IT Based Knowledge Management for Institutions of Higher Education : A Need

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Technology makes a system more convenient and efficient But, for transforming tit-bits of data into information, the modern researcher needs tools, that can filter the loads of information for any significant professional use. These tools become all the more relevant in the knowledge based society of 21st century, where all round socio-economic development of the country is aimed to be achieved by adoption of the most recent technological and informative tools, of which, management and computerization are the prime components. These advanced tools have already proved their utility and usefulness in various industrial and business sectors of the society and also with the passage of time, society has very harmoniously responded to their usage by absorbing them into its day-do-day activities.

Pertinent to the issue is the fact, that various technologies have converged, rather blended with each other so well, that information has become quickly accessible in a very cost effective way and thereby adding an additional dimension to its usage. With respect to the Indian Higher Education System, education at the pace of the learner and at the 'space' of the learner (through internet etc.) is a vibrant example of the same. In fact it would not be out of place to observe that the merger of various advanced technologies has brought about an information explosion, the extent of which at times, tends to leave even a literate person flabbergasted, due to his inability to cope with the abundance of information that is doled at his disposal, due to these modern interventions.

Indian Institutions of Higher Learning, therefore, need to bear in mind these impacts while attempting to accept the modern management and computerized interventions into their systems. They have also to be aware of the competitive pressure engendered by the various technological advancements *vis-a-vis* the options and opportunities they present in terms of accessibility, costs, speed and benefits and at the same time appreciating that these modern initiatives, shall very soon question the existing policies besides providing institutional mechanisms, new ideas-online (Powar-2000).

Indian Higher Education System

In the 50-odd years since India achieved independence, its higher education system has undergone a remarkable transition from an elite system, having deep colonial roots, to an egalitarian system striving to meet the aspirations of a vibrant democracy (Powar-1997). The number of university-level institutions has gone up from 18 in 1947 to 252 at the beginning of the third millennium and touching 273 by Dec.2003. At the same time the number of colleges have increased from 591 to over 10,000 and of students from 0.2 million to about seven million. Today, with over 300,000 teachers the Indian higher education system is the second largest in the world. About 88% of the students are in undergraduate programmes in the liberal arts (Arts, Social Sciences, Science and Commerce). Enrolments in the faculties of Engineering and Technology, and in Medicine are about 5% and 3.5% and in Agriculture and Allied fields about 1.5%. Women constitute about 35% of the student population (Powar-2000).

Education was a state responsibility until 1976 when it was brought into the "concurrent" list of the constitution of India (and that *inter alia* gave more powers and responsibilities to the union government). Higher Education, administered largely through 'Universities' (bodies with perpetual seal and authorized to grant degrees) are therefore established by the union or state government (though now private universities are also a legal phenomenon) and are funded largely by funds through undergraduateC or state governments ,union and state governments together invested about 3.5% of the national income on education (Tilak, 1998), which is committed to be brought up to 10% now.

Higher Education in India is offered by a variety

of universities and similar other institutions. Structurally they are classified as follows:

1. ***Unitary Universities***	The ones confirmed to a single campus with provision for both, undergraduate and postgraduate instruction, with emphasis on research viz. AMU, BHU, JNU etc. A variation of unitary University is a city University which has constituent colleges viz. University of Allahabad, MS University of Baroda etc.
2. ***Affiliating Universities***	These generally have a central campus comprising of departments. or schools that impart postgraduate instructions and conduct research. They are characterized by having a variable no. of colleges affiliated to them and spread over a number of districts (in accordance to the jurisdiction of the university) to look after largely the undergraduate education (and postgraduate classes duly in selected subjects), viz. Calcutta University, Mumbai University, etc.
3. ***Deemed-to-be-University***	These are such institutions, that are conferred the status of a University by virtue of their long tradition of teaching or Specialization and Excellence in a particular area of knowledge, viz, Tata Institute of Social Science, Mumbai, IIIT-Allahabad, etc. This status is granted by undergraduateC with the approval of the Department of Education, MHRD, Govt. of India.
4. ***Institutions of National Importance***	Are so designated through the Act of parliament and as a special case are empowered to award their own degrees, privilege normally granted only to Universities, examples of this kind include IIT's etc..

At grass root level, the Higher Education in India is however imparted through 273 such University level Institutions, which besides falling in either of the above four categories, are classified as below (University Handbook-2002):

Professional Universities (Total 145):

01.	Agricultural University	: 40	Of these 18 are Central Universities, 12 are Institutes of National Importance and 54 are Deemed to be Universities.
02.	Engineering and Technical	: 33	
03.	Information Technology	: 3	
04.	Journalism	: 1	
05.	Law	: 6	
07.	Medical	: 18	
	Open	: 10	
	Specialised	: 34	
	Conventional Universities	: 128	
		273	

The present growth of the Indian Higher Education system is a result of the nation's policy, adopted immediately after independence, to promote education amongst the masses. The National Policy on Education, 1986 (Government of India, 1986) visualizes education to be:

- A process of empowerment, which is to be promoted through the development of knowledge, skills and values (Education for Development), and
- An instrument of social change that provides means for upward economic and social mobility (Education for Equality).

Hence in the Indian Higher Education scenario, provision of access and promotion of equity are important considerations. It has become necessary to balance these

against the demand for quality. And admittedly, in the whole process the latter has been the worst sufferer.

The state of Indian Higher Education has been examined by a number of education commissions and committees that have identified the major problems and suggested remedial actions (Powar-2000). However, progress towards alleviation of the problems has been limited largely because of the vast magnitude of work, lack of resources and inadequate human resource development.

The major shortcomings that have been identified in the Indian Higher Education system are:

- Inadequate access to Higher Education institutions with the worst sufferers being persons from the weaker sections of society and those living in the countryside.
- Variable quality of Higher Education in different institutions: Institutions providing education that is internationally recognized co-exist with others that can be described as sub-viable.
- The system of affiliation of colleges, followed by most universities, which centralizes decisions and discourages accountability.
- Inflexibility in academic structure, that inhibits innovation and promotes mediocrity.
- Inadequate (and diminishing) financial support for Higher Education from the government and society in general.

Information Technology

The Organisation for Economic Cooperation and Development (OECD 1987), treats IT as a term used to cover technologies used in collection, processing and transmission of information. It includes micro-electronic and info-electronic based technologies incorporated in many products and production processes and increasingly affecting the service sector. It covers *inter alia* computers, electronic office equipment, telecommunication, industrial robots and computer controlled machine electronic components software products. UNESCO 1998, however considers IT to cover scientific, technological and engineering disciplines and the management techniques used in information handling and processing, there application, computers and there interaction with men, machines and associated social, economic and cultural matters" (Shafi-2002)

The vision documents of the working group of ministry of IT, Government of India however envisages IT as "a set of media devices and services out of which proper solution can be configured, based on the needs and the affordability of the target clientele in the country" (GOI, 2000).

IT and its Role in Higher Education

From the foregoing it may though appear that the term IT means different things to different people, taking a comprehensive view, one can attempt to identify IT as a tool for efficient management of Information in terms of storage, retrieval, processing, communication, diffusion and sharing of information for social, economical and cultural upliftment.

A review of the rapidly growing applications of IT shows its potential to fundamentally alter the traditional face of the teaching and learning process, viz. through the use of multimedia, internet, etc.

Fowlers *et al* (2000) have drawn attention to the fact that "if used appropriately with powerful pedagogical approaches, IT is bound to enhance the students learning capacities, by enriching synchronous classroom activities and by providing students with an engaging, self paced asynchronous learning system. This enables students to learn more than they would otherwise at costs ultimately equal to or below that of classroom based instructions'.

IT, being dynamic in nature has a strong potential to improve and manage different aspects of Higher Education, successfully. It can bring about revolutionary changes in the realm of education, besides promoting equity, better quality and lowering the overall economics of education. Multimedia, coupled other advanced audio-visual based equipments have become an integral part of professional education, while internet, chatting, e-mailing etc. facilities have totally revolutionized the lecture delivery system for the benefit of the learners, specially from the distance education mode.

The IT based office automation and decision support system has influenced the productivity and efficiency of the Indian Higher Education management and administrative systems (Shafi-2002). While office automation products have been pivotal by processing the available bulk of data into useful information, decisions support system have contributed immensely by dealing with information to produce intelligent actions, through the logical reasoning embedded in them. As a direct implication of the same, in a Higher Education institution enrolling say 2000 students, it is possible to have the fees paid or not status per students within a second. The entire academic achievement of

students can similarly be accessed through the touch of a button. Option exercised by the students regarding the choice of their subjects, immediately enables the teaching fraternity to decide which electives to be offered and which not, besides also thus simultaneously indicating on their time schedule for class engagement. The Higher Education system administration can accordingly use the same information for deciding the quantum of resources to be allocated to each discipline, which later becomes a vital input for considering the institutional budget, by the finance personals.

The implications of the use of IT in the Indian Higher Education system are therefore undoubtedly, far reaching.

Knowledge Management

Knowledge Management is the process of transforming information and intellectual assets into enduring value (Kidwell *et al*-2000). It connects people with the knowledge that they need to take action, when they need it. And realizing this potential of Knowledge Management, corporate world has already identified it as a key to achieving breakthrough competitive advantages.

Starting with the data raw facts and numbers, Information is looked upon as data put into context and thereby making the data useful. However, only when information is combined with experience and judgment, does it become knowledge. Knowledge includes the information generated by the use of data, through the insight and wisdom of employees. And therefore, once we have knowledge, it can be put to work and applied for decision-making.

Knowledge originates in individuals, but is embodied in teams and work processes of the organisations. It in fact exists in all core functions of an organization, as well as in its systems and infrastructure.

Effective Knowledge Management programs therefore tend to identify and leverage the know-how embedded in work, with a focuson how it will be applied. The challenge in Knowledge Management is to make the right knowledge available to the right person at the right time for assistance in the right kind of a decision.

Knowledge Management and its Role in Higher Education

Knowledge Management concept in education makes eminent sense - a wonderful combination of good intuition, practical know-how, and a feel for what might be best described as an asset of emerging theories focusing on the effective management of knowledge in higher educational institutions. Along the way, Knowledge Management in higher education supplies us with a framework for understanding how good assessment practice, in fact, depends on effective information system.

Assuming simplistically, that Knowledge Management applies systematic approaches to find, understand and use knowledge to create value, one has to also appreciate Knowledge Management as also the formalization of and access to experience and knowledge that creates superior performance, encourage innovation and enhance customer value. And while therefore, commercial organizations are developing their knowledge repositories, Higher Education institutions also appear to be interesting organisations for application of Knowledge Management.

We may however, also say, that Institutions of Higher Education have always managed and in fact, managing and sharing knowledge has been their *raison d'etre* (Kidwell *et al*, 2000). And it has been since time immemorial that Universities and other Institutions of Higher Education have employed researchers and teachers to create and disseminate knowledge, maintained libraries to store and codify knowledge, besides enculturation the students and scholars into the ways of continuous learning.

If however that is the case, then the Higher Education Sector should be replete with examples of institutions that leverage knowledge to spur innovation, improve customer service or achieve operational excellence. The reality however is that though some examples exist, they are the exception rather than the rule.

In view of the present Indian scenario we therefore believe, that Knowledge Management initiatives can benefit the Indian Higher Education System because:

- The institutions usually possess a modern information infrastructure:
- Sharing knowledge with peers, friends and scholars is very natural for teachers.
- Accessing knowledge from available sources as fast as possible is a natural desire of the elite academia and students, associated with this environment.

Need for IT Based Knowledge Management in Higher Education

In the forthcoming years higher education is

destined to play an important role in the progress of nations because socio-economic development will, to a considerable extent, depend upon the capacity of humans to first convert information into knowledge and then manage the same, for societal upliftment. It is therefore, essential that in the coming 'knowledge age', Higher Education systems be dynamic and the ones having the capacity to adapt themselves to the constantly changing needs of a knowledge-based society.

In view of the foregoing, it therefore appears that in order to contribute something original for the benefit of Indian Higher Education system, it would be most appropriate to choose a theme as would attempt to innovate on the existing practices and culture of the prevailing Higher Education system besides intending to inflict a change in the overall economics of education, apart from making the present system more functional, live and vibrant.

It is further worthwhile to observe that the 366* dissertations submitted for the award of PhD degrees on Higher Education, to various Indian Universities and other institutions of Higher Education during the last decade of the second millennium , can broadly be grouped into seven categories as follows, *(Powar-2000)*:

i. Growth and development
ii. Access, equity and environment
iii. Teaching and Learning processes
iv. Academic restructuring and innovations
v. Policy making, planning and management
vi. Economics of Education
vii. Educational Psychology

*(*The number could be a bit higher, as some awards may not have been reported to AIU, the source of this data)*

The allocation of the dissertations to different categories is rather subjective. It is based on a scrutiny of the title only. Some dissertations may also cover more than one aspect. Fig. 1 however, provides an idea about the trend of research and the preference regarding choice of subjects by research students in Indian Universities.

It is also evident from the same that there is a general preference to take up for investigations in topics on educational psychology (21.85%) and teaching and learning processes (26.78%) with those on access and equity (15.30%), policy making, planning and management (12.84%), and growth and development (11.47%) also attracting students. Students are apparently not drawn to the themes of academic restructuring and innovation (6.28%) and the economics of education (5.46%).

Further, as is evident from the literature survey, Information Technology and Knowledge Management have today emerged as mission critical tools, from the principles and initiatives of which, the Indian Higher Education system stands to gain primarily by :

- Adopting them for being taught in an appropriate program of study.
- Using them for management decision support, to smoothen the internal document management and thereby increasing the level of information accession and also knowledge sharing and dissemination.
- Using them for ushering in a qualitative change in the educational process itself.

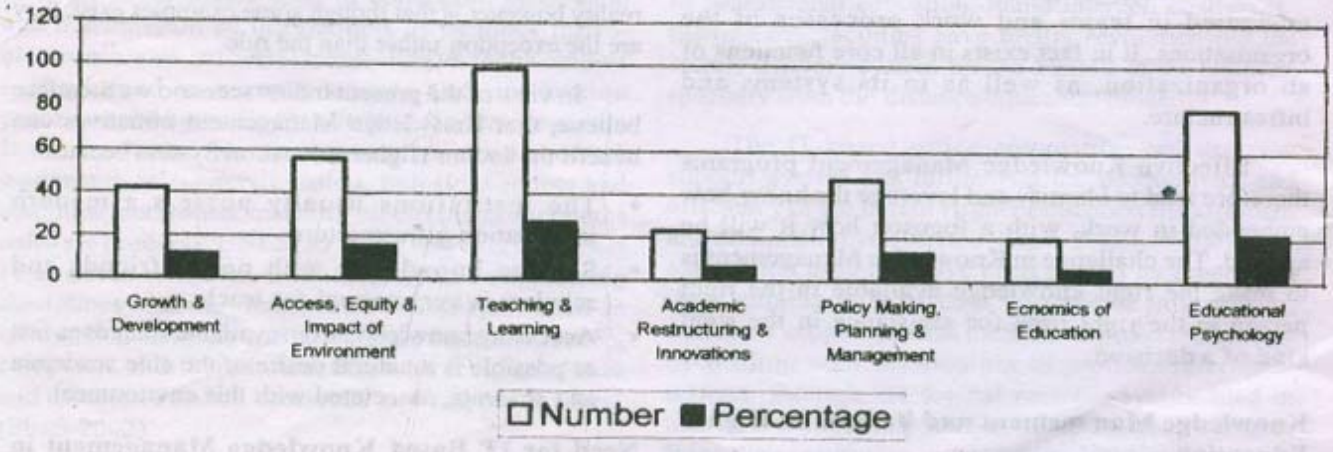

Fig. 1 : Areawise distribution of Ph.D dissertations on Higher education awarded by Indian Universities during 1990-99 (Power, 2000)

Cursorily, though it seems that out of the probable avenues stated above, the decision support mechanisms of the management of Higher Education institutions shall benefit significantly by the implementation of principles and methods of IT based Knowledge Management, the use of such advanced tools to restructure the existing Higher Education System also merits a look, specially in the environment when demand for Higher Education is increasing and the resources availability is being seriously challenged and questioned.

The primary benefit of the IT based KM is that it actively addresses both, the Technology culture as well as the Information culture, at an institution and seeks to advance both simultaneously. Both of them are unique to the organisational context of Higher Education Institutions. The Technology culture can be thought of as an institution's use and integration of technology, in planning, development, operations and assessment. For instance, do teachers have access to computers in their classrooms? Can they track detailed day to day assessments in routine ways? Do academic counsellors have online access to previous student interventions? Are rank and file staff encouraged and provided with training to learn how to use new Software and Hardware?

The information culture on the other hand is distinct from what has become known as information system. It involves processes for sharing information within and across the organisation viz. who possesses information? Are their incentives for an effective means for sharing vital information to improve performance? Does the principal at the school use data in determining the need for specific programs and interventions? Does the Senate of the institution ask for relevant data and information when a Dean requests for a new program or an increased budget? Are new faculty and staff provided with the information they need to perform their jobs? (Petrides et al-2003)

In the same context, Kidwell *et al,* 2000 have attempted to present a list of probable avenues in Higher Education System, which can be taken up to be looked into in the typical Indian Higher Education System context. These include, areas such as Institutional Planning and Development, Institutional Research Activities, Curriculum Development Process, Institutional Administrative, Financial and Accounting areas, Student activities, etc. A case study to identify and prioritise various such aspects from academicians as well as academic administrators point of view shall therefore assist in developing a checklist-cum-priority list for the policy makers to respond to the needs of the society better.

Conclusion

The need of IT based Knowledge Management initiatives therefore makes a strong case for further exploration with a view to look upon them as potent enablers for restructuring the existing Higher Education System in India, which may also cast a serious impact on the overall economics of running and maintaining the higher education system in India.

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