

CHAPTER 8

Summary and Conclusion

8.1 General Background

The upstream oil industry in India is on growth path. The globalization and liberalization policies have provided more opportunities and competitive environment. Existing business organizations are facing more competition from multi-national corporations (MNCs) and new entrants, both from public and private sectors. With the introduction of new exploratory licensing policy by the Government of India in 1998, oil and gas blocks for exploration are being awarded through international bidding, in place of nomination earlier, to central government owned corporations. As a result, there is much stronger need for upstream oil companies to be efficient, economic, flexible and effective in their business operations. Therefore, the development of an enterprise performance management system (EPMS) incorporating flexibility to effectively measure and manage enterprise performance for driving performance improvements in the upstream oil sector, has assumed greater importance.

The upstream oil industry requires very heavy investment for exploration and production of oil and gas to meet energy needs of fast growing Indian economy. In order to fulfil the energy security, Indian upstream companies are also facing fierce competition in oil asset acquisitions overseas from the Chinese corporations and other MNCs. Due to high capital intensive nature of the business, even if performance improvement is small, savings/ benefits will be huge. Therefore, a robust, integrated and flexible performance management model/ framework need to be designed, which will deliver superior value

proposition to various stakeholders and bring about performance improvements in the oil sector.

In this chapter, major results and findings of the research are summarized, and few concrete suggestions are made for the organizations, particularly for the management of upstream oil companies in India (specifically for senior executives and middle management, who want to implement EPMS in their organizations). The significant research contributions, implications for both researchers and practitioners, limitations of the study and possible directions for future work are also summarized in this chapter.

8.2 Summary of Findings

The key objective of the research study, as outlined in section 1.4 of chapter one, was to study the effectiveness of enterprise performance measurement and management system (EPMS) and flexibility in upstream oil industry in India and to evolve a model/ framework based on the findings of the study. Accordingly, various components of the research such as survey and case studies were carried out and the findings are synthesized as per broad research objectives. A brief summary is presented below:

The macro level predictors of enterprise performance management system (EPMS) effectiveness are: (i) strategy planning, (ii) strategic flexibility, (iii) strategy implementation, (iv) EPM system design, (v) performance reporting and feedback, (vi) information system flexibility, and (vii) EPMS implementation issues.

The micro level predictors of EPMS effectiveness are: (i.a) vision and mission clarity, (i.b) setting strategic goals, (ii.a) impact of globalization and

liberalization, (ii.b) in-house capability, (ii.c) external drivers, (iii.a) alignment with operational goals, (iii.b) resources allocation, (iv.a) selection of dimensions and KPIs, (iv.b) customized EPMS, (v) performance reporting and feedback, (vi.a) EPMS functionality, (vi.b) information technology flexibility, (vii.a) effective EPMS implementation, (vii.b) top management support, and (vii.c) quality of data. The dominant micro level predictors are; effective EPMS implementation, EPMS functionality, and impact of globalization and liberalization.

8.2.1 Relationships of Key Variables

Based on the research (both survey and the case studies), the relationships of the key research variables have been established and the research findings are summarized below:

- (i) The values of correlation coefficient are high in correlated independent micro variables impacting EPMS effectiveness in all companies. (*Refer Table 5.6*).
- (ii) The relationships of key research variables are consistent in terms of regression analysis of micro variables of EPMS effectiveness in survey as well as in case studies. The additional micro variables such as in-house capability, alignment of operational goals, customized EPMS, and top management support came from case studies (*Refer Tables 5.23, 6.11 and 6.20*). In-house capability supports internal business process and provides competitive advantage to the organization. Alignment with operational goals helps enterprise to achieve strategic objectives better. Customized EPMS helps organization to monitor performance effectively. Top management support helps in strategic

alignment and monitoring effectively. Hence these micro variables have been considered in the validated model.

- (iii) The value of correlation coefficient is high between independent micro and dependent micro variables of EPMS effectiveness (*Refer Table 5.6*). EPMS effectiveness has been measured in terms of strategic alignment, strategic monitoring, financial perspective, customer perspective, internal business process perspective, and learning and growth perspective.
- (iv) At macro level, the predictors of EPMS effectiveness are: EPMS implementation issues, strategy implementation, strategic flexibility and information system flexibility. Additional predictors such as strategy planning, EPMS design, performance reporting and feedback came up from micro level regression analysis (*Refer Tables 5.5 and 5.23*).
- (v) At micro level, the major predictors of EPMS effectiveness are effective EPMS implementation, EPMS functionality, and impact of globalization and liberalization (*Refer Tables 5.8, 5.10, 5.12, 5.14, 5.16, and 5.18*).
- (vi) Predictors of strategic alignment are effective EPMS implementation, vision and mission clarity, and performance reporting and feedback (*Refer Table 5.8*).
- (vii) Predictors of strategic monitoring are effective EPMS implementation, selection of dimensions and KPIs, EPMS functionality, and impact of globalization and liberalization (*Refer Table 5.10*).
- (viii) Predictors of financial perspective are effective EPMS implementation, EPMS functionality, quality of data, external drivers, and information technology flexibility (*Refer Table 5.12*).

- (ix) Predictors of customer perspective are external drivers, EPMS functionality, impact of globalization and liberalization, and setting of strategic goals (*Refer Table 5.14*).
- (x) Predictors of internal business process perspective are effective EPMS implementation, impact of globalization and liberalization, and EPMS functionality (*Refer Table 5.16*).
- (xi) Predictors of learning and growth perspective are effective EPMS implementation, resource allocation, and impact of globalization/liberalization (*Refer Table 5.18*).
- (xii) The case studies indicate four additional micro predictors; alignment with operational goals, In-house capability, customized EPMS, and top management support (*Refer Tables 6.11 and 6.20*).
- (xiii) The hypotheses for macro and micro variables have been tested and partly proven to establish relationships among research variables, which in turn led to the development of validated model.
- (xiv) Analysis of dependent variables indicate that strategic alignment, strategic monitoring, financial, customer, internal business process, and learning and growth perspectives are effectiveness parameters for EPMS.

8.2.2 Validated EPMS Model

The validated relationships at macro level helped in the development of the validated EPMS model as envisaged in the objectives of the research. (*Refer section 1.4, chapter one*). The hypotheses at macro and micro variables have been tested and few of them have been proved to be true to establish relationships among research variables, which led to the development of a validated EPMS model. This model can safely be treated as the validated

model brought out by this research (*Refer Figures 7.1 and 7.2*). The key findings related to the validated EPMS model are summarized as follows:

- (i) The validated model generated by the survey has been corroborated by the case studies to a great extent. The variations in case studies are corroborated by the micro level analysis of survey data.
- (ii) The validated model of EPMS is comprehensive, integrated and aligned with strategy planning, strategic flexibility, strategy implementation, EPMS design, performance reporting and feedback, information system flexibility, and EPMS implementation issues.
- (iii) EPMS Implementation issues such as effective EPMS implementation, top management support, and quality of data have come out to be major predictors of EPMS effectiveness in the proposed model. Other major predictors are; strategic flexibility, EPMS design, performance reporting and feedback, and Information system flexibility.

The research findings have led to the achievement of research objectives to a marked extent and based on this, some important recommendations have been made. An attempt has also been made to interpret the relationships (*Refer section 7.3*). The research has provided integrated validated model incorporating strategic and information system flexibilities, and implementation issues for enterprise performance management system to be effectiveness in driving performance improvement in organization.

8.3 Implications of Research

Implications of the research for the researchers as well as practitioners/managers are described in the following sections.

8.3.1 Implications for Researchers

This research has several important implications. The current research provides an important empirical step towards understanding the enterprise performance management and its effectiveness. The literature review and identified gaps provided basis for further research. The questionnaire developed in this research could be used as an instrument for conducting further empirical studies on the effectiveness of EPMS and flexibility in other firms/ industries.

The study presents an empirical analysis that emphasizes on the key drivers which impact EPMS effectiveness. In an era of globalization and liberalization, business environment is dynamic, complex, and competitive and hence strategic flexibility, IS flexibility and EPMS implementation issues of greater importance, have been incorporated in the validated model. This clearly distinguishes this research study from previous studies is that it provided an integrated view of enterprise performance management and flexibility. The results can be used to steer further research in EPMS effectiveness incorporating other types of flexibility such as organisational flexibility, operational flexibility, and other functional flexibilities (human resource flexibility, financial flexibilities etc.). These findings have contributed to the theory of balanced scorecard by Kaplan and Norton (1996), Performance Prism by Neely and Adams (1998), Ittner and Larcker (2003), and Martinez and Kennerley (2005).

The study provide addition to the body of literature on performance management by identifying the role of EPMS implementation issues, strategic flexibility and IS flexibility on EPMS effectiveness and highlights the importance for further research in these areas.

8.3.2 Implications for Practitioners

The model developed in this study has some practical implications for managers and practitioners. The model developed has demonstrated its practical application in upstream oil industry in India. The model can also be used to assess skill and training requirements, to identify internal business process gap for adding/ enhancing internal capabilities and capacities, to improve efficiency, to optimize cost, and to design suitable incentive schemes. The model can also be used as an investigative tool for identifying the strategy translation into strategic goals, organizational alignment with the strategy, strategic awareness in the organization, budgetary processes linkage with the strategy, resource allocation linkage with strategic goals, strategic monitoring, and effective performance improvement in the organization.

EPMS implementation issues are significantly important as they would help managers to avoid pitfalls and improve EPMS effectiveness. The research findings would also help managers to focus on integrating various flexibilities with EPMS to take care of dynamic environment. Managers to avoid fragmented and ad-hoc approach for designing and implementing EPMS. Rather, EPMS to be designed and implemented as an integrated and well aligned model incorporating various predictors of EPMS effectiveness.

The proposed enterprise performance management system maturity model has five levels of maturity (*Refer Figure 7.3*). Organizations adopting strategic alignment, benchmarks, quality assessment, risk assessment and flexibility adoption along with EPMS would reach to a corresponding level of EPMS maturity as depicted in the maturity model. Organizations with a higher level of EPMS maturity would be able to reap greater level of performance improvement along multi-dimensions.

8.4 Major Recommendations

Findings of the survey as well as case studies have generated some major recommendations in order to find out ways and means to improve effectiveness of EPMS for the upstream oil organizations. It helps to understand various macro and micro factors necessary for EPMS effectiveness. The recommendations coming out of various components of research are listed as follows:

- (i) EPMS to be aligned and integrated with strategy planning process in terms of vision, mission, strategy and strategic objectives and goals.
- (ii) Strategic flexibility such as factors of globalization and liberalization, external drivers (government policies, market forces, merger and acquisition etc.), and in-house capabilities are to be incorporated in the design and implementation of EPMS.
- (iii) EPMS to be aligned and integrated with strategy implementation process in terms of resource allocation and alignment with operational goals.
- (iv) Customized EPMS, which should include relevant KPIs and dimensions of measurement specific to each organization, need to be adopted.
- (v) An effective performance reporting and feedback mechanism should be evolved and based on feedback, review of strategy, strategic goals, and EPMS design should be carried out periodically.
- (vi) Information system flexibility in terms of access, use, speed, and EPMS functionality plays important role in effective deployment, implementation and success of EPMS. Enterprise Resources Planning

(ERP) and other software for automation of EPMS would greatly help in EPMS success.

- (vii) Effective EPMS implementation issues, key success factors and best practices should be duly considered. Top management support, usage by top management, organisation culture for acceptance, reporting structure, quality of data flow into EPMS are critical implementation issues impacting effectiveness of EPMS in an organization.
- (viii) The effectiveness should be seen in a balanced way on six dimensions such as strategic alignment, strategic monitoring, financial perspective, customer perspective, internal business process perspective, and learning and growth perspective.
- (ix) Managers should carry out Situation-Actor-Process analysis in order to find out interplay of various factors impacting EPMS effectiveness and then Learning-Action-Performance synthesis should be done in order to generate guidelines for suggested actions to improve EPMS effectiveness.

8.5 Research Contribution

The research study provided some new evidences on the relationships between EPMS effectiveness and factors affecting it. Significant research contributions are summarized as under:

- (i) The learning from the survey and case studies have been synthesized, number of important findings and implementation guidelines for EPMS effectiveness have been reported (*Refer Chapter 7*).

- (ii) A validated EPMS effectiveness model is presented, which maps various effectiveness parameters/ factors such as strategy planning, strategic flexibility, strategy implementation, EPMS design, performance reporting and feedback, information system flexibility and implementation issues (*Refer Figures 7.1 and 7.2*).
- (iii) At macro level, strategic flexibility is found to be a major predictor of EPMS effectiveness. At micro level, impact of globalization and liberalization is affecting strategic monitoring, customer and internal business process perspectives, while external drivers are impacting financial and customer perspectives of EPMS effectiveness.
- (iv) At macro level, information system flexibility is also found to be a major predictor of EPMS effectiveness. At micro level, EPMS functionality affects all dimensions of effectiveness except strategic alignment, while information technology (IT) flexibility affects financial perspective negatively as more investment is required to create IT flexibility.
- (v) Interpretation of relationships in the model, based on macro and micro effectiveness variables, has provided better insight.
- (vi) The study is enriching the body of literature on EPMS effectiveness by providing a comprehensive and integrated model recording various factors contributing to effectiveness of EPMS.
- (vii) The study provides practical implications for future researchers and practitioners. This may be used for strategy execution and implementation, resource allocation, budgeting, process and efficiency improvements, human resource planning, skill development, innovation, and incentive schemes.

The study contributed to enrich the literature on enterprise performance management, flexibility and effectiveness. The factors contributing to EPMS effectiveness can be broadly categorized in four groups: (i) strategy related factors such as strategy planning, and strategy implementation, (ii) system related factors such as EPM system design, and performance reporting and feedback, (iii) flexibility related factors such as strategic flexibility, and information system flexibility, and (iv) EPMS implementation issues or key success factors. These predictors of effectiveness have come out to be major contributors of EPMS effectiveness.

The role of strategic flexibility, information system flexibility and implementation issues in enterprise performance management in upstream oil industry in India have been studied for the first time. These factors have considerable impact on organization's EPMS effectiveness.

8.6 Limitations of the Study

The fact is that any research work would have limitations due to limited resources, data availability, and biasness of respondents and researcher. The limitations of this research study are mentioned below:

- (i) Survey was carried out from senior and middle management and random sampling may not have been followed in strict sense. Survey did not include operational managers as study scope was to consider strategic levels only. Questionnaire was distributed to both government and private owned companies including MNCs, but only a few private oil companies responded.

- (ii) The study did not cover other stakeholders such as ministry of petroleum and natural gas, directorate general of hydrocarbons (the regulatory body), equipment manufacturers, vendors, and service providers having interplay with each other.
- (iii) The role of strategic and information system flexibilities has been explored in the study of EPMS effectiveness. Other types of flexibilities such as organizational, operational, technological, marketing, finance and HR flexibilities have not been covered.
- (iv) Case studies covered two high performer companies in upstream oil industry as low performers could not fit into the criteria of selection.
- (v) Interviews carried out as part of the case studies were restricted to senior executives, which might have brought in personal biases in rating the variables of the cases.

8.7 Relevance of the Study

The study is relevant to the following:

- (i) Researchers and academicians pursuing enterprise performance management system designing, implementation and studying effectiveness to steer further research into EPMS.
- (ii) Business enterprises intending to implement and improve effectiveness of EPMS.
- (iii) The validated integrated EPMS model evolved in this research, can serve as a guiding framework for implementation of EPMS to managers, middle and senior management, who are entrusted with the job of EPMS implementation in their respective organizations.

8.8 Suggestions for Future Research

The suggestions for further work are important part of any research study. The few important suggestions for further research work in this area are as follows:

- (i) Proposed model may be tested for oil sector including both upstream and downstream in India and other countries.
- (ii) Future research work may also include operational managers in addition to senior and middle management.
- (iii) Study may include more private organizations and comparison may be done between public sector and private sector oil organizations.
- (iv) Future empirical studies may also cover other stakeholders such as ministry of petroleum and natural gas, directorate general of hydrocarbons (the regulatory body), equipment manufacturers, vendors, and service providers having interplay with each other and their impact on research variables.
- (v) Role of other types of flexibilities such as organizational, operational, manufacturing, marketing, functional, and HR flexibilities need to be researched further.
- (vi) Future research may also study the effect of external flexibilities on EPMS effectiveness.
- (vii) Comparison of case study between high and low performing organizations may be carried out to see the effect of underlying variables.
- (viii) The model may also be tested for other sectors in India and other countries so as to generalize the EPMS effectiveness model.

- (ix) The future research may include risk assessment, benchmarking, system and culture of organisations influencing the effectiveness of EPMS.
- (x) External factors such as geo-political environment, social objectives like subsidy payments to downstream companies to offset rising cost of petroleum products to be provided to the public at affordable prices, environmental and CSR initiatives are very important factors but due to non availability of precise data and its linkages with other variables, they have not been considered in the present study. These factors need to be incorporated for further research on EPMS.

8.9 Concluding Remarks

The chapter one describes the general background, scenario of oil and gas, need for the study and its objectives. It is important to mention that chapter two narrated the literature review of enterprise performance management, key performance indicators, system design, implementation issues and flexibilities. This helped in identifying research gaps and defining research variables. Chapter three described the research design including definition of research variables, proposed conceptual model, hypotheses formulation and research methodology. Chapter four provides details on questionnaire development process, pilot testing, survey and data processing (Univariate analysis) to find relationship of research variables. In chapter five, different hypotheses have been tested to provide a sound validated model of enterprise performance management system effectiveness. Chapter six dealt with case studies of two select upstream oil organizations using dynamic SAP-LAP methodology to

study and evaluate underlying linkage variables. Chapter seven provided synthesis of findings and interpretation of results based on chapter four to six.

Last but not the least, chapter eight provides the summary of research findings and major recommendations. It also mentions implications of research, significant research contributions, limitations of the research work, and suggestion for further work.

The main objective of this study was to design enterprise performance management system incorporating flexibilities and to study the effectiveness of model in upstream oil industry in India. After identifying dimensions of measurement and factors affecting effectiveness from the literature survey, empirical study was conducted and primary data was collected through survey from ten oil companies in India involved in upstream oil business.

The study has established that in face of globalization and liberalization, and dynamic business environment, importance of an effective enterprise performance measurement and management system has increased many folds. The study recommended a validated integrated and aligned model of enterprise performance measurement and management system to effectively measure and monitor enterprise performance so as to provide feedback to the management for taking actions that drive performance improvement in the underlying organisation. Macro factors contributing to EPMS effectiveness have come out to be strategy planning, strategic flexibility, strategy implementation, EPMS design, performance reporting and feedback, information system flexibility, and EPMS implementation issues. EPMS implementation issues have come out to be major drivers for EPMS effectiveness in an organization. The dimensions of measurement of effectiveness are strategic alignment, strategic monitoring, financial, customer, internal business process, and

learning and growth perspectives. The recommended EPMS model may be used by the organizations and practitioners for EPMS to be effective that drive break-through performance.

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