How to Cite:
Roy, S., Khan, I. A., Bhuyan, J., Rani, S., Indira, R., & Jayadatta, S. (2022). Implementation of knowledge management and utilizing tools in healthcare for making evidence-based decisions. *International Journal of Health Sciences*, *6*(S5), 2872–2880.
https://doi.org/10.53730/ijhs.v6nS5.9268

Implementation of knowledge management and utilizing tools in healthcare for making evidence-based decisions

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***Abstract*---**Healthcare firms have understood that the valuation of "intangible resources" is a crucial driver of their profitability due to the complexity of the business environment and the intensity of competition. "Intellectual capital" is a source of "creativity and invention", as well as one of the most important components in a company development, as it is the spark for success and growth. Technology has rapidly grown in importance around the world. As a result, the function of knowledge as a primary unit of wealth has been

reliant on individuals' “creative ability, experience, and skills” to develop new information. The technological underpinning for KMS implementation is provided by information technology (IT). Since it is employed at all phases of the KM life span, it also offers a way of implementing a robust theoretical framework for KM. IT is critical during the steps of the “socialization externalization combination internalization (SECI)” paradigm. This research study mainly discusses the implementation of knowledge management and its impact on decision making in healthcare organisations. In this context, secondary method of data collection has been considered to gather relevant and factual data from different sources. Thus, keywords are used to find out topic-based information from journals, articles.

***Keywords*---**“Knowledge Management or KM”, Healthcare, Information Technology, “evidence-based medical practices (EBMP)”.

1. Introduction

Considering healthcare is an information-driven industry, knowledge management (KM) and learning infrastructure management are gaining traction in the industry. Throughout its entire lifespan, being realised via the installation of a knowledge management system, technology plays a significant role in KM in enabling knowledge flow (KMS). In KM procedures, this paradigm cannot be avoided. To transform tacit and explicit knowledge into conceptual frameworks, some of the innovations which can be used for KM during knowledge creation, i.e., the transformation of one form of knowledge to the other form of knowledge in the framework, include information communication processes, the Online world, and effective team building structures. Information databases and document/content management solutions may be used to convert data into meaningful information. Data warehousing and information systems are emerging concepts that may be used to “transform knowledge” base into “knowledge management”, and tools like “decision support systems” and “electronic performance support systems” could be used to incorporate qualitative data into quantitative insight [1]. People, procedures, and technology all play a role in information collection and dissemination. Healthcare companies are under growing pressure to accomplish more with less, and they are always looking for methods to maximise resource efficiency while maintaining high-quality patient outcomes. Information is critical to achieving these objectives; it has been dubbed the "lifeblood" of healthcare since it is required for successful medical and management decision-making.

Background of study

Healthcare decision-making is complicated, and it necessitates access to a large amount of high-quality data. The utilisation of information and specialised analytical tools to support informed decision making in a range of corporate scenarios is characterised as “business intelligence (BI)”. One of the most important features of BI is that it combines data from a wide range of various

sources, resulting in a useful information framework for healthcare decision-makers. It is commonly known that BI may assist healthcare businesses by improving treatment outcomes, maximising human resource utilisation, increasing efficiency levels, and lowering costs. Despite these potential advantages, many healthcare organisations have yet to deploy BI systems, and information on the characteristics that lead to effective BI implementation in the healthcare environment is scarce. Therefore, for effective KM implementation, careful consideration should be paid to the correct balance of these three elements' activities. The challenge is in the implementation of management practices, the principles for designing and developing knowledge management solutions, the accessibility of numerous KM platforms, as well as related deployments and utilisation [2]. Data management and learning applications; knowledge repositories; databases; electronic bulletin forums, and other KM technologies are recognised to enable knowledge production, preservation, access, exchange, and implementation, and these KM technologies are significant components of KMS in healthcare. In order to offer excellent treatment for people, the healthcare industry relies extensively on knowledge in its everyday activities. In particular, the care provided is dependent on the cooperation of multiple partners who should exchange information [2,3]. Medical information should be made available and easily accessible to everyone who requires it for this purpose, and KM is critical for cooperation and knowledge sharing in order to achieve the best possible healthcare results. In general, KM implementation in the healthcare industry has a lot of benefits.

A further crucial component of KM execution in healthcare is “evidence-based medical practices (EBMP)”, which is defined as the integration of available research, clinical knowledge, and patient-centred in medical decision making, and is thought to promote decision making all through the healthcare delivery process [4]. In this regard, the biggest problem is still figuring out how to incorporate patients' unspoken knowledge into this practice. The desire for care professionals to be more responsible for their clients is the driving force for EBMP. As a result, maintaining both tacit and explicit knowledge is critical to the success of EMBP [5]. The goal of this project was to address the following fundamental questions:

- How does the application of knowledge management influence health care delivery in terms of informed decision-making?
- Which technologies are presently being utilised to manage knowledge to make healthcare services more accessible and effective?
- What are the obstacles to KM adoption in the healthcare industry?

The primary goal of this evaluation is to look into the application of knowledge management and the methods used to define what skills and knowledge in hospitals are for evidence-based making decisions and thereby enhance the quality of medical services.

2. Literature View

“Healthcare knowledge management (HKM)” is the systematic generation, modelling, distribution, successful implementation, and translation of healthcare information to enhance the patient care facilities and their monitoring. Besides, HKM's mission is to improve and communicate optimum, timely, effective, and

practical healthcare information to healthcare practitioners (as well as clients and other stakeholders) when and where they need it to help them "***make big, well-informed, and cost-effective patient care choices***". HKM is aiming to attain this goal in practice by developing unique knowledge-mediated technologies and incorporating them into organizational processes in order to improve the quality, efficacy, and utility of the health care system [6]. The HKM method aims to shift the way researchers think about the actuality and use of healthcare data. Interestingly, the interests of multiple healthcare stakeholders, each of whom has unique knowledge requirements, usage habits, and desired outcomes, are driving this paradigm change [6,7].

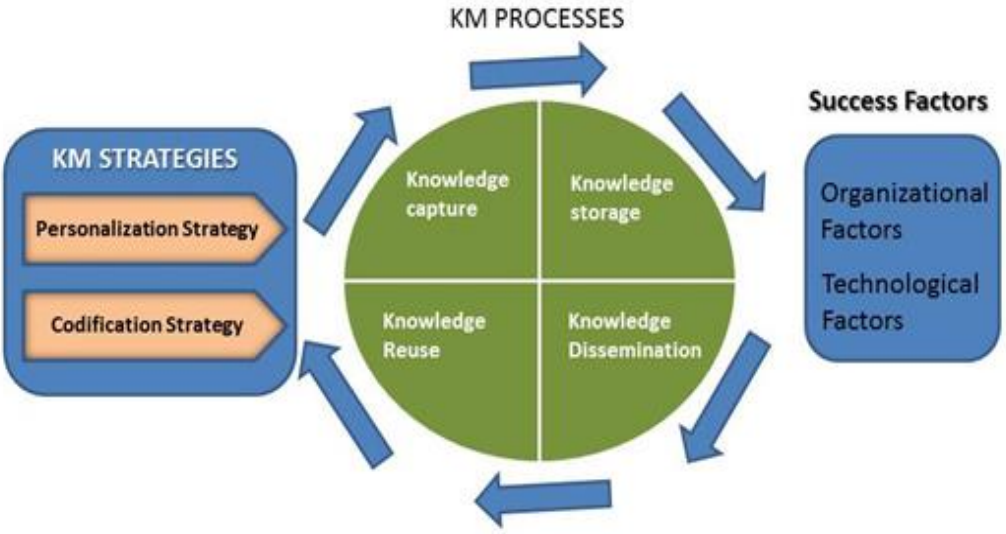

Figure 1: KM model for healthcare
(Source: [7])

For instance, healthcare personnel want not just easy access to experts, but also seamlessly integrated current information into clinical practices to improve decision-making. Patients, too, are searching for personalised care maps and understanding of their treatment regimens to assist them to understand and cope with their treatment programmes. Healthcare competence is viewed as a service instead of a commodity in this approach [8]. HKM addresses the information asymmetry faced by the healthcare stakeholders by designing and implementing a knowledge-centric alternative that includes a technical infrastructure—knowledge management techniques, knowledge discovery and organisational guidelines, and knowledge processing technologies and an operations and maintenance info-structure—operational difficulties and techniques for integrating knowledge services and solutions into the medical sector [8,9]. In terms of performance, the HKM portfolio outlined the various core 'activities':

(a) collect, reflect, analyse, organise, and integrate multiple modalities of healthcare data in order to produce complete, verified, and accessible healthcare knowledge resources.
(b) improve the "current and case-specific knowledge" accessible and useable to healthcare entities.

(c) continue to provide "sensible patient care at the point-of-care and point-of-need, such as decision-support and care-planning" by conceptualising and using patient records inside healthcare workflows.

Many challenges have to be addressed in order to realize the full “HKM portfolio”, notably the “development of knowledge-centric services” that smoothly integrate with the health sector. Technical difficulties in the configuration of generic offerings that could be described to meet a specific user's requisites; stakeholder admittance challenges with a service's effectiveness; and implementation complexities in integrating a provider into existing sites are just a few of the difficulties [9]. Researchers think that HKM initiatives, in both their objective and purpose, can act as change management, influencing how stakeholders perceive healthcare information. In HKM colloquial terms, effective managers are innovative frameworks that provide "high-quality knowledge-centric infrastructure", such as *“point-of-care decision making, availability to evidence-based clinical practice guidelines and literature (i.e. info-buttons), layout of optimal clinical workflows/pathways, ability to share and re-use experience and perspective, and assembling, integration, and appearance of health data, in meaningful forms, with respect to the care setting”*. The "utilisation capacity and structure of healthcare knowledge in the care process" might be changed if these services are properly designed and implemented [10].

3. Research Methodology

Researchers have considered secondary method of data collection to gather relevant and factual data related to the topic. Healthcare organizations can use knowledge management to stay competitive by integrating information with external stakeholders and learning about their “competitors' product, operations, strategy, and best practises”. Knowledge management can also assist businesses in collecting, understanding, and applying knowledge-related materials beyond functional boundaries in order to produce new knowledge. The ability of the company to research and produce new information for use in creativity and attaining its objectives is equally important. To gather knowledge, researchers have used different keywords such as knowledge management, healthcare industry, health data to collect relevant and latest articles and journals from databases.

4. Analysis and Discussion

HKM as a Strategy

HKM presents a strategy for guaranteeing that HKM apps are effectively adopted and may operate as change agents. The following are the steps in the suggested HKM approach:

1) Instruct decision-makers about the influence and interest of this strategy, and show how it will implement value to their “respective care responsibilities”;
2) take into account the cultural existing health work process, requirements of the users, and resource limitations to grow institution-specific possible applications;

3) map out the defined information dissemination within the organisation to identify obstacles and difficulties to the enrolment of knowledge and experience [10,11];
4) map out present knowledge exchange within the organisation to classify threats and difficulties to knowledge deployment;
5) identify various knowledge measures to make sure that stakeholders have effective, preferably individualised access to this information; and
6) establish "HKM applications/frameworks" that encapsulate relevant data to fill local know-how gap that exists.

Furthermore, scholars suggest that HKM is a strategy for turning knowledge into regulations and behaviours, rather than a collection of technologically enabled instruments. As a consequence, HKM's growth is dependent on the ability to bridge the 'know-do gap' in a healthcare context in a collaborative way at both the academic and institutional levels [11]. The computer technology and operational definitions of knowledge artefacts is not straightforward, and it raises several research problems, including:

1) extracting "practice-oriented knowledge" from the artefact;
2) model construction and trying to represent the knowledge in a semantically rich representation;
3) integrating fresh evidence into the computerised artefact to sustain its currency and truthfulness; and
4) adapting the computerised artefact to meet system constraints.

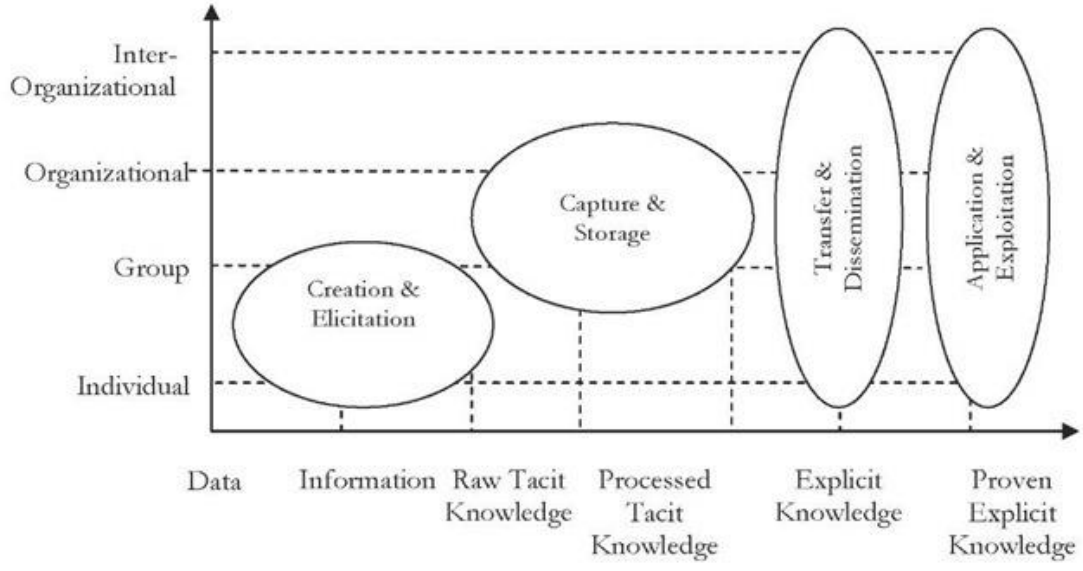

Figure 2: Knowledge management in hospital
(Source: [11])

"Clinical Practice Guidelines (CPG)" and "Clinical Pathways (CP)" are evidence-based medical knowledge artefacts that may be used to help with decision-making and service management at the point of service. CPGs are intended to enhance medical outcomes and standardise care. CP is a time- and activity-oriented record

that determines and records the service delivery in a given healthcare context. There has recently been a surge in interest in utilising such evidence-based information and putting it into practice [11]. Most knowledge artefacts, on the other hand, are paper-based and thus cannot be transformed into practice using computerised medical potential. As a result, there is a strong push among HKM researchers to computerise knowledge artefacts. The computer technology and operational definitions of knowledge artefacts are not straightforward, and it raises several research problems, including:

1) extracting practice-oriented knowledge from the artefact;
2) model construction and trying to represent the knowledge in a semantically rich representation;
3) integrating fresh evidence into the computerised artefact to sustain its currency and truthfulness; and
4) adapting the computerised artefact to meet system constraints,
5) customising the artefact to suit the particular healthcare requirements of particular patients [11,12];
6) incorporating the computerised artefacts with patient-specific information and medical fields, and
7) real-time execution of computerised artefacts for decision-making and care planning.

A variety of projects for healthcare modelling and execution have recently been reported, including “SAGE”, “GLIF” “HELEN”, “GUIDE”, “GEM”, and many others. The use of taxonomies to express healthcare information is at the heart of most of these medical knowledge modelling conceptual frameworks. Ontologies are a formal approach for modelling knowledge that describes a topic in terms of ideas, connections, and axioms. Even though healthcare applications must standardise vocabulary knowledge and terminologies, create conceptual configurations between numerous patient records files, define the semantics of behaviour, standardise method in a possibly executable layout, and purpose over the understanding, an ontology-driven modelling approach is extremely useful [13]. Ontologies can provide a descriptive information representation framework and a logic-based knowledge processing mechanism for healthcare knowledge modelling. The amount of business in healthcare knowledge modelling concentrates on CPG and CP modelling, resulting in a variety of domain-specific taxonomies with varying levels of specificity and effectiveness. The use of knowledge inside an ontology for decision-making depending on medical data, on the other hand, is still in its adolescence. This is primarily owing to a scarcity of good reasoning algorithms capable of thinking over ontologies' information. There are a lot of interesting proposals on the HKM data analysis surface that are continuing to pursue both how to actualize ontology-based knowledge to improve next-generation “Clinical Decision Support Systems (CDSS)” and how to define the diagnostic contexts of CDSS in aspects of their incorporation into a particular healthcare setting's medical system.

The achievement of effective, optimum, sound, comprehensive, and realistic patient monitoring resources that are offered at the point of service or need is seen as the research frontiers in HKM. Knowledge-centric, widespread, assertive, customised to stakeholder necessities, scientific evidence-based, interconnected

among distinct forms of knowledge and functional areas, implanted within clinical practices, interrelated with patient records structures, comply with guidelines, and responsive to socio-ethical beliefs will be the art of the conceivable in the next era of HKM-based patient management solutions [12,13]. It's worth noting that "efficient as well as accurate" case management is a difficult task because it entails a complicated, multi-faceted, and dynamic interactions between (a) patient variables that change over time; (b) up-to-date knowledge of medicine that exists in various modalities and must be precisely implemented during the discussion of the treatment plan; and (c) pre-defined diagnostic processes that must be configured to suit the patient's preferences [13]. To overcome the aforementioned patient management difficulties, researchers believe that next-generation patient management solutions will heavily rely on healthcare expertise and HKM tactics. The Semantic Web framework, which is still in its adolescence, provides exciting and viable techniques for developing next-generation HKM applications. The Semantic Web provides a technological platform for formal semantic representation of medical information in terms of categories, attributes, connections, and premises (i.e. interpretation, generalization, axiomatization, and annotation).

5. Conclusion

Healthcare organisations are increasingly demanding sensible, responsive, multifaceted, and complete healthcare information at the point of service. Although acceptable and realistic, this expectation from health stakeholders will not be met until we are prepared to integrate HKM concepts and practices into clinical processes and create the requisite capacity among healthcare workers to manage knowledge. Furthermore, there is a low level of awareness of HKM's capabilities, reflected in the presence of operational hurdles to information transfer and application within the health service. Furthermore, researchers believe that recent advances in HKM implementations will successfully break down these obstacles since these implementations will show how they can assist obtain higher degrees of patient care, clinical outcomes, teamwork, patient centricity, and expenditure. However, if researchers wish to keep up with the rising demand for HKM standards and procedures in order to achieve a knowledge-cognizant health service, researchers must tackle the sustainability, flexibility, and authenticity challenges that both medical information and knowledge-centric services face. HKM's progress as a discipline and a manifestation of the art of the possible clinical outcomes is at an interesting point. Indeed, researchers must explore the technological, administrative, and tactical elements of HKM driven systems due to a variety of obstacles. However, it is worth emphasising that the HKM analysis scenery includes various research initiatives addressing complicated, multi-faceted HKM concerns, and also that the research results are evolving in aspects of a rich offering of necessary knowledge-centric implementations that are starting to positively affect care delivery in hospital environments. Researchers think that the integration and cross-fertilization of current HKM research topics, concepts, and achievements will result in more comprehensive and advanced HKM applications. Undoubtedly, HKM's future is exciting, bright, and rewarding.

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