

Theoretical Framework of Knowledge Management

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Abstract— Data is a set of values of qualitative or quantitative variables. Information is data that has been given meaning by way of relational connection. Wisdom: the ability to identify truth and make correct judgments on the bases of previous knowledge, experience and insight. Knowledge flows comprise the set of processes as knowledge creation, retention, transfer and utilization. There are certain types of Knowledge Management Systems which includes Expert System , Neural Network, Knowledge Network System

Keywords—Data, information wisdom, Knowledge Management Process

I. INTRODUCTION

Knowledge management systems refer to any kind of IT system that stores and retrieves knowledge, improves collaboration, locates knowledge sources, mines repositories for hidden knowledge, captures and uses knowledge, or in some other way enhances the KM process.

II. DATA, KNOWLEDGE AND INFORMATION

A. Data

Data is a set of values of qualitative or quantitative variables. Data is measured, collected and reported, and analyzed, whereupon it can be visualized using graphs or images. Data as a general concept refers to the fact that some existing information or knowledge is represented or coded in some form suitable for better usage or processing.

B. Information

Information is data that has been given meaning by way of relational connection. This "meaning" can be useful, but does not have to be. In computer parlance, a relational database makes information from the data stored within it.

C. Knowledge

Knowledge is the appropriate collection of information, such that it's intent is to be

useful. Knowledge is a deterministic process. When someone "memorizes" information, then they have amassed knowledge. This knowledge has useful meaning to them, but it does not provide for, in and of itself, integration such as would infer further knowledge.

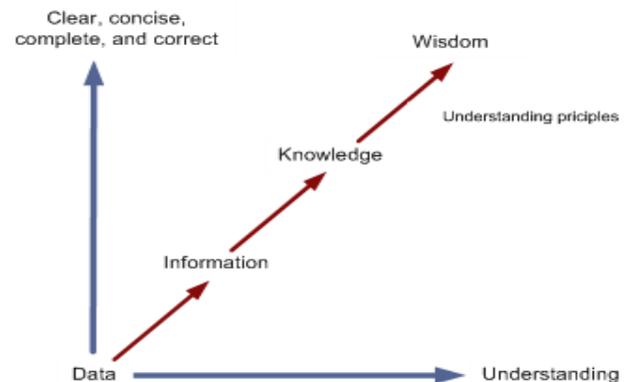
• Types of knowledge:

There are two types of knowledge

1. Explicit knowledge is knowledge that can be captured and written down in documents or databases.
2. Tacit knowledge is the knowledge that people carry in their heads. It is much less concrete than explicit knowledge. (ABC of Knowledge Management, 2005)

D. Wisdom

The ability to identify truth and make correct judgments on the bases of previous knowledge, experience and insight. Within an organization, intellectual capital or organizational wisdom is the application of collective knowledge.



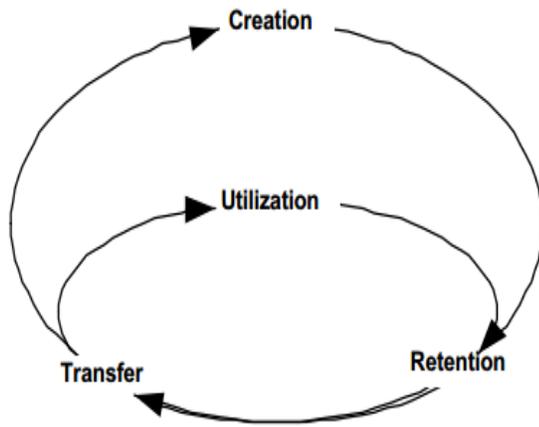
Reference (Data, 2015)

III.

THE GENERAL KNOWLEDGE MODEL

Knowledge flows comprise the set of processes, events and activities through which data, information, knowledge and meta-knowledge are transformed from one state to another. To simplify the analysis of knowledge flows, the framework described in this paper is based primarily on the General Knowledge Model. The model organizes knowledge flows into four primary activity areas:

knowledge creation, retention, transfer and utilization as shown in following figure.



A. Knowledge creation

This comprises activities associated with the entry of new knowledge into the system, and includes knowledge development, discovery and capture.

B. Knowledge Retention

This includes all activities that preserve knowledge and allow it to remain in the system once introduced. It also includes those activities that maintain the viability of knowledge within the system.

C. Knowledge transfer

This refers to activities associated with the flow of knowledge from one party to another. This includes communication, translation, conversion, filtering and rendering.

D. Knowledge Utilization

This includes the activities and events connected with the application of knowledge to business processes. (Characterizing, 1999)

IV. KNOWLEDGE MANAGEMENT

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.

Knowledge management (KM) therefore implies a strong tie to organizational goals and strategy, and it involves the management of knowledge that is useful for some purpose and which creates value for the organization. (Frost, 2012)

V. THE KNOWLEDGE MANAGEMENT PROCESS

The process of knowledge management is universal for any enterprise. Sometimes, the resources used, such as tools and techniques, can be unique to the organizational environment.

The Knowledge Management process has six basic steps assisted by different tools and techniques. When these steps are followed sequentially, the data transforms into knowledge.

1) Step 1: Collecting

This is the most important step of the knowledge management process. If you collect the incorrect or irrelevant data, the resulting knowledge may not be the most accurate. Therefore, the decisions made based on such knowledge could be inaccurate as well.

There are many methods and tools used for data collection. First of all, data collection should be a procedure in knowledge management process. These procedures should be properly documented and followed by people involved in data collection process.

2) Step 2: Organizing

The data collected need to be organized. This organization usually happens based on certain rules. These rules are defined by the organization. As an example, all sales-related data can be filed together and all staff-related data could be stored in the same database table. This type of organization helps to maintain data accurately within a database. If there is much data in the database, techniques such as 'normalization' can be used for organizing and reducing the duplication. This way, data is logically arranged and related to one another for easy retrieval. When data passes step 2, it becomes information.

3) Step 3: Summarizing

In this step, the information is summarized in order to take the essence of it. The lengthy information is presented in tabular or graphical format and stored appropriately.

For summarizing, there are many tools that can be used such as software packages, charts (Pareto, cause-and-effect), and different techniques.

4) Step 4: Analyzing

At this stage, the information is analyzed in order to find the relationships, redundancies and patterns. An expert or an expert team should be assigned for this purpose as the experience of the person/team plays a vital role. Usually, there are reports created after analysis of information.

5) Step 5: Synthesizing

At this point, information becomes knowledge. The results of analysis (usually the reports) are combined together to derive various concepts and artifacts. A pattern or behavior of one entity can be applied to explain another, and collectively, the organization will have a set of knowledge elements that can be used across the

organization. This knowledge is then stored in the organizational *knowledge base* for further use. Usually, the knowledge base is a software implementation that can be accessed from anywhere through the Internet. You can also buy such knowledge base software or download an open-source implementation of the same for free.

6) Step 6: Decision Making

At this stage, the knowledge is used for decision making. As an example, when estimating a specific type of a project or a task, the knowledge related to previous estimates can be used. This accelerates the estimation process and adds high accuracy. This is how the organizational knowledge management adds value and saves money in the long run. (notes, 2015)

VI. TYPES OF KNOWLEDGE MANAGEMENT SYSTEMS

A. Structured Knowledge System

Structured knowledge system means collection and organization of formal textual documents and reports. These items can be tagged to make them easier to search ex: Blackboard-uploaded course documents are stored in a database.

B. Semi-Structured Knowledge System

Semi structured knowledge system means collection and organization of all types of digital content rather than simply formal documents and reports including videos, images, emails. Items can be tagged with relevant keywords to make them easier to locate. Keep in mind that 80% of business content is unstructured as opposed to structure.

C. Knowledge Network System

Resolves the problem of "collective ignorance," where Someone in the organization knows the answer to a specific problem, but that knowledge is not collectively shared. These systems may include a database that stores profiles of content-area experts across the firm, so that you know exactly who to contact when you need the answer to a specific question. Experts may also be able to post best practices and FAQs to share with employees across the firm example: Yahoo answers

D. Neural Network

Finds patterns and relationships in massive amounts of data that would be too complicated and difficult for a human being to analyze. The computer program "learns" patterns by sifting through the data, looking for relationships, and creating rules for classifying the data or making predictions based on those relationships ex: monitoring credit card transactions to spot credit card fraud

E. Expert System

Captures the tacit knowledge of experts regarding how they carry out a specific decision-making task, and converts this knowledge into a set of precise IF-THEN statements, may guide an individual in making a decision by asking them a series of questions that lead them to the appropriate answer ex: loan approval, automotive diagnosis

F. Fuzzy Logic

Uses approximate rather than precise reasoning in making decisions ex: self parking car, rich cooker, digital camera autofocus

G. Case-based Reasoning

Captures the past experiences of individuals working in the organization and stores them in a database for later retrieval when a similar situation is encountered ex: diagnosing patients with unusual symptoms, customer support.

H. Genetic Algorithm

Can determine the optimal solution to a problem even when it has hundreds of variables ex: minimizing costs, maximizing profits.

I. Intelligent Agent

Can be programmed to automatically search for important information based on the users personal preferences ex: shopping bots-helps consumers find what they want online, bidder-automatically place last second bids on ebay. (Inc, 2015)

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