

CHAPTER 6

Case Studies of Enterprise Performance Management Systems Effectiveness in Select Upstream Oil Organizations

6.1 Introduction

The case study methodology is suitable for relatively unstructured approach to develop or cross-validate frameworks and theories. The survey methodology, followed by case studies, provides a better platform to understand and interpret various inter-related issues. The aim of the case study is to study a relatively small number of select cases in-depth from the industry rather than to cover the whole industry (Yin, 1993, 2003). The case study research has other advantages such as:

- (i) It helps to deduce causal relationships with more validity due to availability of long-term observations.
- (ii) It provides broad holistic pattern of phenomenon in real world.
- (iii) It enables to develop ground framework and theories that are relevant and practical.

In light of above advantages, case studies of two major upstream oil companies of India, have been developed and analyzed using SAP-LAP (Situation-Actor-Process-Learning-Action-Performance) framework (Sushil 2000, 2001).

This chapter deals with case studies to understand the enterprise performance management system effectiveness in select upstream oil companies of oil sector. There are few upstream oil companies and few new start-ups, which have come up after introduction of new exploratory licensing

policy by the government of India few years ago. The companies satisfying following criteria have been selected.

- (i) It should be an Indian upstream oil organisation.
- (ii) It should have strong upstream operation with technological and organisational infrastructure.
- (iii) It should have more than 5 years of upstream operations.
- (iv) It should have implemented comprehensive EPMS.

Based on the above criteria, two companies i.e. Oil and Natural Gas Corporation Ltd. (ONGC) and Oil India Ltd. (OIL) have been selected for the case studies. The purpose of the study is to understand the micro issues of effectiveness of enterprise performance management system (EPMS) that have emerged from survey study.

Though conducting a case study at division level of a company appears to be useful to get more insights but due to difficulty in getting confidential data at micro level have limited the researcher to confine the analysis at macro level (Company level).

6.2 Methodology for the Case Study

The research design adopted is shown in Figure 6.1. The case studies have been analysed using dynamic SAP-LAP framework to see the influence of various factors on the enterprise performance management system in driving performance improvement in the organisation and to identify the areas of action. The SAP-LAP findings have also been used to cross-validate empirically validated model identified in previous chapter.

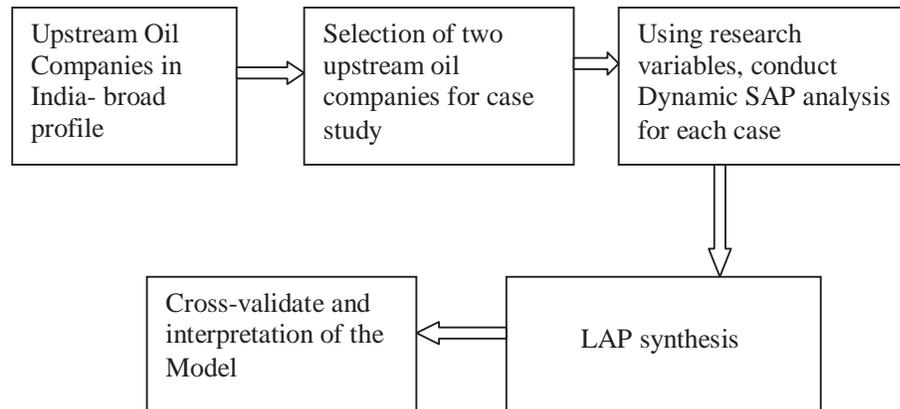


Figure 6.1: Research Design for the Case Studies

In the case study, unit of analysis is corporation/firm level. The data has been gathered based on secondary sources and semi structured interviews of senior executives involved in corporate planning, performance management, benchmarking, and corporate management services in the select organisations. Historic data has been collected from the particular company website and published reports. The questionnaire based interviews were conducted, where executives were asked to rate each variable influencing EPMS effectiveness on a scale of 1-6, 1 being “strongly disagree” and 6 being “strongly agree”. It was done during personal visits by the researcher to the company’s corporate office. The findings of case studies have been compared with the findings of empirical study, and learning from both were synthesized to finally suggest a recommended model of EPMS.

6.2.1 The Dynamic SAP-LAP Framework

The flexible system methodology based on SAP-LAP (Situation-Actor-Process, Learning-Action-Performance) framework (Sushil, 1993, 1994, 1997, 1999, 2000, 2001) has been used to evolve the ‘learning issues’ regarding actual practices and to bring out the ‘suggested actions’ for ‘improvement of

performance'. The methodology is applied in two steps comprising of SAP analysis and LAP synthesis.

In SAP analysis, the case is described through three components that define the dynamic interplay of reality. These components are situation, actor and process. These are definable within a context and interact flexibly on multiple planes in the ambiguous reality. Situation is the present status of enterprise performance measurement and management practices and systems in use by the organization. The participants, including the corporate planning and budgeting managers, performance and benchmarking managers/team leaders/champions, who influence the situation and alter it by their actions or inactions are termed as actors. The procedural steps, including enterprise performance measurement and management processes and systems, taken by the actors are termed as the process. Some aspects of the process may be definable explicitly while others implicitly. Any dynamic behaviour which alters the situation, has the potential of being a process or a part of the process.

The second phase is called LAP synthesis, having three components, i.e. learning issues, actions and performance. Learning issues emphasize the typicality of the situation as well as some features of the uniqueness. Learning issues also lead to action, if taken would lead to improved performance.

The dynamic SAP-LAP framework has been used to understand the enterprise performance measurement and management methodologies, integrated approach of performance management, strategic and information system flexibilities, external and internal environmental changes with respect to time (five years taken for analysis) (Sushil, 2000a). Dynamic SAP analysis gives the analysis of situation, actor, and processes with respect to time to understand the situation before and after EPMS implementation. Dynamic

SAP-LAP analysis application for auto component manufacturing firm in India has been studied by Sahoo et al. (2010). Flexible Strategy Game-card comprises of enterprise perspective and customer perspective of strategic performance (Sushil, 2010). SAP-LAP model of inquiry and interaction of situation, actor and process in SAP-LAP paradigm is shown in Figure 6.2.

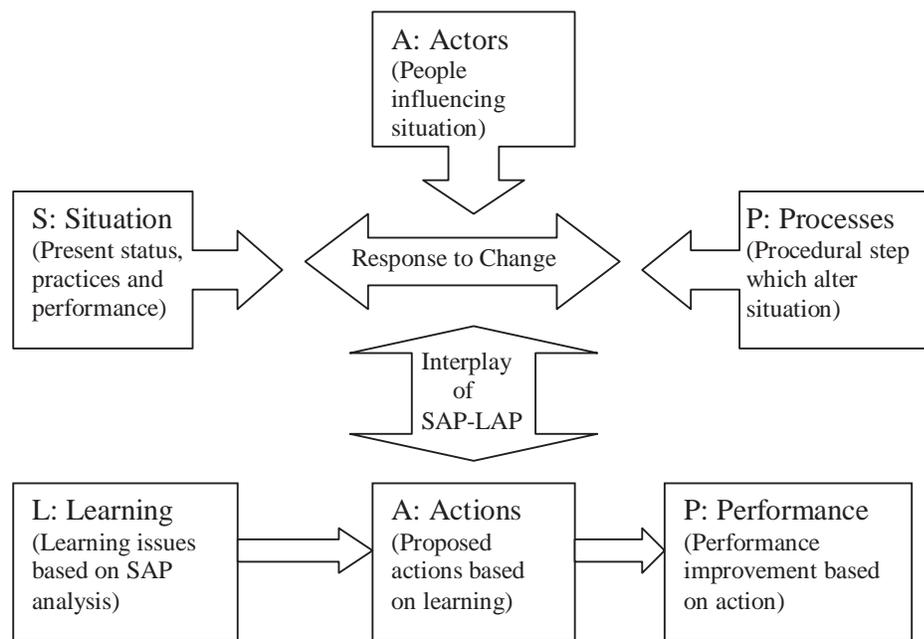


Figure 6.2: SAP-LAP Model of Inquiry

6.3 Case Study I: Oil and Natural Gas Corporation Ltd.(ONGC)

6.3.1 Introduction

Oil and Natural Gas Commission was set up by the Government of India in 1956 to explore and produce oil and natural gas in India. Later in 1994, it was incorporated into a public limited company as Oil and Natural Gas Corporation Limited (ONGC). It is an integrated upstream oil company having major in-house departments/ services such as exploratory survey, drilling, logging, well services, production, reservoir engineering, engineering and construction, transportation, and information technology in addition to support services such

as human resource, materials management, finance and accounts, and marketing. The company has many discoveries of oil and gas fields, both onshore and offshore in India. It has been quick in adopting newer strategies and taking initiatives to achieve its vision and mission. In 2002, it acquired 71.6 per cent stake in Mangalore Refinery and Petrochemicals Limited (MRPL).

6.3.2 Vision and Mission of ONGC

The vision statement of ONGC is “to be a world class Oil and Gas Company integrated in energy business with dominant Indian leadership and global presence”. The stated mission in 2002-03 of ONGC was “(i) doubling of oil and gas reserves, (ii) enhancing recovery factor from 28% to 40%, (iii) increasing turnover from 5 billion to 10 billion USD in next 5 years, and (iv) foreign equity oil of 10 MMT per annum”. It has taken various strategic initiatives such as enhanced exploration effort to increase oil and gas reserve accretion, technological recovery schemes to increase recovery factor from depleting reservoirs, more value added products, diversification into refining, alternate sources of energy such as wind and thermal, and aggressive bidding for oil block acquisition overseas. The current mission in 2010 is “(i) dominant Indian leadership in petroleum sector, (ii) integrated in energy business, and (iii) world class organization”.

6.3.3 Strategic Performance of ONGC

It is one of the major oil and gas exploration and production company in India. Its operations extend from onshore areas such as Assam, Agartala, Andhra Pradesh, Pudduchery, Gujarat, and Rajasthan, to offshore areas such as Bombay High, Kutch, Kerala Konkan, and KG offshore. It has acquired oil and gas blocks for exploration and production overseas in 15 countries such as Russia, Sudan, Venezuela etc. totalling 39 projects (23 exploration, 7

discovered/ development, and 9 producing) and one pipeline project in Sudan (Figure 6.3(a)). It has diversified in last 10 years into petroleum refining, petrochemicals, wind and solar energy production. It acquired 71.6 per cent equity in MRPL (Refinery) in 2002 and has to its credit sizable wind and solar energy installations in Gujarat and Tamil Nadu. Under new exploratory licensing policy (NELP) of government of India started in 1998, ONGC has obtained NELP blocks for exploration of oil and gas in all VIII NELP bidding rounds from 1998 till 2010 totalling 142.

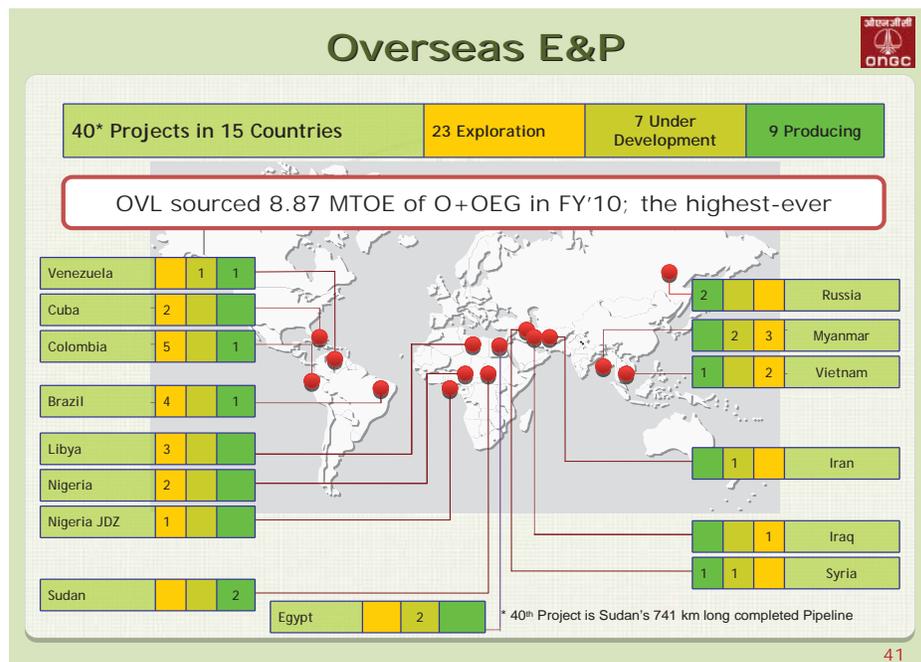


Figure 6.3: Overseas Projects of ONGC Videsh Ltd.
Source: Annual Report, ONGC, 2009

Physical performance (Indian and overseas operations) and financial performance of ONGC from 2002-03 to 2009-10, taken from annual reports and ONGC website, are exhibited in Tables 6.1 to 6.3 and Figure 6.4 to 6.10.

Table 6.1: Physical Performance of ONGC (Indian Operation)

Year	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10
Crude Oil Prod.(MMT)	26.01	26.06	26.48	24.40	26.05	25.95	25.37	24.67
Natural Gas Prod.(BCM)	24.24	23.58	22.97	22.57	22.44	22.33	22.48	23.11
VAP Prod.(KT)	3.795	3.627	3.479	3.428	3.238	3.257	3.224	3.457
Expl. Oil Wells drilled	150	124	109	106	87	98	106	128
Dev. Wells Drilled	190	197	179	164	178	224	218	294
URR Accretion 3 P (MMToe)	41	34	49	52	66	64	69	83
Oil and Gas Reserve (MMToe)	1098	1081	1079	1084	1101	1117	1139	1175
Reserve Replacement Ratio	0.81	0.68	0.99	1.1	1.35	1.32	1.44	1.74
NELP Blocks addition			3	-	24	-	18	17
Petroleum Refining (MMTPA)	9.69			12.12	12.47	12.49	12.59	12.50
Wind Energy (MWH)	-	-	-	-	-	-	50	50

Legend: MMT: Million Metric Tons, BCM: Billion Cubic Meter, KT: Kilo Tons, URR: Ultimate Recoverable Reserve, MMToe: Million Metric Tons oil and oil equivalent gas, RRR: Reserve Replacement Ratio, RLI: Reserve Life Index, RPR: Reserve to Production Ratio, MMTPA: MMT per annum, MWH: Mega Watt Hour.

Source: Annual Reports, ONGC

Table 6.2: Physical Performance of ONGC (Overseas Operation)

Year	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10
Crude Oil Prod.(MMT)	0.183	3.35	3.71	4.58	5.80	6.84	6.56	6.49
Natural Gas Prod.(BCM)	0.07	0.52	1.35	1.76	2.15	1.96	2.22	2.38
URR Accretion 3P (MMToe)	65.04	15.22	10.44	16.72	9.96	46.73	135.08	0.35

Source: Annual Reports, ONGC

Table 6.3: Financial Performance of ONGC

Year	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10
Sales Revenue (*)	353.872	329.270	472.454	494.397	590.575	615.426	650.494	619.832
PBIDT (*)	190.429	181.230	246.784	283.731	306.465	314.790	319.684	375.588
PAT (*)	105.293	86.644	129.830	144.308	156.429	167.016	161.263	167.676
ROCE %	54	45.8	58.8	57.5	56.7	52	49.9	50.9
EPS (Rs.)	73.8	60.8	91.05	101.2	73.14	78.09	75.4	78.39

Legend: Rs.: Indian Rupee, PBIDT: Profit before Interest, Depreciation and Tax, PAT: Profit After Tax, ROCE: Return on Capital employed, EPS: Earning per share.

* Billion Rupees

Source: Annual Reports, ONGC

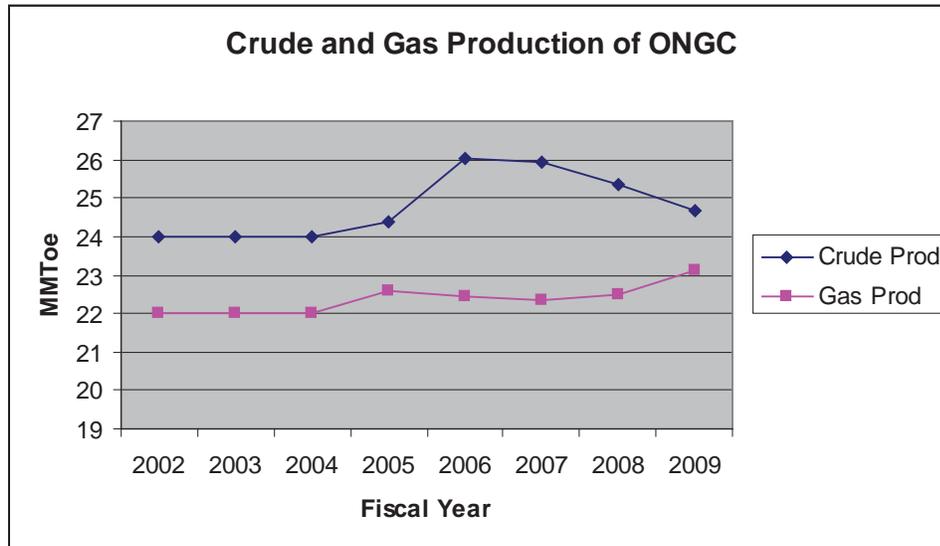


Figure 6.4: Crude and Gas Production of ONGC

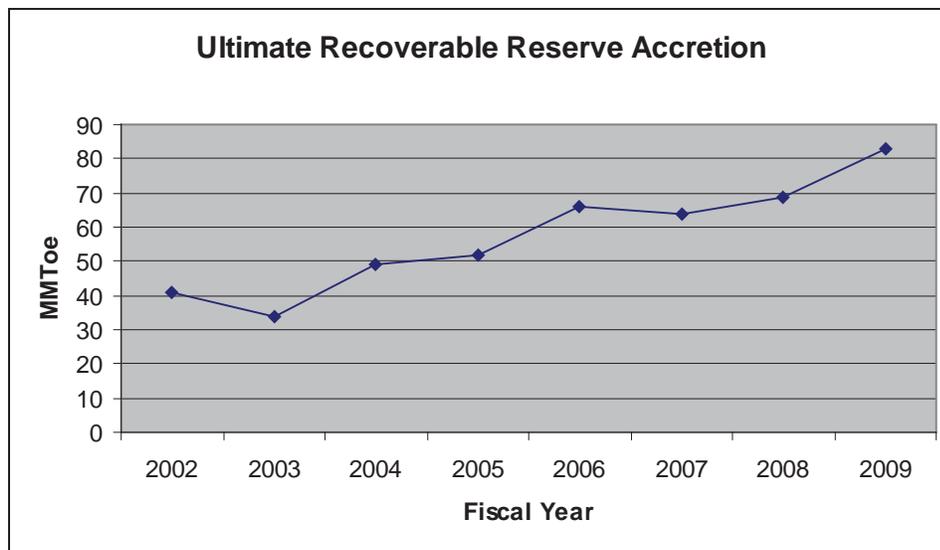


Figure 6.5: Annual Ultimate Recoverable Reserve Accretion in ONGC

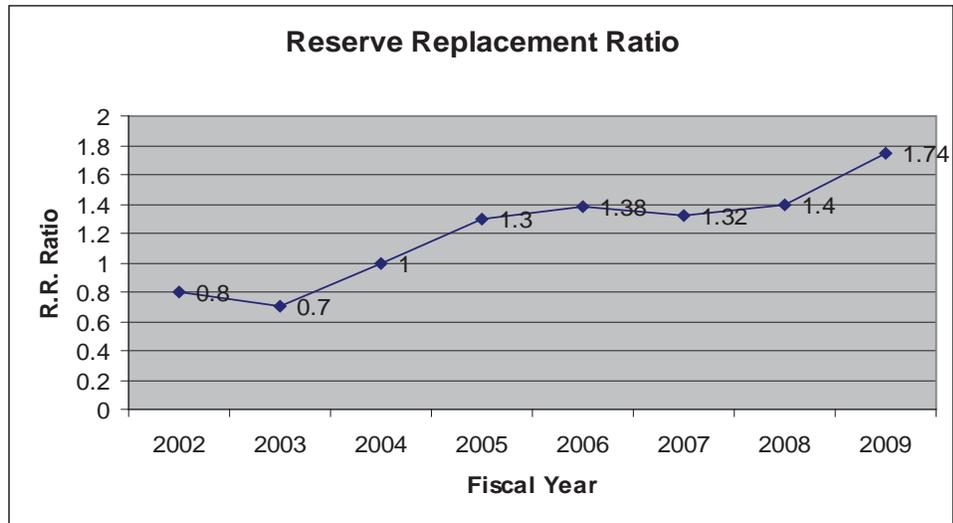


Figure 6.6: Reserve Replacement Ratio in ONGC

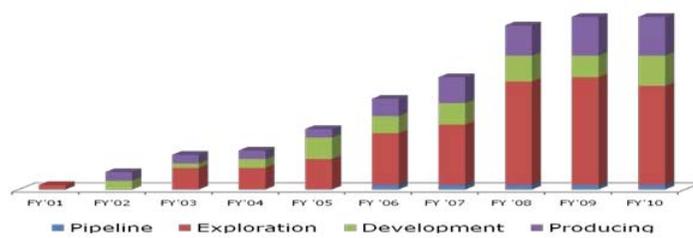


Figure 6.7: Overseas Number of Projects of ONGC Videsh Ltd.

Source: Annual Reports, ONGC

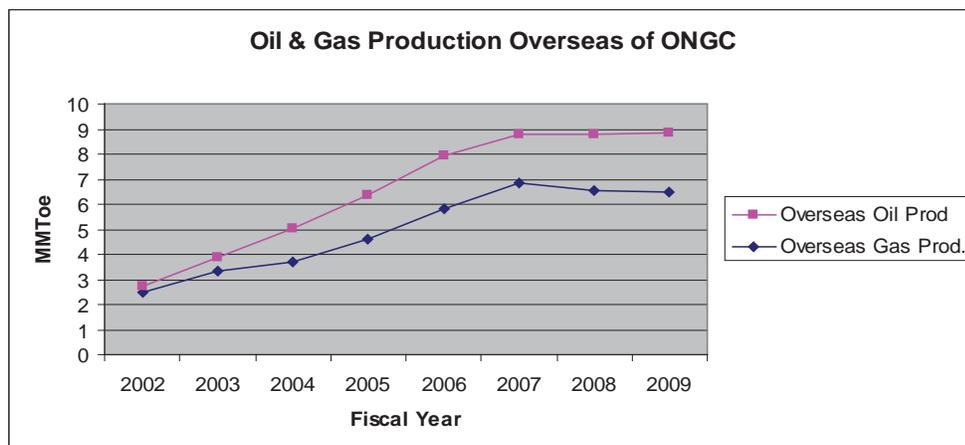


Figure 6.8: Overseas Oil and Gas Production of ONGC Videsh Ltd.

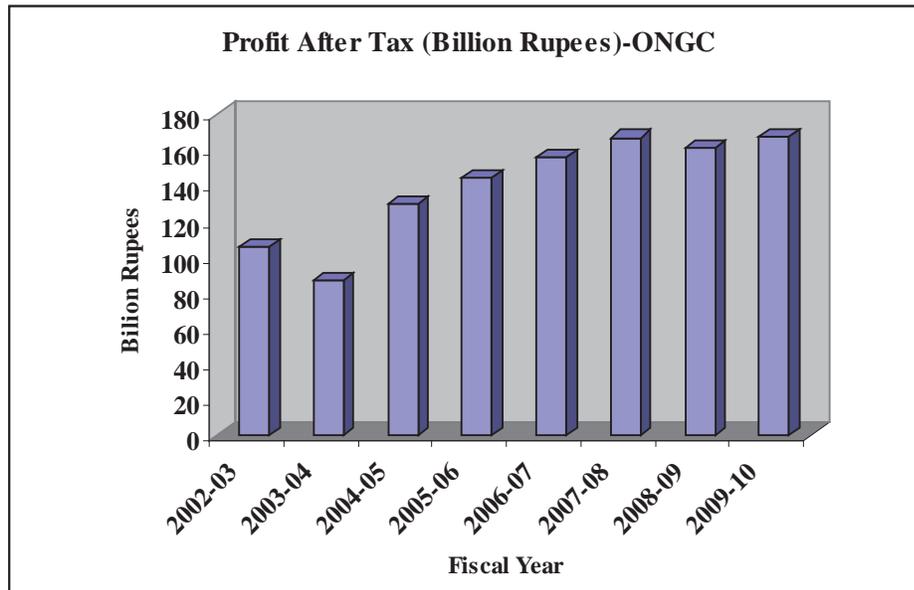


Figure 6.9 Profit After Tax (PAT) of ONGC

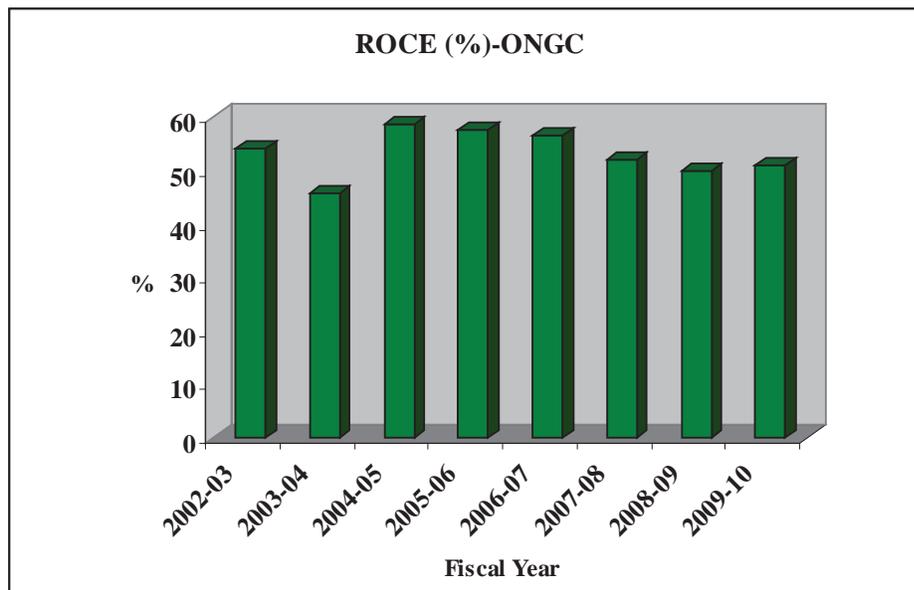


Figure 6.10 Return On Capital Employed (ROCE) of ONGC

Comprehensive performance management systems such as balanced scorecard and benchmarking implementation started in ONGC in the year 2002-03. Looking at physical performance of ONGC from Indian operations from 2002-03 to 2009-10 (refer Table 6.1, Figures 6.4 to 6.6), though crude oil,

natural gas and value added products (VAP) production remained almost constant, but number of development wells drilled increased from 190 to 294, ultimate recoverable reserve (URR) accretion has doubled from 41 to 83 million tonnes oil equivalent (MMToe), and oil and gas reserve has increased from 1098 to 1175 MMToe. Reserve replacement ratio (RRR), which is a ratio of oil and gas reserve addition and oil & gas production, has doubled from 0.8 to 1.74 in the above mentioned period. With old oilfields and declining production, ONGC with its aggressive enhanced oil recovery techniques, has been able to maintain production, and increase recovery factor from 28 per cent in 2000-01 to 33 per cent in 2009-10, which is considered good as per international standards.

On overseas front also, ONGC has improved its performance from 2002-03 to 2009-10 (refer Table 6.2 and Figures 6.7 and 6.8). Crude production increased from 0.183 to 6.49 MMT, and gas production increased from 0.07 to 2.38 BCM during the period but URR accretion has been very inconsistent.

Financial performance of ONGC from 2002-03 to 2009-10 (refer Table 6.3 and Figures 6.9 and 6.10) in terms of Sales Revenue, PBIDT, and PAT has been impressive. Sales revenue, PBIDT and PAT has almost doubled during the period. ROCE has remained above 50 per cent. EPS has increased from Rs. 73.8 in 2002-03 to Rs. 101.2 in 2005-06 but decreased to Rs. 73.14 due to bonus share issue in 2006-07 and then remained around Rs.75. The overall performance improvement of ONGC can be assumed to be an excellent during the period.

6.3.4 Factors Influencing EPMS Effectiveness in ONGC

The macro variables influencing EPMS effectiveness have come from macro and micro analysis of survey. The macro variables have been examined while

conducting case study of ONGC, based on semi-structured interviews with senior executives from corporate planning, and performance management and benchmarking departments and also from reports published by ONGC.

Strategy Planning

- (i) Strategies are decided based on vision and mission statement.
- (ii) Strategy planning is done by consensus across SBUs and other services departments.
- (iii) Enterprise level corporate plans are drawn taking into physical, material, machine and plant capacity, and human resources available.
- (iv) The corporate plans are cascaded down to SBU level and department level operational plans.
- (v) Budget planning is done based on activities and operational plans.
- (vi) Human resources requirement planning is tightly integrated with operational and corporate plans.
- (vii) Corporate plans are 5-yearly as well as yearly plans, which are then broken into quarterly and monthly plans.

Strategic Flexibility

- (i) Globalization has provided opportunity for ONGC to acquire overseas oil and gas assets (oil acreage) in many countries which were not available a decade ago.
- (ii) Globalization and liberalization has forced ONGC to adopt competitive strategy in national and international bidding for oil blocks acquisition for oil exploration and equity oil.
- (iii) With introduction of new exploratory licensing policy (NELP) by the Government of India 10 years ago, ONGC has acquired more oil blocks in international bidding and is able to carry out exploration of oil

and gas better due to its core competence and technical skilled manpower.

- (iv) ONGC has sufficient infrastructure which is acting favourable to business opportunity and growth.
- (v) ONGC has gone for technology scouting and induction of new technology in oil and gas exploration and production.
- (vi) ONGC has also gone for mergers and acquisitions, such as acquisition of 71.6 per cent stake in Mangalore Refinery and Petrochemicals Ltd. (MRPL) in India in 2002.
- (vii) Government policies such as NELP, market driven product pricing from government controlled nomination of blocks and oil pricing, have resulted into better profit margin and achievement of financial objectives.
- (viii) ONGC has adopted diversification strategy in petroleum processing, value added products, petroleum products retail outlets, and alternate sources of energy production such as solar and wind energy in Tamil Nadu and Gujarat.

Strategy Implementation

- (i) Vision and Mission are realistic, attainable and shared across the organization.
- (ii) Enterprise strategy is largely understood at SBU and operational levels.
- (iii) There exists clear ownership of strategy in the organization both at corporate and operational levels but there is some ambiguity in case of services departments.

- (iv) Strategic goals and targets are clearly identifiable at each level such as corporate, strategic business unit (SBU) and operational levels.
- (v) Adequate resources are allocated to execute plans at each level.
- (vi) Budget allocations are based on targets set for each SBU/department, which needs improvement.
- (vii) There is poor coordination among various services and departments leading to delays.
- (viii) Though top management is concerned with time and cost overruns, but it is not so sensitive at operational levels. To overcome this, ONGC in the year 2009 has adopted a multi-disciplinary team (MDT) approach in sharing responsibilities and execution of plans between various departments including services.
- (ix) There are delays in projects execution due to poor planning, cumbersome tendering process, and award of contract, which lead to complaints by bidders to the ministry.
- (x) Though GOI has 74.14 per cent stake in ONGC, it has recently been granted "*Maharatna*" status and thereby having more freedom in decision-making in planning and execution of strategic initiatives.

EPMS Design

- (i) Till a few years ago, ONGC had system of performance monitoring based on physical targets alone as product pricing was 100 per cent government controlled.
- (ii) With liberalization and decontrol regime, ONGC has adopted multi-dimensional domain wise performance contracts (PC) to measure performance in terms of process efficiency, cost reduction, CAPEX

utilization, and human resources development and safety.

Performance contracts are variants of balanced scorecard.

- (iii) Various types of measures/ key performance indicators (KPIs) such as financial and non-financials (both leading and lagging) are included in PCs.
- (iv) Measures designed are to some extent strategically aligned. Few measures selected are not able to measure and highlight performance improvement.
- (v) There is a clear ownership of each measure.
- (vi) Each measure has been given due weightage and score in PCs in view of its importance.
- (vii) Majority of measures are well defined and understood at various levels of organization but few are ambiguous.
- (viii) Various MIS and PMS are aligned.
- (ix) Measures/ KPIs and performance measurement system design are reviewed every year.
- (x) In year 2009-10, service level agreement (SLA) between services and departments has been introduced but it is not fully functional.

Performance Reporting and Feedback

- (i) There are two separate departments to monitor performance. Corporate planning department for physical targets, and performance management and benchmarking department for performance contract and service level agreements. Though physical targets are being monitored daily, performance contracts are being monitored annually by the concerned head of the SBU.

- (ii) Achievements against targets are analysed and reported to management.
- (iii) Based on feedback, strategic plans are revised annually.
- (iv) Performance is not being measured against internal/external benchmarks.

Information System Flexibility

- (i) ONGC has implemented, in 2004-05, organization wide enterprise resource planning (ERP) system (SAP R/3) to integrate various functions onto a single platform in order to avoid duplication of data and decentralised systems. As a result, there is a central integrated system for all purposes of MIS reporting.
- (ii) Performance contracts have been designed and implemented on SAP platform, which is providing full functionality.
- (iii) Sufficient flexibility to users in terms of usage through web-based system and quick access is provided.
- (iv) ONGC has in-house skilled IT personnel both for implementation and maintenance.

EPMS Implementation Issues

- (i) ONGC at present not fully using performance contract for decision-making.
- (ii) There is a concern for quality and timely smooth flow of data into PCs.
- (iii) There is poor acceptance of PCs, although right and adequate measures are incorporated in PCs and SLAs.
- (iv) EPMS is being implemented with sincerity and good ownership.

- (v) EPMS implementation is under executive director (corporate planning) and not directly under CEO.
- (vi) EPMS is neither having full support nor use by top management.
- (vii) Incentive schemes are not aligned with EPMS so far.

6.3.5 EPMS Effectiveness in ONGC

The univariate analysis of variables influencing EPMS effectiveness, based on survey data from 62 senior executives of ONGC, is presented in Tables 6.4 to 6.7 and Figures 6.11 to 6.14.

Table 6.4: Descriptive Statistics for Independent Macro Variables of EPMS in ONGC

		(6-point scale) N=62		
S. No.	Independent Macro Variables	Mean	Median	Std. Dev.
1	Strategy Planning	4.70	4.75	0.71
2	Strategic Flexibility	4.73	4.69	0.66
3	Strategy Implementation	4.49	4.60	0.69
4	EPMS Design	4.14	4.27	0.86
5	Performance Feedback	4.34	4.40	0.87
6	Information System Flexibility	4.54	4.64	0.84
7	EPMS Implementation Issues	4.13	4.19	0.88

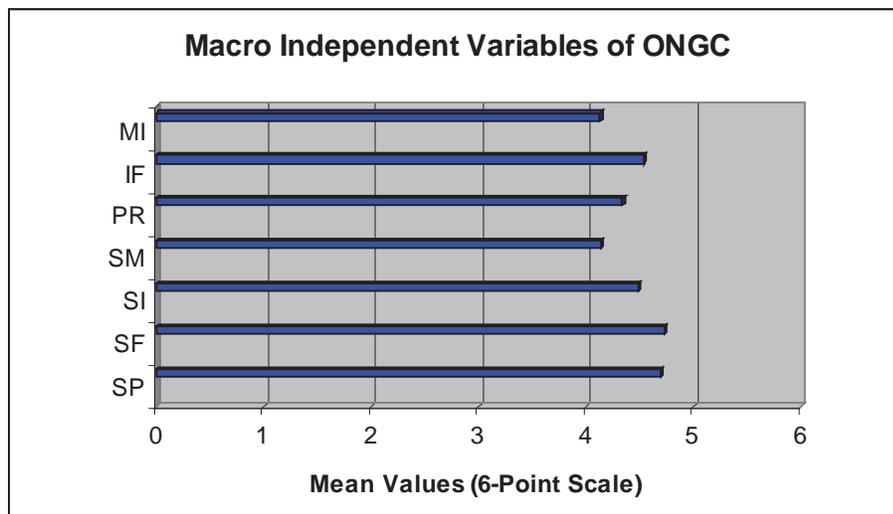


Figure 6.11: Mean Values of Independent Macro Variables of EPMS in ONGC

From Table 6.4 and Figure 6.11, it is seen that all the independent macro variables have mean value more than 4.00 (on a six point scale), which means ONGC plays equal emphasis on all factors such as strategy planning, strategic flexibility, strategy implementation, EPMS design, performance reporting and feedback, information system flexibility, and EPMS implementation issues are contributing to EPMS effectiveness. Mean and median values are close to normal distribution. Standard deviation is in range of 0.66 to 0.88 (less than 1.0), and therefore there is enough confidence in mean values.

Table 6.5: Descriptive Statistics for Dependent Macro Variable of EPMS in ONGC (6-point scale) N=62

S. No.	Dependent Macro Variable	Mean	Median	Std. Dev.
1	EPMS Effectiveness	4.27	4.38	0.87

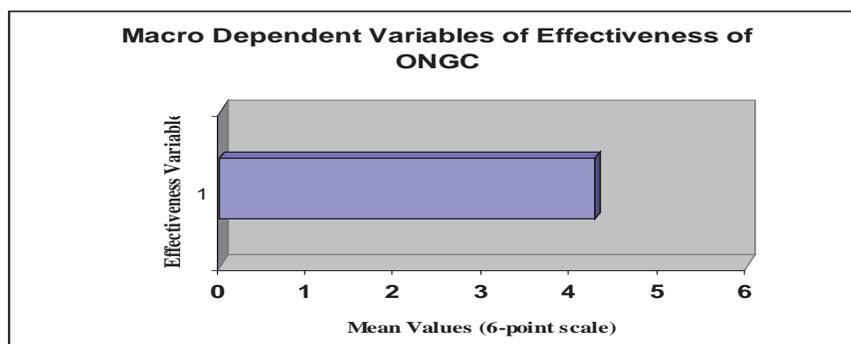


Figure 6.12: Mean Value of Dependent Macro Variable of EPMS in ONGC

It is evident from Table 6.5 and Figure 6.12 that the ONGC plays more emphasis on EPMS effectiveness (mean 4.27).

Table 6.6: Descriptive Statistics for Independent Micro Variables of EPMS in ONGC

		N=62		
S. No.	Independent Micro Variables	Mean	Median	Std. Dev.
	Strategy Panning			
1	Vision and Mission Clarity	4.90	5.00	0.68
2	Setting of Strategic Goals	4.10	4.00	1.21
	Strategic Flexibility			
3	Impact of Globalization/ Liberalization	4.98	5.00	0.66
4	In-house Capabilities	4.75	5.00	0.85
5	External Drivers	4.53	4.67	0.93
	Strategy Implementation			
6	Alignment with Operational Goals	4.49	4.57	0.74
7	Resources Allocation	4.49	4.67	0.79
	EPMS Design			
8	Selection of Dimensions and Measures	4.20	4.39	0.90
9	Customised EPMS	3.40	4.00	1.47
	Performance Feedback			
10	Performance Reporting and Feedback	4.34	4.40	0.87
	Information System Flexibility			
11	EPMS Functionalities	4.57	4.70	0.85
12	IT Flexibility	4.47	4.50	1.06
	EPMS Implementation Issues			
13	Effective EPMS Implementation	4.12	4.17	0.91
14	Top Management Support	4.11	4.17	0.92
15	Quality of Data Flow	4.31	4.50	1.28

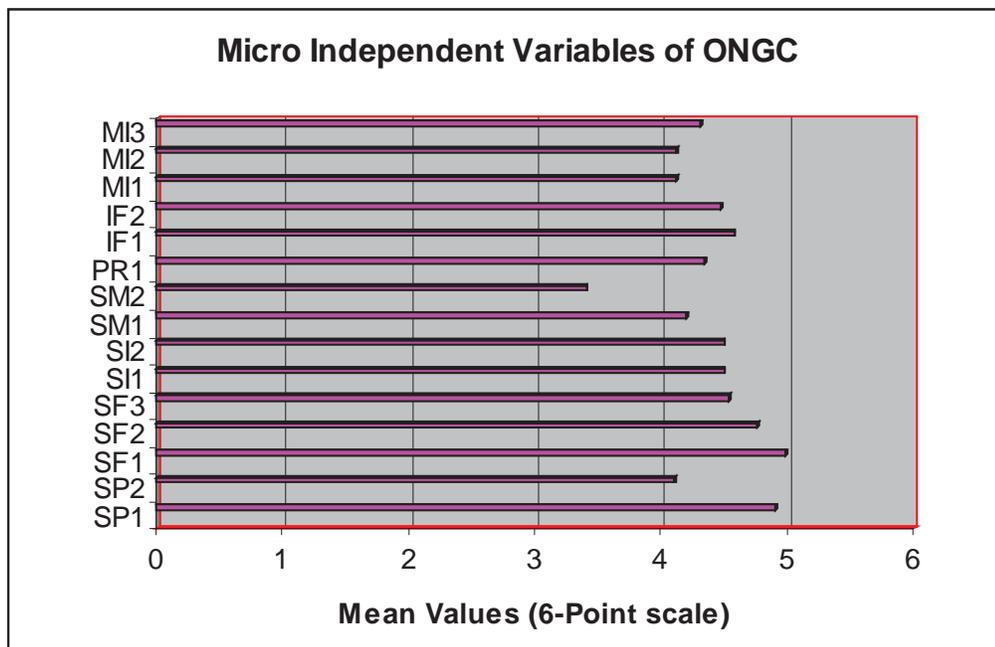


Figure 6.13: Mean Values of Independent Micro Variables of EPMS in ONGC

All independent micro variables are having mean value more than 4.0, except for customised EPMS (3.4) (refer Table 6.6 and Figure 6.13). It implies that all the micro variables/factors (fifteen in number) are contributing positively to EPMS effectiveness in ONGC. There is more emphasis on vision and mission clarity, impact of globalization/ liberalization, in-house capability, external drivers, alignment with operational goals, resources allocation, EPMS functionality, information technology flexibility, and quality of data flow in the case organisation under study. This is in-line with independent macro variables results presented in Table 6.4.

Table 6.7: Descriptive Statistics for Dependent Micro Variables of EPMS Effectiveness in ONGC (6-point scale) N=62

S. No.	Dependent Micro Variables	Mean	Median	Std. Dev.
1	Strategic Alignment	4.06	4.00	1.12
2	Strategic Monitoring	4.34	4.42	0.93
3	Financial Perspective	4.56	4.80	1.06
4	Customer Perspective	4.30	4.40	1.32
5	Internal Business Process Perspective	4.18	4.30	0.94
6	Learning & Growth Perspective	4.24	4.29	0.94

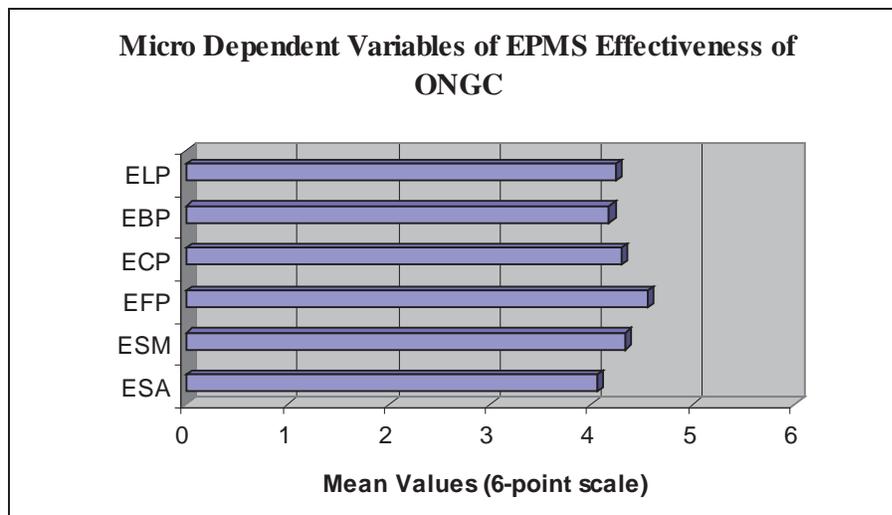


Figure 6.14: Mean Values of Dependent Micro Variables of EPMS Effectiveness in ONGC

It is observed from the Table 6.7 and Figure 6.14 that all effectiveness micro variables are having mean value more than 4.0 (on a six point scale), which implies that all the dependent micro variables are measuring EPMS effectiveness and are given equal emphasis on all dimensions of effectiveness in the case organization. Standard deviations are varying from 0.93 to 1.32, which is indicative of high spread around mean.

6.3.6 SAP-LAP Analysis of ONGC

To understand company's interaction with dynamic business environment, and consequent changes in its strategy formulation, strategy implementation, flexibility adoption, and performance measurement and management, dynamic SAP-LAP model of inquiry has been developed by identifying critical questions in each element of situation, actor and process. The question framework clearly brings out as to how SAP-LAP approach contributes to learning and improves the decision-making of the company. The SAP-LAP inquiry schedule presented in Table 6.8, provides a structured framework for critical questions in each element like situation, actors and process to the respondent during interview/ discussion.

Dynamic SAP Analysis

Situation

The situation can be understood by framing a few questions and providing answer for the same.

Why Enterprise Performance Management System is required?

- (i) Until we measure, we cannot monitor and control enterprise performance to achieve desired results.
- (ii) Both traditional and comprehensive performance measurement and management systems are running parallel since 2002-03.

Table 6.8: SAP-LAP Inquiry Schedule

<i>Situation</i>
What is status of performance measurement practice in the organization?
What is the nature of improvements desired?
What are factors driving towards adopting comprehensive EPMS?
What are initiatives taken by the organization to improve performance?
What are actions taken by the organization to relate strategy with EPMS?
<i>Actors</i>
Who are the key actors playing lead role in performance management?
What are the roles of actors integrating strategy with EPMS?
What is the significance of role played by lead actors in decision-making?
<i>Process</i>
What are formal processes for tracking EPMS developments?
What is the process of EPMS development in the organization?
How plans for EPMS design and implementation are made?
How are strategy integrated with EPMS?
How EPMS design and purpose is documented and people trained?

- (iii) Traditional performance measurement system is based on physical measures, which is monitored daily, and financial measures monitored quarterly/ annually.
- (iv) Operating cost is increasing due to aging oilfields and consequently profit margins are reducing. ONGC needs to improve efficiency in operation and cost optimization.
- (v) Comprehensive enterprise performance measurement system (EPMS) such as performance contract though designed to measure quarterly but being reviewed by top management annual in next fiscal year.
- (vi) Various measures from different dimensions and perspectives have been designed and each measure/ KPI have been assigned due weightages. Realistic target for each measure in BSC is also assigned.

- (vii) Balanced scorecards at various levels such as corporate, SBU and department levels have been designed but are not being given due importance in decision-making processes.
- (viii) No benchmarks (internal or external) for measures have been devised.
- (ix) Balanced scorecards to some extent are strategically aligned.
- (x) Targets are being cascaded down from corporate level to department level.

Why Flexibility is required?

- (i) Environment in which ONGC operates is dynamic and competitive.
- (ii) Oil and gas production is coming down due to depleting oilfield reservoirs. This requires huge investment in enhanced oil recovery (EOR) methods to boost production. In last 6-7 years, ONGC has made sizable investment in EOR implementation.
- (iii) In place of nomination earlier, Government of India is awarding oil blocks for exploration through an international bidding under new exploratory licensing policy (NELP) since the year 1998. ONGC has to compete with other Indian oil companies and MNCs.
- (iv) Top management takes active role in strategy formulation and implementation.
- (v) Globalization and liberalization has provided additional opportunity and competition to ONGC in India as well as overseas.
- (vi) IT system is being used for deployment of enterprise performance measurement system. IT flexibility is important in EPMS implementation. ONGC has provided IT flexibility to EPMS with implementation of centralized ERP (SAP R/3) system in 2002-05.

Actors

Who are the Key Actors?

The key actors enabling EPMS are as follows:

- (i) Top management.
- (ii) Corporate planning department.
- (iii) Performance management and benchmarking department.
- (iv) SBU heads.
- (v) Operational managers.
- (vi) Information technology department including ERP centre.
- (vii) Government of India for framing policies on oil exploration, licensing, and taxation.

Processes

What is being done?

Comprehensive enterprise performance management system (EPMS) has been implemented since 2002-03.

How is it being done?

Implementations in ONGC are as follows:

- (i) ONGC, being a Government of India company, signs a memorandum of understanding (MOU) on various physical and financial targets every year. Based on this, a traditional performance measurement system is designed cascading down targets to SBU and operational levels. Physical targets are being monitored daily and monthly but financial targets quarterly.
- (ii) Balanced scorecard approach of performance management has been adopted since 2002-03, where performance is being measured in terms of strategic goals and achievement of objectives.

- (iii) Design of measures and its targets are done with mutual discussions among concerned directors, SBU heads and performance management department head.
- (iv) Performance-linked incentive scheme is based on traditional PMS and not yet on BSC.
- (v) Risk Assessment not yet integrated with EPMS.

Dynamic SAP analysis of ONGC before and after EPMS implementation is presented in Table 6.9.

LAP Synthesis

LAP (Learning-Action-Performance) synthesis is based on Dynamic SAP analysis. Based on learning from the situation, actions suggested for actors and expected performance improvements of the organization, mapped for EPMS effectiveness for ONGC as mentioned below:

Learning

What is the Key Learning?

- (i) Central control and functional structure of the organization.
- (ii) Poor operational efficiency.
- (iii) Decreasing oil and gas production from depleting oilfields and increasing cost of operations.
- (iv) Poor technology induction.
- (v) Lack of thrust on creativity, innovation, and research and development.
- (vi) Increasing competitors such as RIL, GSPC, GAIL, CEIL etc.
- (vii) Poor exploratory success and average oil reserve addition.
- (viii) Aged manpower and poor manpower planning.
- (ix) Higher attrition of skilled manpower.

Table 6.9: Dynamic SAP Analysis of ONGC

	Before EPMS Implementation	After EPMS Implementation with Flexibility
Situation	<ul style="list-style-type: none"> • Challenge to improve efficiency. • Problem of time and cost overrun of projects. • Challenge for cost reduction in operations. • Increase in demand for oil and gas in the country. • Higher profit margin for value added products derived from gas. • Old technologies and equipments. • Government regulation changes from nomination to bidding. • Globalization and privatization created more competitions and opportunities. • Need for skill improvement of workforce. • Increasing inventory of spares and consumables. • Increase in the attrition rate of highly specialized and skilled workforce. 	<ul style="list-style-type: none"> • Focus on efficiency improvement. • Focus on timely completion of projects within budgeted cost with third party contracts. • Focus on main activities after outsourcing ancillary activities. • Reduction in inventory cost due to rate contract, e-procurement and reverse auction. • Adoption of cost reduction measure. • New technology induction. • Competitive bidding for Oil blocks in India with introduction of NELP. • Business process improvement with introduction of ERP system. • Overseas acquisition of oil blocks to meet energy security for India. • Better pay, perks and motivation to retain employees. • More focus of skill development of workforce.
Actors	<ul style="list-style-type: none"> • Corporate planning monitors the financial targets and physical targets. • No benchmarks for various operations on time, cost, efficiency and productivity • No centralized computerised system for MIS and performance management. 	<ul style="list-style-type: none"> • Board of Directors. • Corporate Planning. • Performance Management and Benchmarking (created in 2005) • SBU heads. • Operational Managers • IT and ERP heads
Process	<ul style="list-style-type: none"> • Performance measurement in silos (un-integrated). • No comprehensive performance management system. • Incentive scheme not linked with individual performance. • No computerised system to measure and monitor enterprise performance. 	<ul style="list-style-type: none"> • Centralised ERP SAP R/3 system implemented in 2002-05 and making various availability online. • Balanced Scorecard implemented throughout the organization since 2002-03. • Computerization of BSC on SAP platform, where data flows smoothly. This has given more confidence and visibility to the users. • Revised incentive scheme linked with performance of the organization and the individuals.

Action

What are the suggested Actions to improve performance/ EPMS effectiveness?

I. What is being done to improve the situation?

- (i) A multi-disciplinary approach with flat organization structure.
- (ii) Focus on operational efficiency measurement and improvement.
- (iii) Cost optimization in all aspects of operation and internal services by reducing non-productive time and import substitution.
- (iv) New technology induction in exploration, drilling, and production and processing.
- (v) Encouragement for creativity and innovation.
- (vi) Optimization of production from older depleting oilfields with induction of newer technology and methods, and better operations management.
- (vii) Improvement in exploratory success ratio leading to oil reserve addition.
- (viii) Exploration in new and tough areas like offshore deepwater.
- (ix) Bidding aggressively for participation in exploration and production in overseas countries.
- (x) Improvement in manpower planning, hiring, retention, and skill development.

II. What more can be done for process improvement?

- (i) Operational efficiency improvement through process improvement, reduction in down time and non-productive time.
- (ii) Efficient utilization of resources such as infrastructure and workforce.
- (iii) Reduction in inventory of materials by rate contract, and better material procurement and inventory management system with the help of ERP system.

- (iv) Exploratory success ratio needs further improvement for better reserve accretion and to reduce cost of exploration.
- (v) Better project management to avoid time and cost overrun and less complaint by vendor/service providers.
- (vi) More professional approach towards business.
- (vii) Extending internal oilfield services to other organizations in India as well as overseas by utilizing specialized technical expertise of oil exploration and production to enhance revenue generation.
- (viii) Aggressive overseas bidding for oil exploration blocks to meet energy security needs of India.

Performance

What are the key performance parameters and their impact on the situation?

- (i) With cost optimization and operational efficiency improvement, profit margin will increase.
- (ii) Aggressive exploration and improved exploratory success will lead to more oil and gas reserve accretion and wealth creation and reduction in exploratory cost.
- (iii) Better project management will avoid time and cost overruns.
- (iv) Inventory reduction will free blocked money as well as reduce inventory carrying cost.
- (v) Extending oilfield services to other companies in India and overseas would generate additional sources of income and better utilization of asset and skilled workforce.
- (vi) Overseas acquisition of oil and gas reserve will improve energy security to the country.

LAP synthesis on macro variables for ONGC is presented in Table 6.10.

Table 6.10: LAP Synthesis for ONGC

Macro Variables	Learning	Action	Performance
<i>Strategy Planning</i>	Moderate integration of strategic planning with enterprise performance management system.	High level integration with performance management system is needed.	Increase in strategic alignment.
<i>Strategic Flexibility</i>	High level of strategic flexibility.	Continuity and change forces to be balanced in a better way.	Increase in business and profitability.
<i>Strategy Implementation</i>	Moderate integration of strategic implementation with enterprise performance management system.	Adequate resources allocation to execute strategic initiatives to meet desired strategic targets.	Increase in internal business process improvement.
<i>EPMS Design</i>	High level of customized EPMS but lack of effective KPIs.	Careful design of SMART KPIs aligned with strategy, which will drive improvement in strategic performance.	Increase in strategic monitoring.
<i>Performance Reporting</i>	Poor performance reporting and feedback to the top management. Though being measured quarterly, but reported annually.	Performance reporting frequency to senior and middle management to be increased atleast to monthly. It should be taken up seriously by top management to bring a change in organization culture.	Improvement in strategic alignment and performance.
<i>Information System Flexibility</i>	High level of information system flexibility but many KPIs are outside system.	Effort should be made to put maximum KPIs on system.	Increase in strategic monitoring.
<i>EPMS Implementation Issues</i>	Poor EPMS implementation. Top management support in implementation and use is lacking.	Effective implementation methodology and top management support needs to be adopted.	Overall EPMS effectiveness will improve.

6.3.7 Interpretation of Validated Model

The Dynamic SAP-LAP framework provides better insight for situational analysis. This general framework can be applied to varied situation using qualitative or quantitative approach, which helps in improved decision-making and making the correct choice. In the changing scenario, organizations need to be more flexible in terms of adaptability, agility, openness and innovativeness,

so as to resonate with the environmental flexibility to drive higher corporate performance.

In case study of ONGC, following points have emerged from dynamic SAP-LAP analysis. Interpretations of micro variables linkages in EPMS effectiveness model for ONGC are shown in Table 6.11.

EPMS integration with seven macro areas would positively influence EPMS effectiveness in measuring and managing performance of an organization. In addition to eleven influencing micro variables from micro analysis of survey data (refer Table 5.21), four additional micro variables linkages such as in-house capabilities, alignment with operational goals, customised EPMS, and top management support, have emerged from the case study, which will influence EPMS effectiveness. The case study of ONGC, a larger upstream corporation, where four additional predictors of EPMS effectiveness have been found whereas survey included smaller start-up upstream oil companies also and hence these additional predictors could not clearly be identified in the opinion. Linkages of fifteen influencing micro variables of EPMS effectiveness has been explained in Table 6.11. An integrated EPMS model linking seven macro factors and fifteen micro factors has been presented, which would enhance effectiveness of EPMS in managing and improving enterprise business performance. Integration with strategy will lead to improved EPMS strategic alignment. Adequate resources allocation for strategy initiatives will eventually lead to improvement of internal business processes and learning and growth. In today's globalized world, continuity and change forces are to be managed in a way that gives competitive advantage to enable business and profitability improvements. Selection and carefully designed KPIs will lead to improved strategic monitoring. System based EPMS

will provide better flexibility in operation and use and thus would increase strategic monitoring. Effective implementation methodology of EPMS coupled with top management support would positively increase overall effectiveness of EPMS.

Table 6.11: Interpretation of Micro Variable Linkages in EPMS Model for ONGC

S. No.	Linkages/ Micro Variables Influencing EPMS Effectiveness	Interpretation
1	Vision and Mission Clarity	Vision and mission clarity in organization at various levels will enhance strategic alignment of EPMS
2	Setting of Strategic Goals	Setting strategic goals to meet demands and value creation for the customer will achieve customer perspective.
3	Impact of Globalization/ Liberalization	Impact of globalization and liberalization influences the organization to become more competitive and improve internal business process in order to meet customer perspective. It also leads to better strategic monitoring.
4	In-house Capabilities	In-house capability enhances learning and growth, and internal business process perspectives. Additional linkage from case study.
5	External Drivers	External drivers such as market forces, mergers and acquisitions, and favourable government policies influence both financial and customer perspectives.
6	Alignment with Operational Goals	Alignment with operational goals would impact strategic alignment, strategic monitoring and customer perspective. Additional linkage from case study.
7	Resources Allocation	Adequate resources and budget allocation will enhance learning and growth, and also internal business process perspective.
8	Selection of Dimensions and Measures	Selection of suitable KPIs and Dimensions of measurement will enhance strategic monitoring.
9	Customised EPMS	It has emerged from case study that customised EPMS for an organization would influence strategic alignment and monitoring.
10	Performance Reporting and Feedback	Performance reporting and feedback to management would not only effect strategic alignment but also strategic monitoring.
11	EPMS Functionalities	Information system flexibility providing flexibility of access and use would enhance all four perspectives and strategic monitoring.
12	IT Flexibility	Providing IT flexibility in terms of software and hardware would require more investments and thus it effective financial perspective negatively.
13	Effective EPMS Implementation	Addressing EPMS implementation issues would lead to success of EPMS and thus impacting all six dimensions of effectiveness.
14	Top Management Support	Top management support is crucial for success of EPMS implementation and would influence all six dimensions of EPMS effectiveness. Additional linkage from case study.
15	Quality of Data Flow	Quality of data and timely flow into EPMS system would allow better financial control and strategic monitoring.

6.4 Case Study II: Oil India Ltd.(OIL)

Oil India Limited's introduction, vision and mission, strategic performances both physical and financial, and factors influencing EPMS are described below:

6.4.1 Introduction

Oil India Ltd. (OIL) traces its origin from discovery of crude oil in far-east of India in Digboi, Assam in 1889. Oil India Pvt. Ltd. was formed in Feb, 1959 to expand and develop newly discovered oilfields in north east. In 1961, it became joint venture company between Government of India (GOI) and Burmah Oil Co. Ltd., UK. In 1981, OIL became central public sector undertaking. It is primarily an upstream oil company engaged in exploration, development, production, transportation of crude oil, natural gas and LPG. It also has 26 per cent stake in Numaligarh Refinery Ltd. It has paid up share capital of Rs. 240.45 Crores, of which 78.43 per cent is held by the Government of India.

6.4.2 Vision, Mission and Strategies of OIL

OIL's core purpose as defined is "the fastest growing energy company with a global presence providing value to the shareholder". Its vision and missions are to become the fastest growing energy company with highest profitability, delight the customers with quality products and services at competitive prices, be a learning organization, nurturing initiatives, innovations and aspirations with best practices and fully committed to safety, health and environment.

The main strategies are to make organic growth from existing oilfields by enhancing production, discover new hydrocarbons in new NELP blocks, joint venture with Indian Oil Corporation Ltd. to acquire producing properties, and venture into downstream in refining and petrochemicals.

6.4.3 Strategic Performance of OIL

OIL is second largest oil and gas exploration and production company in India. Its main oil production comes from north east, Assam and 10 per cent gas from Rajasthan. In recent years, it has acquired 30 NELP blocks for exploration in onshore areas such as Ganga and Mahanadi vallies as well as offshore areas such as Mahanadi, Mumbai and KG deepwater though international bidding. It has also acquired participatory interest in 19 blocks in 9 overseas countries such as Nigeria, Sudan, Libya, Iran, Gabon, Venezuela, Yemen and Timor. It also has 1157 km crude pipeline and 660 km multi-product pipeline. Physical and financial performance of OIL from 2004-05 to 2009-10, taken from annual reports and website, are given in Tables 6.12 to 6.13 and Figures 6.15 to 6.19.

Table 6.12: Physical Performance of OIL (Indian Operation)

Year	04-05	05-06	06-07	07-08	08-09	09-10
Crude Oil Prod. (MMT)	3.196	3.235	3.107	3.101	3.468	3.572
Natural Gas Prod.(BCM)	2.01	2.27	2.26	2.341	2.269	2.415
VAP Prod. (KT)	49.50	48.32	43.75	48.06	47.61	44.95
Expl. Wells drilled	8	12	9	11	13	17
URR Accretion (MMToe)	8.80	8.4	10.4	10.3	9.4	9.7
RRR	1.78	1.59	2.04	2.04	1.69	1.65
NELP Blocks addition	5	1	0	6	4	8

Legend: MMT: Million Metric Tonnes, BCM: Billion cubic meter,
VAP: Value added products, KT: Kilo Tonnes, URR: Ultimate recoverable reserve,
MMToe : Million Metric Tonnes oil equivalent, RRR: reserve replacement ratio,
NELP: New exploratory licensing policy

Source: Annual Reports, OIL

Table 6.13: Financial Performance of OIL

Year	04-05	05-06	06-07	07-08	08-09	09-10
Sales Turnover (billion Rs.)	38.88	56	54	61	72.41	79.06
PBIDT(Billion Rs.)	20.42	32.15	28.10	30.23	37.72	43.80
PAT(billion Rs.)	10.62	16.89	16.40	17.89	21.62	26.10
ROCE (%)	20.44	28.56	22.97	24.20	24.24	20.25
EPS(Rs.)	49.61	79	77	84	101	114

Legend: PBIDT: Profit before interest, depreciation and tax, PAT: Profit after tax,
EPS: Earnings per share.

Source: Annual Reports, OIL

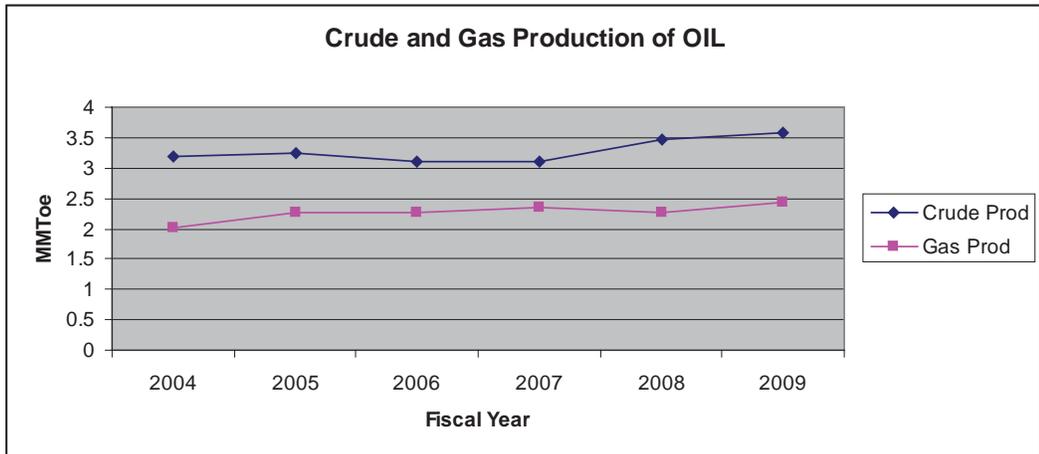


Figure 6.15: Crude and Gas Production of OIL

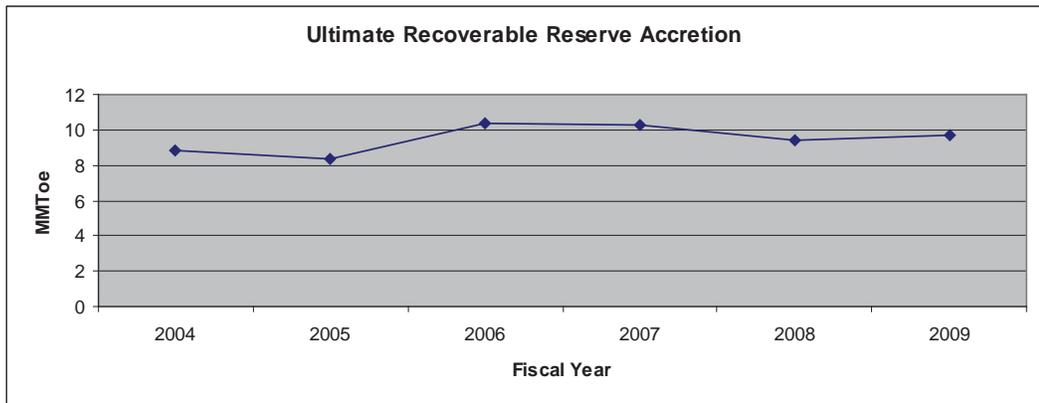


Figure 6.16: Annual Ultimate Recoverable Reserve Accretion in OIL

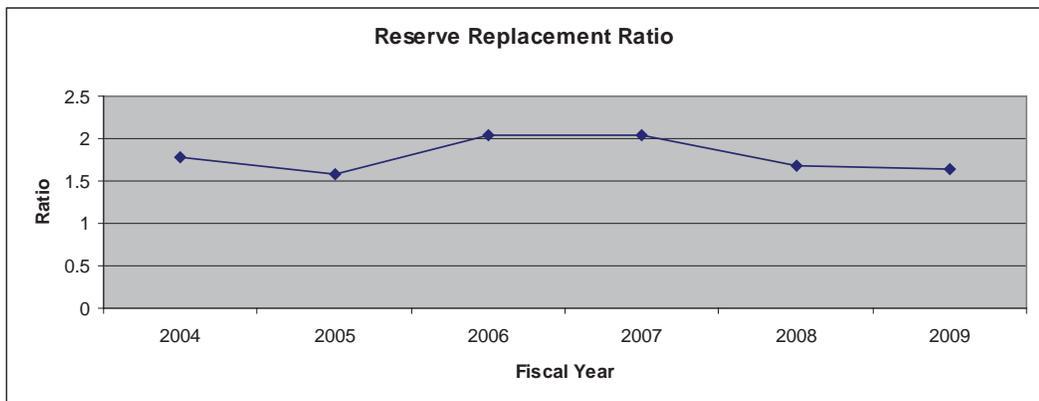


Figure 6.17: Reserve Replacement Ratio in OIL

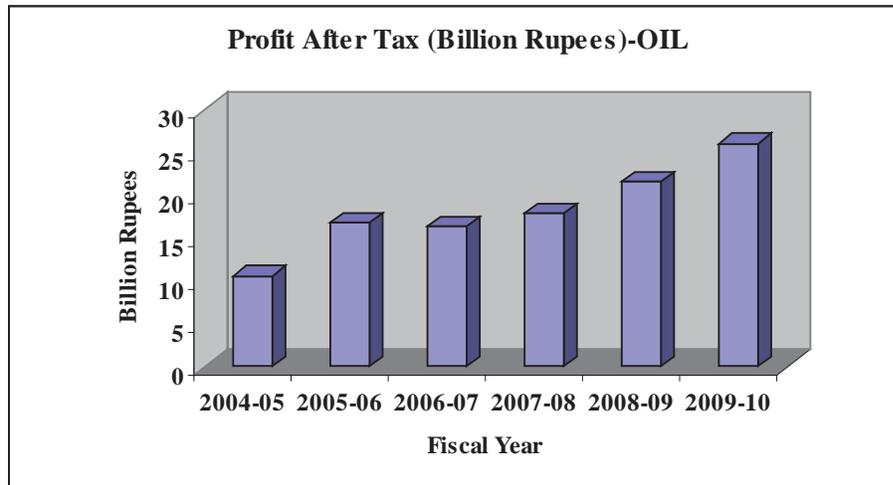


Figure 6.18: Profit After Tax (PAT) of OIL

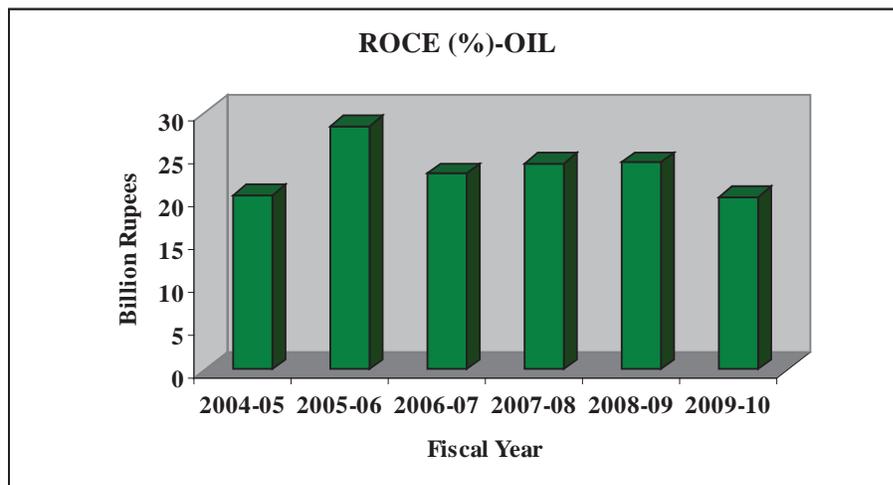


Figure 6.19: Return On Capital Employed (ROCE) of OIL

Application of modern performance management tools such as balanced scorecard and benchmarking implementation were initiated in the company in the year 2004-05. Seeing the physical performance of OIL from Indian operation (refer Table 6.12, and Figure 6.15 to 6.17) during 2004-05 to 2009-10 period, crude oil, natural gas and value added products (VAP) production remained almost constant. Due to aggressive exploratory strategy, annual ultimate recoverable reserve (URR) accretion has increased from 8.8 to 9.7 MMToe, and reserve replacement ratio (RRR), has been maintained above

1.65, which is an excellent achievement (more than 1.0 is considered very good). With application of enhanced oil recovery methods, OIL has been able to maintain production from old depleting oilfields. New NELP block acquisition has been rising during the period.

It has secured in partnership, 19 exploratory blocks in 9 overseas countries but production is yet to start.

OIL has also shown excellent financial performance improvement during the period under study (refer Table 6.13 and Figures 6.18 and 6.19). Financial performance indicators such as sales turnover, PBIDT, PAT, and EPS have almost doubled during the period. ROCE has remained more than 20 per cent, which is good achievement.

6.4.4 Factors Influencing EPMS Effectiveness in OIL

The variables which came out from survey are being studied in detail in this case study of Oil India Ltd. The case study is based on study of reports and interviews with senior officers in corporate planning and budgeting departments to understand the status of factors in the case organization.

Strategy Planning

- (i) Based on vision and mission, strategies were formalized in 2004-05 and will be re-visited in 2010-11.
- (ii) A corporate 5-year and annual plan is drawn by corporate planning department based on strategies of the organization.
- (iii) The yearly corporate plan is broken into plans at SBU and department level plans. This is further divided into quarterly and monthly plans for monitoring purposes.
- (iv) Budget plans are prepared based on departmental activity level and then aggregated to corporate level.

Strategic Flexibility

- (i) In recent years, OIL has expanded its operation from far east to other part of India after acquisition of new oil blocks under “new exploratory licensing policy” (NELP) through bidding.
- (ii) It has also got opportunity for oil blocks acquisition in overseas countries due to globalization and liberalization.
- (iii) It has formed joint ventures with other oil companies. Due to core competence and skilled manpower, it became operator for new blocks, which has provided additional business opportunity to it.
- (iv) Its profitability has increased due to removal of administered/ subsidized oil and gas pricing policies of government in past few years.

Strategy Implementation

- (i) Corporate strategy is broadly understood at almost all levels in the organization.
- (ii) Clear strategic goals and objectives exist at all levels.
- (iii) Budget allocations need improvement in order to meet strategic goals and targets.
- (iv) Coordination between various services and units appears to be good.

EPMS Design

- (i) Balanced scorecard (BSC) implementation started in 2004-05. Before this, traditional performance measurement based on physical and financial measures were monitored.
- (ii) BSC was initially designed for corporate level but later it has been extended to strategic business unit level also.

- (iii) Both traditional performance measurement and balanced scorecards are running parallel. Still traditional performance measurement is being given more importance in the organization.
- (iv) There is no clear accountability of measures of scorecard in the organization.
- (v) Few internal benchmarks have been set so far.
- (vi) The KPIs and BSC are reviewed annually.

Performance Reporting and Feedback

- (i) Existence of two parallel systems of performance measurement, one traditional based on physical and financial measures, the other is based on balanced scorecard methodology.
- (ii) Physical targets are monitored daily, financial quarterly and balanced scorecard annually.
- (iii) Achievements against targets are monitored at different levels of management such as corporate, SBU and operational levels.
- (iv) Balanced scorecard reporting is annual.
- (v) Yearly plans are revised based on reporting and feedbacks.

Information System Flexibility

- (i) Implementation of SAP R/3 ERP system in 2005-06 provided for central MIS reporting system and information system flexibility. The system is likely to be upgraded to ECC6 in 2011-12.
- (ii) Balanced scorecard has not been computerised.
- (iii) It is being operated and monitored manually although sufficient hardware, software and IT manpower exist.

EPMS Implementation Issues

- (i) BSC implementation is under executive director (corporate planning). Hence its importance has not been understood across the organization.
- (ii) In OIL, BSC has found a poor cultural acceptance.
- (iii) Since traditional performance measurement is getting more importance, BSC is being neglected.
- (iv) BSC review being annual, it is losing its very purpose. Hence it is not able to drive performance improvement.
- (v) Incentive schemes are not aligned with BSC but with traditional system.
- (vi) Top management of OIL seems to be poorly concerned with BSC implementation and its use.

6.4.5 EPMS Effectiveness of OIL

The univariate analysis of data of variables influencing EPMS effectiveness obtained from survey of 24 respondents (senior and middle level executives) from OIL is presented in Tables 6.14 to 6.17 and Figures 6.20 to 6.23.

Table 6.14: Descriptive Statistics for Independent Macro Variables of EPMS in OIL (6-point scale) N=24

S. No.	Independent Macro Variables	Mean	Median	Std. Dev.
1	Strategy Planning	4.08	4.25	0.99
2	Strategic Flexibility	3.69	3.46	0.72
3	Strategy Implementation	3.88	4.30	1.08
4	EPMS Design	2.89	2.67	0.83
5	Performance Reporting and Feedback	2.46	2.00	1.11
6	Information System Flexibility	3.32	3.43	0.63
7	EPMS Implementation Issues	2.46	2.38	0.98

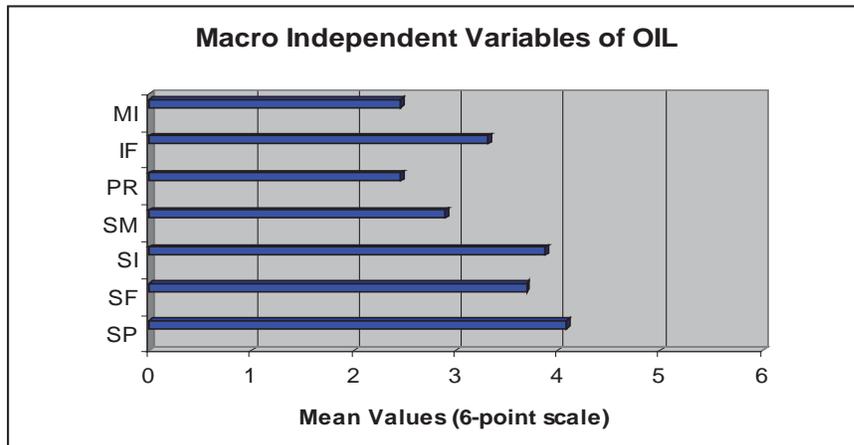


Figure 6.20: Mean Values of Independent Macro Variables of EPMS in OIL

It can be noted from Table 6.14 and Figure 6.20 that four independent macro variables have mean value more than 3.0 but three other variables have mean value less than 3.0. It is inferred that more emphasis is given to strategy planning, strategy implementation, strategic flexibility and information system flexibility where as it gives less emphasis on EPMS design, performance reporting and feedback, and EPMS implementation issues in the OIL's enterprise performance management system. Except two variables, remaining variables have standard deviation less than 1.0 and there is enough confidence in mean value. However, it is noted that all the seven macro variables have mean value less than ONGC.

Table 6.15: Descriptive Statistics for Dependent Macro Variable of EPMS in OIL (6-point scale) N=24

S. No.	Dependent Macro Variable	Mean	Median	Std. Dev.
1	EPMS Effectiveness	3.28	3.10	0.84

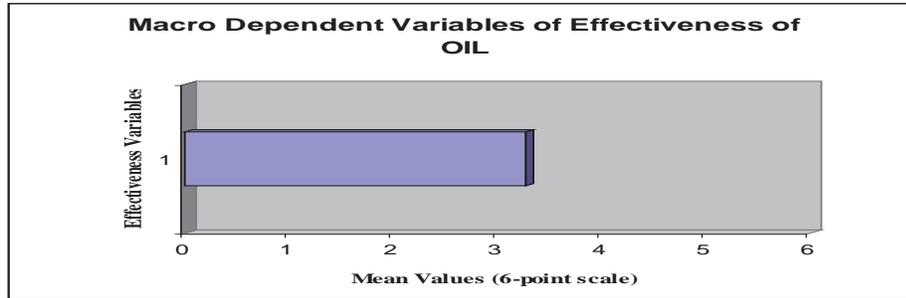


Figure 6.21: Mean Values of Dependent Macro Variable of EPMS in OIL

From Table 6.15 and Figure 6.21, it is seen that OIL plays medium emphasis on dependent macro variable of EPMS Effectiveness (mean 3.28) but its value is comparatively less than that of ONGC (4.27).

Table 6.16: Descriptive Statistics for Independent Micro Variables of EPMS in OIL (6-point scale) N=24

S. No.	Independent Micro Variables	Mean	Median	Std. Dev.
	Strategy Panning			
1	Vision and Mission Clarity	4.32	4.67	1.00
2	Setting of Strategic Goals	3.38	3.00	1.17
	Strategic Flexibility			
3	Impact of Globalization/ Liberalization	3.77	3.40	0.89
4	In-house Capabilities	3.60	3.50	0.98
5	External Drivers	3.58	3.17	0.83
	Strategy Implementation			
6	Alignment with Operational Goals	3.90	4.36	1.10
7	Resources Allocation	3.85	4.33	1.12
	EPMS Design			
8	Selection of Dimensions and Measures	2.86	2.65	0.86
9	Customised EPMS	3.04	3.00	1.00
	Performance Feedback			
10	Performance Reporting and Feedback	2.46	2.00	1.11
	Information System Flexibility			
11	EPMS Functionalities	3.22	3.20	0.73
12	IT Flexibility	3.58	4.00	0.82
	EPMS Implementation Issues			
13	Effective EPMS Implementation	2.51	2.44	0.97
14	Top Management Support	2.21	2.17	1.08
15	Quality of Data Flow	3.54	4.00	1.18

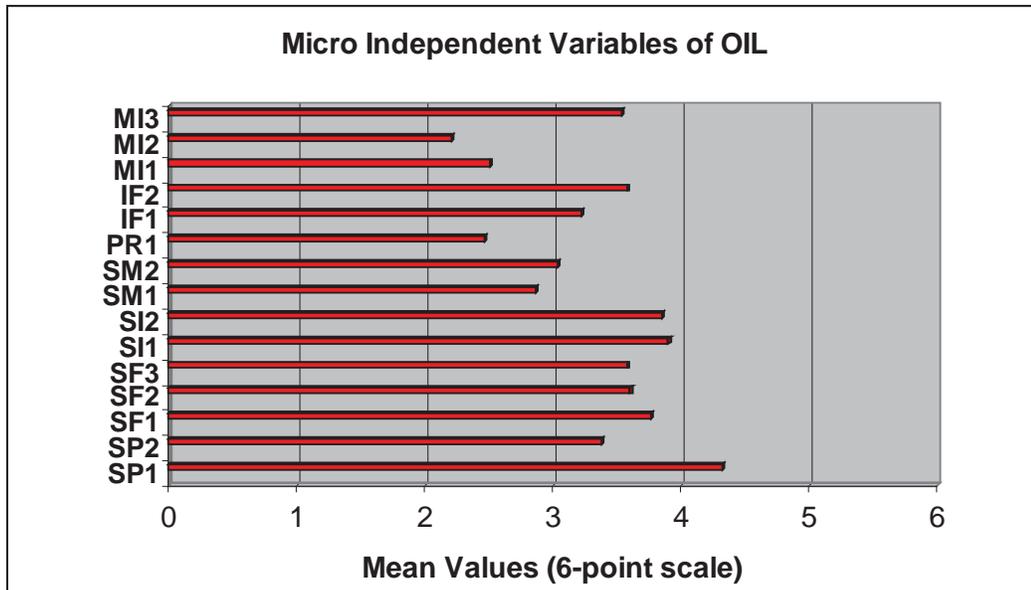


Figure 6.22: Mean Values of Independent Micro Variables of EPMS in OIL

It is observed from Table 6.16 and Figure 6.22 that eleven independent micro variables influencing EPMS effectiveness have mean value more than 3.0, which indicates that they are contributing positively to EPMS effectiveness in OIL. Four micro variables, having mean value less than 3.0, are selection of dimensions and measures, performance reporting and feedback, effective EPMS implementation, and top management support, are contributing less to EPMS effectiveness. Micro variables such as vision and mission clarity, setting strategic goals, impact of globalization/ liberalization, in-house capability, external drivers, alignment with operational goals, resources allocation, EPMS functionality, information technology flexibility, and quality of data flow in EPMS are contributing more to EPMS effectiveness in OIL. The results are in-line with independent macro variables result presented in Table 6.14. Standard deviation being in the range 0.73 to 1.17 showing high spread around mean value.

Table 6.17: Descriptive Statistics for Dependent Micro Variables of EPMS Effectiveness in OIL

		(6-point scale)		N=24
S. No.	Dependent Macro Variables	Mean	Median	Std. Dev.
1	Strategic Alignment	2.85	2.88	1.15
2	Strategic Monitoring	2.89	2.75	1.08
3	Financial Perspective	3.68	3.40	1.07
4	Customer Perspective	3.80	3.70	1.17
5	Internal Business Process Perspective	3.12	2.95	0.92
6	Learning & Growth Perspective	3.44	3.43	0.60

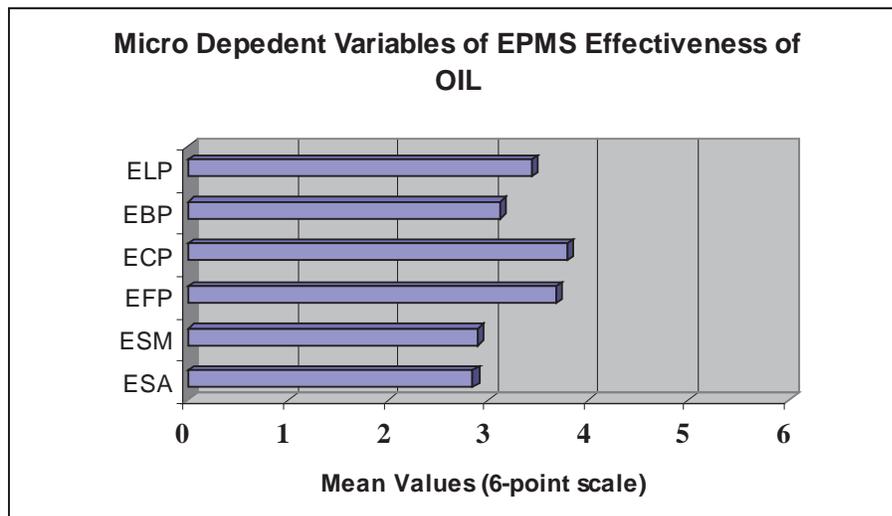


Figure 6.23: Mean Values of Dependent Micro Variables of EPMS Effectiveness in OIL

From the Table 6.17 and Figure 6.23, following conclusions are drawn. Four effectiveness micro variables have mean value more than 3.0 and two have less than 3.00 on a 6-point scale. There is greater emphasis on customer, financial, learning and growth, and internal business process perspectives in comparison to strategic alignment and strategic monitoring in case of OIL. The standard deviations vary from 0.60 to 1.17, which is indicative of comparatively high spread around mean.

6.4.6 SAP-LAP Analysis of OIL

Dynamic SAP analysis and LAP synthesis for Oil India Ltd. (OIL) has been carried out to see dynamic interplay of reality.

Dynamic SAP Analysis

Situation

The situation can be understood by framing few questions and providing answer for them provide better understanding of the situation.

Why Enterprise Performance Management System is required?

- (i) To measure, monitor and control enterprise performance.
- (ii) Traditional performance measurement system has largely been applied by the management of OIL. Balanced scorecard approach seems to have been tried on experimental basis.
- (iii) Operating cost is increasing due to high input cost and ageing oilfields. Application of enhanced oil recovery methods has also increased production cost.
- (iv) Operational efficiency also needs improvement to remain competitive.
- (v) Targets at various levels are realistic and achievable.
- (vi) Exploration in new areas and deepwater offshore is more challenging in terms of cost and risk.

Why Flexibility is required?

- (i) Due to liberalization, OIL has more competition from other oil companies and MNCs in acquiring oil blocks for exploration and production.
- (ii) International oil pricing is very volatile. Higher market price of crude and gas would increase profit margin.

- (iii) Globalization has thrown additional opportunity for overseas oil block acquisition.
- (iv) Since oilfield services are now better available in the market, hence OIL can outsource some of its activities.
- (v) IT flexibility would support EPMS implementation and changes required.

Actors

Who are the Actors?

The key actors enabling EPMS are given as follows:

- (i) Top management.
- (ii) Corporate planning department.
- (iii) SBU heads.
- (iv) Operational managers.
- (v) Government of India.
- (vi) IT department.

Processes

What is being done?

Comprehensive enterprise performance measurement and management system has been implemented since 2004-05.

How is it being done?

Following processes are in place in case of OIL.

- (i) Corporate annual plan based on MOU with Government of India, broken down into SBU and department plans. These plans of physical targets are monitored daily and monthly.
- (ii) Financial performance is reviewed quarterly and annually.

- (iii) Balanced scorecard having measures from all four perspectives are reviewed annually.
- (iv) Performance incentive is not yet related with BSC but with MOU targets.

Dynamic SAP analysis of OIL before and after EPMS implementation is presented in Table 6.18.

Table 6.18: Dynamic SAP Analysis of OIL

	Before EPMS Implementation	After EPMS Implementation with Flexibility
Situation	<ul style="list-style-type: none"> • Need for cost optimization. • Increase demand for oil and gas. • Projects are delayed leading to time and cost overrun. • Challenge to improve efficiency. • Old equipments and technologies in oil exploration and production. • Government framing new exploration policy. • Globalization has provided additional business opportunities. • Need for skill improvement of workforce. 	<ul style="list-style-type: none"> • Outsourcing ancillary activities. • Focus on timely completion of projects. • Enhance oil recovery methods to increase oil production. • Prioritizing new fields development for additional oil production. • Induction of new oilfield technology. • Skill upgradation of employees.
Actors	<ul style="list-style-type: none"> • Corporate planning department monitors the financial and physical targets. 	<ul style="list-style-type: none"> • Board of Directors. • Corporate planning. • SBU heads.
Process	<ul style="list-style-type: none"> • Need for comprehensive integrated performance measurement system. • Incentive scheme to be aligned with performance. • No computerised system to measure and monitor enterprise performance. 	<ul style="list-style-type: none"> • Balanced Scorecard implemented since 2004-05. A more holistic approach need to be adopted. • SAP R/3 ERP has helped in timely getting few measures and MIS report online timely for decision making.

LAP Synthesis

LAP (Learning-Action-Performance) synthesis is based on dynamic SAP analysis. Based on learning from SAP analysis, suggested actions and expected performance for EPMS effectiveness for Oil India Ltd. (OIL) is given below:

Learning

What is the Key Learning?

- (i) Poor operational efficiency.
- (ii) Oil production is decreasing and cost of operation is increasing from older and depleting oilfields.
- (iii) Low recovery factor of the oilfields.
- (iv) Poor equipments and technologies. Induction of newer technologies has been slow.
- (v) Increasing competition for acquiring new exploratory blocks.
- (vi) Average oil reserve accretion.
- (vii) Skilled and specialized manpower remained a challenge.

Action

What are the Actions?

I. What is being done to improve the situation?

- (i) Improvement in operational efficiency
- (ii) Cost optimization in all areas of operation to remain competitive.
- (iii) Induction of newer technologies.
- (iv) Encouragement and facilitation for creativity and innovation.
- (v) Improving recovery factor by applying enhanced oil recovery methods and technologies.
- (vi) Competitive bidding for NELP blocks.
- (vii) Aggressive exploration of new oil blocks for reserve accretion.
- (viii) Improvement in manpower planning and retention.

II. What more can be done for process improvement?

- (i) Monetization of assets. Development of already discovered fields on priority to augment oil production.

- (ii) Efficient utilization of resources.
- (iii) Overseas bidding for oil exploration blocks.
- (iv) Building competencies to remain competitive.
- (v) Improving learning curve of workforce.

Performance

What are the key performance parameters and their impact on the situation?

- (i) Reduction in operating cost and productivity improvements will increase profit margin.
- (ii) More oil and gas reserve accretion means more wealth creation.

Table 6.19: LAP Synthesis for OIL

Macro Variables	Learning	Action	Performance
<i>Strategy Planning</i>	Strategic planning integration with performance management system is moderate.	Strategic planning need to be tightly integrated with performance management system.	Increase in strategic alignment.
<i>Strategic Flexibility</i>	High level of strategic flexibility exists.	Better management of continuity and change forces.	Increase in business and profitability.
<i>Strategy Implementation</i>	Strategic implementation is moderately integrated with performance management.	Adequate budget and other resources allocation for strategy implementation.	Increase in internal business process improvement.
<i>EPMS Design</i>	Poor design and implementation of KPIs and EPMS.	To design KPIs and balanced scorecard for various levels and aligned with strategic goals of the organization.	Increase in strategic monitoring.
<i>Performance Reporting</i>	Performance reporting and feedback to the top management of comprehensive EPMS is annual and does not serve the purpose.	Performance reporting frequency at various levels should at least be monthly for decision making.	Improvement in strategic alignment and performance.
<i>Information System Flexibility</i>	Moderate level of information system flexibility exists but partly is in-use.	IT system flexibility should be used for deployment of KPIs and EPMS for effectiveness.	Increase in strategic monitoring.
<i>EPMS Implementation Issues</i>	Poor top management support for EPMS implementation and its usage.	Top management support and effective implementation methodology to be adopted.	Overall EPMS effectiveness will improve.

(iii) Enhanced production from existing and new fields will improved energy security to the country.

LAP synthesis of OIL is presented in Table 6.19.

6.4.7 Interpretation of Validated Model

From case study of Oil India Ltd. (OIL) using dynamic SAP-LAP analysis, following points have emerged. Table 6.20 displays the interpretation of micro variable linkages in EPMS effectiveness model for Oil India Ltd. (OIL).

All the seven independent macro variables integrated with EPMS have positive influence on EPMS effectiveness in measuring and managing performance. From the case study of OIL, four more micro variables; in-house capabilities, alignment with operational goals, customised EPMS, and top management support, have been identified, in addition to eleven micro variables from the survey. Survey includes smaller start-up upstream oil companies also but case study relates to OIL, a larger corporation, where additional variables have been found to be positively affecting EPMS effectiveness. Linkages of these fifteen micro variables influencing various dimensions of EPMS effectiveness are described in Table-6.20. Each micro variable is influencing one or more than one dimension. Setting strategic goals, impact of globalization and external drivers, resources allocation, selection of right type of measures and customised EPMS, performance reporting and feedback, information technology flexibility and key success factors such as effective implementation methodology, quality of data flow and top management support have emerged out to be major drivers of EPMS effectiveness in case of OIL.

Table 6.20: Interpretation of Micro Variables Linkages in EPMS Model for OIL

S. No.	Linkages/ Micro Variables Influencing EPMS Effectiveness	Interpretations
1	Vision and Mission Clarity	Vision and mission clarity provides strategic alignment of EPMS.
2	Setting of Strategic Goals	Setting realistic and achievable strategic goals improves customer perspective.
3	Impact of Globalization/ Liberalization	Globalization and liberalization forces organization to be more competitive and helps improve strategic monitoring, internal business process, and customer perspectives.
4	In-house Capabilities	In-house capability influences internal business process, and learning and growth perspectives. Additional linkage from case study.
5	External Drivers	External drivers influence financial and customer perspectives.
6	Alignment with Operational Goals	Alignment with operational goals would impact strategic alignment, strategic monitoring and customer perspective. Additional linkage from case study.
7	Resources Allocation	Adequate budget and resources allocation will enhance learning and growth, and also internal business process perspective.
8	Selection of Dimensions and Measures	Suitable KPIs and dimensions will enhance strategic monitoring.
9	Customised EPMS	Customised EPMS for an organization would influence strategic alignment and monitoring. (from case study)
10	Performance Reporting and Feedback	Strategic alignment as well as strategic monitoring gets influenced by performance reporting and feedback to management.
11	EPMS Functionalities	System flexibility of access and use would enhance all four perspectives and strategic monitoring.
12	Information Technology Flexibility	More investments are required in providing IT flexibility in terms of software and hardware and thus influences financial perspective negatively.
13	Effective EPMS Implementation	Management of EPMS implementation issues leads to success of EPMS and thus impact all six dimensions of effectiveness.
14	Top Management Support	Top management support is very important is one of key success factor in EPMS implementation. It influences all the six dimensions of EPMS effectiveness. Additional linkage from case study.
15	Quality of Data Flow	Quality of data and timely flow into EPMS system would allow better financial control and strategic monitoring.

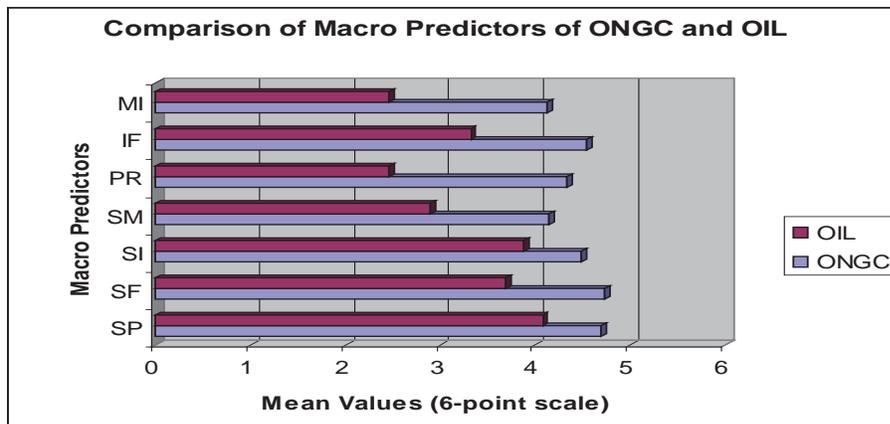
6.5 Comparison of Learning Issues

The two case studies from upstream oil industry have been undertaken to study the variables influencing EPMS effectiveness in case situation. The comparison of learning from these two case studies is presented in Table 6.21, Figures 6.24 and 6.25. The degree of outcome of EPMS is different in these two cases as variables influencing EPMS effectiveness are different as is evident from learning issues. In case of ONGC, EPMS design and information technology flexibility being high, while it is low and medium in case of OIL. Difference in macro and micro variables is also visible in analysis of survey data (Figure 6.24 and 6.25). The situational issues and EPMS implementation in these two organizations are different, though both are in exploration and production of oil and gas (upstream) business.

Table 6.21: Comparison of Learning Issues from Case Studies of ONGC and OIL

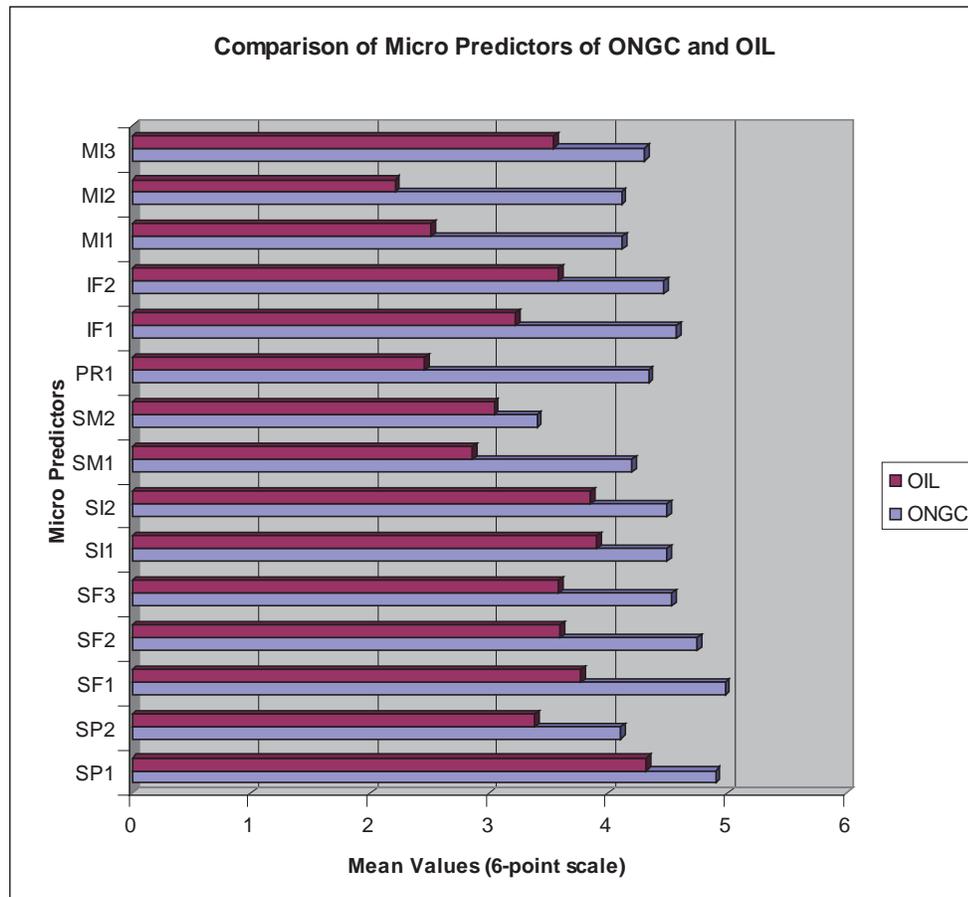
Issues	ONGC	OIL
Strategy Planning	M	M
Strategic Flexibility	H	H
Strategy Implementation	M	M
EPMS Design	H	L
Performance Reporting and Feedback	L	L
Information System Flexibility	H	M
EPMS Implementation Issues	L	L

Legend: H-High; M-Moderate; L-Low.



Note: For Code refer Table 4.5

Figure 6.24: Comparison of Macro Predictors of ONGC and OIL from Survey



Note: For Code refer Table 4.5

Figure 6.25: Comparison of Micro Predictors of ONGC and OIL from Survey

6.6 Concluding Remarks

Enterprise performance management system effectiveness from the two cases of ONGC and OIL has been studied and presented in this chapter. From the case studies, it is observed that ONGC have implemented comprehensive EPMS but OIL has not yet fully implemented it. Their outcome/ effectiveness is different due to various factors affecting EPMS effectiveness such as strategy planning, strategic flexibility, strategy implementation, EPMS design, performance reporting and feedback, information system flexibility, and EPMS implementation issues. At ONGC, micro variables such as strategic flexibility, EPMS design and information system flexibility are high and therefore have

high EPMS effectiveness. While at OIL, strategic flexibility is high but EPMS design, performance reporting and feedback, and EPMS implementation issues are low and therefore have low EPMS effectiveness has been noted. By integrating strategy planning, strategic flexibility, strategy implementation, EPMS design, performance reporting and feedback, Information system flexibility with EPMS process, coupled with better management of EPMS implementation issues, it is expected to achieve high EPMS effectiveness.

Synthesis of learning from survey and case studies, and validated model of EPMS effectiveness are presented in next chapter.

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