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Knowledge Management for Service to Society

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Chapter 6

Knowledge Management for Service to Society

Knowledge comes from learning and wisdom comes from living.

*Anthony Douglas William*

Without community service, we would not have a strong quality of life. It’s important to the person who serves as well as the recipient. It’s the way in which we ourselves grow and develop.

*Dr. Dorothy I. Height, president and CEO of the NCNW*

6.1 Introduction

Universities have been focusing more on teaching, learning and research activities in order to show their global presence. But now a time has come when they need to move beyond these traditional roles towards another function of connecting campuses to communities. In this context universities can play an important role in serving the society through continuous education, lifelong learning processes, research and scientific popularization, job creation through spin-offs and student services. Universities have to make the knowledge access affordable to all the stakeholders.

In this view of knowledge management as a service to society, University has to guarantee the most efficient linkages between University research departments (centres/institutes) and possible applications of the research results in economic development in the society at large. Direct involvement in economic life will probably never be the main objective of a University, but it would be wrong to exclude the link between the world of research and the world of business. This link creates promising possibilities. One of the most important ones is the cross-pollination between research and business. On one hand, the economy receives valuable input, which can generate added value and new jobs, and on the other hand, a University receives additional income.
and valuable feedback, which, in turn, can be used to improve research results, or to start new research. Furthermore, this mutual contact will be of great benefit to the students, who get to know the culture of business and industry, which will make them better equipped to take up jobs after graduation.

This knowledge transfer rarely happens all by itself. Companies still don’t have the practice of knocking at a University’s door, and University staff lacks the experience or the courage to enter into business life. In Sardar Patel University, we have the distinction of using chemistry faculty members extending services to the society with their expertise on testing industry chemicals in the University laboratories.

In general, Services to Society with knowledge management concepts would help the University in achieving the following goals among several others:

- It acts as a go-between and a market-place, connecting business life with the world of research, in both directions.

- It also acts as an active interface of research results, looking for ways to commercialize them. Sardar Patel University tries to bring promising research in collaboration with promising companies.

- It also has an important role as an adviser, acting as a trusted assistant in the murky waters of intellectual property rights, and in the establishment of spin-offs. Some of these companies have been created, some of which have grown into true world leaders in their particular niche in Vithal Udyognagar.
A second way in which service to society coincides with knowledge management can be found in communication. Although the ivory tower has disappeared, the outside world still perceives universities as "black boxes". This means that it is often very difficult for the outside world to know who is doing what. In a knowledge society, “know-how” is one thing, and “know-why” is another. But also the “know-who” is becoming increasingly important. In this respect, universities should try to communicate more openly and more actively about the many specializations and specialists within its walls.

A third way universities can materialize their knowledge management can be found in the popularization of science. If we are truly living in a knowledge society, universities have the duty to spread their knowledge to society at large. This is not so much a matter of knowledge transfer, but of knowledge dissemination.

The fourth component of service to society is ‘permanent or lifelong learning’. In a knowledge society, the half-life of knowledge is rapidly decreasing. What our students are learning today, will be obsolete tomorrow. In order to prevent this, universities have to offer a wide-ranging array of courses, seminars etc. to make sure that graduates can keep up with scientific developments. Learning how to learn should be the main target of our students, and universities should encourage and accompany them in this direction. This does not stop on the day of graduation. Instead, we should start thinking of University degrees as including permanent maintenance contracts.

There are many more ways for a University to use its duty of service to society as a platform to materialize its knowledge management. In this chapter, we present our study on different processes that offer Services to Society and our contributions in designing and developing the corresponding models for Knowledge Management.
6.2 University Knowledge Forums

6.2.1 Science Forum

We have the following Departments in Sardar Patel University:

- **Physical Sciences**: Chemistry, Computer Science, Electronics, Physics, Home Science, Mathematics, Material Science, Statistics
- **Biological Sciences**: Botany, Microbiology, Zoology, Biochemistry, Biotechnology
- **Educational Programs**: M.Sc., MCA, M. Phil., Ph.D.

6.2.2 Arts Forum

Under the Arts Faculty, we have the following Departments in SPU:

- English, Economics, Gujarati, Hindi, Foreign languages, Social Sciences, Library Sciences, Physical Education
- **Research Areas**: Gender Studies; New Literatures in English; Western and Oriental Literary Theories; Literature, Psychology, and Psychoanalysis; Indian Literatures in English and in English Translation; and Applied Linguistics, etc.
- **Educational Programmes**: M.A., M.Lib., M.Phil, Ph.D
6.2.3 Commerce & Management Forum

Under the Commerce Faculty, we have the following departments in SPU:

- Commerce, Business Management
- **Educational Programmes**: M.Com., M.B.A., M.Phil., Ph.D.

6.2.4. Service Forum

We have the following centers for extending technical services:

- Computer Centre for extending computer-based solutions
- University Science & Instrumentation Centre (USIC) for extending services on maintenance of scientific equipment, Infrastructure supporting equipment, fabrication and other services.
- University Press for printing & documentation
- University Library
- University Health Center

6.3 Knowledge Modelling in Each Department:

Knowledge Management in individual department/centre include:

- Research expertise and accomplishments that are related to the concerned department/Centre
- Educational Programs that are offered in each department/Centre
- Content Management that includes: content development, course structures, syllabus, lecture notes, PPTs, Question Bank Tutorials, management & maintenance of the content related to the area of expertise in each department/centre.
6.4 Services Required for Society

Society has educated persons, employees working in heterogeneous disciplines, unemployed youth, housewives, senior citizens, uneducated mothers, farmers and farm labourers. They all need continuous education throughout their life. Employees require certificate/orientation/training programs on the technological developments, continuous programs for enhancing technical and soft skills, certificate programs that facilitate in improving the knowledge related to new developments, programs on developing the expertise, etc. Also each sector of economy needs continuous entrepreneur development programs, knowledge sharing programs, Food & Nutrition programs, healthcare programs, social responsibility programs, programs on communication, computer technology, mobile service & maintenance programs, programs for developing driving skills, communication skills, and other orientation programs for improving the quality of life in the neighborhood. Police force requires programs on educating the masses on law and order. Revenue staff requires programs on updating the records with new technology. Law agencies & courts require orientation programs on managing the databases. Minority community needs to have such kind of programs like painting and tailoring to improve the economy of the family. Teachers in the schools & affiliated colleges require programs on use of computers in teaching-learning process. Farmers require programs on cultivation of suitable crops, expertise development on use of fertilizers, pesticides. They need programs on bio-diversification and precautions on use of chemical based products. Farmers need to have programs on making their product market ready. They need connectivity programs to link the markets. They need to know such kind of orientation programs to deal with banks, deal with markets, to avail Government promotional programs, soil testing programs, transportation alternatives, preserving processes, animal husbandry programs, and farm equipment maintenance programs. Scores of such programs are required in the society. It is the responsibility of the University to meet the social obligations.
Universities cannot confine to the four walls any more with the stated objectives of higher education in terms of offering degrees and laboratory-based research. The expertise and knowledge developed in the University can be useful in serving the society on a variety of ways to bring up the society as Knowledge Society.

### 6.5 University as “Skill Knowledge Provider” (SKP)

University can conduct Vocational Education Programs to develop skills and knowledge at different levels to provide multiple path ways between formal, vocational education systems and job markets. These programs allow the students to progress through different certificate levels at their work place. A process that facilitates to acquire a basic certificate at the beginning and serve in suitable work place and later come back and continue to get the next level certification leading to diploma level in an open ended approach. A framework of different level certifications can be offered leading to advanced level diploma/specialized certifications to improve the qualifications of individuals and developing the University neighborhood as a knowledge partner.

Some of the areas which any University could plan include the following apart from several others:

It is proposed that SKF centre(s) be established in each department in the University and interface with the Industries of corresponding relevance in Industry/ Society at large and serve the Society.

National level Statutory bodies like AICTE\textsuperscript{19, 20} & MHRD provide financial and support to implement such programs.

### 6.6 Knowledge Models for Universities

We have observed that plethora of knowledge is available in the universities which are untapped and unorganized. The knowledge lying in corners is of no use as well as value. Most of the knowledge that we are focusing on is the static knowledge that should reach the stakeholders. Some knowledge has to be gathered by respective universities and put it in a place that can be accessible from a single window by the Society.

In our study, we have explored the ways in which the universities can be the knowledge providers to the students and the society. An attempt is made to provide knowledge to the society through the Website of the University. The Website of the University \texttt{www.spuvvn.edu} is the outcome of this research. The website was designed and developed under the guidance of the researcher. We have tried to incorporate the set of features that will be helpful to the stakeholders. We are still working on the improvement of the Website to make it a complete Knowledge Portal.
The knowledge forums are shown on the Website of the Sardar Patel University (Figure 6.1 and Figure 6.2).

**Figure 6.1 : Sardar Patel University Forum**

**Figure 6.2 : Computer Science Knowledge Forum**
The Knowledge forums will help in transforming individual ideas into collective knowledge. For this we have provided space for static knowledge that can be gathered from the concerned departments and other ideas can be gathered through the online discussion forum. We suggest the wiki concept (Figure 6.3) which helps in sharing and gathering the ideas through a single platform. Every individual contributes his or her ideas on the wiki for e.g. http://spuknowledge.wikia.com/wiki/Computer_science. Wiki is a website developed collaboratively by a community of users, allowing any user to add and edit content. This becomes the knowledge building community of the University which helps in knowledge innovation by sharing the knowledge.

As we know, that all the faculty members may not be well-versed with ICT hence it is recommended that a separate team should be constituted which
helps in imparting knowledge on contributing to Knowledge Forums of the University.

The Industry-Academia cell would help students in preparation of information in various areas, like:

- List of researches in collaboration with industries
- Contact information of various industries
- Prospective researches that can be carried out with the industry
- Job opportunities for students at various levels
- Advisory knowledge to the students on selecting a career

6.7 Helping the Society By Improving Responsiveness Of RTI (Right To Information Act) Queries Through Knowledge Management

“RTI (Right to Information) Act, 2005” provided a gateway to citizens to access Information from organizations. For organizations, responding queries in fixed time period has become very difficult due to unorganized & inadequate information, insensitivity and ignorance of the employees towards storage and dissemination of information. Even the best-implemented Information Systems fail to provide required Information at a single-click and lack to generate, preserve and disseminate organizational knowledge. Application of Knowledge Management (KM) in this domain for improving responsiveness to queries in general and University administration in particular is the prime focus. An attempt is made to visualize a broad framework for futuristic tool(s) that fulfill the requirement of University administration. This will help to improve quality of services in shortest period of time with minimum manpower.

Generating replies to the RTI queries in a fixed time period has become very difficult, because of

- Unorganized and inadequate information.
- Insensitivity & ignorance of employees towards storage & dissemination of information\textsuperscript{[38]}.
- Incompetence of Information Systems to generate, preserve and disseminate organizational knowledge to stakeholders.

An application of KM in improving responsiveness to RTI queries is an unexplored arena, which helps to overcome above issues for organizations.

The main objective of application of KM in this domain will be to:

- Improve responsiveness of University to RTI queries.
- Prepare University for proactively publish Information.

In University Administration, tasks and responsibilities of University are divided among various sections, where each of the sections has its own Information Systems, which are not integrated or loosely coupled. The problem arises when an applicant comes with a query with RTI application form. Generally these queries are based on historical transactions with various views (including summarization, bifurcation, association, visible or invisible patterns, etc. and their representation using various methods like tables, charts, relational diagrams, etc.). For example:

- Summary of students of OBC category, gender wise, with their percentage in graduation that got admission in post-graduate courses in Arts faculty in your University in last three years.

- List of registered PhD guides and their students in Faculty of Management with their categories.

- List of faculty retired in the last 10 years along with their addresses
The above examples of RTI queries show that all the information is stored in various repositories of the University, but due to varieties in the context of the queries and loosely coupled & unorganized information, difficulties are faced to respond to them quickly.

KM supports the concept of ability to identify, create, represent, and disseminate the knowledge that resides within the organization\[37\]. KM also helps organizations to achieve improved performance, competitive advantage and innovation\[16\]. And that is the objective to apply KM in the domain, and if so, it will help us to integrate various Information Systems and help us to find out hidden knowledge that improves responsiveness to RTI queries. Along with the above objective, it will also help us to create knowledge other than asked, will help us to proactively publicize information. Thus, we see KM as the way to not only increase effectiveness managing the knowledge that resides in University, but also as a way to create new knowledge and thereby increase the overall value in these initiatives.

Major components of the framework (Figure 6.4) are shown below:

- Data warehouse, which is responsible for fetching relevant data after deciding context of data (based on metadata).
- Knowledge base, which will hold knowledge in machine-readable form.
- Data mining engine, which can selectively apply various data mining techniques based on the context of queries.
- Knowledge evaluation module, which is based on metadata and experience on evaluation of knowledge.
- User interface, which needs more efforts for providing user-friendliness.
The major prospects of functioning are discussed below –

The pre-processing phase (where the objective is to transform the data for mining), which has all or some of the following tasks:

- Data cleaning, here the law is in the concern, hence we have to remove noise and inconsistent data very carefully.
- Data integration, while integrating various data sources from various sections,
- Data selection, which is context specific where we use one or combination of available sources.
- Data transformation, which may be required to have summarized or transformed views.

The Knowledge Discovery in Databases (KDD) phase (where the objective is to dig hidden patterns using data mining techniques), which is the core part of
framework, where one can actually try to find out hidden knowledge from databases by applying following data mining techniques:

- **Characterization**, by application of attribute oriented induction; we may characterize or classify data. For example, we may identify the students with distinction and belonging to Vadodara district.

- **Associations**, by careful study we may find frequent patterns that refer to the set of items that appear together, that lead to discovery of interesting association. For example, a student is having ATKT in First year of B.Sc.; there is high possibility that he/she will fail in Chemistry.

- **Classification** is the way to model our data in various hierarchies. For example, we may derive hierarchies of various levels of students with various courses with their different attributes.

- **Cluster analysis** is the way to identify unknown classification. For example, we may find some interesting cluster of students who are toppers in under-graduate course with English medium but mostly have done their schooling in Gujarati medium.

- **Outlier analysis** is the way to identify exceptions in trends. For example, in a particular college where aggregate result of its students is 40-50% and suddenly it is found that it has risen to 80%.

- **Evolution analysis** is the way to describe how trend changes and evolves. For example, we may find, gradually applications for a particular courses is increasing or reducing over a period of time.
The Knowledge storage and representation phase (where the objective is to store found knowledge in knowledge base, development of inference engine – which tries to retrieve answers from knowledge base, representation & dissemination of knowledge), includes:-

- Initial representation of knowledge in the form of tables, charts, etc. in a knowledge base.

- Dissemination of knowledge according to its level & applicability (for other than RTI applicant).

In the development of the above framework, we suggest the following tools. However, the selection of software tools can be the developer’s choice.

- Java, for programming.
- MySQL, for database.
- JasperReport, for reports.
- JFreeChart, for charts.
- JBOSS application server.
- Linux platform.

This system once developed can be accessed to the knowledge portal or the Website of the University.

### 6.8 Conclusions

Universities are devoted to train their students on campuses, carry out research in different fields but at the same time forget to provide support services to the students and the society. The Universities have now to think beyond the walls of their campuses in order to help the students and the society. The type of education the Universities are providing to their students is sufficient to help
the society during natural disasters, or for improving pollution control, or for other purposes. Universities can contribute through their faculty & students, as well as through the research and teaching for the betterment of society.

In this chapter, we present our study on different processes that constitute services to society and our contributions in designing and developing the corresponding models for Knowledge Management. RTI queries have become very frequent affair in the Universities. It consumes lot of the time of the University staff to answer the queries although the answer lies in the available repositories of the University. Hence a framework is proposed which will help to improve the responsiveness of the RTI queries.