An Online Management and Decision Making Resource for Agricultural Educationin India

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Abstract- **The size and the complexity of the educational system continue to expand as the population and economy grows. Educational planners and administrators have been witnessing a steady growth in the amount and variety of information that has been collected and made available to them. With this growing pressure of information revolution and knowledge explosion, the informational requirements of educational planning and management are tremendous. There are various decision-makers, like employers, planners and administrators, who are continuously engaged in the process of educational planning and management. It is important for each one of them to have reliable and relevant information they require for decision-making in education. This paper presents a solution to this problem with the development and deployment of a National Information System on Agricultural Education Network in India (NISAGENET) using the .NET technology.NISAGENET is a unified system for collection, compilation and analysis of data about the activities of the agricultural education system in India.**

Keywords- **ICAR, Agricultural Education, MIS, Nodal Officers**

I. INTRODUCTION

Agricultural Education has been viewed in many developing countries as a significant contributor to sustainable development and poverty alleviation. So, in Agriculture sector also need for improved agricultural education has been felt with the development of Agricultural Science and technology all over the world. The quality and quantity of information and data collected and processed for the planning and management of Agricultural Educational activities has been constantly on the increase.

Information Technology (IT) solutions had always been very effective and successful in such situations. Management Information System(MIS) can be used for the management of such exponentially growing information. MIS is commonly used to refer to the group of information management methods tied to the automation or support of human decision making. They provides information that is needed to manage organizations efficiently and effectively. The advantage of using IT is that time-consuming data management tasks can be performed by means of this technology and time can thus be devoted instead to communicating and informing, to the processing of information and the production of knowledge.

An MISwas needed at the national level where all institutions contributing under Agricultural Education in India were to be managed. Indian Agricultural
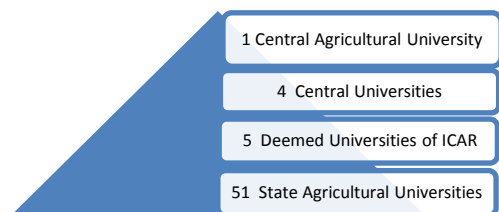


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1 Central Agricultural University
4 Central Universities
5 Deemed Universities of ICAR
51 State Agricultural Universities
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Figure.1: Organizational Structure of NISAGENET

Statistics Research Institute (IASRI) took a step ahead in this direction, by developing and deploying a system -National Information System for Agricultural Education Network (NISAGENET) for the management of Agricultural Education in India. NISAGENET was previously developed   and implemented using Active Server Pages (ASP) technology [Sharma et al. (2006)]. With the increasing demand for more decision support modules on Agricultural Education, need was felt to further strengthen and maintain the NISAGENET. It was also observed that the system needs to be rebuilt on a latest robust and more secure technology so that it remains compatible with higher versions and upcoming web technologies. Thus development of a new version of NISAGENET started using .NET framework [Farooqi et al. (2011)].

In NISAGENET, broadly Information on General & Academic information of the Universities, Infrastructural facilities, Budget provision, Manpower employed R&D activities of each and all the State Agricultural Universities (SAU) and Deemed universities of Indian Council for Agricultural Research (ICAR) is made available. The system has been designed, developed and being maintained at the Indian Agricultural Statistics Research Institute (IASRI), New Delhi. There are 61 participating organizations of NISAGENET, engaged in Agricultural Education in India. These organizations are broadly distributed amongst State Agricultural Universities, Deemed Universities of ICAR, Central Universities and Central Agricultural Universities.

The NISAGEnet is available centrally at the IASRI site at the web address: http://nisagenet.iasri.res.in/. The data entry and updation can be done online by directly accessing the Data Management Module of

NISAGENET from the Central Server. In order to provide the realistic and up-to-date reporting through NISAGENET, it is essential to update and validate the existing data and regular updating from all the SAU's along with their constituent/affiliated colleges. Under NISAGENET, 63 universities and 527 affiliated and constituent colleges are providing data into NISAGENET. Out of 527 colleges, there are 343 Agricultural colleges, 115 Veterinary colleges, 21 Fisheries colleges and 16 Dairy colleges and 32 Horticultural Colleges throughout India. For the purpose of proper data storage, management and reporting, NISAGENET has been distributed amongst seven modules. Each module is based on some important activity of the University/College. The modules are:Academic, Infrastructural facilities, Budget provision, Faculty and other Manpower, Research & Development, Human Resource Development and General Information. To make Data Management a regular activity the following facilities have been provided to all SAU's and ICAR deemed universities:

- Independent and secure User Id and Passwords have been provided to all the Nodal officers. Nodal Officers are the designated officers from each University/College for Data management in NISAGENET.
- The Nodal Officers have direct access to Data Management Module of theirrespective University/Colleges.
- A facility to the Nodal Officer(s) has been provided to create User ID and Password for their respective affiliated/constituent colleges.
- Independent data entry is made possible from the colleges by using respective User Id
  and Password.

II.SOFTWARE DESIGN

It is a process of problem solving and planning for a software solution. It includes Data Structures, Software Architecture, Interface Representation and Procedural Details. NISAGEnet has been designed as a web application which can be accessed for updating and reviewing from any node on the internet through any web browser. The Thin - client 3-tier client server architecture has been used for the development of the system. The Data Access tier was developed using MS SQL-Server at the backend. The Business Logic tier was developed using C# in ASP.NET framework. The User Interface or Presentation Tier contains web pages where data is presented to the

user or input is taken from the user.The main advantage of 3-tier architecture is to separate the presentation layer from data access layer. There is no need to write any function to communicate with database in presentation layer, all the required functions for communication with database are available in DataAccessLayer. Therefore, at presentation layer there is focus on the information that is being presented in front of the user.

III. DATABASE DESIGN

The term database design can be used to describe many different parts of the design of an overall database system. The relational model of database design has been used for NISAGEnet. The SQL Server was used for the database design, access and management. The database tables were designed following the rules of normalization and consequently the redundancy was minimized. A unique University Id and corresponding College Id were generated for all the Universities and their consequent/affiliated colleges. The Entity Relationship diagram of NISAGENET describes all these entities and the attributes considered for data storage and management in detail (Ref. Figure. 4)

IV.NISAGENET FEATURES

- Agrikhoj – A Search Engine has been developed for searching and using any information related to agricultural education.
- Directory – It is a collection of classified information on educational parameters. Search facility has been provided here to find out any important educational information related to any Agricultural University/College under NISAGENET.
- Reports / Queries – Dynamic Reports (Ref. Figure. 2, 3) can be generated for user without the requirement of User Id and Password.
- Online Data Entry/ Updating by Nodal Officers of all Universities/ Colleges.

Figure.2. A report showing Courses Offered at all course Levels in a University

Figure.3. A report showing the availability of Distance Education Programmes under the Department of Agriculture at different Universities
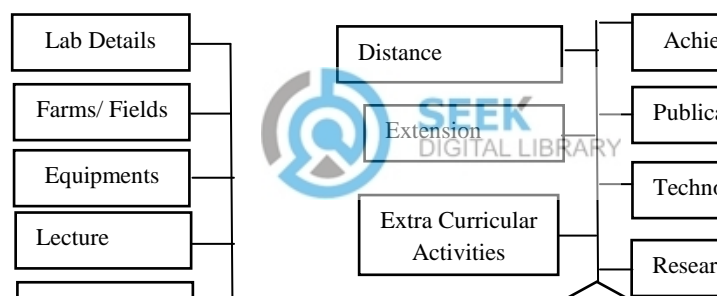
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Figure. 4. ER-Diagram of NISAGENET

CONCLUSION

Use of .NET technology in the development has provided enhanced security features and user-friendliness to the system. Being web based, the reports could be generated online in a variety of ways – consolidated reports, selective reports and module wise university/college individual reports on all the parameters defined in the database of the system. The online data entry and updating also provides ready data on all educational attributes of a University and its affiliated colleges to the managers.

NISAGENET is a platform to capture the present agricultural education status throughout the country in an organized way. It is a kind of system which assembles nationwide information on agricultural education, synthesizes the data and produces them in a meaningful way so that the overall agricultural education scenario in India becomes visible and comprehensive. The system will act as a tool for decision making for agricultural education, research, development and manpower planning. Continuous updating and edition of new reports and modules in the system will provide improved decision support to Managers of ICAR. The statistical data would also be provided to Planners, Policy Makers, Administrators time to time.

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