance are mainly assessed in the information technology (IT), which is used as a platform for managing knowledge, facilitating access to knowledge, the organization itself based on culture and leadership style, as well as the organizational processes that govern the interactions between the people. Information technology also manages the knowledge itself in the organization in terms of accessibility, the extent of accumulation and utilization, and how people share this knowledge and how ownership is accorded to individuals, so as to reduce knowledge hoarding (Răula et al. 2012)s. According to Răula et al s (2012), the four key measurements of knowledge management implementation success are:

The higher the levels of knowledge accumulation in an organization through the tacit-explicit knowledge transformation of internalization and externalization, the more effective knowledge management(KM) in the organization(Almashari et al. 2002; Lee et al. 2005)

Increased knowledge utilization positively affects organizational performance (Kulkarni & St. Louis, 2003).

Increased sharing of knowledge among organizational members also increases the implementation of KM as well as the impact of KM on organizational performance (Lee et al. 2005)

O rganizations that promote knowledge sharing and reward behaviors that positively influence knowledge sharing improve accessibility of knowledge, and further

increase the success of KMS（Al Mashari et al. 2002）

Ră u la et al s (2012) further stress the importance of information technology tools in the capture of knowledge and emphasize how critical these are for the successful implementation of KM initiatives. The IT platforms and tools can facilitate knowledge exchange, knowledge storage and accessibility. Capturing explicit knowledge is important in knowledge creation (Nonaka & Takeuchi, 1995). Despite this, however, codification of knowledge in IT tools does not guarantee that there will be successful usage (Răula et al. 2012)s. This is why organizational culture is so integral to the success of KM initiatives in organizations. This is particularly true for organizations that are comprised of highly skilled knowledge workers, such as in hospitals and technical industries (Artail, 2006), where knowledge workers may tend to hoard information (Anantamula & Kanungo, 2006).

The importance of knowledge in the hospital

Hospitals are knowledge directed environments with highly specialized knowledge workers and management processes that are knowledge specific (Guptill, 1995, Abidi, 2007). There is a high need for hospitals to meet the demands of a changing patient demographic and to develop new and technological tools to deal with a growing population (Abidi, 2007). There is a strong need to support internal activities of knowledge workers and to facilitate internal processes that make knowledge flow better in the hospital. Moreover, hospitals need to retain knowledge and create new knowledge by fostering collaboration among their knowledge workers (Răula et al. 2012)s. There is a significant growth in scientific knowledge in the past decade in terms of new diseases, their management and caring for patients (Abidi, 2007), however, there is a lack of knowledge transfer skills in the hospitals to cope with the rapid rate at which new knowledge is created (McGlynn, Asch, Adams, Keesey & Hicks, 2003). In addition, clinicians deal with a high influx of new information on a daily basis that replaces old information, as well as requiring the integration of new information into diagnostic processes (Desouza, 2001). Indeed a clinician has to know more than 10,000 different diseases, a variety of medicines to treat those diseases as well as to keep up with the ever- growing literature in the biomedical field (Davenport & Glaser, 2002). This leads to information overload, lack of access to the right information at the right time, so as to provide the best quality care to the patient. This can lead to a range of medical errors that cost the hospital money. Moreover, this falls short of the objective of the hospital which is to remain sustainable, innovative and competitive while providing quality care to the patient (Wickramasinghe, Gupta & Sharma, 2005).

Increasingly, governments and stakeholders are putting pressure on hospitals to deliver

quality care more efficiently and at less cost (Morr & Subercaze, 2010). Moreover, increasing external pressure from competitors such as public vs. private entities, the challenges presented by the increased change in epidemiology where more patients are presenting with chronic illness that not only require specialist treatments, but also changes in hospital infrastructure (Morr & Subercaze, 2010). Therefore, effective access to knowledge is required in clinical decision support to provide the medical practitioner with an opportunity to utilize explicit knowledge that they are trained in, as well as interpretations using tacit knowledge they have gained through experience (Wyatt, 2001). The role of hospital management is to ensure the viability of the hospitals through ensuring quality service, which will ensure patient satisfaction and ultimately financial success (Montani & Bellazi, 2002). However, according to Abidi (2001), as data-rich as hospitals are, there is a lack of knowledge creation because the data, which is found in databases and hospital records, is rarely transformed to knowledge or included in hospital processes, such as clinical decision support, to effectively create new knowledge (El Morr & Subacaze, 2010).

Hospitals need to be innovative in developing new technologies; however, it is in the knowledge sharing practices of the hospital medical and management staff that the hospital can become competitive and meet high international standards (Jackson, 2000 ; Abidi, 2007; Mueller, 2012). Knowledge management platforms can increase individual and team efficiency, and thus may be powerful contributions to the medical teams in their daily operations, particularly in the provision of knowledge on information technology platforms (Choi et al. 2008). Facilitation of access to knowledge is important in hospitals to offer better decision support because of the distribution of knowledge in multiple forms (Waling, 2006; Abidi, 2007). Support systems to ensure the flow of information and access to information, as well as collaborative decision making support systems are critical in the hospital of today. Firstly there is a greater need for collaboration, which is very important for reducing issues of medical errors that may cause monetary loss to the hospital (El Morr & Sabucaze, 2010). Although there are various information technology platforms that are used to manage some aspects of knowledge in the hospital, particularly to meet the demands of international standards of practice (Guptill, 2005), there is a greater need to foster hospital culture of knowledge sharing among knowledge workers in the hospital (Artail, 2006).

Knowledge management in hospitals

Healthcare managers aim to maintain high levels of knowledge creation and innovation by utilizing the high knowledge volumes; while staying up to date with new technologies

that improve care. Due to this need, hospitals need good knowledge management strategies (KMS). . According to Myllärniermi, Laihonen, Kappinen and Seppänen (2012), two types of information exist in hospitals, documented i nformation that is based on patient data and other codable information, and interpreted d ata that is based on the health practitioner's knowledge derived from experience. The latter is more crucial in the hospital, as this knowledge must be shared with others (Morr & Subercaze, 2010).

Knowledge management strategies are mechanisms used in an organization to transfer knowledge among individuals within an organization. Knowledge management strategies can be broadly grouped into two parts, codification and personalization (Fields, 2007). Codification involves storage of information and knowledge by people into manageable documents, software, reports and as data in both soft and hard copy; while personalization involves information sharing between people, because people are highly involved in the dissemination of knowledge between each other (Fields, 2007). As mentioned above, knowledge creation requires the combination of tacit and explicit knowledge (Nonaka, 1994). When knowledge is largely explicit in the organization, it means that it must exist in a usable and accessible form, so that the right knowledge can be accessed when it is needed and applied in the right contexts. Explicit knowledge defines the organizational knowledge assets or competencies, and requires extensive tacit knowledge to keep growing and to be useful. By this we mean that explicit knowledge must be used. If it is not used, then it becomes obsolete. Moreover, if more knowledge is captured in explicit form, the more tacit knowledge will not be shared. Knowledge that flows through sharing and communication, i.e. shared tacit knowledge, results in the creation of new knowledge. This is detrimental with regards to growing the organizational knowledge, and also means that new knowledge cannot be created, which in turn affects organizational competitiveness (Figure 1). In this context, it is clear that capturing knowledge in explicit forms, but not using it effectively through process of sharing, can result in knowledge loss (Figure 1). Knowledge loss can also occur through the turnover of employees, who will leave with their tacit knowledge. Explicit knowledge also must be coded during storage and decoded through access, so that it can be applicable to accurate context. This requires that employees must be open to this ability to decode the stored knowledge and internalize it to create tacit knowledge. These processes require the standardization of process and practices, likely facilitated by information technologies.

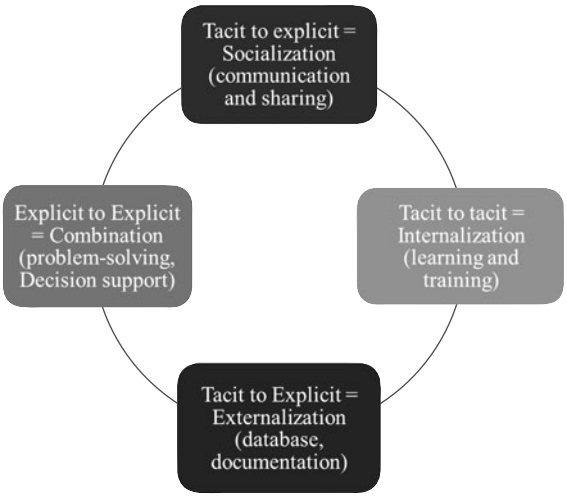


Figure 1. The knowledge creation life cycle as defined by Nonaka and Takeuchi (1995); added to this is the context in which the conversion of knowledge can occur within the organization.

Knowledge management frameworks in hospitals

The hospital is characterized by a collective of diverse specialists working in specific environments towards a collaborative goal of quality patient care. The poor access of knowledge is detrimental to the goals of the hospital to provide quality care using innovation to reduce costs and improve patient care. Using KM can improve performance by helping knowledge workers deal with the fragmented knowledge that exists in medical environments. Knowledge in hospitals is derived from patients, clinicians as well as external sources. The ability to integrate externally derived knowledge sources into existing knowledge can improve knowledge creation (Morr & Subacaze, 2010). Medical knowledge is highly dynamic (Choudhry, Fletcher, & Soumerai, 2005), while hospitals depend on evidence based medicine practice, the inability to integrate externally derived and existing knowledge can be detrimental to the achievement of the goals of using innovative therapeutic treatments to provide quality care to patients through effectively using the abundant knowledge in the hospital.

The ultimate goal of the hospital is to improve patient care in the communities that they are service. Access, use and application of knowledge resources in the hospital are affected at the level of the medical staff or healthcare provider. In Figure 2, we can see that to reach

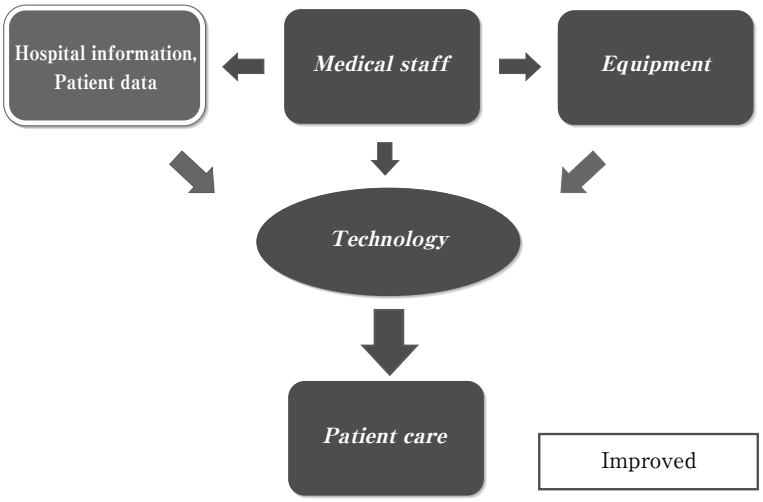


Figure 2. Example knowledge management framework that can be used in the hospital (source: author).

the outcome of effective patient care, healthcare providers must access the knowledge about the patient, and then use the right equipment to manage the patient. Using technology is essential in facilitating this pathway of diagnosis and treatment and also to ensure that the flow of information is sustainable and traceable so that other practitioners can also be able to follow through. In this way, knowledge is created and shared in an open space.

Application of KMS to improve hospital performance

Hospitals have to report to a range of stakeholders such as patients and funders, government, as well as medical staff (Mienville et al. 2008). The quality of performance can be measured against those of other hospitals with regards to patient length of stay, number of deaths, cost of admission and patient satisfaction (Nerenz & Neil, 2001). Financial data can be indicator of usage, supply and measure of sustainability, while clinical and utilization data can give an indication of how efficient the hospital is. Patient satisfaction surveys are typically used as a measure of quality of care, and typically address four key parts which are overall hospital experience, wait times, care and staff (Nerez & Neil, 2001). Thus, the main indicators of hospital performance are regulatory inspections, statistics indicators of financials and other variables, descriptive and controlled studies, third party assessments and public satisfaction surveys, as well as internal assessments (Shaw, 2003). Accountability is critical in hospitals (Murray & Frenck, 20008), thus performance measures allow hospital

to ensure that they reach their goals of providing quality healthcare, as well as identifying shortfalls (Murray & Frenck, 2000; Krock & Duan, 2007). Third party assessments measure the quality of the hospitals, and accreditation gives a measure of quality. Accreditation influences how consumers or patients perceive the hospital (Nerenz & Neil, 2001). Accreditation certificates identify the best value of an organization, while highlighting areas that need improvements that will affect the user, processes and outcomes, and overall organizational performance. According to the National Health Performance Committee (2001) of Australia, healthcare and hospital performance is determined by a series of factors operating at different tiers. These are determinants of disease, which includes environmental, socioeconomic, community related health behaviors, and person related factors. Thus, there is a range of external factors that influence processes in the hospital, which ultimately can affect the performance of the hospital. In the Table 1 below, the main indicators of performance in the hospital setting are listed along with their measurements. We can see that the main measures of quality are associated with what the hospital has to offer. Additional measures of quality as mentioned above are sourced from accreditation, which measures several variables associated with measures of standards of practice to those that are acceptable globally.

Knowledge management strategies are important in contributing to organizational performance. Firstly, the codification strategy is important in the storage, accessibility and application of knowledge. The personalization is important in the interpretation of knowledge with regards to the context in which it is applied and also requires that individual mental models be conformed to the hospital strategy of using knowledge to provide quality healthcare.

In the Table 2 below, the following performance measures rely on KMS in order to improve not only efficiency, but the application of knowledge to different aspects of processes in the hospital. It can be seen that KMS can contribute significantly to hospital performance.

Effective KM, through codification strategy can enable knowledge accessibility particularly for allowing the continuous flow of knowledge through the hospital. Continuous flow is a performance indicator that means that information is readily available when needed and can be applied to the contexts in which it is required. It refers to the fact that information needs to be available when needed, however, this information must be available for the right context to which its application will be effective, Medical intervention is a process that starts at the patient level, and then the GP and nurse, with possible referral to the hospital for further diagnosis or intervention. The hospital needs to be coordinated in

Table 1: Performance indicators of a hospital as described by Nerenz and Neil (2001), HEN (WHO, 2003) and Vlieland (2009).

Performance indicator	Measurement
Quality of care Structure	Safety measures in place, system of medical reviews, patient death reviews, storage of medical and pharmaceutical products
Process	Utilization measures that can affect clinical practice
Outcome	Change in health condition or status of patient, Financial improvement
Efficiency	Measurable hospital activities: Relative stay index Length of stay, visit rates, readmission rates, bed occupancy, Cost effective interventions and use of resources
Appropriate	Appropriate interventions based on approved standards
Responsive	Interventions provided speedily
Safe	Limited harm and few medical errors
Continuous	Coordinated services throughout units and across the hospital
Capable	Staff have appropriate skills and knowledge
Sustainable	Infrastructure, Research and monitoring
Satisfaction	Standardized surveys for staff and for patients, cost of care
Financial	Net gains and losses, Revenues and expenses
Other	
Overuse	Wasteful use of medicines, procedures and processes
Misuse	IInappropriate use of medical facilities, procedures and medicines, medical errors
Underuse	Lack of provision of adequate interventions, or poor application or resources
Cultural and Linguistic competence	Open-ness of language facilities, translation facilities, cultural awareness of community being serviced.

Table 2: The performance indicators that are affected by knowledge management strategies.

Performance indicator	Measurement	Knowledge Mangement strategy
Efficiency	Measurable activities	Codification
Responsive	Interventions provided speedily	Codification
Continuous	Coordinated services across the hospital	Codification
Capable	Staff have appropriate skills and knowledge	Codification
Sustainable	Infrastructure, Research and monitoring	Codification
Satisfaction	Standardized surveys/questionnaires	Codification/personalization
Other		
Overuse	Wasteful use of facilities and interventions	Codification
Misuse	Inappropriate use of facilities and interventio	Codification/personalization
Underuse	Inadequate use of facilities and interventions	Codification
Cultural and Linguistic competence	Cultural sensitivity to community being	Codification/Personalization

order to provide the patient with the best care. All the practitioners that will be treating the patients, need to have information about the patient and then about the processes of intervention. At this phase, codification strategy is very important. However, with regards to decision making about the treatment to be followed, it is also important to apply personalization strategy. This means that there will be a need for some collaborative decision support between the doctors and the nurses as well as other technical staff. There will need to be monitoring of the diagnosis as well as pharmaceutical treatments given to the patients. These must be recorded so that there will be a history of which interventions were given to the patient for what illnesses. This medical history should be accessible to all medical staff and GP that are treating the particular patient. Thus, there is a need to continuously apply both of these strategies. Identifying the type of strategy that will improve the performance of the hospital overall is important. This synthesis of the hospital procedure, suggest that KMS are critical to hospital operations. They can influence the speed at which information is stored and usable. Recording is a critical aspect of hospital performance in that it directs the activities of practitioners in terms of patient care.

Value chain in hospital management

The value chain refers to a set of activities that an organization performs, that are industry specific, so as to provide the valuable service or product. The value chain, as described by Porter (1985), consists of two categories of activities－Primary and Secondary activities.

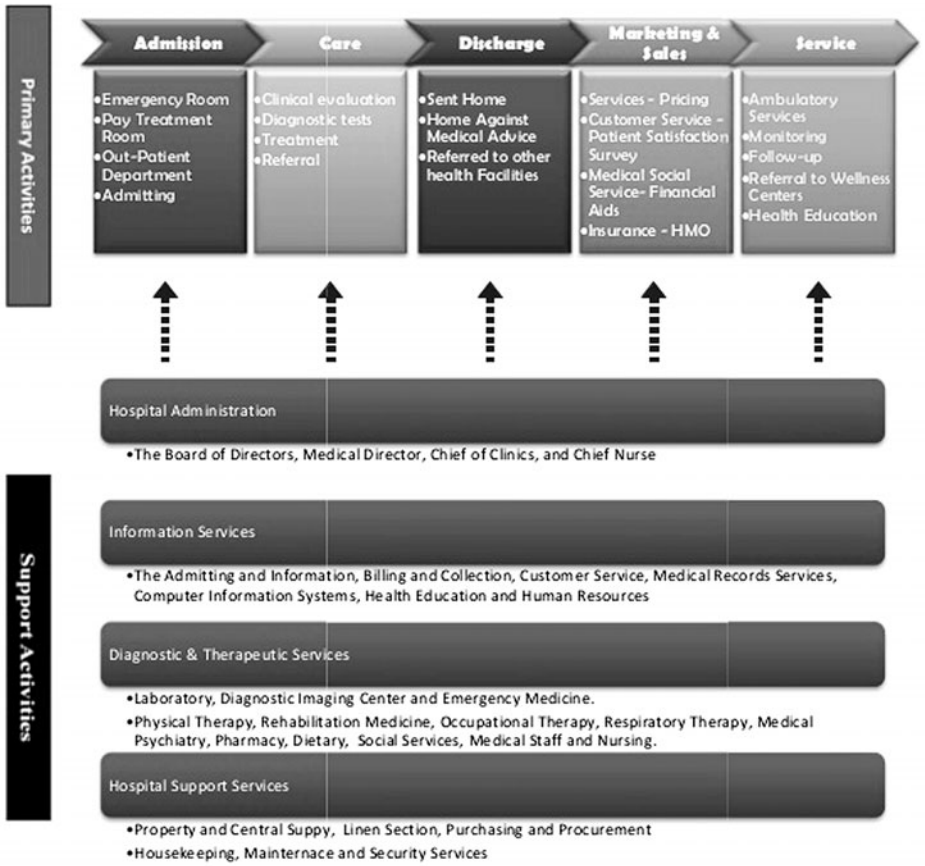
Primary activities: inbound logistics, operations, outbound logistics, marketing, sales and service

Secondary / Support activities: Procurement, Human Resource management, Technological Development and Infrastructure

Primary activities are associated with how the product is developed, manufactured and transported; as well as how it is marketed and sold. The value of the product is affected by the quality of materials used, as well as the costs of packaging and transporting it. How it is used is affected by how it is marketed to customers.

Value Chain in Hospitals

In order to successfully apply knowledge management frameworks, we need to link them directly to the overall hospital management. Understanding the value chain can help us to do this. Value is added by looking at whether there is a shift in-patient needs from the external perspectives and then implementing these requires into the service process (Figure 3). This will mean that the service provided is what is needed by the customer / patient. In addition, there is a high level of competition among hospitals, with patients



Source: Adopted to Michael E. Porter Value Chain model to the hospital. The primary processes are activities devoted to care patients. The support processes support primary activities by providing human, technical and material resources.

Figure 3. The value chain of a hospital showing the primary activities associated with primary patient care and support activities associated with the storage of information, KM and running of the hospital.

choosing hospital on the provision of quality of care at a reasonable cost. Thus, hospitals must capture patients by getting accreditation, which is a sign of quality of care provisions as it measured on international standards.

The support services are critical for the effective management of the hospital. These flow from the board of the hospital, right down to the clinical nurse. Communication between administrators and ranging from the board of directors who approve budgets and policies, to hospital director who implements the policies, chief of clinics who manages clinical staff and supervises diagnostic and therapeutic care, and training of medical and research staff.

The chief nurse enforces the standard and quality nursing care and procedures. On the second level is the information and financial management services:

These can be categorised into four aspects:

Admission section - taking of patient information and bed assignment

Medical records - maintaining patient records and allowing them to be accessible when needed

Customer services - feedback on data and improvement of patient care and service delivery, dealing with patient concerns

Billing and collection - concerned with financials for services provided to the patients.

Coordination of these activities is reliant on information technology.

When medical staff receives a patient, they need to have the patient files with patient history of illnesses, diagnostics and medical interventions. These all influence the intervention that the specific medical practitioner and other supporting staff will use to manage the patient's care. If the support services are poor and not effective, the whole value chain will be affected as information cannot be accessed appropriately or communicated effectively. Coordination using information technology is critical in order to allow knowledge to flow from unit to unit along the value chain (see Figure 3). According to Dorbzykoswki and Vonderembze (2009), the medical staffs influence the value chain of the hospital significantly at three point, selection, supply management and provision of care. At the care level in the value chain, medical staff is concerned with diagnostics, looking at patient history and developing ideas on routes of treatment or intervention based on cause of illness. They then are in a phase of preparation, where they are combining teams of doctors, nurses and support staff, and then they are in a phase of intervention, and then lastly focused on monitoring and managing recovery and patient release. Thus, the care process is dependent on highly efficient communication of information among teams and support staff in order to bring accurate and efficient care to the patient. To effectively treat patients, the correct material must be provided in the patient history so that appropriate care can be given (Schneller and Smeltzer, 2006). In addition, new information will be added to the patient file as well as to the hospital knowledge base with regarding the development of a particular disease as well as in the management of it (Schneller and Smeltzer, 2006). This is because teams can come up with different medical interventions to improve patient care, particularly in the recovery phase post-intervention, if the intervention was not effective for the particular patient. Lastly, Schneller and Smeltzer(2006) state that the patient also influences the value chain through their adherence to treatment protocols and also to the provision of quality feedback. Understanding the patient also means that the hospital can meet its mission and strategy of providing quality care.

Knowledge Management in Multicultural Organizational Hospitals

The advent of industrialization and globalization has increased the rate of people travelling to areas outside their home countries seeking employment. In consequence, across the globe many organizations have become multicultural and highly diverse (Lauring & Selmer, 2012). These multicultural organizations are thought to benefit from the diverse knowledge and experience from their employees, and potentially have advantage in turbulent economic times due to potentially high levels of innovation generated by the broad spectrum of ideas (Hartel & Hartel, 2004; Gaur & Kumar, 2009 ; Stahl, Maznevski, Voigt, & Jonsen, 2010). Organizations can be multicultural by race, language or skills base (Lauring & Selmer, 2012). Openness of organizations to these diversities can be advantageous but there are many barriers (Hartel & Hartel, 2004). The first challenge in multicultural organizations is typically language barriers which may hamper communication, an important prerequisite in knowledge creation, and KM ; and decrease social interactions among members of an organization. In consequence, there is potential for high conflict among individual.

Differences in culture and belief systems also hamper KM in multicultural organizations. To overcome language barriers in multicultural organizations, the introduction of a common language has been shown to improve communication efficiency. Lack of communication among diverse people has been shown to produce high levels of animosity, lack of trust and conflict among individuals. Common language can create a source of identity and oneness among individuals in multicultural organizations. Lauring and Selmer (2012) studied multicultural organizations in Denmark and found that openness to diversity in organization led to high levels of trust among individuals and significantly reduced group conflict. They also posit that conflict was mainly due to language and communication issues that arose from language, more than visible differences among individuals in multicultural organizations. Because their results show that the introduction of English as a common language significantly improved socialization and knowledge sharing practices among organizational members. They state that this could be due to the direct influence of communication breakdown on successful work outputs. In support, Barner-Rasmussen (2003) posits that common language creates a point of entry for people from different cultures to communicate with each other. In other words, it gives them access to each other. This is essential in knowledge sharing processes (Nonaka & Takeuchi, 1995).

In hospitals, KM is meant to improve knowledge processes such as creation, adoption and utilization (Morr & Subacaze, 2010). Cultural differences in multicultural hospitals can be a barrier to KM practices, and even to the functioning of the organization. The major barrier is communication among multicultural staff and with patients, which, if not addressed, can

lead to poor patient care, and high levels of medical errors, as well as lack of cooperation and innovation (Dieng - Kuntz et al. 2006). Moreover, differences in the norms and values of medical staff can influence their perceptions about knowledge sharing (Ryu, Ho & Han, 2003). Hospitals are knowledge centered and sharing knowledge is integral to all the processes of the hospital, there is a constant need to learn and create new knowledge and to adapt to changing global conditions (Abidi, 2001). Knowledge management may play a key role in multicultural hospitals to overcome the language barriers and improve collaboration (Lee & Choi, 2003; Kilowska, 2006; El Morr & Subacaze, 2010). However, to be effectively implemented, the practitioners must use KM initiatives as a communication tool among themselves and with patients (Morr & Subacaze, 2003).

Knowledge sharing practices in multicultural organizations can be enhanced by KM platforms that enhance smooth exchange of information and overcome cultural barriers (Morr & Subacaze, 2010). The one important issue in establishing good KM practices, and strengthening communication, is to establish trust by developing an organizational culture that embraces diversity and inclusivity, which will affect interactions among multicultural staff.

Understanding multicultural organizations

Rosado (1996) defines multiculturalism as: "… a system of beliefs and behaviours that recognizes and respects the presence of all diverse groups in an organization or society, acknowledges and values their socio - cultural differences, and encourages and enables their continued contribution within an inclusive cultural context which empowers all within the organization or society."

This definition is pertinent to the understanding of multicultural organisations due to the many challenges they face in creating a cohesive environment with little conflict (Hartel & Hartel, 2004). Rosado (1996) also summarised the multiculturalism as a system that allows organizations and people in general to be culturally sensitive and internationally focused due to the higher movement of people across the world. The world has become accessible and many people are seeking employment in places outside their home countries (Lauring & Selmer, 2012). Successful multicultural organizations show value to their people by encompassing the definition of multiculturalism as posited by Rosado (1996). Firstly, by showing recognition to diversity in culture, race, ethnicity and cultural norms that multinational people show; having respect for those differences by acknowledging the differences by valuing those people and enabling interactions and socialisation regardless of these diverse differences (Zofi, Melter & Sasanian, 2008). In turn, these fundamental behaviours then create opportunity for engagement where organisations can provide

support and encouragement for inclusive behaviours that bring unity in diversity (Zofi et al. 2008). In order to encourage a diverse workspace and optimally harness knowledge and innovation from it, organisations must ensure effective communication by first breaking down language and communication barriers (Lauring & Selmer, 2012), increase sensitivity to cultural differences by developing empathy in the workplace, equipping the organisations with tools such as developing a common language and translating work related information (Zofi et al. 2008).

For multicultural organizations, including hospitals, a different approach to KM must be applied with greater emphasis on using technology as an enabler to strengthen communication. Effective communication is essential for the hospital, in particular, to reach its goal of accuracy in applying data or knowledge. To apply data or knowledge, it needs to be accessible and usable so that it can be applied to the right context at the right time. The framework below is developed (by the author) for multicultural hospital by including the primary services which are dependent on information technology, communication, human resource management; while the support services include quality assurance and quality assurance management. To reach the value-added goals of having low mortality and morbidity, while have increased quality patient care, the hospital must strengthen its primary enablers which are a strong information technology infrastructure to support activities related to service delivery, management of knowledge, management of human resources and communication. Technology and communication are essential as they are important in overcoming the barriers of language and culture. Technology allows communication a single language that everyone in the organization has to use. In the hospitals, information technology infrastructure and human resources must also facilitate communication between hospital staff and patients. For example, using digital resources with multiple language platforms can enable multicultural staff to operate effectively in the hospital. In addition, the importance of employee selection cannot be masked. Employees with the right culture mix and openness are more likely to be adoptive of hospital culture. Because the hospital is highly conservative in the way of doing things, opening up communication channels can reduce problems of adoption of information technology infrastructure for KM, as well as resistance to change.

Several challenges can arise in knowledge intensive organizations such as hospitals. Knowledge is distributed in areas of expert knowledge, but also needs to be well integrated s that healthcare workers can all produce the best outcome, which is quality patient care. Having technology infrastructure in place that can deal with high volumes of knowledge and also improve accessibility, can help practitioners reach this goal. This case study was

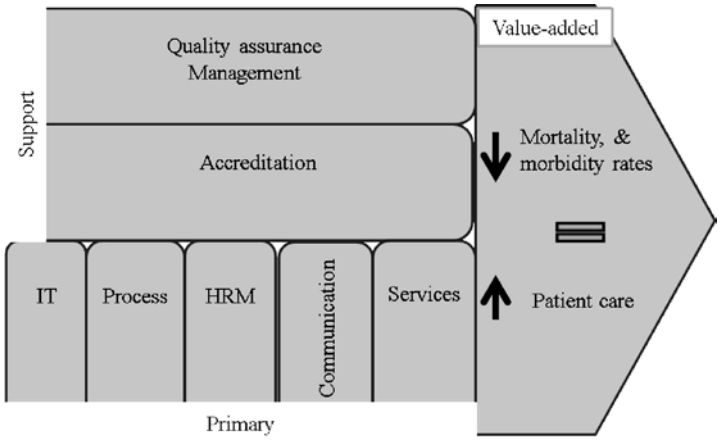


Figure 4. A proposed framework for multicultural hospitals to reach their goals of quality healthcare delivery. Quality assurance and quality assurance management are dependent on information technology resources and effective communication which enable the hospital to perform well (source: author).

selected to highlight the problems that lack of technology integration can have on a multicultural hospital characterised by knowledge intensive environments. Errors can reduce the effectiveness of medical care and affect the value chain, making the hospital lose its ability to provide quality care to its community.

Case study: Challenges in managing knowledge through Medical Record Management, Pathoumthong, Burstein & Bain, 2014

Hospitals use medical records as a form to store data about patients, which they can retrieve at a later stage and use in medical decision support. Most hospitals use the traditional Paper-based Medical Record System or in combination with Electronic Medical Record System. They are both referred to as the Clinical Information System (CIS) or the Electronic Health Record (ERH). Since a single patient might be seen by a number of specialists during their stay in the hospital, it is important that the information pertaining to the particular patient is of a high quality, accessible, usable and informative so that the best care can be given to the patient. Often, patients are too ill to communicate directly with the doctors or medical staff or treatment teams, the data in the Medical Record System can provide the best source of knowledge about the patient's illness. Hospitals can use both the paper-based and electronic medical records to manage patient information. Electronic Medical Record systems can be a useful and enabling tool for the management of large data

and information, typical of the medical environment. In this case study, a hospital (Hospital X) in Australia was evaluated for its use of the Electronic Medical Record System to determine what are the success factors and challenges that are experienced in the use of electronic data. Challenges in the quality of data entered into the electronic system, as well as accessibility of this data were found to be problematic. Additionally, issues of appropriate infrastructure for the full adoption of an Electronic Medical Record System were also raised. Largely, there is a challenge of communication among the medical staff treating patients, a large number of low quality data that is illegible and affects that time taken to retrieve it in order to help in patient assessment and clinical decision making (diagnostics). The poor data quality, the high levels of duplication, poor communication among medical teams, leads to poor accuracy in patient treatment. Lastly, most medical staff prefers to use the traditional paper-based Medical Record system because of its ease of use, accessibility and the ability to move around with it. This may cause resistance to the technological change and poor adoption of the Electronic Medical Record System.

The case study analysis revealed that at Hospital X, there is a problem in the time taken to retrieve patient data due to the usage of a dual paper and electronic Medical records system (Figure 1). The data entered into the electronic Medical Records System is from scanned patients files which a catalogued. However, because they are hand written, most of them are poor quality and illegible. This causes issues of accuracy in data retrieval. The inability to access accurate data means that there will be inaccuracy in patient management. This not only weakens the quality of care provided to the patient as doctors often have to contend with illegible materials, incomplete information, duplicated documents and patient files, hard to interpret acronyms and so on. These factors take away the time needed to help the patient and diagnose the problem. In addition, most of the doctors prefer to be able to communicate with each other, particularly among different teams. Verbal communication can assist in sorting out those complex medical decisions to deliver the best and appropriate care to that particular patient. However, this may not always be the case in multidisciplinary teams. In Hospital X, managers noted that each specialist was operating at an individual level even though they were treating the same patient.

Technology Infrastructure Problems and Quality Healthcare Delivery

Issues of poor quality data and illegible materials can be avoided by having effective communication strategies. Having the appropriate information technology platforms to facilitate communicate directly between healthcare professionals in the hospital can aid in facilitating effecting clinical decision support. Data storage, access and retrieval depend on

effective technological tools that are easy to use. Paper-based Medical Records appears to be better used in hospitals because it is a traditional mechanism of information storage, access and dissemination. Moreover, it is found to be easy to use as most practitioners say they write better and it is easier to take notes immediately while talking to a patient. Challenges are that the same paper record of a patient can be used by many different specialists, which can lead to duplication, challenges in access to patient files when needed to learn about patient history. These issues lead to high levels of inaccuracy in patient care, because the data that is stored in medical records must be of high quality in order to ensure quality and appropriate clinical decisions are made for each patient. The highest cost of poor performance in hospitals is high levels of mortality and morbidity.

According to the comments of doctors, the biggest hurdle would be the adoption of such technologies by medical practitioners due to the cultural change that will be required to be able to effectively implement the technologies. The infrastructure would mean the computerization of each hospital bed so that patient data can be entered immediately into the records right at the bedside. This will not only increase efficiency, but quality of data that will be entered into the system. Since timeliness is a critical factor to treating patients, electronic medical records with appropriate infrastructure can mean ease of data accessibility. Introducing electronic tools in hospital management will then require effective change management. This will require openness of communication between managers, data managers and clinical staff.

Impacts of poor information technology use on the hospital value chain

This case study shows the disruption of the value chain and the compromising effects on the hospital's goals, which is particularly the provision of quality care and reduction of medical errors associated with the measure of safety as a performance indicator. Performance of the hospital is reliant on the value chain. At the first state, the doctors in hospital X are struggling to make use of hand written medical files that are highly coded and illegible. These documents are the first line of information and knowledge about the patient and will influence how the patient is diagnosed and treated. In hospital X, this first level of failure leads to high rates of medical errors, affecting the outcome of patient care, increasing hospital length of stay and other variables, leading to overall poor performance of the hospital. In particular, significant impacts are observed in the failure of the hospital to adhere to its mission and strategy. An additional factor is that in hospital X, doctors working on the same patient did not continually communicate with each other about the intervention. Dorbzykoswki and Vonderemze (2009), show that the medical personnel are an integral part of the value chain as they interact with it on a daily basis, gaining from it

and adding to it. The important aspect of patient care starts with diagnosis, and panning intervention. These two parts require teams of medical practitioners, ranging from nursing staff, support staff and to other doctors. This requires high levels of communication and cooperation in developing effective intervention, as well as the opportunity to develop new interventions in cases were prescribed methods do not work.

Integrating the tacit and explicit knowledge efectivey is critical to improve performance. Explicit knowledge that is not used will eventually become obsolete. Therefore, using technology and effectively implementing will standardise processes in the hospital. Standardisation will enable the use of explicit knowledge and also facilitate the transfer of tacit knowledge. In hospital X, change management is required also to create openness so that teams of medical staff can world together to improve the patient care though effective diagnosis and intervention, as well as monitoring and management. These activities contribute positively to patient outcomes and thus to hospital performance.

CONCLUSION

The hospital's performance is measured at the basic level by the quality of service it provides to its patients, by the reduced number of patient mortality and morbidity, reduced lengths of stay and increased and sustained financial performances. A range of measures are in place to analyse these variables in order to bench mark a hospital against others. Compared to business environments, hospitals have to show high levels of performance while reducing the costs in order to fulfil its mandate to its stakeholders who are the patients, funders and political influencers. These aspects make the hospital very conservative environments, in addition to the fact that standards of procedures and practices are normally followed to make sure those things are done right. This reduces openness to change and that creates a culture that is resistant to new ways of doing things. The hospital has an abundance of data and information which is dynamic, changing every time with new and emerging diseases, chronic diseases, new medical research areas which bring with them new data. This dynamic nature of medical knowledge means that the healthcare professional must stay abreast of these new outcomes, however, access to information is shown to be a large problem in the hospital.

Multicultural hospitals also face additional pressures and challenges above that of regular hospitals. The employee profile is characterized by people from diverse background, languages and cultures. The first difference is the existence of difference in communication, differences in value and cultural norms and differences in work cultures. Communication is the largest barrier in multicultural hospitals; therefore a framework for multicultural

hospitals that focusses on the integration of this aspect in the hospital process was introduced. The role of human resource management is critical in particular for employee selection. Those employees must be selected on the basis of openness to culture change and adaptability, by having similar culture structure to that of the hospital. In this way, adoption of change in the hospital will be more efficient, in particular for the use of technological tool. The quality assurance and accreditation can give an additional stamp of quality to the hospital process and the services that are provided to patients. Culture and resistance to change can be overcome by effective communication. Technology is an integral tool to help the multicultural hospital in identifying its knowledge sources, cataloguing them so that they can be accessed at the right time, and that these sources are of the high quality. This will enable the hospital to have accuracy in patient care and clinical decision support according to the requirements of evidence-based medicine, which will lead to the goal of high performance with regards to quality of care provided to the patient, as well as reduced mortality and morbidity.

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REFERENCES

Abidi, S. S. R. 2001. Knowledge management in healthcare: towards 'knowledge-driven' decision-support services. *International Journal of Medical Informatics,* 6(31), 5-18.

AlMashari, M., Zairi, M.and AlAthari, A. 2002. An empirical study of the impact of knowledge management on organizational performance. *Journal of Computer Information Systems,* 42 (5), 74- 82.

Anantatmula, V. and Kanungo, S. 2006. Structuring the underlying relations among the knowledge management outcomes. *Journal of Knowledge Management,* 10 (4), 25-42.

Artail, H. A. 2006. Application of KM measures to the impact of a specialized groupware system on corporate productivity and operations. *Information & Management,* 43 (4), 551-564.

Barner-Rasmussen, W., and Björkman, I. 2007. Language fluency, socialization and inter-unit relationships" in Chinese and Finnish subsidiaries. *Management and Organization Review,* 3, 105-128.

Baskerville, R., and Dulipovici, A. 2006. The theoretical foundations of knowledge management. *Knowledge Management Research & Practice,* 4(2), 83-105.

Choi, B., Poon, S.K. and Davis, J.G. 2008. Effects of knowledge management strategy on organizational performance: A complementary theory-based approach. *Omega-the International Journal of Management Science,* (36), 235-251.

Choudhry, N. K., Fletcher, R. H., and Soumerai, S. B. 2005. Systematic review: the relationship between clinical experience and quality of health care. *Annals of Internal Medicine,* 14(24), 260-273.

Desouza, K. C. 2005. *Knowledge management in hospitals. Creating Knowledge Based Healthcare Organizations,* N. Wickramasinghe, J.N.D Gupta and S.K Sharma (eds.), pp. 14-28. Hershey, PA: Idea Group Publishing.

Dieng-Kuntz, R., Minier, D., Ruzicka, M., Corby, F., Corby, O., & Alamarguy, L. (2006). Building and using a medical ontology for knowledge management and cooperative work in a health care network.

Computers in Biology and Medicine, 3(67-8), 871－892.

Dobrzykowski D.D. and Vonderembse M.A. 2004. Healthcare supply chain and IS strategies for improved outcomes. POMS 20th Annual Conference, Orlando Florida, USA, Abstract 011-0251, Guptill, J. 2005. Knowledge Management in Health Care, 31(3), 10－14.

Koch, E. A. and Duan, M. 2003. Hospital performance improvement: Trends in quality and efficiency. A quantitative analysis of performance improvement in U.S. hospitals. Commonwealth Fund（1008）.

Kulkarni, U. and St Louis. R. 2003. Organizational Self Assessment of Knowledge Management Maturity. *Proceedings of the 9th Americas Conference on Information Systems,* 2542－2551.

Lauring, J. and Selmer, J. 2012. International language management and diversity climate in multicultural organizations. *International Business Review,* 21(2), 156－166.

Lauring, J. and Selmer, J. 2013. Diversity attitudes and group knowledge processing in multicultural organizations. *European Management Journal,* 3(12), 124－136.

Lee, H. and Choi, B. 2003. Knowledge Management Enablers, Processes and Organizational Performance: An Integrative View and Empirical Examination, *Journal of Management Information Systems,* 2(01), 179－228.

Lee, K. C., Lee, S. and Kang, I. W. 2005. KMPI: measuring knowledge management performance. *Information & Management,* 42 (3), 469－482.

McGlynn, E.A., Asch, S.M., Adams, J., Keesey, J., Hicks, J. 2003.The Quality of Health Care Delivered to Adults in the United States. *English Journal of Medicine,* 348, 2635－2645.

Minvielle, E., Sicotte, C., Jeantet, M., Pr, N., Bourdil, A. and Richard, C. 2008. Hospital performance: Competing or shared values? 87, 8－19.

Morr, C. El. and Subercaze, J. 2010. Knowledge Management in Healthcare. Handbook of Research on Developments in E-Health and Telemedicine, *Technological and Social Perspectives,* 490－510.

Murray, C. J. L., & Frenk, J. 2000. Theme Papers A framework for assessing the performance of health systems. Bulletin of the WHO, 78(6), 717－731.

Myllärniemi, J., Laihonen, H., Karppinen, H. and Seppänen, K. 2012. Knowledge management practices in healthcare services. *Measuring Business Excellence,* 16(4), 54－65.

Nerenz, D.R. and Neil, N.2001. Performance measures for the health care systems. Commissioned paper for health management research. WHO.

Nonaka, I.（1994）. Nonakas kunnskapsteori.pdf. http://doi.org/10.1287/orsc.5.1.14

Nonaka, I. and Takeuchi, H. 1995. *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation.* New York, Oxford（UK）: Oxford University Press.

Orzano, A.J., McInerney, C.R., Scharf, D., Tallia, A.F. and Crabtree, B.F.（2008）A knowledge management model: Implications for enhancing quality in health care. *Journal of the American Society for Information Science and Technology,* 59(3), 489－505.

Rasula, Jelena, Vuksic, Vesna Bosilj and Stemberger, M. I. 2012. The Impact of Knowledge Management on Organizational Performance. *Economic and Business Review,* 14(2), 147－168.

Schneller, E. and Smeltzer, L. 2006. *Strategic management of the health care supply chain.* SanFrancisco, CA: Jossey-Bass.

Shaw C. 2001. External assessment of health care. BMJ, 322:851－854.

Stahl, G., Maznevski, M., Voigt, A., and Jonsen, K. 2010. Unraveling the effects of cultural diversity in teams: A meta-analysis of research on multicultural work groups. *Journal of International Business Studies,* 41(4), 690－709.

Waling, L. 2006. *Managing the tacit knowledge in hospitals: successfully delivering the intangible with IT.* MSc thesis. Delft University of Technology, Germany.

Wickramasinghe, N., Gupta, J.N.D. and Sharma, S.K. (eds.) 2005: *Creating Knowledge-Based Healthcare Organisations,* Idea group Publishing, pp. 14-28