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Research paper

How to Build a Knowledge Management System in Digital Era? A Theoretical Framework

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ABSTRACT
In the contemporary era man has become much focused on implication of technology in every sector associated with human development. Knowledge being indispensable center of attention attracts the interest of the researchers to deal with its management from generation to dissemination and ultimately to proper use especially in the field of Science and Technology. A Knowledge Management System (KMS) being an amalgamation of content, experience, and process management; take care of management of knowledge as well as enabling its free flow amongst the employees working in an organization for a common goal. Therefore, the paper is an effort to discuss the concept of Knowledge Management along with a detailed theoretical framework for developing a KM System for any knowledge dealing enterprise. The study can be much helpful which acts as a torch bearer concept for all those organizations especially research institutes that are planning for implementation of such Systems hence lessen their efforts and time.

Keywords: Knowledge; Tacit Knowledge; Explicit Knowledge; Knowledge Management; Knowledge Management System; Design; Development.

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1.1 INTRODUCTION

Knowledge Management (KM) is the management of information and experiences, belonging to the people of the organizations intended for the assistance of its users. KM promotes different knowledge processes including knowledge identification, capturation, organization, retrieval, and finally its use all the way through a web-based portal called KMS (Kumar & Gupta, 2012). A Knowledge Management System is a collaborative knowledge sharing platform preordained to enhance learning and performance in the association which is set in with ready reference tools like visitor tracking, sitemap, web-based discussion forum, blogs, wikis, expert systems FAQs etc. The technologies required to make such platform are software, web server, network etc. In the present era where time has a great role to play, proper planning for design and development of KMS is must. Keeping the importance and role of such collaborative advanced Systems into consideration the present study came up with the eight stage pragmatic KMS model which focuses on exploration of approaches taken up into action for the progress of System in any knowledge enterprise from the start of understanding the concept to the development of dynamic KMS.

1.2 RESEARCH METHODOLOGY

A study undertook the realistic methods with analytical approach to conduct the research. The study is divided into three phases as follows:

The concepts of KM and KMS are discussed.

Essentials for building KMS are explored with suitable examples.

An eight stage pragmatic KMS model is developed; discussing the steps involved in the development of KMS.

1.3 KNOWLEDGE MANAGEMENT AND KNOWLEDGE MANAGEMENT SYSTEM

Knowledge Management is the scientific process of managing the knowledge by making use of technology. It looks into all knowledge processes from knowledge generation through socialization, discussions etc. to its dissemination and ultimately to proper use.

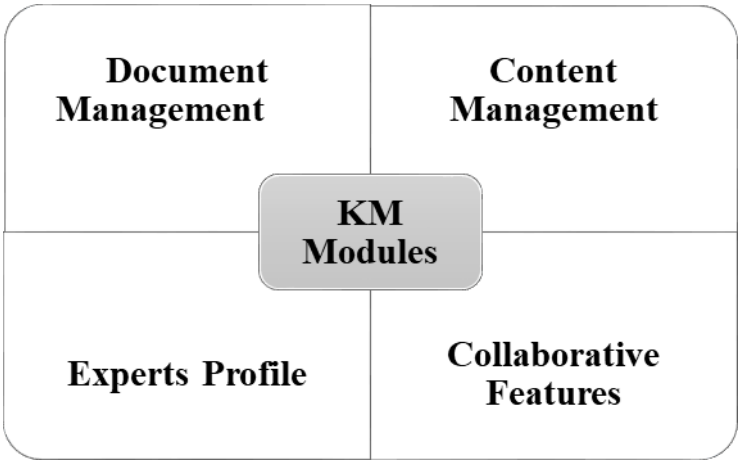
> "Knowledge Management is the systematic management of an organization's knowledge assets for the purpose of creating value and meeting tactical & strategic requirements; it consists of the initiatives, processes, strategies, and systems that sustain and enhance the storage, assessment, sharing, refinement, and creation of knowledge (Frost, 2010)".

Knowledge Management System supports the techniques and processes that make the platform for promoting knowledge processes. It is a display place of different work processes used within the organization to locate, produce, identify, characterize and disseminate the experiences that are either embodied in an individual or lies within organizational processes and practices.

"KMS supports the networks of knowledge workers in the creation, construction, identification, capturing, acquisition, selection, valuation, organization, linking, structuring, formalization, visualization, distribution, retention, maintenance, refinement, evolution, accessing, search, and one of the most important elements is the application of knowledge, anytime anywhere which aims to support the dynamics of organizational learning and organizational effectiveness" (Lecturer & Bertolt, 2007).

1.4 ESSENTIALS FOR BUILDING KNOWLEDGE MANAGEMENT SYSTEM

The approaches for building Knowledge Management System have been well described by L&T Infotech Company under the heading of KM modules along with their features as given below:



- **Document Management:** This part of the KMS exhibits the document repository, with edit, delete, download, copy, move, upload, etc. functionalities and also the approval control of overall processes involved.
- **Content Management:** Content management involves the user generated upload or contributed articles, also carries wikis, blogs and FAQs.
- **Expert Profiles:** The experts profile allows experts to share their personal and professional knowledge thus giving much importance to tacit knowledge sharing.
- **Collaborative Features:** This part involves many handy services provided through the KMS which include the Site usage report, full text inbuilt search, and importantly the user management (L&T Infotech, 2019).

1.5 EIGHT STAGE PRAGMATIC KMS MODEL

The eight stage pragmatic KMS model gives a clear picture of the stages involved in building a KMS in any organization. The description of the stages is fixed to define 2Ws and 1H i.e. What, Why and How?

W1: meaning of the stages.

W2: purpose of the stages.

H: working of the stages.

Stage 1: Development of Understandings

Concept development is essential before take up of the practical development of a System. It helps to know about the recent trends which facilitate the ways and the approaches leading to the final stage of the study. KMS takes many concepts to get build in, starting with understanding the concept of knowledge, its types, KM, processes, and later KMS. The psychological confidence and concrete mental faculty put up by learning the concepts make it easy to go through the other steps and finally to the organizational KM System.

Stage 2: Type of Organization

The type of Knowledge Management System is solely dependent on the type of organization and the audience they serve. Business organizations may have different knowledge processes which they are dealing with, as compare to academic institutes which are totally converse. It is important to identify the type of organization and there requirements prior developing the KMS for the same.

Stage 3: Physical and Online Survey

Physical survey signifies the on ground survey of the KMSs already operational in both academic and business organizations. While as online survey involves the study of those KMSs which are operational in open domain belonging to any field of knowledge. This practice is important in itself because not just to identify the already existing KMSs but also to know about their functionalities and role for the purpose which they are developed. This stage clears the doubts

Regarding the scope and requirements of main elements to build the KMS.

Stage 4: Evaluation of KMSs

While surveying the KMSs their evaluation on defined criteria's is also important in order to make oneself aware about its functioning, usage, structure, flow of knowledge etc. Evaluation can be of two types:

a) **Direct Evaluation of KMS operational in online mode:** Such type of evaluation will be based on usability factors given by Nielsen (2012), as follows:
   "Learnability: How easy is it for users to accomplish basic tasks the first time they encounter the design.
   Efficiency: Once users have learned the design, how quickly can they perform tasks? The less time it takes a user to accomplish a task, the better the efficiency
   Memorability: When users return to the design after a period of not using it, how easily can they reestablish proficiency?
   Errors: How many errors do users make, how severe are these errors, and how easily can they recover from the errors?
   Satisfaction: How pleasant is it to use the design?"

b) **In direct Evaluation of KMS through survey of users:** This evaluation must be carried out by surveying the users who are already making use of KMS. The useful data gathered from them will be based on the following criteria's:
   Precision: whether the information and the sources given are accurate or not. Is the content free of spelling, punctuation and grammar errors?
   Objectivity: The matter that has been provided does meet the requirements of the staff. Is it clear that why this System has been created and for whom.
   Coverage: The content which has been provided through KMS is clear and well defined whether the system has extra featured tools like site map, blog, wikis, FAQs etc.

Design: The design of a KMS has a great role to play in its usage. Does the design of KMS is appealing, and easy to navigate?

Efficiency: The efficiency of a System can be measured by its efficiency of information retrieval. The search techniques used are well enough to retrieve relevant knowledge or not?

Satisfaction: Whether the users are satisfied with the aspects like functionalities, design, information retrieval, responsiveness, problem solving elements etc. of the KMS or not?.

The evaluation is important as a result of which good suggestions can be recorded and by which idea of what to take and what to left for building KMS can also be acquired.

Stage 5: Conceptual model Design

Conceptual framework of KMS varies from organization to organization, depending on their knowledge requirements, but it serves the same purpose to smoothen the development of KMS. C-Model gives a detailed overview of the flow and management of the knowledge in an organization, the purpose of CF is to make clear the attributes used in the management of knowledge and gives clear picture of what knowledge is to be managed internally and what to get from external sources. The C-model acts as a base for the development of the data flow of KMS.

Stage 6: Data Flow Structure

After the conceptual model is developed the important aspect which needs to be taken care of is Data Flow of KMS which explores the working of the backend of a System considered to be its base. DF shows the flow of information from originator to the receiver and in between the people associated with it which include: Administrator, Knowledge Manager, Experts, Staff, Users, etc. Data flow makes clear the path of flow of information from one associated point to another highlighting the pros and cons of KMS. The example of registration of users as an expert, librarian, research scholar, or as a guest user and also a data flow of expert user(s) is given as under.

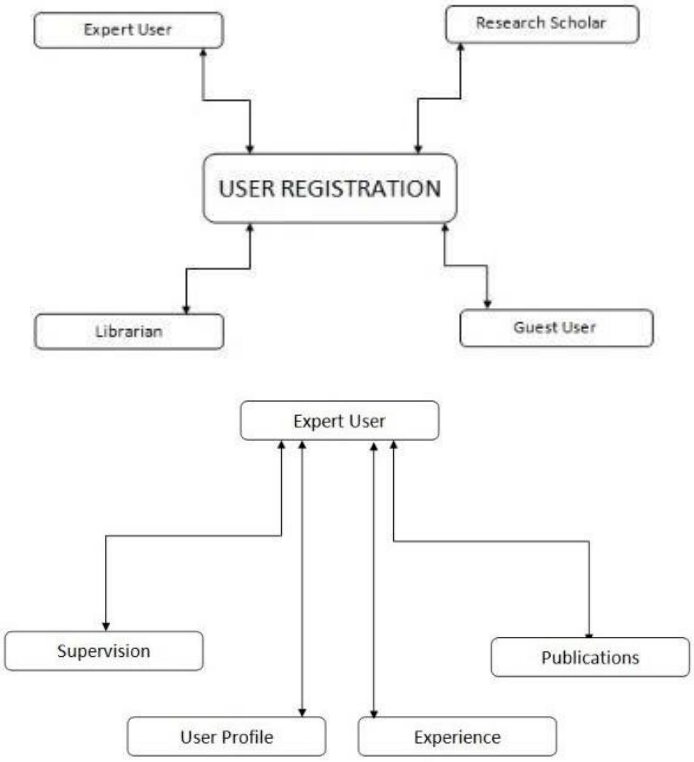


Figure 1: Data Flow of User Registration and Experts profile

Stage 7: Software packages

From conceptual to practical shape of a KMS, software plays a major role. Selection of software is as crucial as development of a System. In present times there are many KM software packages available in market for open purchase mostly used by business enterprises. Before choosing software either a KM specific or simply a Content Management System few things are to be taken care of e.g.

1. Interoperability
2. Customizable
3. Team Collaboration
4. Powerful search

Stage 8: Design and Development of dynamic KMS

The seven steps ladder stages lead to the development of KMS as per the requirements of the enterprise. This stage involves the practical work and the combination of the efforts done in preceding stages to give them a shape which is to be known as KMS. It is essential for all organizations to design a prototype before the development of KMS as it serves the purpose to meet the knowledge requirements of the organization.

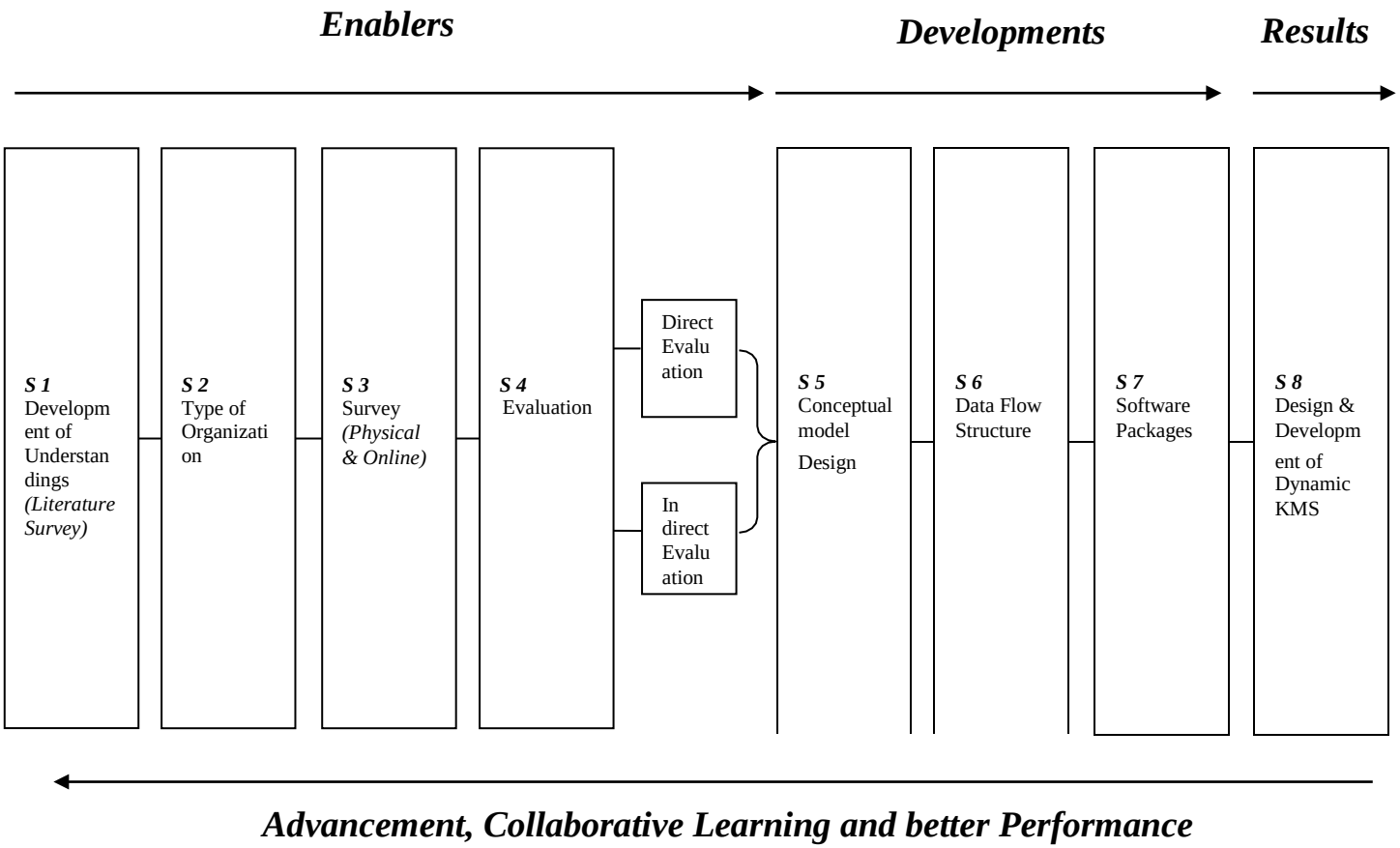


Figure: 2: 8S-PKMS Model

Conclusion

In the time of this cutthroat competition where every organization is on improving their wits to furnish, improvise their knowledge assets, technology plays a great role to materialize the knowledge sources to benefit the organization. The advent of ICT has enabled organizations to manage their knowledge assets which otherwise remained unnoticed before the emergence of the concept of Knowledge Management Systems (KMS). A Knowledge Management System is aimed to create applied knowledge for effective decision making leading to the disposal of a proper solution in order to be of assistance intended for firms to get a return on investment (ROI). The organizations including both for-profit as well as nonprofit need to implement their organizational KMS to make full use of both tacit and explicit knowledge. Intended for all knowledge dealing institutes, this paper will be of much use especially the 8S-PKMS model which explores detailed steps from enablers to processes then to results finally leading to the development of a successful KMS giving Advancement, Collaborative Learning and better Performance back to the organization which otherwise is not available in the literature for that reason fulfills the void.

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