Sharing and Capturing Tacit Knowledge in Higher Education 一 The Info-Ca-SH

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Abstract—**An institution represents the ultimate knowledge organization. The rapid growth of data and technologies trigger the transformation of data to useful information known as 'Knowledge'. To leverage knowledge, institutions need a knowledge sharing network that can meet the demands of changing knowledge. The knowledge sharing network is accomplished by sharing and capturing knowledge among faculty members and students.**

Info-Ca-Sh is a dynamic web content knowledge portal. The architecture serves as an information exchange of knowledge by using various open source tools. The tacit and explicit knowledge of the registered users are made codified and accumulated as knowledge repository. The various documents uploaded on the portal by the registered users are made share and capture. The implementation creates interests among faculty members to share and to capture information by exploring a social network. The result of social network analysis shows the information flow and degree of knowledge sharing in the network.

Index Terms—**Knowledge Management, Repository, codification, Social Networking.**

I. INTRODUCTION

The recent development in Information and Communication Technology (ICT) helps the faculty members to create and share their knowledge through web based knowledge sharing system. The networking is the informal exchange of information between individuals who have grouped together for some common purpose.

Knowledge Engineering as Knowledge management is one of the newly developed idea to improve social community practices among faculty members and students in higher educational institutions where the knowledge is a blend of experience, values, Information in context and insight that forms a basis on which to build new experiences and information, or to achieve specific goals.

The knowledge management system is process and procedure for enabling knowledge management. The knowledge has two forms:
1) Implicit / Tacit Knowledge
2) Explicit knowledge

The Tacit knowledge is the product of interaction between people, or between their environments. An individual will acquire tacit knowledge only by gathering information,

relating it to existing knowledge, and accumulating experience. In groups, tacit knowledge exists in practices and relationships that develop through working overtime.

The Explicit knowledge consists of anything that can be codified, or expressed in words, numbers, and other symbols can be easily articulated, usually in the form of documents and practices.

The problem arises in Knowledge Management is due to lack of appropriate knowledge base creation, planning and community of practices system. The Knowledge Engineering involves the planning, design, development, construction and management of expert systems. Such kind of experts system based on knowledge management includes people, processes, culture, and structure and change management. To implement such system the development of a knowledge repository, from which the knowledge can be shared and captured.

The recent tool used to codify the knowledge is 'Portal', which is the most abused term in IT. It is a website that acts as a Gateway to the internet by providing a broad and diverse range of services, including directories, search engines or links, email, reference tools, forums, chat facilities etc.,

Start from the internet portal there are many kinds of portals available now in market. They are grouped into three primary categories from the view of handling different kinds of information.
1) Unstructured
2) Structured and
3) Collaborative

The proposed architecture is a key to successful knowledge dissemination strategy, to channel the knowledge to the communities of practice and at the same time provides the means of codification of information exchange and peer-to-peer collaboration particularly for higher education. It makes knowledge accessible among registered faculty members and allows exchange of knowledge. The Knowledge Portal Info-Ca-Sh focuses on the improvement in knowledge collaboration, codification and social network analysis of higher educational institutions.

II. METHODOLOGY

A. Knowledge Codification

Knowledge codification means converting tacit knowledge to explicit knowledge in a usable form for the organizational members. The converted explicit knowledge is organized, categorized, indexed and accessed by the network community. Codification is in a structure which will eventually build the knowledge base as knowledge repository.

Based on the above theory, the Info-Ca-Sh is developed to convert the personal knowledge to explicit knowledge and store in a repository, from where the knowledge is made shared and captured in the network. In the portal architecture, the blog and twitter are used as tacit codification tools. The portal network can have 'n' number of users, which is put into real time as time independent.

B. System Architecture:

The architecture of the Info-Ca-Sh tool is as shown in Fig. 1.

The architecture shows the faculty members and students accessing web server from various institutions through ICT. The portal is established by using server based network model with star topology. The portal allowed to access information from a Knowledge repository server which is a web database server and the clients from various places can access the web server. Here, the knowledge is codified and made available for the access of users in the network. The web server used is Apache2; the portal application is executed using PHP 5.5. The database used is My Sql. PHP 5.5 and My Sql alone does not support the functions of the web content database updation and retrieval of data. The portal has an additional supportive database function of 'PHPMyAdmin'.

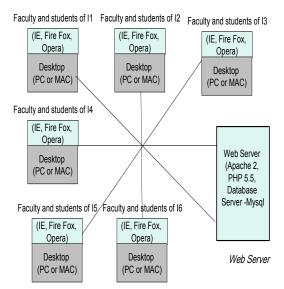The Fig. 2. shows the entity relationship of the Info-Ca-Sh Knowledge Portal.
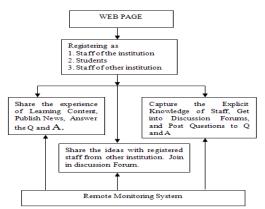

Fig. 1. Server based architecture

Fig. 2. Entity Relationship diagram of Info-Ca-Sh

III. RESULTS

The portal has a data repository of faculty members and students from the institutions in and around an area. They shared their knowledge what they experienced related academic. They are shared documents, Papers, Forums & News etc on this Portal which benefited the growth of the individuals and the institutions.

The registration is done by providing their personal details. The details are stored in the database and activated by the portal admin after verification. The activated message is sent by the admin and received by the members in their mail.

The following Fig. 3. shows the screen shot of the Knowledge Portal 'Info-Ca-Sh'

Fig. 3. Home page of Info-Ca-Sh

The registered users had shared news related to academic activities and general information. The articles of latest topics related to higher education syllabus have been uploaded by admin in the database of the portal.

The papers and documents in the format of PDF, Word and PPT have been uploaded by the faculty members of various institutions and that has been downloaded by the download module and rated accordingly. This showed the passion of the users to upload many documents on the portal.

The users made friends from the user list of the registered users on the portal. They shared messages among them and the result of such practices found some improvement in their information exchange.

The portal also concentrated on sharing and capturing the tacit knowledge by a technique 'blogging' and "twitter". All the friends and students from in and nearby institutions are joined as followers and posted their comments. The direct link had been uploaded in link module of the portal. This technique helped to improve the social community practices among the followers of this blog and twitter.

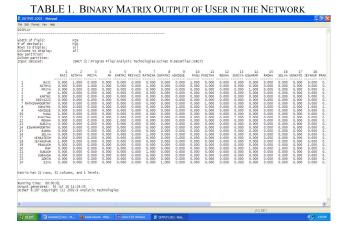The following Fig.4. shows the screen shot of the followers of twitter

Fig. 4. Screen shot of the followers of twitter

As "turn over" process in IT and business sector, the documents, news, articles is uploaded by faculty members or students will be made stayed on the portal admin database

until the admin turn on into its login. This technique is implemented to avoid unwanted information or news made published/uploaded on the portal.

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The portal encompass a social network, which is a social structure made up of faculty members and students called "nodes," which are tied (connected) by one or more specific types of interdependency, such as friendship, kinship, common interest, dislike, sexual relationships, or relationships of beliefs, knowledge or prestige. In order to understand information flow and knowledge sharing, we employed social network analysis. It is a study of mathematical models for interactions among people and groups. Here, we took the nodes as faculty members and students tied by trust and interest.

The following Table 1. shows the connectivity of members in the network in the form of binary matrix.

TABLE 1. BINARY MATRIX OUTPUT OF USER IN THE NETWORK

In order to visualize the patterns of interaction among the users, we codified interactions into two dimensional matrixes AXB.

By this concept, we generated a network composed of 25 nodes with connections indicating the flow of interactions to determine the flow of information and knowledge sharing. The following Graph 1. shows the visual pattern connectivity in the network.

In Fig 5. the links indicate engagement between nodes in the community. A single link suggests one-way communication and the double-edge link suggests tow-way communications.
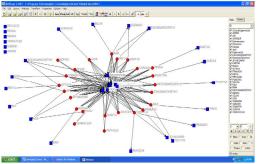

Fig 5. Visual patterns of connectivity in the network.

A node's prestige in a network is essentially its reputation or influence arising form success, achievement or rank of that individual node. The simplest measure of prestige of a member is denoted by PD(i), the indegree of the connectivity.

Trust can also encourage knowledge sharing when people are aware that they share common goals and common values. However, when people do not share common goals and values, a sense of a community is not likely to develop, and the self-interest of high status people is likely to predominate. In other words, people who feel they possess more power are likely to use it inappropriately.

In terms of sharing tacit knowledge, if the recipient of knowledge is not aware or convinced that the source is competent and trustworthy it is unlikely that knowledge from that particular individual will be accepted.

Better connections can strengthen better social relationships, which in turn can enable individuals to effectively exchange tacit knowledge.

IV. CONCLUSION AND DISCUSSION

The research work concludes that

1) The discovery of Info-Ca-Sh is one possible platform to share and capture tacit knowledge of faculty members across the higher education institutions.

2) The Formal Concept Analysis exemplified the percentage of tacit knowledge shared and codified among the portal users.

3) The potency of socialization and sharing culture is analyzed by forming a social community network and found that awareness should be enhanced among faculty members to share and capture tacit knowledge among their community.

The need for knowledge acquisition and knowledge sharing is readily acknowledged across the institution. Form the view of faculty and students, the approach for a web-based knowledge system is greatly needed to facilitate collaboration efforts across and within the different academic areas and to employ social network. The faculty focused primarily on website usability issues. The main objective is to integrate the knowledge management practices for developing an effective knowledge-sharing platform between teachers and students.

As a result, a possibility of knowledge codification for sharing and capturing explicit and tacit knowledge in the higher educational institution will be an effective resource sharing platform of knowledge between faculty members and students. The social network formed by them shows the interactions. From the output graph, it is clear that network properties are not enough to discover all the roles individuals can play in a social network.

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