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WHO SHOULD MANAGE INFORMATION TECHNOLOGY DEVELOPMENT IN UNIVERSITIES?

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Abstract

The paper argues that Information Technology Development in a university, research institute or organization whose mandate is not electronics, computer hardware- software development and research is not purchase of computers, establishing networks and doing research on those aspects. It is mainly application of Information Technology to improve speed, efficiency and quality of activities which are the institutes mandate. Hence Information Technology should mean there the convergence of information recorded in traditional and digital media, their storage, organization, retrieval and dissemination and application of computers, communication systems and other tools for these functions. These are the functions traditionally undertaken by library and information science professionals. Information or content which is to be the blood, is to be pumped by the heart which is library. Hence the paper establishes that in forming Information Technology Strategy and in Information Technology Development in an institution the major role is to be played by librarian who is responsible for managing information of that institution.

1 WHO SHOULD MANAGE INFORMATION TECHNOLOGY IN UNIVERSITIES?

Information Technology denotes here the convergence of information recorded in traditional or digital media, and the tools like computers, telecommunications, electronics and many more things for information/knowledge storage, organization, retrieval and dissemination developed mainly in library and information sciences and the resulting technologies. The high availability of goods and services in IT market, needs to be addressed as a more central issue in management thinking and work organizations than ever before.

The financial aspects of IT have become a critical management responsibility and focus for attention in organizations. IT is of capital importance in a deeper sense also. This is its large potential impact on organizations. How IT is applied can have massive implications for how an organization function can be structured, what it can achieve and how, changed ways of working, improved quality, speed and effectiveness of operations. Many universities and organizations in developed countries are already highly dependent on IT. This demand priority attention from those responsible for managing universities and other institutes. Information-based assets and the capabilities they offer, embodied in people, technology and/or their combination may well form a core competence in many organizations, producing ways of differentiating the organization in terms of both offering and performance.

One meaning contained in the phrase *information of capital importance* presents itself. Given the large and rising expenditure on IT and its potential critical importance, clearly the evaluation and control of IT investments become a vital management task. There is a more fundamental issue that arises at this point. IT is used here mainly to refer to the supply of information-based technologies. What matters however is how IT becomes translated into Information Systems (IS), that is organizational applications, more, or less IT based ,delivering on the information needs of the organization and its beneficiaries in the society. It is the evaluation of Information System investments that becomes of capital importance. It is reinforced still further when the evidence on all issues of information management strategy is taken into account.

2 PRESENT SCENARIO

There is a lack of understanding of IT as a major capital asset in universities and other organizations. While the annual expenditure on IT may receive detailed attention amongst senior managers as well as IT directors, there is little awareness of the size of the capital asset that has been bought over the years. IT and the information asset, it underlines are merely seen as a balance sheet item, a fixed asset. Too often IT is seen as an expensive, and treated as one. If the cost of accumulating such a potential asset is more often understood, an information asset may well be less under managed than they are at the moment. Clearly, improved evaluation and control again have rules to play here in bringing the critical issue of the cost of IT/information assets as well as its potential value, to detailed management attention.

Information Technology application and Information Systems are, at present areas where serious misappropriation and wastage of resources occur in our country. People become helpless and strategic decision goes wrong due to intelligent manipulation of things by vested interest groups. Irregularities and misappropriation of funds are never unearthed or clearly understood. It is an area haunted by corruption and technical people are not bold enough to offer their know how or recommend correct decisions.

What is an information system any way? An Information System is defined as a set of interrelated components working together to collect, retrieve, process, store and disseminate information for the purpose of facilitating, planning, control, coordination, analysis and decision making as well as education, research, extension and development in organizations and institutions. Information Systems contain information on people involved, research work done earlier, works in progress, their findings, the institution's records and many more things that the organization will need for its further activities. Information Systems collect this, organize it in a scientific way, re pack them in a usable way if essential and supply required information or document speedily and effectively as printed document or through electronic methods.

This activity was there for thousands of years. The only difference was earlier information was recorded in tablets, paper etc. The work was done silently by librarians or non professionals called record keepers archivists etc. But when printed book became a commercial item people came forward to undertake purchase or selling, pushing back the librarian to become their store keeper who is to receive the blame for not having materials of use in his store. But gradually, librarians established their role. But then came the next explosion which was beyond their capabilities to defend. The information digitised, books in computer readable media, storage and distribution through computers with the highly competitive market for digitised information and equipments and systems for storing, retrieving and distributing them. Again many claimants have come to the scene to undertake library and information scientists' responsibilities. It is a common argument now in university and educational institutions that information is something different from a library. Only if that could be established one can divert the allotments for information system development away from the library; which is the information store managed by information professionals. What is the role of library then? I have once while presenting a case for vitalising library

services at a high level committee faced an eminent scientist who asked me not to stretch libraries' role to information service areas which were one of the dirtiest instances I have faced in my professional life. He has directly told at may face that librarians role is maintaining the stock of books and distributing it and hae has no role in academic matters and I was included in that committee by some mistake and he opined that the committee do not want to hear anything more on information services and information system development the responsibilities of which legitimately can not be assigned to libraries. You can see people using crore and crore of rupees in the name of information system development. Yes systems have come and found a place there. Servers, hubs, satellites, cables, and many more things. But information is not there. With a one crore worth materials they installed for information system if they need any information they have to come to you the librarian who is sitting around a traditional collection dumped into a room or rooms in the remote corner of the building of a research institute or dark dusty dirty, halls of a big university library or in a college without sufficient space and staff. Some times they would have been kind enough to give you one of the 486 computers which they throw away. You would have automated your catalogue which helped to find his document speedily. If you know the technology better than him and is bold enough to question the appropriateness of the systems built up., you will suddenly find out that there is nothing more suicidal than that for your peace in life and the safety of the job in which depends your rice. For IT is a multi billion business and no one knows what is what and those who know things and can do something are to be silenced for the sake of those who currently are interested to deal it in educational and research institutions which are not special institutes on electronic and communication or have specialists on those areas.

3 INITIATIVES UNDER ICAR

The major groups at national level supporting IT applications in institutions are UGC, ICAR, AICTE, ICMR and Planning Commission. Of these; Planning Commission has under it a division specialising in Information Technology; National Informatics Centre and it manages the system and network at national, regional and institutional levels. UGC has formed a special institution for IT management named INFILBNET with Library and Information Science professional and computer and communication specialists to run the show. Under ICAR stream the IT is managed mainly by user group comprising agricultural scenists in an informal system named ARIS.

The advent of Information Age has thrown open new challenges and opportunities for Indian Agriculture. Agricultural development in the country is faced with new challenges on food, nutrition, population and environmental fronts. Vastness and diversity of our agriculture is reflected by the fact that it caters to incredibly diverse habits and practices of almost 70 crore of our agrarian population, living in six lakh villages, cultivating 184 million hectares of land broadly demarcated into 20 agro-climatic zones and harnessing 2.02 million km2 of Exclusive Economic Zone spread around 8,129 km long tropical coastlines. The new World Economic Order and globalization of markets call for prompt and efficient infrastructure, better resource management and competitiveness of existing agricultural production systems. ICAR has recognised that Information is vital to fulfil these dictates of time and that quick access to information level through electronic media can provide the way to tackle future challenges of Indian Agriculture

In this context a major initiative of Agricultural Research Information System (ARIS) has been taken by ICAR in order to modernise and bring information management culture in National Agricultural Research System (NARS) equipments and facilities for the basic infrastructure required for linking all ICAR institutes and SAUs has already been acquired under National Agriculture Research Project II and distributed for by creating LANs and providing E-mail connectivity. Many of these institutes/SAUs have been provided with VSAT connectivity using NICNET and ERNET services. The aim of ICAR is to connect all the sites catering to agricultural research, education & extension so as to provide easy nation-wide

access and international linkage through Internet to all concerned. A substantial support of about Rs. 200 crore per year has been earmarked under National Agricultural Technology Project (NATP) to meet above objectives

The goal of the ARIS is to strengthen Information Management Culture using modern tools within the Indian NARS so that agriculture researches become more efficient and effective. The major objectives are: to put information close to the managers and scientists, to build the capacity to organize, store, retrieve and use the relevant information into the agricultural research infrastructure, to share information over NARS and to improve the capacity to plan, execute, monitor and evaluate research programs.

The Agricultural Research Information System (ARIS) came into being in the terminal years of the eight plan and the beginning was made by providing bare minimum hardware and software to 49 ICAR Institutes, 10 Project Directorates, 27 National Research Centres (NRCs), 28 State Agricultural Universities (SAUs) and 120 Zonal Research Stations (ZRSs). This support would have enabled these institutions to get electronically connected and provide E-mail facility for all the scientists working in these institutions if the support would have been cleverly utilised. All the SAUs could have created Campus LANs that would connect all the buildings at least in their main campus and all the computers existing in the main campus to the Internet through one of the more than on Vsats they have secured.

The ARIS has four information modules namely; Agricultural Research Personnel Information System (ARPIS), Agricultural Research Financial Information System (ARFIS), Agricultural Research Library Information System (ARLIS) and Agricultural Research Management Information System (ARMIS). In addition, training and Agricultural Research Information Centre (ARIC) are integral part of the over all effort.

ICAR under ISD component of National Agricultural Technology Project (NATP) provided financial support to the tune of 131 crore for information system development programmes in research institutes and SAUs. Under this programme hardware items were provided for expansion of electronic connectivity of Agriculture Research Information System (ARIS), initiated under NARP II, down to divisional level within all ICAR Institutes. This is intended to; provide to scientists access to worldwide web, link all SAUs with their ZRSs, and develop electronic linkages between and amongst the concerned units of the Directorate of Extension (DOE) and MANAGE. The electronic connectivity will have to be extended to the extension units at the State and districts participating in the project. The project will finance consultancies, training for staff including new computer users, and workshop costs associated with setting up the expanded system and its operation.

ICAR has extended all support for development of Library Information System: Using the enhanced connectivity made possible the project is expected to improve on-line access by Indian scientists in the ICAR and SAU systems to international databases and scientific literature held centrally within the country; new databases on Indian agricultural and socio-economic research and development to be created with project support; and external databases accessible through the world wide web. Funding will also have to cover subscriptions to some technical and scientific journals; the acquisition of reference material and abstracting journals in CD-ROM format to be made available through ARIS and a number of remote-access CD-ROM readers; and consultancy and training support for modernisation of the library systems and procedures. Four major national research centres are proposed to be equipped as hubs for the strengthened library and information system. In addition, a selected number of central research institutes and SAUs will be linked to the main libraries. The project will support establishment of a network of library information system specialists and provide training in library information systems. These improvements are to be executed under the overall guidance of the information System Development (ISD) cell in ICAR.

The major work to be done under ISD component is information developments which naturally is to be based on library systems. High Level Executive Committee for ISD Component of NATP consists of DG (ICAR), DG(NIC), DDG(Eng.), ADG(ARIS) and other related officers but no expert from Information Science field or Content Management field is available in it. ICAR has called for converting the existing information into knowledge base. ARIS cell in-charges have to take responsibility as a nodal officers and get catalysed to adopt the IT revolution in big way. But there is no standard that prescribes that ARIS Cell in charge should be and Information Professional or Electronics and communication professional. Even if these experts are available they are not consulted or kept aware of the developments while implementing ARIS in institutions. Why should amateurs entrusted with this work when professionals are available in these institutions and why should these programmes be assigned to other departments when departments responsible for providing information services exist and it is their legitimate area of activity also.

ICAR considers that two cradles of IT implementation are institutional capacity building and Human Resource Development. The support to the SAUs has been recently extended up to divisional/departmental level in each of the colleges. Converting the existing conventional information base into electronic databases, data warehouses and ultimate knowledge bases is a challenging task to be managed by librarians. This is an acid test for the ARIS to take responsibilities of establishing and extending the electronic connectivity through LAN on priority basis and train more and more people to make best use of the facilities provided under ARIS programme

Even though ICAR has released grants to SAUS and institutes which is sufficient for putting on the net all the information generated by these institutions and provide a 24 hour dedicated communication link to libraries of all these institutions if you examine the results it will be embarrassing. Non of the libraries under ICAR is available for online access. There is no library having a Vsat of its own or dedicated 24 hour connection provided to access it. Of the Educational and research institutions to which ICAR has provided this huge support; 90% of their libraries still do not have even an ordinary Internet access or E-mail connection during the office hours at least. This is something which is to be taken very seriously. Even libraries which have digitised collections due to initiative and enthusiasm and opportunities provided by chance were found to be denied connections and kept away from getting exposed. Communication equipments like Vsats were acquired and kept unused or merely for the utilization of one or two scientists, while building LANs servicing with information were functioning nearby without communication links. Scientists are unaware of the facilities unnecessarily denied to them. Decision makers are ignorant of the power of the technology allowed to them and they take foolish decisions based on the amateurs who distorted facts to protect their vested interests.

4 STRATEGIC PLANNING OF IT

All the problems in IT development discussed earlier as well as the problems that prevented from getting optimum results from the huge IT investments done in agricultural education and research institutions as well as in many other organizations points to one important factor. IT should be managed by people having specialization in Information Management and IT management. It is not something to be handled by amateurs. Funding agencies like UGC and ICAR should strictly monitor IT projects they have supported and the institutions should formulate IT strategy in adherence to their directions or standards as well as IT management should be entrusted to units which manage information or information science, electronics or communication people at the managerial level in the institutions.

Formulating a strategy for Information Technology (IT) is essential for the optimum utilisation of the resources spend for information systems as well as the information resources available which will in turn result in the effectiveness of the functioning of the university or research institute. The importance of

strategy formulation for Information Technology can be achieved only when its technological issues are viewed in a wider context of the university where they are to be applied. Forming an overall information system management strategy will cover information systems and information management as well as technological strategies all of which are to be considered together. Preparing an integrated information management strategy brings into consideration. three main issues; Information Technology, Information Management and   Information System. These three aspects together form an integrated strategy on Information handling in an university or research institution. If we examine the above factors in detail we can understand that their dimensions, their subsystems etc. are not similar. But the management and cultural and organizational dimensions cut across them

5 IT AND QUALITY IMPROVEMENT

IT's contribution to quality improvement, efficiency and effectiveness of higher education and research is a widely accepted fact. The elements in educational and research system that can be highly influenced by the use of information technology can be listed as; quality improvement, avoiding repetition, up-to-datedness, cost effectiveness, effective teaching, convenient learning, variety of support services, operational feasibility and improved management.

The possibilities offered by IT for transfer of information has now made learners to question the obsolete methods and outdated contents of courses offered, as well as research projects suggested from above which indirectly affects quality improvement in education. Educational and Research systems are made up of a variety of functional activities. They are information technology, library provisions, teaching, research, extension, development, finance, personal policies etc. which are crucial. Ensuring co-ordinated strategies to support these aspects of an university is of significance in preserving a healthy academic environment over time. Alternative option to academic administrators is to operate on a day to day basis with little strategic support to their decision making. This will result in short termism which is divisional or localized sub optimal policy which has a risk of failure in long term. An examination of the functioning of our universities can show that they lack strategic thinking. They are administered by political opportunists who are appointed for a very short term. Even second level managers like university librarians who have to develop and manage information resources and other facilities worth crore and crore of rupees are short term or contractual appointees in most of the universities and they hold their posts till the vested interest groups are kind towards them. Staff, students and public had no say until it will be too late. In many universities we can see such inefficiency, and loss of investments which have resulted from the failure to plan long term and to appreciate the wider context in which information technology should be managed.

Information technology related strategies are very important requirement for education and research management policy for the survival in a world in which tons and tons of knowledge products are out every nano second. The need for co-ordinated strategic thinking should pervade in a university's administration and should be applied as much as to other domains as to library and information system management and technology. Teaching methods, research projects, library and information services, personal, finance, and organizational strategy should be developed parallel to IT strategy if there is to be a balanced development. There will be no result oriented system without a strategy. But despite the fact that information and the document holdings of the library form part of the most vulnerable assets of a university or research institution, they are frequently the victims of ad hoc planning and piecemeal development rather than being incorporated into strategic thinking. Perhaps with the present concern and enthusiasm in education and research systems for Information Technology; various information systems have been established. But the support provided under these programmes for information system development never reach libraries. But INFLIBNET, ERNET, ARIS etc. are founded on a realization that coordination of

information, its acquisition, organization, dissemination and utilization are crucial to an educational or research system's timely response to developments and changes going on all around.

6 COMPONENTS OF INFORMATION SYSTEM

There will be bidirectional relationship between Information Technology (IT), Information Management (IM) and Information System (IS) Strategies which are the components of Information Management Strategy. In different universities or systems different plans will be there. In some decision making will be from top down. i.e. IS to IT. Requirement are intimated to IT managers from above without considering the benefit of system integration, use of new technologies and development of long term architectures. In some other universities bottom up initiative can be found. Initiative and control of IT development plans are kept to the unit by Library and Information Systems and the higher level is concerned only with budget approaches. A balanced scenario in which top down initiatives are mixed and combined with technical initiatives, innovation and bottom up service development where a continuous exchange of views takes place is more advisable.

There are many situations where the IT function is fully integrated into the planning process. It can significantly influence the quality of research and education of a university as well as its position in the national development. This may be through the timely availability of information on current research, efficient processing and speedy dissemination made possible by the information system. The relations between information system and information management components and between information technology and information management components are to do with the issues of absorption of policy directives into the organizational structure, cultural impact and cultural constraints on new systems and the impact on and the impact of management in the university. Relation of information system to information management involves consideration of the impact of application systems on organizational topology/ management relationships and roles whereas IT and IM interact at the level where Information Technology and Information Technology functional area are itself folded and incorporated into the organization.

7 INFORMATION TECHNOLOGY

IT Strategy will describe the operational imperatives of Information Technology Department. In universities IT Departments should be in modernized library and information services management units. It will be concerned with the heart; the information/ know ledge resources, the engine, and the services or products it generates, and the mechanisms that lie behind them. It includes consideration of the communication systems for access and down loading information, digital storage facilities, packages for organizing and managing huge quantum of information, search engines and normal computing and data processing facilities and application programs which are essential in all departments. Issues involved in IT strategy formulation are complex. Here also the exercise has to go beyond university library boundaries for completeness. Technology in turn, security and the channels of communication with users are all integral parts to be considered.

IT strategy is also deeply concerned with content or information which library and information systems have to manage , its definition, its flows, utilization, value, availability and security. It is strange that the content, its characteristics and usage is so casually considered and handled in most of the universities, research institutes , not to say in so many institutions whose concern itself is IT. Even though ARIS program has distributed more than 200 crore per year not even a 5% of the amount was utilised for information development or for digitising libraries by the receiving institutions. Reports generated by Management Information Systems support many executive decisions. These may be operational decisions, decisions on academic and research programs, development decisions, budget etc. Even though

all that may affect an university's standing or repute there is frequent evidence of inconsistency in data definition, and presentation and storage of this basic resources which underlies and underpins the reporting system that contribute to university's success or failure.

In most of the university's there is a tendency to identify IT strategy, with computer purchase considerations of hardware manufacturers, software developers, OS, communication protocols and other technical matters being at forefront of management planning. To utilise funds under ARIS and other IT projects some universities including agricultural universities have formed Directorates of Information Technology, computer Science etc which shows in what sense they have taken ARIS. Development of Library and Information services at these institutions and providing of staff for that at most of these institutions are pending for decades. ARIS is not intended for developing special departments for purchase of computers or research in hardware, software etc. These are not the mandates of these institutions also. ARIS support is for information system development and for application of IT for that as well as agricultural education, research and extension activities. They are important but they are only tools of the system.

8 MANAGEMENT STRATEGY

The existence of an information management strategy gives long term confidence in the direction of development. It enables support for long-term educational research and development goals and targets. Information management strategy enables cost-effectiveness measured over a long term and stability in infrastructure of the university or research institution and its operations. With a strategy; development is not limited to short term. It goes on as continuing incremental improvement of systems, services and operations built on a secure base and a solid structure.

In the process of developing information strategy information component should be well understood if benefits are to be derived from that. Otherwise results can be negative. A misdirected information management strategy based on insufficient analytical work lacking realism or narrow in its genesis but too broad in its application, and without involvement of library and information science professionals, can cause conflicts of interest, confusion and disaster in the long run. An information technology strategy is well developed when the process is linked as should be the outcome with other management strategies of the University especially library and information service management strategy which is to form the man component.

Information technology and its application in an university is wrapped up in the wider issue of information systems and information management. IS and IM may be more or less IT based. In strategy evolving we have to recognize and apply our self to a whole range of factors which ensure optimal choice of target applications impact on the choice of successful applications implementation, and provide the chance for the long term realization of the chosen developments. Hence a framework and an understanding of the scope and aims of the strategic planning exercise by librarians, information scientists and all others who are involved is essential.

Study of strategy formulation gives an understanding of the exercise we have to do, a frame work for the application of real and worthwhile analytical techniques that are both top down and bottom up in their approach. They can give a checklist for the practitioner. They can point out the interaction between conventional IT domain and the users that should be studied and managed in the migration process from the system concept through to implementation.

By determining strategy for an IT system, the hardware architecture, the communication facilities, application priorities, data definitions and so on one is not by that alone presenting a comprehensive strategy for the handling of corporate information systems. There are many things more than that. There will be an

overlap between IT application selection and the need to support university's objectives. There will be a clear and acceptable projection as to the pay off, the return on the investment or the pay back period. In the initial phase of IT evolution benefits are of the immediately obvious. As the impact of IT becomes more percussive and systems becomes more sophisticated benefits begin to be questioned. IT strategy becomes essential if proceeding with IT is to be justified. As university achieves success with IT and IT begins to impact and also underpin, it be comes critical and even the most important factor supporting university's activities. It will be come a critical aspect to; achieve marginal increase in efficiency of organization, teaching, learning, research extension, development and all other activities and function.; avoid costly disastrous or misfortunate discontinuities either in the processes, technological upgrading or communications; introduce up-to-date course content, methods of teaching, research projects on aspects essential for the community etc. without the technology being a constraint and ensure quality of education and research and systems alignment.

In an University that has not experienced in any depth the potential of IT opportunities development at the initial stage can give high motivation and an exposure to the advantage of IT. But when university reaches IT maturity advantages will reduce. Strategic planning of information systems avoids need for beneficial chance elements for success. In strategic environment one is better able to steer around some of the traditional stumbling blocks to successful implementation of information technology.

9 WHO SHOULD MANAGE IT

Important issues in information strategy formulation are who should form it, when it is to be done and how? Choice of the person who will conduct the formulation exercise is crucial. Many barriers may be imposed on the manager who will be entrusted with research and strategy formulation for information system management. This may be related to his experience and expertise, rank, sphere of influence or accessibility to vital facts or opinions. This can happen even if they are higher level officers next to the Vice Chancellor or Director. If the task is to be completed successfully it needs to be managed by University Librarian or Director of LIS in universities or Deputy/Asst. Directors of Library, Information and documentation Divisions in research institutes or some one with a broad range of competence similar to them who has wide access in the University at all levels. In India Nagpur University and some others have accepted this fact and are far ahead of others in IT implementation.

If a competent librarian with good exposure to developments in IT is not present in the system and can not be made available immediately a consultant with specialization in library and information science from outside the organization can be considered though such a person can never be a substitute for the University Librarian or heads of library/documentation divisions. Many unexpected problems can restrict the scope of the strategy in broader context. The reasons can be poor' choice, inability of Librarian or manager' terms of reference etc. and lack of understanding at Vice Chancellor/Director level above. The complexity of university's or institute's organizational set up also will be an affecting factor.

10 FACTORS TO BE CONSIDERED

Of the various factors to be recognized as important by the person are group analyzing and preparing the strategy; information technology strategy and information management strategy. The individual or team preparing strategy should have knowledge and experience in content. The increased level of risk associated with systems investment if any not considered during strategy formulation is also important..

Broad management perspective of the activities of library and information system, as well as activities of all other departments of the university is essential for strategy formulation. This requires second level managers that is those in the level of Registrar, Comptroller, Directors whose functions cut across depart-

ment, Director of LIS, University Librarian or Deputy Directors who deal with information and documentation etc. But these managers can be least spared from their normal duties. Of these the most apt manager will be Director of LIS, University Librarian or Head of Library/Documentation Division for it is their responsibility to manage the library and information services of the university or institute. Ninety five per cent of the information stored will be under their control. It will be their responsibility to extend services across administrative subject departments under other managers of his equivalent status. 90% of the use of computers and communication systems will be to provide such services or access services of their unit. Hence Heads of Library or Documentation on Divisions are the apt persons to formulate Information Technology strategy or to lead the team managing it. They have the liaison with the executive and are members of the Academic Councils, Boards of Studies and management group of the university or institute so that the will be able to understand the need of the system and formulate it with total concept and according to the actual requirement.

The putting up of scientists or other people from lover level of some unit which has nothing to do with information services or have or required specialization will affect the university's successful existence and will also waste crore and crore of rupees spent for information technology. Strategies also can not be developed on an additional duty basis. This attitude of giving an indifferent unimportant role to information strategy can not be changed unless the people at the top who still regard library and information systems as an unimportant appendage necessitated by conditions to get grants, and it as something to be introduced as lot of funds for that can be flown in are to be educated to understand the power of information. Another thing librarians have to note is they have under go the metamorphosis into information managers absorbing current technology. If they are to retain credibility they should be able to provide solid services using IT to the scientist and students at different stages of development according to the capacity of each development stage. The aim of long term information system plan is not for delivering a fully integrated system in a prescribed period. The plan should be able to cope with short term requirements of education, research and extension, harness available possibilities and meet existing mandatory requirements efficiently for all such things. But a long delay for the fully developed information system as well as continuance of management of information system by amateurs. will also waste resources spent as well as hinder development and achieving quality and speed os development..

11 REFERENCES

1. Deshmukh, P.P . Information systems for agricultural sciences and technology. New Delhi, Metropolitan, 1987.

2. Eral, M. Management strategies for Information Technology, London, Prentice Hall, 198)

3. Evenson, Robert and Jha (Dawanatha). Contribution of Agricultural Research Systems to Agricultural Production in India. Indian J. Agr. Econ. **28** (4): 1973.

4. Hornik Robert, C. Development communication, Information agriculture and nutrition in the third world. New York, Longman, 1988.

5. Lakshman Moorthy, A. and Rajendran, V. Information technology for libraries and information centres. AGLIS Journal. **8** (1-4): 1990. 7.

6. Lion Berger, Herbert, F. Farm information for modernising agriculture: The Taiwan System. New York, Prager, 1970.

7. Livingston, E.D. Agricultural library services in Guntur District; an evaluation. IASLIC Bulletin, 37: 2, 1992.

8. Mann, Ernest, J. Focus on agricultural information transfer, <u>Academic Librarian</u>, 1 (1): 1988.

9. Mohammed Kunju, A and Raman Nair, R. Development of an Academic Database and Network. *AIU National Seminar on Information technology in Higher education*, Rabindra Bharathi University, Calcutta, 1996

10. Raman Nair, R Agricultural and Farm Information System for Kerala. At the ILANational Seminar, December,1996. Directorate of Public Libraries, Andhra Pradesh, Vijayawada, 1996.

11. Raman Nair, R. Computer application in library and information services, Delhi, Ess Ess, 1992.

12. Raman Nair, R. Priorities in information management systems for agricultural research and development in India. At the National Conference on Role of Libraries in national development, University of Calicut,1996.