CHAPTER VI
Observations, Conclusion and Suggestions

6.1 Introduction:

The present study has probe in the status and problems of computerization in eighteen selected cooperative sugar factories located in western Maharashtra and also revealed that none of the sugar factory has undertaken scientific approach in computerization i.e. carrying out feasibility study. The computerization in cooperative sugar factories of western Maharashtra mooted in late 1980s. The selected units of cooperative sugar factories were grouped into large and small units based on the crushing capacity for comparison purpose. The status of computerization is classified into three categories viz. manual operations computerization initiated, and fully computerized. The present study covers the various problems in computerization process and manual operations. The study also includes problems related to hardware, software and behavioural aspects.

6.2 Observations:

The status of computerization is analyzed considering 6 main functional areas and 40 sub functional areas including byproduct units for 18 selected units. It has been observed that no sugar unit has succeeded in deploying computerization to cover entire activities. Though the process of computerization is initiated in cooperative sugar industry in Maharashtra from 1986, only one unit has achieved almost expected level of computerization i.e. covering almost about 85% of the activities under computerization. There are two units which have succeeded in covering about 60% of the activities under computerization. It is also noticed that majority of units under study have computerized operational activities, whereas the computerization of middle and top level management activities are not been covered. IT steering committee was not found in any sugar unit and monitoring was also not done by the top management.

- The Administration Departments under the General Management Area have so far achieved computerization in most of their activities as compared to their
counterparts like Legal, Civil and Irrigation. The activities of Watch and ward, Vehicle and Guesthouse departments are totally ignored.

- Majority of sugar factories concentrated on computerization of Finance Department, mainly focusing its attention on cane accounting due to its voluminous transactions, in terms of number and size. This has facilitated the sugar factories for timely payments to the sugarcane suppliers (farmers). This has been acknowledged irrespective of the size of the unit.

- The computerization in store accounting and costing is still ignored inspite of computerization is almost two decade old.

- The computerization of weighbridge and harvesting scheduling under the Agriculture Area is noteworthy and has been taken care in all units. As the harvesting scheduling involves a complicated process requiring huge data of plantation, scheduling of harvesting according to maturity of various sugarcane variety and according to village and section. The computerization has benefited to overcome huge complex tasks related to harvesting scheduling and ultimately has benefited to sugarcane harvesters and transporters too. This has helped sugar factories to eliminate malpractices in weighing process as millions of tons sugarcane is weighed during the crushing season. Despite the efforts taken for computerization in Agriculture area, the cane development and transport scheduling activities are ignored in almost all the units under study.

- It has been observed that under the Labor and Welfare Area, payroll and attendance systems are computerized in majority of the units. Whereas the other important sub-areas like medical, sanitation, recruitment and selection, and personnel information system have not been considered so far.

- It is found that in the engineering and manufacturing departments, majority of the units are doing operations manually. In Inventory Management, Sugar-godown and Laboratory, computerization has partially succeeded in switching over to computerized systems. However Production Planning, Plant Maintenance, and computer based automation etc. are ignored.

- It has been observed that computer based automation is ignored in cooperative sugar units. The majority (about 83%) of units are performing cane feeding operations manually. Computer based automation in juice weighing,
sulphitation, pan, centrifugal and boiler is found in only one unit i.e Chhatrapati Shahu SSK Ltd., Kagal, Dist. Kolhapur. Computer based automation in boiling house is done in three units whereas six sugar units under study have computerized their sugar weighing systems.

- The study reveals that byproduct units are overlooked in computerization. The details of byproduct units are as summarized below.
  - Thirteen sugar factories have distillery and ethanol byproduct,
  - Four factories have liquor and
  - Five factories have cogeneration byproduct units.

It is found that, only few (about 25%) units have initiated computerization in distillery and liquor byproducts and rest of the units are functioning manually. In cogeneration byproduct units, 20% of the units are fully computerized, 40% of the units initiated computerization and rest are operated manually.

- It is found that, 28% each sugar units are using mainframe machines for server and minicomputers and remaining units (44%) are using desktop machines for server.

- It is observed that, 50% of the sugar units are using windows operating system; 40% are working under both DOS and Windows operating system platform while only one unit is found working on DOS platform. Majority of sugar units are using VB, only one unit is using VB.NET and D2K and rest are using database utilities as a front end tool.

- It is found that all sugar factories under study are using Shri lipi and ISM for multilingual data processing. Majority (95%) of the sugar units are using modularized application software for various functions with the exception of Chhatrapati Shahu SSK Ltd., Kagal which has implemented ERP system.

- It is found that, more than 50% of the sugar units are using both DBMS viz. dbase III, FoxBASE and FoxPro and RDBMS viz. Oracle, Access, SQL server as a backend. Some applications of these units are RDBMS based and some applications are DBMS based which is major hurdle in integration of systems and for generating MIS reports. Of the remaining units, about 25% units are using DBMS and RDBMS as backend respectively.

- As regards the usage of deployment of application software the study reveals that
Six units have developed in house software and
Six units outsourced software development.
Three units are using tailor-made package and
Three units are using both i.e. in-house development and outsourcing software development approach.

- It has been observed that almost all units have given due weightage for system security. Though all units have antivirus software, majority units have implemented data and software access control measures for protection of data and software from unauthorized access. Fifteen units have implemented network access control system. Ten units have implemented physical access control system for protecting physical and logical system assets from intruders.

- All sugar units under study are using internet facility mostly for sending email and browsing. Seven units have developed their websites which provide static information about their organization and two units are using internet for online sugar trading through membership of www.esugar.com.

- Most of the units have not followed guidelines laid down by MRSSKS Ltd. with regard to recruitment of IT staff.

- Majority of sugar units have overlooked the IT training for the existing IT and related staff. Few sugar units have initiated the IT training process but is inadequate.

- From the analysis of the various aspects of computerization, it has been observed, there is huge gap in terms of extent of non computerised systems under General Management area; especially Vehicle, Guest-house, Legal, Civil & Irrigation and Watch and Ward department are uncovered. Whereas computerization of finance department is satisfactory. Cane development and transport scheduling in agriculture department have not been computerized. Under Labour and Welfare department except the salary management (i.e. payroll system) other areas are totally uncovered. Plant maintenance, production planning and process automation activities in Engineering and Manufacturing departments have not at all been considered for computerization.
• Hardware problems found in all units were similar, some frequently occurred hardware problems are related to printer, keyboard, mouse, SMPS, display and CD drive. The hardware problems related to keyboard, mouse, CD drives and printers are result of improper handling by the users whereas the SMPS problems are due to improper earthing. The problems related to Software viz program bugs and flexibility, are found repeatedly in small sugar units. On the other hand, flexibility, operating system failure and database interface related problems are faced by large units. These problems occur due to incorrect requirement specification, ignorance towards acceptance testing, and lack of training to users.

• Intrapersonal behavioral problems like resistance of an employee for computerization and lack of management support and involvement for computerization are observed in all units.

• The performance analysis of leading computerized and meager computerized small sugar unit for the year 2007-08 reveal that, the performance parameter such as capacity utilization, sugar recovery, reduced mill extraction, boiling house recovery etc. are, better in leading computerized unit than that of meager computerized unit. Similarly in large sugar units performance results for the said parameters in leading computerized unit are better than that of meager computerized unit.

• It has been observed that total losses and cost of production per quintal is lower in leading computerized unit as compared to meager computerized units.

• In almost all the sugar units, computerization is more focused at operational level than the top and middle levels of management.

• It has been observed that top management of most of the cooperative sugar factories under study, is unaware about the benefits of computerization and following orthodox manual procedures to manage their business operations. Most of them are not taking the advantage of latest information technology solutions.

• Most of the units under study prefer outsourcing option for maintenance of their entire IT setup.
CHAPTER VI

OBSERVATIONS, CONCLUSION AND SUGGESTIONS

- Implications of manual system in uncovered areas of computerization in all units are similar as listed below.
  - Decision making is delayed,
  - Unavailability of timely and accurate information,
  - Operating cost is increased, delaying in services to stakeholders,
  - Increased manpower requirement.

- Almost all the sugar units under study have inadequate IT infrastructure which may be due to lack of awareness of its requirement.

- It is observed that the business objectives and IT objectives are not aligned in all units.

- All sugar units are maintaining database and software backup on magnetic media (i.e. magnetic tapes and disks) and compact disks. Only two units have a separate data server and online backup kept on hard disk by using hard disk mirroring as well as daily back-up compact disks are used. The remote backup systems are not found in any sugar unit.

- It is found from the discussions with the officials, that before computerizing, the following problems were encountered by them.
  - Timely unavailability of needed information in desired formats,
  - Inaccuracy in data processing,
  - Classification and consolidation of data in the forms of desired reports.

- It is observed that employees working in IT department were willing to adopt ERP systems. But the department is utmost tolerated as core department and has been less blessed on the financial aspects from the top management.

- It has been observed that, in few units, IT department has separate identity in organizational hierarchy. In majority of the units, IT department is counterpart of the finance department.

6.3 Conclusions:

In the light of above observations, discussions and observations on site the following conclusions are derived:

- Irrespective of the size of the sugar units, the status of computerization is more or less the same in the general management functional area of all the units.
- All the units are performing the activities of their finance department by using
computers. The larger sugar units are involved actively in computerization of finance department as compared to small sugar units. The computerization in finance area has benefited to the stakeholders for getting timely payment of their bills. It has also reduced the burden of the employees of finance department.

- The majority of the sugar units initiated computerization in agriculture department. The main focused areas in this department are harvesting schedule and sugarcane weighing. The computerization in this area has improved working and efficiency of the department and it has also improved sugarcane recovery. But cane development and transport scheduling are the most ignored areas among all the sugar units. Though cane development and transport scheduling areas were the key important areas of the agriculture department yet, they were not given due weightage with regard to computerization.

- Apart from payroll and attendance system, there are other important areas in the Labour and Welfare department such as recruitment and selection, medical and sanitation, performance appraisal etc, were the most ignored areas for computerization.

- Engineering and Manufacturing departments being key departments in the process of cost reduction and quality improvement, the computerization of these departments is still a distance dream for most of the sugar units under study.

- Although the computer-based process automation has played a major role in improving the performance and controlling wastages in manufacturing units, however management has not given serious thought for computer based automation.

- Byproduct units have not been considered so far for computerization.

- Almost all the sugar units have given more focus on operational level computerization than the middle and top level managerial activities. The delay in decision making, lack of providing timely services at both the ends have resulted in an increased operation cost and increased manpower cost. This is mainly due to lack of interest and initiative on the part of the management towards computerization.
• Very few units are taking care of upgrading their IT infrastructure whereas majority of the units are still performing their activities with age-old technology. Despite of the facility of internet connectivity, all the sugar units are not exploiting this facility for E-commerce applications.

• The majority of the sugar units did not follow the overall guidelines laid down by Maharashtra Rajya Sahakari Sakhar Karkhana Sangh Ltd., regarding the recruitment of IT manpower and their training. This has resulted in poor performance of sugar units.

• The foreign ERPs available in market are not suitable for cooperatives sugar units.

6.4 Suggestions:

Based on the study undertaken on computerisation in sugar factories of selected region i.e. Western Maharashtra, there is a wide scope for improving computerisation in terms of its usage in a day to day inbound and outbound applications of the sugar factories. Hence, It is suggested that the computerization in the possible areas such as inventory, cane development, plant maintenance and production etc. should be give due attention.

• The sugar units may prepare long term plan and employ scientific approach for computerization.

• For efficient utilization of the resources, the sugar units are suggested to go for BPR which will also help for the implementation of ERP.

• The sugar units may identify capital intensive areas like inventory management, plant maintenance, cane development etc. for computerization.

• There is a genuine need for creating an awareness amongst the members and top level management which would help in removing hurdles in furthering computerisation drive.

• To reduce IT implementation related problems, there is a need to follow a scientific approach in selection of hardware and software with the help of internal IT team and external experts from reputed Institutions and apex bodies.
The sugar units need to focus on uncovered areas, handled manually at present, which would enable sugar units to serve the stakeholders effectively.

The regular training related to computer operations, trouble shooting and maintenance is the need of the hour, in order to minimize the dependency on the hardware and software vendors.

The units need to focus on changing the mindset of staff in order to speed up the process of computerization. The phenomenon of changing mindset may bring a turn-around in the job profiles of employees and in the organizational structure of the units.

The necessary infrastructure such as proper electrical supply and back up provision needs to be taken care by the sugar factory management. This would reduce frequent hardware and software failures.

The study finds inadequacy of IT staff in almost all units under study. Therefore, there is a need to assess requirement of trained manpower in order to achieve expected results of computerization. The revised formulations of manpower requirements, their qualifications, expertise and the like should be assessed on the basis of manpower structure decided by Maharasthra Rajya Sahakari Sakhar Karkhana Sangh Ltd. Mumbai in 1994.

Handful of sugar units switching over to contemporary technology need to adopt latest technology on a continuous basis instead of reengineering. More than 70% of the sugar units are still using outdated technology which need reengineering because the obsolete technology has its own limitations in terms of data security, multiple access and deploying latest technology based interfaces for e-commence applications. viz sugar sale, purchases etc.

It is advisable to establish parallel organization for the smooth implementation of ERP systems in organization. It may help for accepting change.

In view of non availability of suitable ERP software for functioning of the cooperative sugar industry, it is dire need of the hour to develop such software. The development of such software by Vasantdada Sugar
Institute, Pune still is in process. On the basis of empirical findings, researcher has made an effort to suggest the required modules for ERP software and its implementation strategy focusing cooperative sugar industry. For selecting ERP package following points may needs to be considered.

- Functional fit with various business processes of sugar factory
- Flexibility and scalability
- User friendliness
- Ability to support section wise planning and control
- Technology- client-server capabilities, Database independence and security
- Amount of customization
- Availability of regular upgrades and local support from vendors
- Degree of integration between various components
- Total Cost (cost of license, training, implementation, maintenance, customization and hardware requirements)

- **ERP System for Cooperative Sugar Factory**: As it is necessity to develop a suitable ERP system for the integration of various activities of cooperative sugar industry. The suggested ERP modules with their subsystems are as below.

The ERP system may have following six main modules viz. General Management Module, Finance Module, Agriculture and Cane Management Module, Labour and Welfare Module, Engineering and Manufacturing Module and Byproduct Module. Following is diagrammatic presentation of ERP modules suggested for cooperative sugar unit.
Fig. 6.1 ERP Modules for Cooperative Sugar Factory
The major modules would have their own integrated sub systems which are depicted in details in Table No 6.1.

### Table No.6.1
**Subsystems of Different ERP Modules**

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<thead>
<tr>
<th>Sr.</th>
<th>Module</th>
<th>Sub Systems</th>
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<tr>
<td>1</td>
<td>General Management</td>
<td>General Administration</td>
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<td>Strategic planning</td>
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<td>Vehicle</td>
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<td>Civil and Irrigation</td>
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<td>Watch and Ward</td>
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<td>2</td>
<td>Finance</td>
<td>Share Accounting</td>
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<td>Cane Accounting</td>
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<td>Deposit Accounting</td>
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<td>Harvesters Billing</td>
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<td>Financial Accounting</td>
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<td>Store Accounting and Costing</td>
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<td>Sales and Distributions</td>
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<td>- Excise</td>
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<td></td>
<td></td>
<td>Financial Analysis</td>
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<td>3</td>
<td>Agriculture and Cane</td>
<td>Cane Development</td>
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<td></td>
<td>Management</td>
<td>- Plantation Planning</td>
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<td></td>
<td>- Soil Testing</td>
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<td>- Seed Supply and Fertilizer</td>
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<td>- Subsidy</td>
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<td>- Garden and Nursery</td>
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<td>- Framers Training</td>
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<td>Harvesting:</td>
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<td>- Registration and Agreement of Plantation</td>
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<td>- Harvesting Scheduling</td>
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<td>GIS</td>
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<td>Transport Management</td>
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<td>Weighbridge and Cane yard Management</td>
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<td>4</td>
<td>Labour and Welfare</td>
<td>Organisation Structures</td>
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<td>Manpower Planning</td>
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</table>
| 5 | Engineering and Manufacturing | Recruitment and Selection  
Attendance, OT and Leave  
Payroll  
- Monthly Salary  
- Overtime  
- Retention  
- Bonus  
- Arrears  
- PF  
Performance Appraisal  
Increments and Promotion  
Disciplinary Actions  
Accidents  
Deputation  
Training  
Medical and Sanitation.  
Materials Management  
- Purchase Management  
- Receipt, Inspection and Issue  
- Inventory Control  
Production Management  
- Master Production Scheduling  
- Capacity Planning,  
- Material Requirement Planning  
- Shop Floor Control and Process Automation  
- Scrap Accounting and Control  
- Plant Maintenance  
- Laboratory  
- Grading and Batch Control  
Sugar Godown and Excise,.  |
| 6 | By product | Production Management and other subsystems according to byproduct. |
Following figure exhibits ERP architecture for cooperative sugar unit. The system would serve farmers, harvesters, transporters, suppliers through central data base interface.

For attaining the integration of ERP modules as per above suggested figure, ERP implementation should begin from agricultural department followed by finance department, engineering and manufacturing, labour and welfare and sum up with general management. By product is considered as a distinct strategic business unit and may link with mother sugar unit. Considering existing module-wise computerization in cooperative sugar units, phased approach for implementation is more suitable and shown in Figure No 6.3, implements one module at a time in sequential order. This limits the scope of implementation to one functional department and do not share many common process across different functional
areas. After implementation of independent modules integration of ERP will be done

The suggestions offered would be of immense help to sugar units under study in particular and cooperative sugar industry in general for furthering its computerization base. This, in turn, would result in efficient and effective management of cooperative sugar units.
6.5 SCOPE FOR FURTHER RESEARCH

Researcher purports statements for further research based on present study. The studies mention below on ERP systems implementation may help to take sugar cooperatives on the development horizon.

- Design and development of ERP system suitable to global environment changes for cooperative sugar industry.
- A study of hardware, software requirements and its maintenance
- A study of manpower development on the basis of education, training in the light of ERP system.
- Designing of curriculums for imparting training in ERP by notable sugar institute.

6.6 CONCLUDING REMARK

It is concluded that, the study throws light on many direct and indirect factors which have affected the progress of computerization in sugar cooperatives in general and sugar units under study in particular. The analysis of the data pertaining to computerization of various systems and subsystems clearly indicates that there is an ample scope for furthering computerization base in sugar units especially for the requirements of Management Information System and Decision Support System. The study reveals the fact that the computerization for desired MIS and DSS requirement is in its infancy stage, because of lack of IT awareness and non-realizing the analytical power of the computerized information systems. The computerization of operational activities has received attention almost in all units under study and has more or less it stands on almost similar status. The computerization in sugar units would greatly influence by involvement of top level management and may expand vertically and horizontally to ensure all the business requirements are well taken care of by computerized systems. This could happen only when -

- Top management associates themselves as IT user
- Computerization objectives are clearly defined
• Adoption of strategy for deployment of computerization and furthering as per technology and business changes
• Establishes separate department with required qualified professionals
• Business processes are reengineered

Besides above mentioned factors the involvement of regulatory agencies with mandatory and minimum standards in terms of technology deployment would also work as driving force. The study carried out on selected units clearly indicates that there is an urgent need to act and deploy standardized software solution which could cover all the functions, tasks, sub tasks and activities under one umbrella. The suggested integrated model based on the study would probably provide a roadmap for sugar units and put the computerization as a business driver rather than business enabler. The study principally embarks new entrepreneurship in ERP system development for cooperative sugar factories.