An Analytical Study of Present Status, Problems and Prospects of Computerization in Selected Sugar Factories in Vidarbha

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ABSTRACT

The co-operative sugar factories movements are well established in Maharashtra and further in many other areas. These movements changes lives of many people. It has provided them with good living standatds, education, good infrastructure and much more. Now a days the cooperative sugar industry suffering with many problems related to management, farmers, their correlation, transparency problems and many rules and regulations. The computerization is the need for this industry. There are many suggestions and solutions coming forward for the computerization of the sugar industry but due to lack of sufficient research and investigation a common, appropriate and rugged solution has not been accepted by industries. This paper focuses on these areas with respect to Vidarbha.

Key words: : Co-operative, Computerization, Movements, Sugar factory

Introduction

The cooperation and coordination is the basis of human society. First builds the society while other manages it. The co-operative movement is well flourished in Maharashtra by efforts and philosophy of Mahatma Phule and Rajarshi Shahu Maharaj. 'The way of cooperation is the only way to the prosperity' was well understood by Mahatma Gandhi. The co-operative sugar factories and dairies are the examples of well-flourished co-operatives in Maharashtra. These co-operatives have changed the lives of millions of peoples from villages. The roads, education, irrigation and even the culture in the rural area have been supported by these co-operatives. The first co-operative sugar factory was established by late Padmashree Vithalrao Vikhe Patil inspired and supported by late Vaikunth Mehta and Prof. Dhananjayrao Gadgil. The beauty of the rural co-operative movement is these big establishments of hundreds of crore of rupees are owned by semiliterate and poor farmers. They elect Board of Directors and run the organization. But now a day the co-operative industries are suffering from many problems and these problems are related to management. The ignorance of the farmers, lack of transparency in the management and slow rate of information processing leads to losses, corruption and misappropriation of funds. The co-operative sugar factories are not only income generating or sugar producing establishment but they are biggest employers. In 2005-06 there are 173 sugar factories are registered in Maharashtra state out of which more than 90% factories are co-operative sugar factories and situated in Western Maharashtra, Marathwada and Vidharbha. Out of 173 sugar factories more than 50% factories are located in Western Maharashtra and these units are successful units and have played vital role in development of Western Maharashtra. These factories are directly related to livelihood of 30 million plus farmers, 1.7 million plus employees and 5 million plus labours in Maharashtra. The co-operative dairy industry is related to sugar industry as the green fodder is mainly generated from sugarcane leaves and residues. Even the industries producing chemical fertilizers are depending on sugarcane growers. Therefore the progress of rural Maharashtra depends upon survival and progress of sugar co-operatives. In the era of globalization and liberalization, all industries in private sector have improvised their management systems through Information Technology and they have improved their performance while the co-operative sector is lagging behind in this regard. Hence it is national and social need that the management of these co-operatives should be improved through Information Technology. There are many suggestions and solutions coming forward for the computerization of the sugar industry but due to lack of sufficient research and investigation a common, appropriate and rugged solution has not been accepted by industries.

Review of Literature

C.Anikhindi conducted study of computerized cost based Information system for decision making in selected organizations from Kolhapur district. Researcher selected four sector viz. private, public, service and cooperative. He concluded private organizations are using computer based information system and others are lagging behind in this regard. Researcher has suggested model for computer based information system and observed benefits of computer based information system in private organization are Reduction in cost and product life cycle, Inventory control, Optimum utilization of capacity and Decision making is more effective.

D.Suzanne Beaumaster carried out research study on Information Technology Implementation Issues: An Analysis. This research project addresses the issues affecting information technology development and deployment. The research in this study suggests that there are three primary results, which are shown here. The first is that—strategic planning for IT is fundamental to the ultimate effectiveness of IT implementation. Planning with regard to IT acquisition and deployment has proven to be a difficult accomplishment regardless of organization type or sector. This study specifically addresses many of the issues surrounding this problem, as it is integral to the implementation process as a whole. Secondly, it is shown that interdepartmental coordination has proven to be a major factor in effective IT implementation. Previous studies in this area have shown a propensity over the course of the development of IT towards decentralization of the acquisition and management of technologies. This trend speaks directly to the issue of interdepartmental coordination and the difficulties local government managers face when attempting to implement ITs in their organizations. Finally, it is shown that the expertise levels of executives with regard to IT have proven to be a contributing factor to effectiveness of the IT development and deployment process. Yashwant S carried out research study on Computerized Management Information Systems for Sugar Cooperatives in Maharashtra State. The research exposes that, the computerization of three sugar factories in particular and of the 7 sugar factories in general. It is observed that the computerization in sugar cooperatives is in first stage. The study also exposes hurdles before the cooperative sugar factories for computerization. The researcher has identified many hurdles and main hurdles include Lack of support from the top level management, Lack of awareness of computerization and its benefits for effective and efficient Management, Non availability of computer qualified and experienced manpower locally, No separate provision for funds on the lines of other departmental budgets.

The researcher has suggested a need for systematic approach in computerization and its integration into various information systems, with the participation of top level personnel of the sugar factories and departmental heads. Besides, the researcher has also made valuable suggestions for effective and efficient usage of computerization which includes formation of IT committee, networking of sugar cooperatives and other regulatory agencies for whole information flow

Statement of Research Problem

Researcher would like to find out micro perspective of these problems to suggest solution(s) on the magnitude of such problems for better management of sugar factories. Keeping this in view, the study was undertaken, titled as- 'An analytical Study of Present Status, Problems and Prospects of Computerization in Selected Sugar Factories in Vidarbha'. The title signifies study of the computerization on the magnitude of the present status and various problems faced by sugar industry, identify prospects of further computerization in belief to encountered majority of the problems faced by cooperative sugar industry.

Objectives of the Study

1. To find out current status of computerization in sugar factories in Vidharbha.
2. To identify the problems in computerization and their causes.
3. To identify the uncovered areas of computerization vis-à-vis their implication in Vidarbha.
4. To study the comparative analysis of computerization with respect to problems and prospects.
5. To suggest Enterprise Resource Planning modules for cooperative sugar factories.

Hypotheses of the Study

The study is also undertaken to test following hypotheses.

1. Most of Cooperative sugar units are not using Enterprise Resource Planning systems.
2. The co-operative sugar factories in Vidarbha are more computerized at operational level with compared to managerial level and executive level activities
3. Sugar factories in Vidarbha are facing Hardware and software problems in similar in nature.
4. The sugar factories in Vidarbha are facing problems in computerization such as lack of trained staff, inadequate infrastructure facilities are not dependent on capacity of plant.
5. The efficient and effective plant capacity utilization and decrease in total losses are directly related to extent of computerization.

Scope of Study

The present study confined to sugar factories in Vidarbha i.e. A unit(s) which collect sugarcane from farmers, process it and producing sugar as a finished product which runs on co-operative philosophy. This study relates to selected sugar factories in Vidarbha, which includes eleven districts viz. in Amravati Division includes Amravati, Akola, Yavatmal, Buldhana and Washim & in Nagpur Division includes Nagpur, Bhandara, Gondia, Wardha, Gadchiroli and Chandrapur as specified by the district under Vidarbha belt by commissionrate of sugar from the administrative perspective. The sugar factories studied on the magnitude of its problems and prospects relate to computerization in selected units. Present research encompass concept like different performance parameters such as capacity utilization, recovery, reduced mill extraction, pol percentage in baggasse etc. The data collected and analyzed with the help of simple statistical tools viz. percentage, averages, co-relations and the hypothesis have been tested by using statistical tools viz. Mean, Standard Deviation, Spearman's rank correlation, chi-squares test, z test etc. Data from sample units have been collected of last three years i.e. 20012-20013, 2013-14 and 2014-15.

Data Analysis

1. H0 Most of Cooperative sugar units are not using Enterprise Resource Planning systems

Table 1: Sample Units having ERP Systems

Sample Units having ERP systems Particulars	Yes	%	No	%
No. of factories using ERP Systems	01	20	5	83

Source: Primary Data

For testing the hypothesis researcher has used z test of proportionate.

$$Z = \frac{p - ?p}{\frac{vpq}{n}}$$

$$Z = \frac{\frac{5}{6} - \frac{90}{100}}{\frac{v5/6 \times 1/6}{6}}$$

$$z = \sqrt{0.031}$$

$$z = 0.72$$

The table value of z for 5% level of significance 1.96. the calculated value of z is 0.72 and less than table value at the 5% level of significance. Hence null hypothesis is accepted. Therefore, conclude that the cooperative sugar units are not using ERP systems.

2. H0: The co-operative sugar factories in Vidarbha are more computerized at operational level with compared to managerial level and executive level activities.

Following tabulation depicts computerization in departmental hierarchy calculation by mean and standard deviation.

Table 2: Computerization in Departmental Hierarchy

Sr.No	Particulars	Executive Level	Managerial Level	Operational Level
1	$\bar{x}$	27.17	38.17	57.17
2	S D	4.79	13.36	21.20

Source: Primary Data

The data in this table is derived from above Table. The data is collected from all departments in the organization as per departmental hierarchy i.e. Executive level, Managerial level and Operational levels of management.

The mean score of operational level of computerization is 57.17 it shows that majority of the departments at operational level are computerized but still it leaves enough space for the computerization. The SD of computerization at operational level is 21.20 which significantly more than managerial level and executive level

The mean score of computerization at management level is 38.17 and at executive level it is 27.17. The standard deviation is 13.36 and 4.79 respectively. The SD is more in case with management level and less in case with executive level.

3. H0 Sugar factories in Vidarbha are facing Hardware and software problems in similar in nature.

Below mentioned table contain information regarding intensity of hardware problems in sample units.

Table 3: Hardware Problem

Sr. No	Particulars	Small Sugar Units		Large Sugar Units		d	d2
		Wt. Avg.	Rank	Wt. Avg.	Rank		
1	Display Problem	2.27	5	1.07	5	0	0
2	Color Related Monitor Problems	2.00	7	0.73	9	-2	4
3	SMPS	2.53	4	1.07	5	-1	1
4	HDD Bad Sector	1.87	8	0.80	8	0	0
5	Interface	1.33	14	0.80	8	6	36
6	CD Drive	1.73	10	1.20	4	6	36
7	Peripherals	1.40	13	0.73	9	4	16
8	RAM/Memory	2.13	6	0.87	7	-1	1
9	Keyboard Problems	3.53	2	1.47	3	-1	1
10	Mouse Problems	3.47	3	1.67	2	1	1
11	Printer Problems	4.00	1	1.73	1	0	0
12	Port Problems	1.27	15	0.67	10	-5	25
13	Login Problems	1.20	16	0.73	9	7	49
14	Linking Problems	1.27	15	0.80	8	7	49
15	Transmission Delay	1.20	16	0.67	11	5	25
16	Data Loss at the time of Transmission	1.00	17	0.53	12	5	25
17	Cable Problems	1.60	11	0.80	8	3	9
18	Switch Related Problems	1.47	12	0.73	9	3	9
19	Connector Problems	1.80	9	1.00	6	3	9
20	Network Adaptor Problems	1.47	12	0.73	9	3	9
						Σ	305

Source: Primary Data

For analyzing hardware maintenance problem data from Computer I/C's of sample unit is collected and problems in small and large units are compared by using Liker scale for validating frequency of problem.

In small sugar units Printer, Keyboard, Mouse, SMPS and Display problems having high frequency whereas in large units Printer, Keyboard, Mouse, SMPS and CD drive problems are occurring very often. To identify relationship between problems occurred in small and large sugar units spearman's rank correlation tool is used.

$$R = 1 - \frac{6\sum d^2}{n^3 - n}$$

$$R = 1 - \frac{6 \times 305}{8000 - 20}$$

$$= 1\text{-}0.22$$

$$= 0.78$$

The rank correlation coefficient is 0.78, it indicates that there is high degree positive correlation between hardware problems found in small and large sugar units. Hence set hypothesis is accepted.

Table 4: Software Problems

Sr. No	Particulars	Small Sugar Units		Large Sugar Units		d	d2
		Wt. Avg.	Rank	Wt. Avg.	Rank		
1	OS Failure Problems	1.73	4	0.80	2	2	4
2	Database	1.53	5	0.73	3	2	4
3	Interface Problems	0.80	7	0.67	4	3	9
4	Response Delay	1.40	6	0.67	4	2	4
5	Bugs Problem	2.07	2	0.67	4	-2	4
6	Security Problem	2.27	1	0.80	2	-1	1
7	Flexibility	1.93	3	0.87	1	-2	4
						Σ	30

Source: Primary Data

Above table depicts software problems in small and large sugar units. Researcher has classified software maintenance problem into seven categories and it has been observed that, aforesaid problems are faced by almost all units but in small sugar units frequency of problem occurrence is more than large sugar units as it is evident from below mentioned spearman rank correlation,

$$R = 1 - \frac{6\sum d^2}{n^3 - n}$$

$$R = 1 - \frac{6 \times 30}{7^3 - 7}$$

$$R = 1 - \frac{180}{336}$$

$$R = 1 - 0.53$$

$$R = 0.47$$

The rank correlation coefficient is 0.47, it indicates that if software problems found in sugar units are similar but their intensity in small and large units are different. Hence, set hypothesis has been accepted.

1. H0 the sugar factories in Vidarbha are facing problems in computerization such as lack of trained staff, inadequate infrastructure facilities are not dependent on capacity of plant.

Table 5: Problems in Computerization

Sr. no.	Unit size	Capacity	Inadequate Trained Staff (No. of units)	Inadequate Infrastructure (No. of units)
1	Small	Below 1000 TCD	2	1
2	Large	Above 1000 TCD	1	0
Total			**3**	**1**

Source: Primary Data

Above table furnishes the information about capacity wise sugar units having inadequate IT trained staff and inadequate IT infrastructure facilities. Researcher has used chi square for testing of hypothesis which is as follows.

Table No. 5.19 shows inadequacy of trained staff calculated with the help of Chi-square.

Chi-Square Test

Table 6: Inadequate Trained Staff (No. of units)

	Observed N	Expected N	Residual
1	1	1.0	.0
2	1	1.0	.0
3	1	1.0	.0
Total	3		

Source: Primary Data

Table 7: Inadequate Infrastructure (No. of units)

	Observed N	Expected N	Residual
0	1	1.5	-.5
1	2	1.5	.5
Total	3		

Source: Primary Data

Table 8: Test Statistics

	Inadequate Trained Staff (No. of units)	Inadequate Infrastructure (No. of units)
Chi-Square	.000[a]	.333[b]
df	2	1
Asymp. Sig.	1.000	.564

a. 3 cells (100.0%) have expected frequencies less than 5. The minimum expected cell frequency is 1.0.

b. 2 cells (100.0%) have expected frequencies less than 5. The minimum expected cell frequency is 1.5.

Source: Primary Data

5. H0 the efficient and effective plant capacity utilization and decrease in total losses are directly related to extent of computerization.

The Table 9 depict relational analysis of extent of computerization with average capacity utilization and average total losses of two years (2013-14 and 2014-15).As mentioned in research methodology, sugar factories generally have 36 sub functional areas of management. While calculating extent of computerization, the computerization done in these sub functional areas of management are considered. The hypothesis stated, the effort to gauge the relationship between extents of computerization its impact on capacity utilization and total losses. While detecting this relationship other factors namely sugarcane quality, efficient utilization of machinery and other resources which also has impact or could produce combine impact on capacity utilization and total losses.

Table 9: Extent of Computerization, Capacity Utilization and Total Losses in Large & Small Sugar Units

Sr. no.	Name of Factory	No. of sub functional areas computerised	Computerization (%)	Rank	Cap. Utilization%	Rank	d	d2	Total Losses %	Rank	d	d2
1	Vidharbha Sugar Pvt. Ltd. Amravati	4	11.11	6	84.4	5	1	1	1.95	3	3	9
2	Vainganga Sugar Industries Bhandara	22	61.11	2	97.9	2	0	0	1.82	6	-4	16
3	Shivshakti Aadivasi & Magasvargiya SSK Ltd. Sujatapur	20	55.55	3	96.7	3	0	0	1.83	5	-2	4
4	Purti Power & Sugar Industry ltd.	23	63.88	1	98	1	0	0	1.83	4	-3	9
5	Jijamata SSK Ltd Shankamagar Post- Dusarbid Tal- Sindhkhed Raja Dist- Buldhana	8	22.22	5	88.8	4	1	1	2.38	1	4	16
6	Vaishnavi Sakhar Kharkhana Pvt ltd. Buldhana	16	44.44	4	76.5	6	-2	4	2.11	2	2	4
								6				58

Source: Primary Data

Table 9 reveals that Sr. No. 4 sugar factory have done 63.88% of the computerization, carries first rank and average capacity utilization is 97.99% on the contrary total losses are 1.835%. Sr. No one unit has got 11.11% of computerization with capacity utilization is 84.4% carries fifth rank and total losses are 1.952 carries third rank. This shows positive trend in extent of computerization and capacity utilization and negative trend in extent in computerization and total losses. This is more specifically tested with the help of spearman's rank correlation as follows.

a) Correlation coefficient between extent of computerization and capacity utilization

$$R = 1 - \frac{6\sum d^2}{n^3 - n}$$

$$R = 1 - \frac{6 \times 6}{216 - 6}$$

$$R = 1 - 0.17$$

$$R = 0.83$$

b) Correlation coefficient between extent of computerization and total losses.

$$R = 1 - \frac{6\sum d^2}{n^3 - n}$$

$$R = 1 - \frac{6 \times 58}{216 - 6}$$

$$R = 1 - 1.65$$

$$R = -0.65$$

For large & Small sugar units the value of R=0.83, signifies perfect positive correlation between extent of computerization and capacity utilization and calculation of R value for extend of computerization and total losses shows R= -0.65, which signifies moderate negative correlation. **Hence H0 is accepted.** Therefore, concluded that the efficient plant capacity utilization and decrease in total losses in large sugar units are directly related to extent of computerization

Conclusion

1. 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.
2. 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.
3. The foreign ERPs available in market are not suitable for cooperatives sugar units.

References

Balwe, T. (2004). Proceedings of State level conference on 'Cooperative Sugar Industry in Maharashtra: Past, Present and Future' Pune.

C, K. S. (2006). *'Research Methodology Methods and Techniques'*, . New Age International Publishers, II[nd] Edition.

D K Pant, S. a. (2005). Sugar Industry Diversification For value Addition, . *Cooperative Sugar,Vol 37,No5 Jan 2006* .

Grover D. K., S. (1991). *'The Problems of Sugar Industry in India'*,. Allhabad: Vihar Publications.

Gupta, G. S. (2008). *'Statistical Techniques'*, . Himalaya Publication House, New Delhi, V[th] Edition .

Shah, R. J. (1997). *'Statistical Techniques'*,. Sheth Publications Mumbai .

Shah, S. (2006). *Mathematics and Statistics.* Kolkata: Central Education Enterprises(P) Ltd, IX[th]Edition.