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Implementation Issues and Enterprises Performance Management System Effectiveness: A Case Study of Indian Upstream Oil Industry

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Abstract

Traditional Enterprise Performance Measurement and Management were based on financial measures having short term focus. Non-financial measures such as customer satisfaction, quality of product, technical skill of work force etc were given importance in addition to financial measures and the concept of balanced measurement came into existence. These measures are derived from mission and strategy of the enterprise. In the face of globalization and competition, organizations are operating in a turbulent environment and accordingly strategic planning and enterprise performance management has to be dynamic to respond to the changes in the enterprise environment. The present paper analyses the managerial issues having linkage with the enterprise performance management system by taking a case study of Indian upstream oil industry.

1. **Introduction:** Enterprise Performance Management System (EPMS) is a set of process that help business discover efficient use of their business units, financial, human and material resources. It describes all of the processes, methodologies, metrics and systems needed to measure and mange performance of the organization. It should be used as a strategic tool of learning, enabling to better understand what drives values creation in the enterprise.

Enterprise performance management helps organizations achieve their strategic goals. The objective of performance measurement has changed over the past few decades. Traditional performance measures based on

financial performance or productivity are no longer appropriate in today's competitive global market. Alternative performance measurement systems have been developed that incorporate variety of performance measures/key performance indicators (KPI).

The objective of performance measurement has changed over the past few decades. Traditional performance measures based on productivity are no longer appropriate or representative of the information needs of today's competitive global market and accordingly alternative performance systems have been developed. Review of various performance measurement systems reveals the limitations of traditional approaches to performance measurement in the context of emerging environment in which the organizations have to work and accordingly alternative measures have been developed to produce world-class enterprise performance.

Researchers have tried to give alternative model of performance measurement having a particular perspective in mind. However, their models can be broadly put in two categories: external models such as performance benchmarking and internal models such as Activity Based Costing (ABC), Management Audi, Budgeting, TQM, Navigator etc. Most of them lack in strategic perspective and comprehensiveness. To remove this lacuna, alternative models have been developed, incorporating the strategic perspective and comprehensive in scope such as Balanced Scorecard (Kaplan and Norton, 1992) and Performance Prism (Neely and Adams, 1998).

Globalization has created competition and uncertainty which has put increased pressure on organizations to adapt rapidly and perform at high levels in turbulent environment. The enterprise environment is constantly changing and therefore flexibility adoption becomes imperative. Performance management system should incorporate flexibility such as strategic flexibility and information system flexibility. Enterprise performance management encompasses complete cycle from strategy planning, strategic flexibility, strategy implementation, strategic measurement, and information system flexibility, performance analysis and feedback to strategy planning process.

2. **Research Objective:** The objective of the study is to examine the various implementation issues involved in the successful implementation of enterprise performance management system.

3. **Review of Literature:** The traditional performance measures were based on financial and cost parameters, which didn't reflected the true picture of the enterprise and lacked in strategic focus. Hayes and Abernathy (1980) pointed out that system designed for external reporting are heavily financially biased and have not been correctly used to manage enterprise. Skinner (1974) emphasized on strategic focus and competitiveness. Cross and Lynch (1991) proposed a structure of measures that permeate through the organization's hierarchy in order to integrate performance.

The other measures of quality, efficiency, productivity, market share, customer satisfaction, innovation, employee satisfaction known as leading indicators are more important which drive the performance of an enterprise. Many researchers have come out with various leading indicators to be considered in performance management.

Chakravarty (1986) while finding out the limitations of traditional financial measures suggested two other measures; stakeholder satisfaction and quality of enterprise transformation. Performance of an enterprise is a complex inter-related phenomena having linkage with seven criterion related to effectiveness, efficiency, quality, productivity, quality of life, innovation and profitability. They suggested four areas to be focused on viz. Performance improvement planning, measurement & evaluation, improvement &

control and cultural support system (Sink and Tuttle, 1989). Quality, customer satisfaction, innovation, market share etc often reflect a company's economic condition and growth prospects better than its reported earnings do (Eccles, 1991, 1992). More innovative non-cost measures such as quality, time and flexibility, human resource are to be considered alongwith cost measures such as production costs and the productivity (Toni and Tonchia, 2001). There is a substantial relationship between unit-level employee satisfaction-engagement and business-unit level outcomes (Harter et. al., 2002). They further suggested that changes in management practices to increase employee satisfaction would increase business-unit outcomes, including profit. Performance measurement methodology and tools have been suggested by various researchers. Performance measurement questionnaire (PMQ) approach to find out strengths and weaknesses of the currently used in performance measurement systems in manufacturing sector (Dixon, 1990). SINTEF (1992) developed another Performance Measurement system known as TOPP in which 4 alternative methodologies; Self-Audit, Extended Audit (Experts), Self Assessment and Benchmarking to be used. The performance has been measured on 3 dimensions of effectiveness, efficiency and changeability.

Traditional financial measures (e.g. ROI, EPS etc.) provide misleading signals. They proposed a balanced set of measures consisting of non-financial parameters in addition to financial parameters called Balanced Scorecard (BSC) where performance is measured along 4 dimensions: Financial, Customer, Internal Business Process and Innovation & Learning perspectives (Kaplan and Norton, 1992, 1996). It translates strategy into performance measures and targets to help organizations to focus on what must be done to create break-though performance. Neely & Adams (1998) conceptualized a performance prism framework which depicts the measurement as the process of gathering management intelligence. Performance prism is a 3-dimensional model having 5 facets for delivering stakeholders value such as (i) stakeholders satisfaction. (ii) strategies to be adopted to satisfy stakeholders needs. (iii) processes required to execute these strategies. (iv) capabilities needed to operate and enhance these processes. (v) contribution required from stakeholders to develop and maintain these capabilities.

Some researchers have studied the effect of PMS implementation, causes of success and failures. Martinez and Kennerley (2005) studied PMS in energy companies in Europe and found a mix of positive and negative effects. Eight positive effects identified are; concentration on critical aspects, improvement in business, customer satisfaction, productivity, alignment of operations with strategy, employee satisfaction, culture and company's reputation. Seven negative effects identified are; time consuming process, require considerable investment, bureaucratic in nature, complex in measurement, misleading prioritization, mechanistic and monotonous in operation. Ittner and Larcker (2003) have studied more than 60 service and manufacturing companies and discovered that only few companies are able to achieve benefits of non-financial measures. The main reasons for failure in outcome include; non-linking of measures with strategy, non-validation of cause and effect relationship, non-setting of right performance target, measuring incorrectly i.e. statistical validity and reliability of metrics.

4. **Research Methodology:** Research hypothesis has been designed based on the research objectives. Research questionnaire has been designed and pilot tested. Primary data is collected through questionnaire survey wherein six-point scale (1 for strongly

disagree to 6 for strongly agree) has been adopted.

5. **The Research Hypothesis:** The research hypothesis being tested is that EPMS implementation issues affect the EPMS effectiveness. If various implementation issues are not resolved, the desired outcome of EPMS may not be achieved.

6. Data Analysis & Interpretation: The questionnaire were sent to all oil & gas companies in India (7 government owned and 7 private). Finally the questionnaire data of 139 respondents from ten (Six government controlled and four private) oil & gas companies in India has been received and analyzed.

The researchers after a thorough review of the available literature of the subject have identified 16 micro variables of EPMS implementation issues. Univariate analysis has been applied to process the data. The mean and the standard deviation *of the selected variables have been calculated and are shown in the given Table-1.*

Table 1: Mean and Standard Deviation of EPMS Implementation Issues Micro Variables

S. No.	EPMS Managerial Issues Variables	Description of Micro Variables	Mean (6-point scale)	Std. Dev.
1	M101	Use as Strategic Tool	3.85	1.19
2	M102	Management Process supportive	3.90	1.07
3	M103	Good Acceptance	3.85	1.15
4	M104	Organisation culture effect	3.83	1.15
5	M105	PMS training to reduce resistance	3.63	1.24
6	M106	Quality of data collection	4.12	1.16
7	M107	Flow of data	3.80	1.23
8	M108	Right and adequate Measures	3.93	1.16
9	M109	IT Tools	3.91	1.24
10	M110	PMS Champions	3.68	1.30
11	M111	Implementation under CEO	3.85	1.28
12	M112	Synergetic approach	3.76	1.15
13	M113	Sincere and dedicated implementation	3.77	1.30
14	M114	PMS usage by Top Management	3.84	1.31
15	M115	Ownership and support by Top Management	3.87	1.33
16	M116	Incentive scheme aligned with PMS	3.51	1.31

From the above Table-1, it is evident that all the 16 EPMS Implementation Issues have a mean score of> 3.85 and standard deviation around 1.2, which gives enough confidence in mean value as indicative data.

EPMS effectiveness has been studied from six perspectives; Strategic Alignment (ESA), Strategic Monitoring (ESM), Financial

Objective Attainment (EOF), Customer Objective Attainment (EOC), Business Process Objective Attainment (EOB), Learning and Growth Objective Attainment (EOL).

Univariate analysis has been applied on the above EPMS effectiveness micro variables. Their mean and standard deviation (on 6-point scale) are shown in Table-2.

Table 2: Mean and Standard Deviation of EPMS Effectiveness Micro Variables

S. No.	EPMS Effectiveness Macro Variables	Description of Micro Variables	Mean (6-point scale)	Std. Dev.
1	ESA	Strategic Alignment	3.98	1.08
2	ESM	Strategic Monitoring	4.03	1.08
3	EOF	Financial objective attainment	4.33	1.03
4	EOC	Customer objective attainment	4.40	0.99
5	EOB	Business Process objective attainment	4.00	9.95
6	EOL	Learning & Growth objective attainment	4.09	0.88

From the Table-2, it is evident that all 6 micro variables of EPMS effectiveness have mean score of > 4.0 and standard deviation around 1.0, which gives enough confidence in mean value as indicative data.

Correlation analysis between 16 micro variables of implementation issues and 6 micro variables of effectiveness of EPMS is placed in Table-3.

Table 3: Correlation between Micro Variables (EPMS Implementation Issues) and Micro Variables (EPMS Effectiveness)

	ESA	ESM	EOF	EOC	EOB	EOL
M101	0.772	0.758	0.655	0.616	0.695	0.684
M102	0.749	0.753	0.584	0.552	0.710	0.618
M103	0.741	0.744	0.578	0.570	0.676	0.658
M104	0.689	0.689	0.539	0.547	0.690	0.610
M105	0.678	0.657	0.537	0.540	0.671	0.662
M106	0.492	0.489	0.551	0.521	0.528	0.548
M107	0.697	0.706	0.629	0.637	0.686	0.684
M108	0.749	0.772	0.550	0.488	0.688	0.658
M109	0.696	0.711	0.591	0.568	0.685	0.583
M110	0.741	0.737	0.661	0.616	0.673	0.660
M111	0.607	0.597	0.486	0.433	0.538	0.469
M112	0.739	0.716	0.556	0.498	0.675	0.647
M113	0.750	0.746	0.544	0.544	0.692	0.647
M114	0.758	0.758	0.626	0.595	0.744	0.602
M115	0.755	0.744	0.609	0.571	0.738	0.638
M116	0.653	0.571	0.486	0.455	0.722	0.555

****All Correlations are significant at the 0.01 level (2-tiled).**

Table-3 shows the strong correlation between EPMS Independent (Implementation Issues) variables and EPMS Dependent (Effectiveness) variables, where all cases have two stars (**).

Regression Analysis:

Stepwise regression analysis using probability of F (entry level 0.05 and removal at 0.10, excluding cases list-wise for missing values) for each EPMS dependent effectiveness micro variable with EPMS independent implementation issues micro variables has been carried out and the results is summarised in Table-4.

Table 4: Result of Regression Analysis

1	2	3	4	5	6	7	8	9
ESA	0.732	0.570	72.76	0.000	Const	0.637	3.422	0.001
					M114	0.205	3.362	0.001
					M108	0.223	3.112	0.002
					M103	0.198	2.921	0.004
					M116	0.127	2.449	0.016
					M110	0.128	2.127	0.035
ESM	0.754	0.544	81.50	0.000	Const	0.637	3.574	0.000
					M108	0.223	3.225	0.002
					M114	0.182	3.116	0.002
					M101	0.170	2.514	0.013
					M110	0.155	2.698	0.008
					M103	0.153	2.270	0.025
EOF	0.567	0.684	59.05	0.000	Const	1.401	5.894	0.000
					M110	0.288	4.841	0.000
					M101	0.258	3.810	0.000
					M106	0.212	3.582	0.000
EOC	0.552	0.677	32.82	0.000	Const	1.843	7.642	0.000
					M107	0.255	3.397	0.001
					M101	0.241	3.330	0.001
					M110	0.283	3.997	0.000
					M108	-0.249	-2.879	0.005
					M106	0.143	2.258	0.026
EOB	0.707	0.523	80.89	0.000	Const	1.167	6.859	0.000
					M114	0.150	2.519	0.013
					M116	0.265	5.838	0.000
					M108	0.183	3.227	0.002
					M101	0.157	2.624	0.010
EOL	0.613	0.558	52.96	0.000	Const	1.508	7.759	0.000
					M101	0.217	3.774	0.000
					M107	0.184	3.094	0.002
					M110	0.167	3.204	0.002
					M106	0.105	2.007	0.047

1 – EPMS Dependent Effectiveness Micro Variable
2 – R square
3 – Std. Error
4 – F
5 – Sig. of F
6 – EPMS Const/Indep. Variables (Predictors)
7 – B
8 – T
9 – Sig. of T

From above Table-4, it is seen that R Square in most cases is above 0.55 i.e. 55% of variation in dependent macro variables is explained by the independent EPMS Implementation variables. F-test indicate that significance of F < 0.01, that is all the 6 models are overall good at confidence limit > 99%. T-test for the model indicate that significance of T is < 0.05 (above 95% confidence level) i.e. all the independent variables are significant in the models. It is inferred that:-

1. EPMS usage by top management, right & adequate measures, good acceptance, PMS aligned incentive schemes, and EPMS implementation with champions will increase EPMS Strategic Alignment.

2. Right & adequate measures, EPMS usage by top management, EPMS usage as a strategic tool, EPMS implementation with champions, and good acceptance in the organization will increase EPMS Strategic Performance Reporting.

3. EPMS implementation with champions, EPMS usage as a strategic tool, and quality of data, would increase EPMS customer objectives attainment.

4. Smooth flow of data EPMS usage by top management, EPMS implementation with champions, and quality of data, would

increase EPMS customer objectives attainment.

5. EPMS usage by top management, EPMS aligned incentive scheme, right adequate measures, and EPMS usage as a strategic tool would increase EMS business process objectives attainment.

6. EPMS usage as a strategic tool, smooth flow of data, EPMS implementation with champions, and quality of data would increase EMS learning and growth objectives attainment.

Conclusion and Recommendations

The result of the research study are very positive. In the organizations under study, various EPMS implementation issues have been found to be strongly correlated with EPMS effectiveness. The hypothesis that the effectiveness of enterprise performance management system is dependent/strongly correlated with various EPMS management issues stands proved.

Limitations of the Research

The research is limited to 10 Oil & Gas upstream organizations in India. Four government owned and two private companies responded well but two government owned and two private companies had responded poorly. Few private oil companies did not respond. To get a clear and broader picture of EPMS in upstream oil industry, the research should be extended to more oil companies. The benefits of EPMS implementation have also not been analyzed in detail.

References

Atkinson et. al. (1997), The Stakeholders Scorecard, Sloan Management Review, V 38(3), 25-37.

Anderson B. Wt. Al. (1997), Performance Measurement: The ENAP Approach, The Intl J. of Business Transformation, V, 2, 73-84.

Bititci, U.S., Turner T. And Begemann C. (2000), Dynamics of Performance Measurement Systems, Intl J. of Operations and Production Management, V 20(6), 692-704.

Cam R. C. (1989) Benchmarking: The Serch for Industry Best Practices that Lead to Superior Performance, ASQ Quality Press, Milwaukee, U.S.A.

Chakravarthy, B.S. (1988) Measuring Strategic Performance, Strategic Management Journal, 7, 110-118.

Toni De and Tonchia S. (2001) Performance Measurement Systems: Models, Characteristics and Measures, Intl. J. of Operations and Production Management, 21, 46-70.

Dixon J., Nanni A. And Vollmann T. (1990) The New Performance Challenge, Business Review, Jan-Feb, 131-137.

Eccles R. G. (1991) The Performance Measurement Mainfesto, Harvard Business Review, Jan-Feb, 131-137.

Epstein, M. J. (2000) Measuring & Managing Performance in 21st Century, Cranfield MGr Research Institute website.

Hayes R. H. And Abernathy W. J. (1980) Managing Our Way to Economic Decline, Harvard Business Review, Jul-Aug, 67-77.

Harter JK., Schmidt FL and Hayes TL (2002) Business-unit-level relationship between employee satisfaction, employee engagement, and business outcome: A meta-analysis, J. of App. Psychology, Apr, 268-279.

Ittner C.D. and Larcker D.F. (1197) Quality Strategy, Strategic Control Systems and Organizational performance, Accounting Organizations and Society, 22, 293-314.

Ittner C.D. and Larcker D.F. and Randall T. (2003) Performane Implications Accounting, Organizations and Society, 28, 7-8, 715-741.

Kaplan R.S. and Norton D.P. (1992) The Balanced Scorecard: Measures tht Drive Performance, Harvard Business Review, Jan-Feb, 71-92.

Kaplan R.S. and Norton D.P. (1996) The Balanced Scorecard: Translating Strategy Into Action, Harvard Business School Press, Boston, MA., U.S.A.

Kaplan R.S. and Norton D.P. (2000) The Strategy Focused Organization – How Balanced Scorecard Companies Thrive in the New Business Environment, Harvard Business School Press, Boston, M.A., U.S.A.

Lynch RL. And Cross KF. (1995) Measure UP! 2nd edition, Blackwell Publishers, Cambridge, M.A., U.S.A.

Martinez V. And Kennerley M. (2005) Impact of Performance Management Reviews: Evidence from an Energy Supplier, EurOMA Conference Proceedings, 19-21 June.

Neely AD. (1998) Measuring Business Performance, The Economist Book, London, U.K.

Neely AD., Adams C. And Kennerley M. (2003) The Performance Prism: The scorecard for Measuring and managing Stakeholder Relationships, Financial Times Prentice Hall, London, 2003.

Neely A.D., Gregory M. And Platts K. (1995) Performance Measurement System Design: A Litecature Review and research Agenda, Intl. J. of Operations and Production Management, 15, 4, 80-116.

Quinn J.B. (1978) Strategic Change: Logical Instrumentalism, Sloan Management Review, Fall, 7-21.

Schneiderman A.M. (1999) Why Balanced Scorecards Fail, J. of Strategic Performance Measurement, 6-11.

Sigurt V. (2004) Continuity and change: Making Sense of the German Model, Competition and Change, 8(4), 331-337.

Simon R. (2000) Performance and Control System for Implementing Strategy: Text and Cases, Uper Saddle River, NJ, Prentice Hall.

Skineer W. (1974) The Decline, fall and renewal of manufacturing, Industrial Engineering, Oct, pp 33-38.

Stewart T. (1997) Intellectual Capital: The New Wealth of Nations, Nicholas Brealey, London.

Sushil (2005) A Flexible Strategy Framework for Managing Continuity and Change, Global J. of Flexible Systems Management, 1 (1), 22-32.

Sushil (2000) Cornerstones of Enterprise Flexibility, Global Institute of Flexible Systems Management, Vikas Publishing House, New Delhi.

Thompson Jr. A. A., Strickland A.J. and Gamble J.E. (2005) crafting and Executing Strategy, The Quest for Competitive Advantage, Tata McGraw-Hill Publishing Company, New Delhi.

Waterhouse J. and Svendsen A. (1998) Strategic Performance Monitoring and Management: Using Non-Financial Measures for Corporate Governance, Canadian Institute of Chartered Accountant.