

PROBLEM'S IN COMPUTERIZATION OF COOPERATIVE SUGAR FACTORIES IN WESTERN MAHARASHTRA

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Abstract - Cooperative Sugar Industries playing the pivotal role in the socioeconomic development of country. India receives the recognition of leading sugar producing and consuming country. Unfortunately modernization and automation of this sector is lagging behind and most of the practices are executed traditionally that is why the sector is not able to keep abreast in this era of globalization. From last two decades cooperative sugar factories in Maharashtra are using computer based system for various business process but they are not getting expected outcomes. With this prospective present study is undertaken to know the problems in computerization in cooperative sugar factories in Maharashtra. Requisite information is collected for select cooperative sugar units with the help of structured schedule encompass different problems in computerization. Result of statistical test indicates the problems noticed in computerization process are similar in nature in all sample units.

Key Words - ICT, TCD, Modernization

I. INTRODUCTION

Computerisation initiated in Sugar Factories in late 1980's. In the initial stage computerisation was considered as an enabler and most of the sugar factories handled desktop computers for their correspondence and work related to typing. Subsequently sugar factories realised the importance of computerising various manual work and efforts were put for computerisation of complex and highly repeatative activities which included pay-roll, sugarcane billing, transporter billing etc. factories for deploying integrated software solution and this has resulted in increasing awareness and importance for integrated software solution. In the process of computerization sugar factories are facing various problems related to infrastructure, maintenance and manpower.

II. RESEARCH OBJECTIVE

The study aims to know problems involved in computerization of cooperative sugar factories. The study undertaken confines the following objective.

- To identify the problems in computerization and their causes.

III. HYPOTHESIS OF THE STUDY

The study is also undertaken to test following hypothesis.

- Hardware and software maintenance problems have been faced by sugar factories that are of similar in nature

IV. RESEARCH METHODOLOG

Present research is of inferential descriptive in nature; to suffice aforesaid objective data has been collected from primary and secondary sources. For collecting primary data structured schedule is used and data is collected from technical peoples and IT users.

SAMPLING:

It was found that these cooperative sugar factories are using computers since 1986 for various applications. The method used for selection of sample is stratified proportionate random sampling method in which sample units are divided into seven stratum. Each district is considered as stratum.

More details are as under,

1	Sampling Technique	Proportionate Stratified Random Sampling
2	Population	Cooperative Sugar factories from Western Maharashtra
3	Type of Population	Finite Population
4	Size of Population	90 Sugar Factories
5	Analysis Unit	A Plant of Sugar Factory
6	Sampling Frame	Sugar Factories from 7 Districts of Western Maharashtra
7	Sample Size	18 Sugar Factories
8	Parameter of Interest	Status and Problems in Computerization

V. PROBLEMS IN COMPUTERIZATION

The sugar factories under study have different production capacities vary from 1250 TCD to 10000 TCD. For micro analysis of problems researcher categorized theses units in to two groups i.e. Small units. (1250 to 4000TCD capacity) and Large Units(Above 4000 TCD capacity). The problems are also categorized in three types viz. hardware, software and behavioral.

- HARDWARE PROBLEMS

The following table deals with hardware, software and behavioral problems in computerization of the sample sugar units. The problems have explored and its intensity was analyzed by using Likert type of scale. The hardware problems are categorized into twenty different types viz. printer, display, network card, HDD, Memory etc. whereas software problems are categorized in seven types viz. OS failure, program bugs, database, security etc. The behavioral problems are observed and grouped into different six dimensions viz. support and commitment of top management for computerization, employee's involvement in computerization. These are presented as per variables used to deal with problems of computerization as mentioned above.

Hardware Problems Faced by Sample Sugar Units

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

20	Network Aadapter Problems	1.47	12	0.73	9
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Source: (Primary Data)

The above mentioned table contains information regarding the intensity of hardware problems in sample units. It shows the common hardware problems faced in the respective departments of the sample sugar units. The researcher has taken twenty problems for the study and feedback was taken from Head of the IT Department. The same is analyzed using Likert type scale on the basis of intensity of problem. In a small sugar units Printer, Keyboard, Mouse, SMPS and Display problems are occurring frequently as it ranks between 01 to 05, whereas in the large units, Printer, Keyboard, Mouse, SMPS and CD drive problems occurred very often as these problems received a rank between 01 to 05.

A Color Related Monitor Problems, HDD Bad Sector, Connector, CD Drive, Cable, Switch, Network Adaptor, Peripherals, Interface, Linking, Port, Login, Transmission Delay, Data loss at the time of transmission, Ram / Memory are the problems occurred moderately in small sugar units whereas in large units same problems acknowledged infrequently.

The researcher probed in-depth to analyze a consistency of problem on the basis of intensity. It has found that Mean (\bar{x}) of the total problem in small units is 1.93 and SD (σ) is 0.85. It shows a little variation in the consistency of problem intensity, hence, a researcher has clubbed up first five ranked problems and found that in small sugar units its Mean (\bar{x}) is 3.16 and SD(σ) is 0.72 and rest ranked problems has mean (\bar{x}) is 1.52 and SD(σ) is 0.32. It shows a variation in the mean. Hence it can be realized that first five ranked problems are major one and frequently occurred problems.

In a large units, Mean (\bar{x}) of the total problem is 0.94 and SD(σ) is 0.34. It also shows a little variation in the consistency of problem intensity, hence a researcher has clubbed up first five ranked problems and found that in its mean (\bar{x}) is 1.4 and SD(σ) is .031 and rest ranked problems has Mean (\bar{x}) 0.78 and SD(σ) is 0.15. It shows a variation in the mean. Hence it can be concluded that first five ranked problems occurred frequently.

Comparing both the problems faced by the small and large units it has been found that same problems are identified in both the units but the intensity of problem in the small unit is more.

• SOFTWARE PROBLEMS

The below table depicts software problems in small and large sample sugar units. Researcher has taken seven problems for the study and a feedback is taken from the Head of IT Department has been assessed using Likert type scale on the basis of intensity.

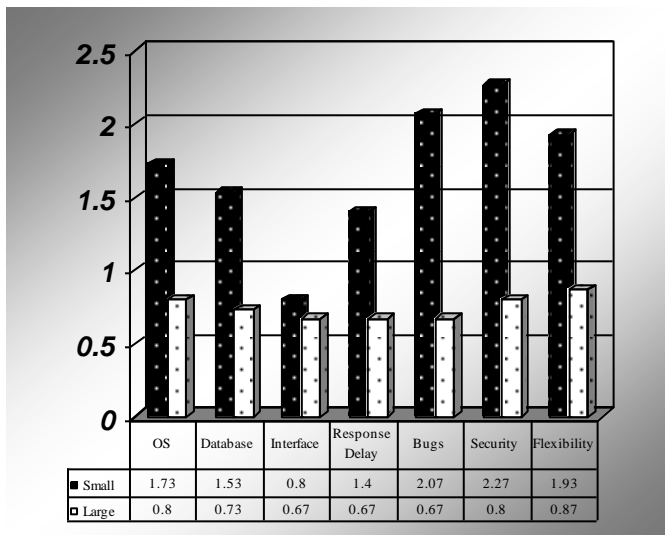
Software Problems

Sr No	Particulars	Small Sugar Units		Large Sugar Units	
		Wt Avg	Rank	Wt Avg	Rank
1	OS failure problems	1.73	4	0.80	2
2	Database	1.53	5	0.73	3
3	Interface Problems	0.80	7	0.67	4
4	Response Delay	1.40	6	0.67	4
5	Bugs Problems	2.07	2	0.67	4
6	Security Problems	2.27	1	0.80	2
7	Flexibility	1.93	3	0.87	1

Source : (Primary Data)

The above table indicates about the details of common software problems faced in the respective departments of the sample sugar factories. A researcher has taken seven problems for the study and a feedback is taken from the Head of IT Department and has been assessed using Likert type scale on the basis of intensity of problem.

In small sugar units, security, bugs and flexibility problems are noticed repeatedly as it ranks between 1 to 3 whereas OS failure, Database interface, interface problems and response delay problems occurred rarely and it ranks between 4 to 7. In a large units, flexibility, O.S failure and database interface problems occurred frequently as it ranks between 01 to 3, whereas in a large units occurrence of OS failure, interface, database interface and response delay problems is very less.



Software Problems

Above Graph conveys that, software problems are more in small units than in the large units.

• BEHAVIORAL PROBLEMS

The below table indicates the behavioral problems encountered by the sample sugar units. The data has been collected by the researcher from middle and operational level employees and the same was analyzed with the help of likert scale.

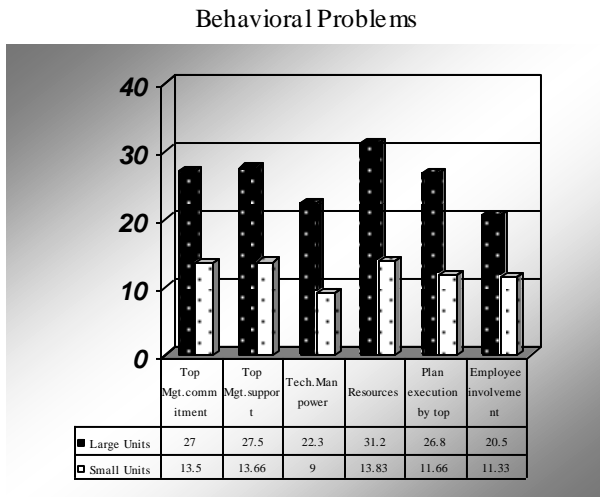
Behavioral Problems Faced by Sample Sugar Units

Sr. No.	Particulars	Small Sugar Units		Large Sugar Units	
		Wt Avg.	Rank	Wt Avg	Rank
1	For computerization in factory top management is fully committed	13.5	3	27	3
2	Top management has extended full support for computerization	13.66	2	27.5	2
3	Required technical manpower is available in resource market for computerization	9	6	22.3	5
4	Management has allocated sufficient resources	13.83	1	31.2	1
5	Top management has executed the plan for computerization and taken due care of its implementation	11.66	4	26.8	4
6	Employees are involved and give cooperation for computerization	11.33	5	20.5	6

Source: (Primary Data)

The above table depicts, majority of the employees in small and large Sugar Units strongly agreed that Management has allocated sufficient resources and extended full support for computerization as it received 1st and 2nd rank respectively, Employees neither agreed nor disagreed with the top management commitment and execution of a plan for the computerization as it secured 3rd and 4th rank respectively, Whereas most of the respondents agreed that, required technical manpower is not available and the employees were not willing to involve in computerization.

It has been concluded that, the small and large Sugar units have encountered the same behavioral problems with an equal magnitude.



The above graph indicates that, the behavioral problems are more in the larger sugar units as compared to the smaller sugar units.

VI. TESTING OF HYPOTHESIS

- H₀ Hardware and software maintenance problems have been faced by sugar factories that are of similar in nature.

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

Hardware Problems

Sr.	Particulars	Small Sugar Units		Large Sugar Units		d	d ²
		Wt Avg.	Rank	Wt Avg.	Rank		
1	Display Problems	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 Problem	1.27	15	0.67	10	-5	25
13	Login	1.20	16	0.73	9	7	49

	Problems						
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 Aaadaptor 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.

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

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

$$= 1 - 0.22$$

$$= 0.78$$

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.

Software Problems

Sr.	Particulars	Small Sugar Units		Large Sugar Units		d	d ²
		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 Problems	2.07	2	0.67	4	-2	4

6	Security Problems	2.27	1	0.80	2	-	1
7	Flexibility	1.93	3	0.87	1	-	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.

VII. FINDINGS

- It is revealed that no sugar factory has undertaken scientific approach in computerization
- It is observed that the business objectives and IT objectives are not aligned in all units
- Majority of sugar factories are outsourced hardware maintenance and software development activity and they are fully rely on vendors.
- 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 and electrical backup systems.
- 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.

VIII. SUGGESTIONS

- 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 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 of by the sugar factory management. This would reduce frequent hardware and software failures.

IX. CONCLUSION:

The analysis of the data pertaining to problems in computerization of various systems and subsystems clearly indicates that there is an ample scope for reducing the problems observed in computerization. Behavioral problems are observed in all the units under study hence there is need to organize training program especially for top level and middle level management related to business process reengineering and information technology applications in decision making process.

X. REFERENCES

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