

# Management Control and Information Systems: An Empirical Investigation in a State Electricity Board in India

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## ABSTRACT

*In today's ever increasing complexities of business as well as competitive environment, organizations, (in order to achieve their pre-determined objectives and goals), not only need efficient internal control systems, but also increased ability to well developed Management Information Systems. A review of related studies has revealed that there have been gaps in research in the area of Management Control and Information systems in general and in effectiveness of Management Information System for Management Control System in particular. Keeping in mind the importance of the subject and the gaps in research, the researchers have undertaken a study in a State electricity board to understand and analyze the Management Control & Information systems. The findings from the study have lead the researchers to recommend certain guidelines and course of action to the management of the board. It is expected that the findings and recommendations would go a long way in improving the management control and information systems at the electricity board in particular and in similar organizations in general.*

## Introduction

Management Control Systems (MCS) are of great importance in every type of organization, as management control activity is fundamental and vital to it, in its achievement of goals and objectives. In order to work towards these larger objectives, organization not only needs efficient internal control systems, but also increased ability to well developed Management Information Systems.

Second, in the era of globalization, liberalization and Information Technology, the information plays an important role towards the growth of an organization. This vast, timely and accurate information could be provided, to the management of the organization, by well developed Information systems. A review of

related studies has revealed that there have been gaps in research in the area of Management Control and Information systems in general and in effectiveness of Management Information System for Management Control System in particular. A brief review of related studies has been given as below.

## Review of Related Studies

Ford, Matthew W. and Green, Bertie M.(2005) evaluated data obtained from 22 managers of various organizations and explored the extent to which managers believe management control systems were employed when implementing planned change. They found a strong relationship between the use of control systems which were based on outcomes monitoring and implementation success. Dechow,

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Niels and Mouritsen, Jan (2005) analysed that how two companies pursued integration of management and control through Enterprise Resource Planning(ERP) systems. Further their cases illustrated the methodology, which was followed by the organizations in the quest for integration. Rikhardsson, Pall, et al. (2005) in their study propose a new framework for viewing management control in the information society. They further describe the changes taking place in companies operating in the information society and criticize existing management control frameworks for not recognizing the significance of information, communication and risk control in today's business operating environment. Maheshwari, N.Pand Bhattacharyya, N, K.(2005) make an attempt to critically analyze Hydropotential in Uttaranchal state and reforms of power sector in India. They concluded that to remain competitive in the global economy and to close the increasing demand-supply gap, it is important to give serious attention to the question of reducing the cost of power and for the development of the Indian economy, power has to be affordable to all concerned.

Bisbe Josep and Otley David (2004) in their paper examine the relationships among variables embedded in Simons' framework of levers of control (which indicates that an interactive use of management control systems contributes to fostering successful product innovation), and found that an interactive use of management control systems don't favour innovation, in contrast they concluded that the impact of innovation on performance is moderated by the style of use of management control systems. Chenhall, Robert H.(2003), in his paper provides a critical review of findings from contingency-based studies over the past 20 years and concluded that the designs of management controls systems are more effective if they best suit the nature of the environment, technology, size, structure, strategy and national culture. Patel, B.C.(2003) in his paper first highlights the fact that the cost of energy is skyrocketing with every passing day and

then suggests five cost reduction measures for energy conservation ,that is, identification of inefficient energy use; upgradation of machinery and processes; improvement in maintenance practices; promotion of employees' awareness; and conservation in domestic consumption.

Sikidar Sujit and Hazarika Padmalochan (2002) in their paper have investigated the application of Activity Based Costing as a means of cost reduction and cost management relating to university system of education . For the application of costing techniques and development of Activity Based Costing system they have identified structure of University Budget , various cost centers, key activities and their corresponding cost drivers. Sridhar, S. *et al.* (1997) demonstrate the need to integrate a task assignment decision with the design of MCS as each affects the other. Kim Langfield-Smith, (1997), in this paper reviews the relationship between management control systems and business strategy, by focusing on specific aspects of management control system and their relationship with strategy like cost control orientation, performance evaluation and reward system, the effects of resource sharing, the role of management control system in influencing strategic change and the choice of interactive and diagnostic controls.

Arora, D.D. (1994) made an attempt to define the critical aspects, complex characteristics and functions of management control by giving the review of existing literature on the subjects. Efforts have been made to explain the measures of organizational climate and its methodology as a guiding force to organizations to implement effective control systems. Bhadada, B.M. (1985) has analyzed the role of management control process in the cotton textile Industry. He has identified factors which provide obstacles in the efficient working of the control system. Rekha Rani, (1990) analyzed the present management control system and practices in an organization with respect to financial, material and human resources.

Review of related studies reveals that whatever efforts have been made remained confined to the macro level only. The organizational levels have not been studied in depth. There exists a research gap in the field of MCS in general and in the development and application of MCS in specific. Further, there have not been serious attempts to study MCS in the service organizations in India. Thus, the survey of literature clearly establishes a need for research to be undertaken on the structure and application of Management Control Systems in the service organization in general and a State Electricity Board in particular in India.

Thus, keeping in mind the importance of the subject and the gaps in research, the investigators have undertaken this study with the following objectives in mind.

#### Objectives of the Study

This study has been carried out to study the Management Control System in the distribution sub-systems of Punjab State Electricity Board (PSEB); and to evaluate the performance of MIS supporting the Management Control System in the distribution system of PSEB.

#### Research Methodology

Primary data was collected through a pre-tested questionnaire cum interview method from the selected respondents. The questionnaire was designed based on the literature survey, and discussions held with many academicians and professionals in the field. To ensure the quality of the instrument, it was tested for its reliability, content validity and sensitivity. The questionnaire used for the study was found reliable as the cronbach's alpha reliability of the scale was more than 0.7 thus indicating the goodness of the scale measurements. Content validity of the questionnaire was tested by having many discussions on the comprehension, depth of study,

relevance in the selected enterprises and the topic of the study. It was found that the questionnaire was comprehensive, appropriate, and relevant to the study. The feedback thus collected was incorporated before administering the questionnaire. Similarly sensitivity of the questions was also found good as Likert scales were used to gather the responses on the perceptions of the respondents. Second, multiple questions pertaining to similar theme were incorporated to ensure the sensitivity. Secondary data was collected from the records / reports etc. of the respective organizations. 140 managers from all the three levels participated in the study.

The details of the sampling plan have been given in Table-1.

**TABLE-1**

#### Details of the sampling plan

Designation of the Respondents	Popula-tion	Sample	Per-centage
Chief Engineer (Level-I)	05	05	100%
Superintendent Engineer (Level-II)	26	10	40%
Executive Engineer (Level-II)	157	31	20%
Assistant Executive Engineer (Level-III)	238	47	20%
Assistant Engineer (Level-III)	237	47	20%
Total	663	140	-

In order to reach meaningful conclusions, collected data was subjected to codification and tabulation. SPSS software package was used for applying of the appropriate statistical tools. On the basis of analysis of data and findings, meaningful conclusions have been reached at and recommendations given.

### Analysis & Findings

Management Control system at PSEB follows organization structure, based on circles, divisions and sub-divisions known as responsibility centers. The manager in charge of a responsibility centre is provided with the information mainly through reporting that is needed for the planning, decision-making, control, remedial action etc. The purpose of these reports is to communicate series of data about the performance of specific responsibility centers to their organizational heads. The management of the Board receives two kinds of reports, namely:

- 1) Control reports and
- 2) Information reports

These control reports focus on the comparison of actual performance with planned performance. And information reports inform the management about what is going on in the Board.

#### *Information gathering for Management Control Systems*

Table-2 lists the responses from the respondents on the techniques being used to gather information for management control. An analysis of Table-2 reveals that to collect actual information, the managers at all the three levels of the management of distribution system in PSEB use reporting system, informal system, observation and/or feedback. However, managers at the strategic level are found using more of reporting system followed by observations (3.53) and feedback (3.50), whereas at Level II and at Level III, observation is not used much. This finding indicates that in the distribution system of PSEB, the formal control system is more structured at all the three levels.

TABLE - 2

#### Information Gathering for Management Control Systems

N=140  
Maximum Score = 5  
Minimum Score = 1

Variables	Level-I Score (S.D.)	Level-II Score (S.D.)	Level-III Score (S.D.)
Reporting System	4.13 (0.62)	3.77 (0.94)	3.84 (0.96)
Informal System	2.57 (1.12)	3.19 (1.33)	3.33 (1.29)
Observations	3.53 (1.15)	2.94 (1.16)	2.77 (1.11)
Feedback / Complaints	3.50 (1.12)	2.84 (1.19)	3.03 (1.10)

After the information gathering, the next phase of the management control is to review and analyze the gathered information, which is done in the Technical Review meetings. On the basis of the information supplied by the heads of the department, performance reports are analyzed and finalized at the respective levels. Further, for the in-depth analysis of reports, the Chief Engineer calls Technical Review Meetings at the end of every month. The scrutiny and examination of control performance reports as used in Technical Review Meetings reveals that generally the compliance of the minutes of last Technical Review Meeting, with respect to the given points, is provided through the MIS of the Board to discuss in the meeting. To know the relevance, importance and application of various control reports, data was gathered from all the managers. Table 3 lists the scores of the managers at the three levels of management of the distribution system at PSEB with respect to the various reports (16 in number), which were being discussed at the monthly review meetings. The names of the sixteen reports, which were discussed in monthly review meetings, have been given in Appendix-1.

TABLE- 3

Reports Discussed in the Review Meetings

(N=140; Maximum Score=5; Minimum Score=1)

Report	Level-I Score (S.D.)	Level-II Score (S.D.)	Level-III Score (S.D.)
I	4.13 (0.62)	3.77 (0.94)	3.84 (0.96)
II	4.13 (0.62)	3.77 (0.94)	3.84 (0.96)
III	4.13 (0.62)	3.77 (0.94)	3.33 (1.29)
IV	4.13 (0.62)	3.77 (0.94)	3.84 (0.96)
V	3.53 (1.15)	3.77 (0.94)	3.84 (0.96)
VI	3.53 (1.15)	3.19 (1.33)	3.33 (1.29)
VII	4.13 (0.62)	3.77 (0.94)	3.84 (0.96)
VIII	3.53 (1.15)	3.77 (0.94)	3.33 (1.29)
IX	3.53 (1.15)	3.19 (1.33)	3.84 (0.96)
X	4.13 (0.62)	3.77 (0.94)	3.33 (1.29)
XI	3.53 (1.15)	3.19 (1.33)	3.84 (0.96)
XII	4.13 (0.62)	3.77 (0.94)	3.33 (1.29)
XIII	4.13 (0.62)	3.77 (0.94)	3.33 (1.29)
XIV	3.53 (1.15)	3.77 (0.94)	3.84 (0.96)
XV	3.53 (1.15)	3.19 (1.33)	3.84 (0.96)
XVI	4.13 (0.62)	3.77 (0.94)	3.33 (1.29)

An analysis of Table 3 reveals that the sixteen reports, which were introduced by the board as a part of the control system, are discussed and reviewed at all the three levels of the management of the PSEB. Out of the sixteen reports, no report has been rated below average at any of the three levels. Thus, the finding indicates that the control reports are relevant for the purpose of the control and these reports are discussed in terms of their utility and contents.

**Evaluation of MIS of the Board**

As has been discussed above, information required in management control system is required for planning, coordination, evaluation and to take corrective measures. Different types of information are required in the Board for each area and, within each area; the relevant information depends upon the situation, environment, the behavior desired and cost and value of the information. In addition to the information about plans, budgets and programmes, managers are also provided information about the type of actions they are expected to take, or to refrain from taking, under various circumstances, termed as standing instructions. For an effective Management Control System, it is essential that the Management Information System must be effective. In order to evaluate the MIS of the distribution system at PSEB, Various questions pertaining to the effectiveness of MIS, covering all the functional areas namely Finance, Administration and Personnel, were asked from the respondents. These responses have been portrayed in Table-4.

An analysis of Table-4 reveals that in the financial control area, the managers at the strategic management rated variables like 'timeliness'; 'adequacy'; 'frequency of reporting'; 'format clarity'; and 'periodic review' as above average. However the managers were not found satisfied with 'duplication free'; 'accuracy'; 'exception reporting'; and 'clarity' parameters. The finding indicates that strategic management control level of distribution system of PSEB is being provided

with information which is duplicate, inaccurate, ambiguous, and without exceptions. This is not desirable for an effective control system in the board and thus the board needs to look into this finding as a priority. However, the respondents at the Management Control level as well as at the operational control level rated the entire factor as above average. This may be due to the fact that MIS is more structured at the lower levels and the managers at these levels are getting the information as per their expectations.

In the administrative control area, the managers at level-I have rated the below average performance of MIS in terms of 'relevance' (2.80); 'duplication freeness' (2.73); 'accuracy' (2.73); 'exception reporting' (2.80); and 'format clarity' (2.93). This level has expressed their satisfaction in terms of 'timeliness'; 'adequacy'; 'clarity'; 'frequency'; and periodic review. At the managerial level, managers have rated all the variables above average except 'duplication free' variable, which has been rated as below average (2.81). At the operational levels, MIS is found effective, as all the variables have been rated as above average. The findings indicate that in the administrative control area, MIS is lacking at the strategic planning control level in respects of adequacy; duplication; accuracy; exception reporting; and format clarity whereas at Level-II, MIS is lacking in respect of duplication.

In the personnel control area, MIS has been above average in all the variables of an effective MIS except for 'duplication free' (2.73); and 'accuracy' (2.73); whereas at Level-II, MIS is found lacking in respect of 'duplication free' (2.81); and clarity (2.84.) However at Level-III, MIS has been rated as above average for all the respective variables. This finding indicates that Level-I needs to be provided duplication free and more accurate reports. Similarly as the information provided to the managers at Level-II is not duplication-free and accurate, Level-II should be provided with duplication free and unambiguous reports.

## Recommendations

- ◆ For an effective management control, more structured control system should be in place. It would reduce subjectivity of the managers and would make the control system more transparent and robust.
- ◆ It is a good practice to have only the relevant control reports and to discuss and review these reports in a monthly meeting. This practice should continue so that irrelevant reports are discontinued and relevant reports are introduced. The control reports should be categorise into on in categories like 'A'; 'B'; 'C' category reports on the basis of importance and criticality of these reports. The frequency of such reviews should be increased for highly critical reports.
- ◆ To ensure effective control in the board, MIS should be evaluated at all the levels on continuous basis and the weakness, if any, must be addressed at the priority level.
- ◆ To make the MIS evaluation system easy, user friendly and regular, it is suggested that the board should have an on line evaluation system. This would help the board in providing immediate feedback on the weakness or otherwise of the system.

## Limitations of the Study

This study has only been undertaken in one of the sub-systems of PSEB. To further improve the accuracy of the results, a detailed study covering all the sub-systems is called for. Also the study has been conducted without following an integrated model for the evaluation of Management Control Systems. The further research, which has a lot of potential in this area, should be done to design an integrated model to evaluate Management Control Systems in an organization.

## Conclusion

The overall structure of Management Control System of the Board is based on the basic

principles and has been found performing fairly well. However MIS is found faltering in various respects, especially at the strategic planning level of the distribution system of the board. Based on these broad findings, various recommendations have been made in this study. It is expected, if these recommendations are implemented, it will go a long way in improving the management control systems in the distribution system of the board in specific; and in the board in particular. These findings can become a framework for other organizations to sensitize and to follow suit in improving their MIS and management control systems. This study can also pave a way to take up more detailed studies in other organizations, so as to design an integrated model for the evaluation of MIS as well as management control systems.

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APPENDIX-1

List of reports, which are discussed in the review meetings:

I	Progress of release of Tube well, ISC & GSC connections
II	Status of 24 hour supply to villages
III	Status of returning of meters to ME labs
IV	Progress of Scanning/replacement of seals
V	Key exceptions
VI	Progress of dispute settlement cases
VII	Status of pending complaints/references received from the CM Punjab and the Chairman's office
VIII	Inspection of Divisions/Sub-divisions
IX	Revenue growth
X	Installation of capacitors at Sub-stations, 11KV lines and district Transformers
XI	Detection of theft of energy/leakage of revenue
XII	Performance of 66/33/11 KV lines
XIII	Current complaints
XIV	Status of damage to district Transformers
XV	Theft of Transformers parts
XVI	Position of 4-Laning of State Highways
XVII	Electrification of focal points, provision of complaint centers/cash collection centers/ construction of buildings



TABLE-4  
Evaluation of Effectiveness of Information System

Variable Name	Financial Control Average Score (S.D.)			Administrative Control Average Score (S.D.)			Personnel Control Average Score (S.D.)		
	Level-I	Level-II	Level-III	Level-I	Level-II	Level-III	Level-I	Level-II	Level-III
	Maximum Score=5			Minimum Score=1					
Timeliness	3.47 (1.02)	3.39 (1.10)	3.55 (1.22)	3.20 (1.17)	3.39 (1.01)	3.46 (1.05)	3.27 (1.29)	3.35 (0.93)	3.63 (1.01)
Relevance	3.40 (0.95)	3.10 (1.06)	3.39 (1.07)	2.80 (1.28)	3.23 (1.01)	3.43 (0.90)	3.07 (1.29)	3.26 (1.01)	3.54 (0.99)
Adequacy	3.27 (1.00)	3.06 (0.91)	3.26 (1.05)	3.07 (1.18)	3.13 (1.04)	3.21 (0.99)	3.07 (1.29)	3.13 (0.98)	3.33 (1.07)
Duplication freeness	2.93 (0.85)	3.26 (1.05)	3.05 (1.18)	2.73 (1.00)	2.81 (1.09)	3.11 (1.12)	2.73 (1.12)	2.81 (0.90)	3.14 (0.97)
Accuracy	2.93 (1.00)	3.23 (1.13)	3.22 (1.09)	2.73 (1.12)	3.19 (0.93)	3.18 (1.15)	2.73 (1.06)	3.00 (1.05)	3.28 (1.07)
Exceptional reporting	2.93 (1.39)	3.48 (1.19)	3.30 (1.06)	2.80 (1.28)	3.26 (0.80)	3.23 (0.94)	3.07 (1.12)	3.32 (1.06)	3.21 (1.07)
Clarity & Conciseness	2.87 (1.45)	3.45 (1.13)	3.29 (0.97)	3.00 (1.26)	3.06 (0.95)	3.16 (0.94)	3.00 (1.03)	2.84 (1.11)	3.40 (0.97)
Frequency of reporting	3.60 (1.25)	3.65 (1.06)	3.46 (1.06)	3.33 (1.19)	3.19 (0.96)	3.36 (0.93)	3.00 (1.15)	3.45 (1.01)	3.27 (1.21)
Format Clarity of control reports	3.47 (1.09)	3.13 (1.01)	3.22 (1.20)	2.93 (1.24)	3.45 (1.01)	3.11 (0.97)	3.13 (1.09)	3.19 (1.00)	3.45 (1.03)
Contents and periodic review of management reports	3.60 (0.95)	3.06 (1.24)	3.30 (1.18)	3.60 (0.95)	3.06 (1.24)	3.30 (1.18)	3.00 (1.51)	3.29 (1.02)	3.23 (1.10)