Knowledge-Enabled CRM System For E-Health Services In A Developing Country: The Case Of Bahrain

Minwir Al-Shammari

Department of Management and Marketing, University of Bahrain, Bahrain
malshammari@uob.edu.bh

Abstract, In today's world, where things change quickly, knowledge is becoming increasingly important for growth and making countries more competitive. Today's knowledge economy has undergone significant changes, making it the most valuable resource for a company that doesn't know what it owns. This study investigates how the Ministry of Health (MoH) in the Kingdom of Bahrain could use the knowledge-enabled relationship management (KCRM) model to offer e-health services. This paper adopts a qualitative exploratory method based on a review of relevant academic literature and official documents and reports. The KCRM enables e-health systems to offer patients comprehensive and integrated information about themselves. As a result, clients are happier, and their health care is improved. Changes in the organization's people must complement the use of ICT in e-health services, structure, and processes to create a good KCRM model. It discusses the potential benefits and challenges of implementing CRM in healthcare and provides insights into its impact on patient satisfaction. It also explores critical perspectives and identifies future research directions.

Keywords: Knowledge Management, CRM, E-Health, Health Services, And Bahrain

1. Introduction

Today's knowledge economy has undergone significant changes, making it the most valuable resource for a company that doesn't know what it owns. More people are becoming aware of the possibilities of expanding organizational knowledge as a non-depleting resource for economic growth, particularly in developing nations. Because of how important customers are in the digital economy, there are fierce "rivalries" over luring in new ones or keeping and growing ties with existing ones.

The MoH anticipates that the e-health project will reduce duplication of effort, expedite patient treatment, and improve safety while saving money. Clinics require a single patient view that several departments can use to increase productivity, quicken workflow, and maintain compliance. Clinics don't need to log into a different system to get patient data from other institutions immediately, even as they are conversing with a patient. When clinics need access to the most recent drug formulas or the patient's complete prescription history, mistakes occur in the current manual prescribing process. The appropriate drug takes longer to receive because of this.

Knowledge-based CRM (KCRM) is a strategic model that combines knowledge management (KM), customer relationship management (CRM), and information and communication technology (ICT) [1]. There are numerous diverse ways to think about and use CRM, and no single, concise conceptual model exists. The CRM is a comprehensive model that integrates concepts, strategies, and tactics with roots in people, processes, and technology. Its objective is to satisfy customers. CRM is a business strategy that requires a thorough transformation to be implemented. It goes beyond social (based on people) or transactional (based on technology) customer data. KCRM processes are used to understand and satisfy clients' demands (Figure I). Organizations may foster enduring customer connections and provide each customer with the desired services thanks to CRM [2].

This study explores the potential application of KCRM in a public health service environment. It examines reports from the Kingdom of Bahrain's Ministry of Health (MoH) and pertinent academic literature to determine how the KCRM model was created because it is new.

2.   E-Health Services In The Kingdom Of Bahrain

In Bahrain, e-health services are made available as a part of e-government projects. The MoH administration needs efficiency, cost-cutting, and value for money. Bahrain's e-government strategy is centered on providing citizens, businesses, and residents with efficient access to government services and providing customers with value through cooperative governance. When the design corresponds to reality, Bahrain's e-government is excellent [3]. The MOH seeks to offer services and high-quality healthcare to all clients and citizens through its strategy. Out of more than 300 services provided by 32 government organizations, e-health services are among the 200 critical governmental services recognized for delivery through electronic channels as part of the service enablement strategy. The 200 services were selected based on their importance (i.e., how much customers value them) and ease of delivery via electronic means [4]

The MOH has launched many initiatives to establish a KM section, online access to the ICT primary health system (a central repository), a collaborative communication center, health statistics and indicators, an intranet website, e-health services, document management, telemedicine, and project management documentation. KM initiatives have addressed some of the difficulties, but still, others need to be tackled [5]. Up to 200 of the essential services are now available via the e-Government Portal or the websites of government agencies. The service enablement strategy recommends the electronic enablement of 200 services over three years (2007-2010) based on the level of e-Readiness that the governmental agencies now possess. Bahrain's e-government strategy includes thirteen important agency projects.

Bahrain has made significant progress in implementing e-health services to enhance healthcare delivery and patient care. Bahrain's government and healthcare institutions have taken several initiatives to develop and promote e-health services. Here are some critical e-health services in Bahrain:

a.   National Health Information Exchange (NHIE): Bahrain has implemented the NHIE, a secure electronic health information exchange platform. It allows healthcare providers to access and share patient health records across healthcare facilities, including medical history, lab results, and imaging reports.

b.   Electronic Health Records (EHRs): EHRs have been introduced in Bahrain to digitize and centralize patient health records. This system enables healthcare providers to securely access and update patient information, facilitating more efficient and coordinated care. Patients can also access their EHRs to view their medical history and test results.

c.   Telemedicine: Telemedicine services have gained prominence in Bahrain, especially considering the COVID-19 pandemic. Telemedicine allows patients

to consult healthcare providers remotely using video calls or other digital platforms. It helps provide timely medical advice, follow-ups, and non-emergency consultations, reducing the need for in-person visits.

d.   Mobile Health (mHealth) Applications: Several mHealth applications have been developed in Bahrain, enabling users to access healthcare information, track their health parameters, and receive personalized health advice. These apps offer appointment scheduling, medication reminders, and fitness tracking features.

a.   Online Appointment Booking: Many healthcare facilities in Bahrain provide online appointment booking systems, allowing patients to schedule their visits conveniently, reducing waiting times, and streamlining the appointment process.

b.   Health Information Portals: Bahrain has health information portals that provide valuable resources and educational materials on various health topics. These portals offer information on diseases, treatments, preventive care, and healthy lifestyle choices.

c.   Prescription and Medication Management: E-health services in Bahrain include electronic prescription systems that enable healthcare providers to generate digital prescriptions, reducing the reliance on paper-based processes. Some systems also facilitate online medication ordering and home delivery.

It is important to note that the specific availability and extent of e-health services may vary among healthcare providers and institutions in Bahrain. However, the country has significantly promoted digital health initiatives to improve healthcare accessibility, quality, and patient experience.

3.   Conceptual Background

KM refers to organizations' processes, practices, and systems to capture, share, and use knowledge effectively. KM has been used in healthcare to support decision-making, enhance patient care, and improve organizational performance. KM involves creating, sharing, and using organizational knowledge to improve performance and achieve strategic goals. KM can help healthcare providers and organizations make better decisions, enhance patient care, and improve organizational performance. KM can take many forms, such as capturing and sharing best practices, creating knowledge repositories, and facilitating collaboration and learning.

A growing body of literature on KM in health services highlights the benefits and challenges of implementing KM practices in healthcare organizations. Some studies have shown that KM practices can improve healthcare quality, patient safety, and organizational performance. For example, a systematic review by Sadoughi et al. [6] found that KM practices can improve clinical decision-making, support the implementation of evidence-based practices, and enhance communication and collaboration among healthcare providers. However, implementing effective KM practices in healthcare is also associated with challenges. These challenges include issues related to data quality, privacy, and security, as well as cultural and organizational barriers to knowledge sharing and collaboration. For example, Alavi et al. [7] found that healthcare providers may be reluctant to share their knowledge due to

concerns about confidentiality and liability.

The use of technology is an essential aspect of KM in healthcare. Electronic health records, clinical decision support systems, and other digital tools can help healthcare providers capture and share knowledge more effectively. However, adopting and using these technologies can also pose challenges, such as the need for training and support and concerns about data security and privacy. The literature on KM for health services suggests that effective KM practices can improve healthcare quality, patient outcomes, and organizational performance. However, successful implementation requires careful consideration of local needs, cultural factors, organizational context, and adequate data quality and security management.

CRM is frequently used to retain, attract, and satisfy customers (patients), but it has also been implemented in public settings. CRM fosters customer value creation, promotes consumer loyalty and trust, and aids healthcare providers in preserving mutually beneficial relationships. CRM is frequently used in for-profit organizations to attract, retain, and satisfy clients (patients), but it has also been applied in public settings [8]. CRM fosters customer value creation, trust, and loyalty and aids in the maintenance of mutually beneficial relationships between healthcare professionals and their patients. Patients have a selection of ways to get services from MoH, allowing them to choose the best method. Most of MoH's electronic services are provided via kiosks, mobile channels, and e-health services. The government sought consumer input and discovered that e-health services are among the most crucial. We want to see these services improve.

CRM is a strategy that aims to improve customer satisfaction and loyalty by enhancing the interactions between customers and service providers. KCRM can be used in healthcare to improve patient satisfaction, increase patient retention, and improve the quality of healthcare services. The literature on CRM for health services highlights the benefits and challenges of implementing KCRM practices in healthcare organizations. Studies have shown that effective CRM practices can improve patient satisfaction, customer loyalty, and overall healthcare service quality. For example, a survey by Talla et al. [9] found that implementing a CRM system in a hospital in India improved patient satisfaction and reduced patient complaints. Another Olumide et al. [10] survey found that implementing a CRM system in a Nigerian hospital improved patient retention and reduced patient wait times.

The use of technology is an essential aspect of CRM in healthcare. Digital tools like patient portals, mobile apps, and social media can help healthcare providers better understand and engage with their patients. However, adopting and using these technologies can pose challenges, such as the need for practical training and support for patients and healthcare providers and concerns about data security and privacy. However, implementing effective CRM practices in healthcare is also associated with challenges. These challenges include data privacy and security issues, cultural barriers to patient engagement, and the need for practical training and support for healthcare providers. For example, a study by Mehta et al. [11] found that healthcare providers in India hesitated to use a CRM system due to data privacy and security concerns.

Overall, the literature on KCRM for health services suggests that effective KCRM practices can improve patient satisfaction, increase patient retention, and improve the overall quality of healthcare services. However, successful implementation requires careful consideration of local needs, cultural factors, organizational context, and adequate data quality and security management.

4.   Method

The KCRM value chain is proposed in this exploratory study, and its application to the MoH e-government services is investigated. The study employs an interpretive qualitative analysis approach based on analyzing secondary data from government publications, reports, websites, presentations, and scholarly literature. Therefore, this study does not anticipate that a single organization will employ the KCRM approach.

5.   Result

The MoH's capacity to gather, preserve, and produce information, as well as the sharing of expertise, improve decision-making and increase client satisfaction. Most of the clinical and non-clinical information creation and knowledge collection is concentrated on the patient's CK, including x-rays, blood tests, prescriptions, cost of therapy, etc., because of the complexity of the MoH company (patient management system). The organization's operation regarding money, human resources, etc., is also the subject of some information in the health sector. Each collection of pertinent information or knowledge is required by specific MoH personnel [4].

The MoH's capacity for information creation, storage, and exchange helps to improve customer satisfaction by enhancing the decision-making process. Because the MoH business is so complicated, most of the clinical and non-clinical information creation and knowledge collection is concentrated on the patient's CK, including x-rays, blood tests, drugs, cost of therapy, etc. (patient management system). Additionally, there is information in the health sector on the organization's management of its finances, human resources, etc. The MoH needs specific individuals' pertinent knowledge or data collection [4].

The existing e-health system does not have a module entirely devoted to KCRM. However, high ICT and KM capabilities assist MoH in developing efficient KCRM and equipping clients with information accessibility to manage their relationships, better understand their needs, deliver better healthcare, and increase their happiness. Additionally, there is much room for KCRM systems to combine client information smoothly and, finally, knowledge from various customer contact channels (such as the web, e-government, email, telephone, etc.) across sales processes, customer care, and marketing.

5.1.   KCRM In The Healthcare Industry

KCRM systems play a crucial role in the healthcare industry, including Bahrain, by

improving patient interactions, streamlining processes, and enhancing overall service quality [12, 13, 14].

a.   Patient Relationship Management: KCRM systems in Bahrain's healthcare sector help manage patient relationships more effectively. They provide a centralized database of patient information, including medical history, appointments, and communication records, to deliver personalized care, track patient interactions, and streamline communication channels.

b.   Appointment Management: KCRM systems assist healthcare providers in managing appointments efficiently. They enable online appointment scheduling, automatic reminders, and rescheduling capabilities, reducing no-shows and improving the patient experience.

c.   Feedback and Surveys: KCRM systems help collect and analyze patient feedback to gain insights into service quality and patient satisfaction. By leveraging surveys and feedback forms, healthcare providers can identify areas for improvement and take necessary actions to enhance the patient's experience.

d.   Patient Engagement and Communication: KCRM systems facilitate effective communication through various channels, including email, SMS, and mobile applications. Healthcare providers in Bahrain can use KCRM tools to send appointment reminders, health tips, and educational materials to engage and educate patients.

e.   Follow-up and Care Coordination: KCRM systems manage post-treatment care and follow-up processes. They allow healthcare providers to schedule and track follow-up appointments, monitor patient progress, and ensure continuity of care.

f.   Marketing and Campaign Management: KCRM systems enable healthcare organizations to design and execute marketing campaigns to attract and retain patients. Organizations can identify target audiences by analyzing patient data, personalizing marketing messages, and measuring campaign effectiveness.

It's worth noting that the implementation and utilization of KCRM systems can vary across healthcare providers in Bahrain, depending on their strategies and requirements. To gather specific references and more detailed information on CRM usage in Bahrain's health services,

5.2.   Kcrm Implementation

Implementing a KCRM system in health services in a developing country can help improve patient care and operational efficiency. KCRM can help organizations improve patient satisfaction, streamline processes, and enhance efficiency. Here are some considerations and suggestions for implementing a KCRM in this context [12, 13, 14]:

a.   Needs Assessment: Conduct a thorough needs assessment to identify health services' specific challenges in a developing country to help determine the type of KCRM system most suitable for the local context.

b.   Data Collection and Management: A KCRM system requires accurate and comprehensive data. Ensure that data collection mechanisms are in place and the data is managed effectively to avoid discrepancies or duplication.

c. Accessibility: Ensure the KCRM system is accessible to all stakeholders, including healthcare providers, administrators, and patients, and involve providing access to mobile devices or setting up internet connectivity.
d. Training and Support: Providing adequate training and support to healthcare providers and administrators is essential to ensure the effective use of the CM system, including training in data entry, reporting, and analysis.

a. Customization: The KCRM system should be customizable to suit the needs of the healthcare service providers in the developing country, involving adding or removing fields in the data entry form or creating custom reports to meet the specific needs of the local context.
b. Integration with Existing Systems: KCRM with healthcare systems can help share data and improve operational efficiency and integration with electronic health records (EHRs) or other health information systems.
c. Sustainability: Ensure that the KCRM system is sustainable in the long term and involves building local capacity to manage and maintain the system or establishing a sustainable business model.

In summary, implementing a KCRM system for health services in developing countries requires careful consideration of local needs, data management, accessibility, training and support, customization, integration with existing systems, and sustainability. A well-designed and implemented KCRM system can help improve patient care, increase operational efficiency, and ultimately contribute to better health outcomes in the developing world.

5.3.   Barriers to KCRM Implementation

The main barriers that the MoH faced with its KCRM initiative can be summarized below [4]:
a. Budget restraints. Due to the users of the healthcare pressure, the most significant percentage of the budget tends to be directed to direct patient healthcare services (i.e., drugs, an extension of existing services, and introducing new clinical services).
b. Lack of user readiness. Around 70 percent of the staff have fundamental computer skills and are unaware of the advantages of information sharing through IT.
c. Lack of specialized ICT personnel in KCRM (business intelligence, taxonomy, etc.). The concept of KCRM was centered on email only; more concentration was focused on recruiting application development staff and technical support staff.
d. ICT personnel high turnover. Because of the high demand for ICT personnel worldwide, keeping skilled staff in the same place is challenging. Better job opportunities arise daily and reflect such services' advancement, as new employees must start from the bottom.
e. Executive management tends to be very busy with day-to-day operations jobs related directly to the patient.

f.   Political and social pressure keeps executives busy with operational tasks rather than strategic or tactical goals.

g.   KCRM tools are currently not a high priority in the health sector, where services closely touching the patient tend to be the top priority.

6.   Lessons Learned

Various lessons learned can be derived from the experience of the MoH in the Kingdom of Bahrain in the field of KCRM [4]:

a.   Establishing a communication means and intranet site is essential to enable and encourage employees to exchange knowledge and experiences. Much of the tacit knowledge transfer took place through virtual groups and communities.

b.   Giving the employees timely and accurate information empowered them and increased their productivity.

c.   Building a sound and comprehensive internet website with online capabilities, organizational information, and KCRM functionality enabled the organization to reach customers and exchange relevant knowledge.

d.   Encouraging tacit-to-tacit knowledge transfer by grouping people with the same interest together.

e.   Technology added exotic knowledge from others by breaking barriers and improving the mobilization of top expertise within similar domains.

f.   Having shared knowledge and experience repositories for projects and project management encouraged project managers to learn from one another's experiences and expertise. It facilitated input from other team members or staff.

g.   Setting up key performance indicators (KPI) for the organization will enable the organization to monitor and gain deep systematic knowledge about the quality of its services and allow them to improve continuously.

h.   Using business intelligence concepts and applications empowered the decision-makers and planners by giving them access to specific subjects' cubes of information to look at the data at different dimensions and create knowledge about the topic of interest.

i.   Embedding the culture of KM and knowledge sharing within the organization, employees are empowered and motivated to improve service quality.

j.   Creating a section in the organization to investigate the issues of the KM and try to find solutions for the internal flow of knowledge, and act as a champion for KM is essential to MoH service sustainability.

7.   Discussion And Conclusion

Interest in KM has increased in fields outside of business, particularly in health care, where health practitioners are beginning to realize the potential of embedding KM concepts in their practices and organizations. The article recommended the KCRM model as a tactical shift that calls for social, structural, and technical modifications to procedures and government agencies. The difficulty is that KCRM deployment is a

strategic shift rather than an ICT fix. Public organizations may encounter a few challenges, including managing KCRM as a strategic shift rather than just an ICT project. KCRM integrates key organizational components (people, structure, process, and technology) and places equal emphasis on an organization's intellectual (human) capital and relationship (customer) capital. Although ICT application, integration, and infrastructure are crucial, they must be accompanied by people, processes, and structural adjustments.

The organization's personnel, structure, and procedures must change in tandem with the usage of ICT for KCRM to be compelling. Customer information must still be fully integrated across CRM systems, such as marketing, sales, and services, via customer-integrated contact channels such as kiosks, e-government, email, fax, and mobiles, although MoH conducted several structural modifications. Customer-related information has yet to be linked into a CRM system to create an efficient and integrated two-way interaction between customers and MoH health service providers.

It is worth noting how the health sector differs from the business sector in an organizational context. In the business sector, critical information is withheld in service of competitive advantage in the marketplace. Business is focused on profit, while the MoH aims to produce a somewhat intangible public good. Thus, in discussing ways that the MoH might move forward with a KM agenda, it is acknowledged that there are variations across health centers and that sensitivity to contextual conditions is vital. ICTs for knowledge-sharing purposes, such as social media, can help support KM and e-learning by enabling users to access the content quickly and conveniently.

Further, interactions between individuals can also create new, relevant knowledge. KM and ICT advancements can benefit the quality of health decision-making, especially by non-hierarchical groups, such as a professional discipline, who readily share best practices. Alternatively, such strategies might be ideal for multidisciplinary care teams who provide care collectively and share a similar culture. In this way, technology, serving as the everyday boundary object across professionals, can help in the creation and support of virtual communities to help maximize the sharing of knowledge and learning.

7.1.   Research Implications

The implications of the KCRM strategy are as follows [4]:

a.   E-health services are among the 200 significant services approved for delivery through electronic channels as part of the service enablement strategy out of the more than 300 services provided by 32 government entities. The 200 services were chosen based on their value to customers, simplicity of delivery, and importance.

b.   By revamping processes, clients deal with one government agency rather than several; Integrated, Best-in-Class aims to raise customer satisfaction with government services.

c.   Through process reform, Integrated, Best-in-class aims to improve customer

satisfaction with government services by reducing the number of government departments customers must contact.

d. Through process redesigns that streamline interactions with one government agency rather than several, Integrated, Best-in-class aims to raise customer satisfaction with government services.

7.2. Future Research Directions

Further research is needed to evaluate the effectiveness and sustainability of KCRM practices in healthcare contexts. The literature on KM for health services suggests that effective KCRM practices can improve healthcare quality and patient outcomes. However, successful implementation requires careful consideration of local needs, cultural factors, organizational context, and adequate data quality and security management. Further research is needed to evaluate the effectiveness and sustainability of KM practices in healthcare contexts. Here are some suggestions for future research on KCRM for health services:

a. Impact Evaluation: Conducting impact evaluations to assess the effectiveness of KCRM systems in improving health outcomes, operational efficiency, and patient satisfaction in developing countries.

b. User Acceptance and Adoption: Investigating the factors influencing healthcare providers' and patients' acceptance and adoption of KCRM systems in developing countries.

c. Cultural Context: Exploring the role of cultural factors in implementing and adopting KCRM systems in healthcare contexts in developing countries.

d. Cost-Effectiveness: Assessing the cost-effectiveness of KCRM systems in healthcare contexts in developing countries.

e. Integration with Existing Systems: Investigating the challenges and opportunities of integrating KCRM systems with existing health information systems in developing countries.

f. Mobile Technology: Exploring the potential of mobile technology in enhancing the accessibility and usability of KCRM systems in healthcare contexts in developing countries.

g. Sustainability: Investigating the long-term sustainability of KCRM systems in healthcare contexts in developing countries.

These research areas can help deepen our understanding of the implementation and impact of KCRM systems in healthcare contexts in a developing country like Bahrain and inform the development of effective strategies for improving health outcomes and operational efficiency in these settings.
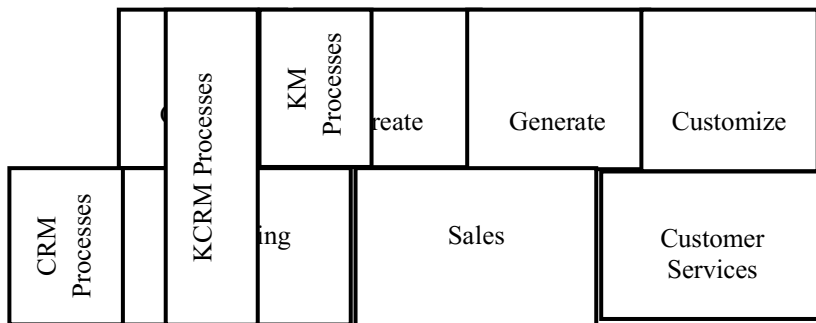
figure 1. kcrm processes conceptual model

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