

“UNDERSTANDING AN ERP DESIGN WITH RESPECT TO COOPERATIVE SUGAR INDUSTRY IN MAHARASHTRA”

Prof. Varada Inamdar
Assistant Professor
Sinhgad Institute Of Management,
Vadgaon, Pune

Dr. Amit Pande
Associate Professor
Sharadchandra Arts &
Commerce Mahavidyalaya,
Butibori, Nagpur

ABSTRACT

Like any other process industry Cooperative sugar industry has also adopted highly sophisticated ERP for managing various activities but the implementation of an ERP in culture of Cooperative sector faces many challenges. The probable reasons behind this are found out through this work. Current research paper focuses on effectiveness of ERP with special reference to Decision making.

Being pioneer Cooperative sugar industry in Maharashtra is one of the virgin area for research as far as IT applications and computerization is concerned. Computerization in Cooperative sugar industry is considered from simple applications like MS Excel up to Sugar ERP. These systems are used from stand alone PCs up to a huge LANS. Even smart cards are created and maintained by MIS departments. Researcher in current work wants to highlight success and failure factors and reasons in focus Cooperative sugar industry in Maharashtra.

Keywords: Process Industry, ERP, Smart cards

I. Introduction

Even after accepting the fact that a co-operative business has its special features, its chief aim in the competitive world of today will have to be “survival”. A co-operative unit must function in a businesslike manner in its operations and must practice the rules of business which ensure continuance. E.g. cost must be controlled, services must be rendered economically, capital must be accumulated and protected. A co-operative unit is a distinctive form of business organization. All the same it shares with all other firms, problems relating to management. Decisions about these and other matters, however, are taken by the Co-operatives in a different frame work of ideas from those of management of a private or a public enterprise.

While certain problems are peculiar to co-operative sugar industry such as, for instance democratic control, special relationships between the management and members of

society, committees and staff etc. All the same a cooperative sugar industry must retain flexibility while it continues to grow in size. This is necessary to meet competition from large aggressive business having greater freedom of action. With the passage of time, the scale of operation is bound to increase in the co-operative sector and technically the enterprise grows more and more elaborate and complex. Under these situations, most of the problems, appear similar for any enterprise.

Microprocessor based electronic instrumentation and control of a system for process modernization has already been adapted at different levels; but the percentage of computerization and effective applications of Information Integrity Systems is still underutilized. Sugar Industry is one of the important agricultural product processing industries not only in Maharashtra but also in India. Unlike other industries such as metal, engineering, heavy engineering, production etc. sugar industry is still in search of best techno

based methods for effective utilization of the men and material i.e. sugar cane. Majority of sugar factories have fully automated machineries and equipment due to which laborious work is handled by different types of machines. Many of them have also implemented information systems in the form of ERP or a software system developed in Visual FoxPro etc. rendered by different vendors.

These systems provide the facilities like data maintenance, querying the data and retrieving them in the form of various MIS reports. These reports are mainly related with farmers & shareholders, cane collected, harvesting contractors & transporters and other production related reports like daily production, recovery, yield, molasses production etc. It is expected that after effective utilization of IT applications & web services for production & marketing the system performance should increase manifolds. Comparative analysis of same performance parameters in different sugar factories using various ERP systems as a automation tool is carried out which clearly indicated that the real reason of being successful for a sugar factory is not in using the ERPs but in using the information effectively within the department and across the departments.

II. Nature and role of an ERP in a co-op field

An ERP encompasses all direct, indirect users, other stakeholders including the suppliers like cane growers up to the common people like buyers of sugar bags. Irrespective of the nature of the system, the integrity in the information system is the key point in giving success to every stakeholder. To achieve overall integrity in Information System, individual entity should achieve its immediate goal, which in turn contributes to the achievement of operable goal of the sugar factory.

There is absence of Inter-departmental data usages and data coordination in turn not contributing in growth, development and expansion of sugar industry economically;

resulting in need of not only an MIS but also a highly sophisticated ERP. There are 179 co-operative sugar factories in Maharashtra. Out of them 36 sugar factories use either type of Information Systems out of which 20 have full versions of ERP like VSIsugarERP and some customized systems developed in Visual FoxPro.

Though they are highly sophisticated IS yet they are capable of only data maintenance. Information is restricted in a structural form rather than having an object oriented approach. Absence of application of IT in processes, results in lack of IT applications on interfaces, which can act as a base for building, Information Integrity System which itself acts as a Decision Support System.

The concept of Information System is devaluated by considering each entity individually thereby creating a loophole for integrity. E.g. Farmers database as well as Soil database are maintained for the record keeping of farmers and soil separately but they have no linkage with each other so as to guide a particular farmer regarding the quality improvement of his land. Overall sugar industry not only needs the best-suited ERP but more appropriately an integrated information system which initially acts as a Database Management System, then like a Decision Support Systems guiding the decision making in uncertain conditions and ultimately stand-in as an Expert System. It will improve the effectiveness of the processes in sugar industry and there after can generate the opportunities of increasing business from various angles. In nutshell ERP will enhance the methods of improving processes, giving a chance to upgrade individual performance of every stakeholder under consideration and will bring Information Technology on interfaces so as to identify the problem generate feedback and to improve technology infrastructure as a whole.

The researcher has tried to study the impact of applications of IT on the performance of sugar industry. These applications are present either in the form of various information systems or in

the form of online systems or in the form of web supported tools for marketing of sugar even at international level. Development of information systems for sugar industry had been remained a challenge always though the efforts have been made to do so in varied platforms like dos based systems, Novel NetWare and in FoxPro etc. Right from 2005-06 Windows 2003 along with IBM server have been used to form structured optical fiber network and cat cabling techniques are also in use.

Maximum applications in this area take care of very routine activities like printing of pay slips, keeping accounts, handling share transfer, costing etc. But they are common in all industries. There are cooperative specific areas where special consideration while designing an ERP must be provided. They are nothing but Cultivator/cane grower's accounting, Transport and Harvest contractor's accounting, Designing and implementation of dynamic harvesting schedule, Optimization of available fleet strength without delaying in transport of harvested cane and synchronizing harvest and transport team efforts with least cost.

Researcher has seen the actual use of such information systems and other allied IT applications and also searched for its use for improving performance of sugar industry especially w. r. t. decision making which is the everyday crucial task in cooperative sector. It was observed that the current information system is not providing the required help in decision making which is ultimately dampening the overall process of decision making and the actions taken thereafter.

Processes involved in any sugar industry are of two types viz. Sugar technology related processes where automation is already in existence since many years and Finance related activities which heavily involve dynamic decisions making and regularization of finances for daily activities in seasons and off season. IT applications can help these financial transaction and financial activities very well through proper designing of an information system.

One of such system developed by Vasantdada Sugar Institute has been considered as base and the various areas automated with its help are also considered in the current work. Highly sophisticated information systems implemented in other types of industries like mechanical and heavy engineering industries not only manipulate the databases but they also act as knowledgebase system and even help a inexperienced person to take right decision. The similar type of functioning is also expected by information systems in sugar industry so that maximum problem related with cooperative sector can be solved without wasting hundreds of man hours and huge data related with cane growers and other stake holders.

Since production process in any sugar industry actually takes place in farms and not in factory IT applications are also supposed to provide help in the routine activities related with every stage of crop development. Secondly since cooperative sugar industry has to deal with thousands of farmers, harvesters, transporters etc. in short time span of the sugar cane development which is of 9 months to 12 months and even can be of 15 months decisions related with fertility of soil of each and every farmer, information related with different varieties of seeds and pesticides, harvesting methodologies etc. should reach to cane growers in proper time which is a challenge in front of current information systems.

III. ERP and Sugar Industries

Enterprise Resource Planning (ERP) systems are one of the most important developments in corporate information systems (Davenport, 1998; Hitt et al. 2002; Upton and McAfee 2000) and in Information Infrastructure (II) (Hanseth and Braa 2001) during the last decade. The business interest in ERP systems can be explained by the benefits associated with the implementation and utilization of ERP systems (Robey et al., 2002). The benefits are related only in part to the

technology, most of these stemming from organizational changes such as new business processes, organizational structure, work procedures, the integration of administrative and operative activities, and the global standardization of work practices leading to organizational improvements, which the technology supports (Hedman and Borell, 2003).

Generally, an information technology-based IS covers those parts of the business processes where information handling can be effectively automated. The nature of this IS requires every information processing option to be specified and programmable. The modern IS relies on the establishment of generalized, systematic behavior and cannot recognize the diversity of human preferences and behavior.

The information technology-based IS also requires every data item used by the IS to be uniquely and precisely defined, and storable on a computer. This represents an information engineer's view: a *hard* view of information. Many websites were referred for knowing various perspectives of IT applications in sugar industry. The scope of data available on these sites is not restricted to local as restricted to Maharashtra but it is also national as well as international. Some of the websites like www.fcamin.nic.in, www.dgftmumbai.nic.in, www.dgftdelhi.nic.in, www.mahasugar.gov.in etc. were reviewed for updating the knowledge regarding the technological involvement of Govt. department like National Information Center in designing innovative IT applications for cooperative sugar industry.

The System Application Product (SAP) is implemented in India at various production oriented industries like Cement Industries, Food Processing Industries to improve the production quality, quantity and profitability to the company and end users. With respect to cane management at present, the information about cultivation of cane by the farmers to the industry is not transparent due to manual method and lack of proper supervision. This makes inconvenience to get

matured cane to the factory; as a result one cannot expect the good yield of sugar cane and recovery of sugar. As a result both the farmers as well as the industries have to face financial crisis. In view of this, to overcome the above all inconveniences, factories intend to implement ERP for sugar cane cultivation, harvesting and transportation of cane to the industry.

The implementation of ERP systems is a difficult and costly organizational experiment (Robey et al., 2002). Davenport (1998) described the implementation of ERP systems as "perhaps the world's largest experiment in business change" and for most organisations "the largest change project in cost and time that they have undertaken in their history". The costs and time frame related to implementing an ERP system can be illustrated by the case of Nestlé, which had invested, by the end of 2003, US\$ 500 million in an ERP system. In 1997, the American subsidiary started the project and in 2000 the global parent decided to extend the project into a global solution (Worthen, 2002).

IV. ERP Modules Requirements for Sugar Industry

- Cane Management system
 - Plantation Details
 - Cutting order details
- Cane weighing and crushing management system
- Cane calendaring systems
- Cane accounting system tightly integrated with Cane management system

V. The objective of an ERP is

- To cater to the complete business requirements of sugar mills
- To keep above unique requirements into consideration,
- To provide an integrated manner and ensure absolute integration with business activities exclusive to cooperative filed.

The modules need to be integrated into one another by way of data integration capabilities and a few modules to the extent of process integration. The application must ensure lowredundancy of data entry, thereby improving speed and ease of operations. The application has to be built with enhancing productivity and competitiveness of the user organization by adoptingprocess maturity in each of the modules. It must provide practices to facilitate easy adoption at units without much of customization.

VI. Current IT set-up for Sugar Industry

The smart card consists of all the information about the formers which is embedded and stored in

a microchip.Farmer's details such ID, Photo, Electronic Signature, Address and related details can be storedin the Smart Cards which can be give to Farmers. Their Cane Supply, Payments made & pendingand all other related details can be stored and tracked in the Smart Card which can be read /written at various centers / factories of the organization.

Smart card is unique identification for each former and this cannot be transferred because all the information about the former i.e name,address, Account No. date of cultivation etc everything will be incorporated in the electronicchip which is embedded in that card.With wireless telecom revolution, most of the farmers in remotest parts of India are equippedwith Mobile phones, most of the data needed to be communicated to the farmers can be sentthrough SMS and if need be, they can be given access through web browsers as well on their mobile. It includes wide variety of web based applications and smart tools like **SMART CARD** for farmers and **SMS Utility**.

VII. Global IT Infrastructure for Sugar Industry

The emergence of a technological and economical paradigm at local platform is also based on innovation, information and

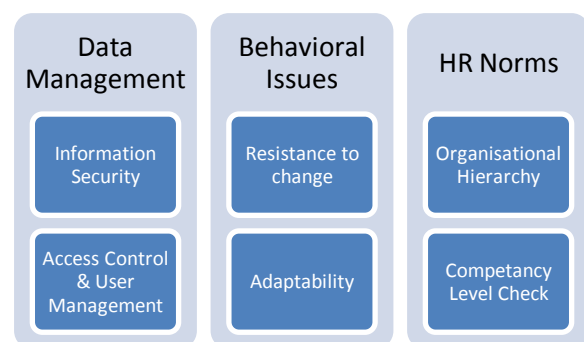
knowledge, as well as the growing consolidation of technologies such as microelectronics, information technology and computer networks bring complex and multifaceted issues to surface facing contemporary organizations.

This transition of the *"old rigidity of the atoms to the fluidity of the bits"* in organizations lights up many discussions concerning the profusion of new terminologies created in the information era. Therefore, contemporary organizations face new terms such as "knowledge management", "communities of practice", "strategic intellectual capital management", "competitive intelligence", "organizational learning" and many others.

These different perspectives reflect different conceptions of organizational knowledge and organizations themselves, besides a growing need of meticulous analysis about the upcoming opportunities for gaining competitive advantages through strategic use of information and knowledge. Hence, information management is just one of the components of IT infrastructure and a starting point for other ERP initiatives and approaches.

Studies show that variety of Decision Support Systems, Management Support systems as well as Knowledge Management systems are successfully developed and implemented at international Sugar Industry. Brazilian and Nigerian sugar industries are important examples of the same.

VIII. ERP implementation Issues



Data Management Issues

Any module in the ERP system is implemented by the consultants engaged by the company.

After the implementation (installation), the system has to be used by the employees of the factory who are called the users. They have to be accustomed to the way the system works to get optimum benefit from the system. Using the software at the end or after the implementation is an End User is the one who performs transactions in SAP after it goes live.

The main reasons or motives for the adoption of and ERP are concerned to following aspects:

- Problems with data/information collection, treatment, organization and dissemination, indicating lack of strategic information management;
- Recognition that both information and knowledge are the main factors of competitiveness of modern times;
- Lack of practices of protection and sharing of information and knowledge, leading the organization to a constant reinvention of the wheel and continuous duplication of efforts;
- Need for the creation of an organizational space for information and knowledge, also the need to address cultural and behavioral issues.
- Actual maintenance of databases and users of ERP along with their hierarchy levels and competencies expected.
- Information security issue

Behavioral Issues

People resist the change: People need to be intimated on prior basis about the changeover in their routine work environment.

People are reluctant to adopt new environment: Screen shots, demos, brochures and other reading material must be properly distributed to all those who are going to use ERP directly. This will make them familiar with the system and make the implementation an easy job.

Error Handling Mannerism: Proper log must be maintained about the errors registered by the users and their maintenance must be done within a stipulated period of time.

Involvement of Decision Makers : Once the managing director and other decision makers in

the sugar factory start taking support of the information generated by the ERP and also show their concern about transformation of all manual dependencies on ERP, everybody directly or indirectly associated will start using it on regular basis.

IX. After effects of Successful ERP implementation

Once we implement ERP in sugar industry, the company expects to achieve the targets, in the meantime farmers expect complete satisfaction regarding transparency in the process.

In addition to that following advantages can be seen after implementing SAP - ERP.

- Increase in yield by timely crushing good quality and matured cane.
- Benefits from the supply of the inputs to the farmers.
- Farmer's loyalty increase.
- Planning, budgeting and achievement have meager deviation.
- Re-deployment of the human resources.
- Staggered plantation helps the factory to crush throughout the crushing season.

The solution from SAP is bound to get the following advantages in sugar industries.

- Total integrated reliable and real time solution
- SAP is user friendly i.e. information will be obtained as and when required.
- Continues maintaining and evaluation of performances
- The complete process of cane cultivation to shifting of cane can be monitored and evaluated by system only.
- Effective inventory control
- The holding stock can be accessed and based on this; action can be taken for procurement of needy items.
- Maximize the utilization of resource
- With the help of SAP solution we can utilize the existing resources in the company and

avoid unnecessary losses.

- Gain edge in global competence
- By implementing of SAP, losses can be avoided, recovery has been improved and the company can compete in global level.

X. Observations and Conclusions

A co-operative unit must function in a business like manner in its operations and must practice the rules of business which ensure continuance. E.g. cost must be controlled, services must be rendered economically, capital must be accumulated and protected. A co-operative unit is a distinctive form of business organization. All the same it shares with all other firms, problems relating to management. Even after accepting the fact that a co-operative business has its special features, its chief aim in the competitive world of today will have to be "survival". Decisions about these and other matters, however, are taken by the Co-operatives in a different frame work of ideas from those of management of a private or a public enterprise.

From the above discussion, a few recommendations have been thought of which also find support from the readings of researcher, appended here.

- Existing IT infrastructure suffering from many problems like old technology, DOS based operating system, network infrastructure, technical staff, training given to the technical staff; MIS report generation as per user requirements, Allocation of resources etc. To eliminate these problems there is a wide scope for implementing IT. Hence, It is suggested that to use ERP software.
- In the age of Information Technology use of computer in sugar factory is expected. IT implementation is essential in sugar factory for reducing the cost of production and improving efficiency.

- Sugar factory also face problems for availability of good quality application software also the computerization is done by converting the existing procedures into computer procedures. So there is need for adopting a method of effective planning of all resources in the sugar factory. This method is known as Enterprise Resource Planning (ERP) which includes all possible resources for organization namely manpower, money, material etc. ERP covers techniques and concepts responsible to improve the efficiency of an organization. So they should prepare where they implement ERP.

- There is a need to follow a scientific approach for selecting hardware and software as well as network infrastructure with the help of experts.
- There is a need to change employee mindset focus on IT. Also in cooperative field they need to recruit trained staff on the basis of structure decided.
- Regular training is given to the technical staff and MIS reports are generated as per user requirements.

There must have a Local Area network(LAN)in their premises for computerized coordination, multiuser facility, good quality application software is a must, improvements in old procedures, selection of equipment is good, and require trained manpower. The study carried out on SahakarMaharshiShankarraoMohitePatil SSK Ltd indicates that installing and implementing ERP proves to be a standardized software solution for all cooperative sugar factories.

It is concluded that, managements of cooperative sugar factories have to make strategic planning quickly. Today's world demands IT Implementation wherever possible. Existing system is unavoidable. Management must take decision to implement ERP Software in all cooperative sugar mills. And for ERP Software management it needs good

infrastructure including computer hardware and trained end- users etc.
software, people who know procedures and

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