



gifsjournal@l
Global Journal of
Flexible Systems Management
2010, Vol. 11, No. 4, pp 1-10

Enterprise Performance Management and Flexibility: Factors of Effectiveness in Upstream Oil Industry in India

Mohd Akhtar

Oil and Natural Gas Corporation Limited (ONGC), India
E-mail: mk71b@yahoo.com

R K Mittal

Vice Chancellor, Teerthankar Mahaveer University, Moradabad, India
E-mail: dr123mittal@yahoo.com

Abstract

Enterprise Performance Management is to help organization to discover efficient use of its resources to achieve its strategic goals. The objective of the paper is to identify the key factors of effectiveness of enterprise performance management system (EPMS) and flexibility in driving performance improvement in the organization. The dimensions of EPMS effectiveness have also to be identified. Further inter-relationships among contributing factors and effectiveness factors have also been explored. Macro variables that have emerged as predictors of enterprise performance are: strategy planning, strategic flexibility, strategy implementation, performance measurement system design, performance reporting and feedback, information system flexibility, and implementation issues and implementation issues being the major predictor. Inter-relationships among factors contributing to effectiveness have been found. EPMS effectiveness factors are strategic alignment, strategic monitoring, financial perspective, customer perspective, internal business process perspective, and learning and growth perspective and they are also inter-related.

Keywords: corporate performance management, enterprise performance management system, performance improvement, performance measurement, strategic management

Introduction

Performance measurement is the process of assessing progress toward achieving predetermined goals. Performance management is building on that process, adding the relevant communication and action on the progress achieved against these predetermined goals. Performance management is a set of processes that help businesses discover efficient use of their business units, financial, human and material resources. Its focus is on creating methodical and predictable ways to improve business results or performance across organizations.

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 or productivity are no longer appropriate in today's competitive global market. Alternative performance management systems have been proposed by many authors that incorporate variety of performance measures/key performance indicators (KPI). These are sometimes called as Business Performance Management, Corporate Performance Management, Strategic Performance Management or Enterprise Performance Management and we have used more generic term Enterprise Performance Management System (EPMS).

Review of various performance measurement system revealed that the limitations of traditional approaches to performance measurement have brought many emerging trends in development of performance management system in order to produce world-class enterprise performance. Many researchers tried to develop a model focusing a particular perspective and it could not give a comprehensive picture of business performance such as EVA, Activity Based Costing, Management Audit, Budgeting, TQM, Six Sigma, ISO, Skandia's intellectual capital navigator, Performance Benchmarking. Most of them are lacking in strategic perspective, comprehensiveness and integral view of the business performance. Next generation of EPMS focused on strategic perspective and tried to incorporate comprehensive view of the business performance such as Balanced Scorecard (BSC) proposed by Kaplan and Norton (1992) and Performance Prism by Neely and Adams (1998).

Globalization and liberalization have created competition, uncertainty and volatility, which have put up pressure on organizations to adapt rapidly and perform at higher level. The business environment is changing constantly and thus flexibility adoption has become imperative for enterprise to survive and perform. There are many types of flexibility such as strategic, organizational, functional, information system flexibility etc. In this study, strategic flexibility and information system (IS) flexibility have been considered.



Literature Review

Enterprise Performance Management System

The traditional enterprise performance management system were based on financial and cost parameters, which did not give true picture as to how enterprise business is moving and were lacking in strategic focus. Hayes and Abernathy (1980) said that system designed for external reporting are heavily financially biased and are not correctly used to manage enterprise. Skinner (1974) emphasized on strategic focus and competitive availability. Lynch and Cross (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 in driving performance of enterprise. Many researchers have come out with various leading indicators to be considered in Performance management.

Chakravarthy (1986) said that traditional financial measures are inadequate for evaluating enterprise performance. He suggested two other measures such as stakeholder satisfaction and quality of enterprise transformation. According to Sink and Tuttle (1989), performance of an enterprise is a complex and inter-related between seven criteria related to effectiveness, efficiency, quality, productivity, quality of life, innovation, and profitability. They suggested four areas to be focused; performance improvement planning, measurement and evaluation, improvement and control, and cultural support system. As per Eccles (1992) leading indicators of business performance cannot be found in financial data alone. Quality, customer satisfaction, innovation, market share etc often reflect a company's economic condition and growth prospects better than its reported earnings.

Toni and Tonchia (2001) said that the traditional cost performances (the production costs and the productivity) are kept separate from the more innovative non-cost measures (quality, time and flexibility). To make effective, it should include financial and non-financial measure with greater consideration of human resources. Hayes, *et. al.* (2002) found a substantial relationship between unit-level employee satisfaction-engagement and these business-unit outcomes. Changes in management practices, that increase employee

satisfaction, may increase business-unit outcomes including profit.

Enterprise performance management methodology and tools have been suggested by various researchers. Dixon (1990) came out with Performance Measurement Questionnaire (PMQ) approach to find out strength and weaknesses of currently used manufacturing performance measurement system. Performance measures used in PMQ were neither related to strategy of organization nor customers. Another Performance Measurement system known as TOPP developed by SINTEF (1992) in which four methodologies are used: Self-Audit, Extended Audit (experts), Self Assessment and Benchmarking. It reviews

performance along dimensions: effectiveness, efficiency, and changeability.

Kaplan and Norton (1992) stated that traditional financial measurements (e.g. ROI, EPS etc) provide misleading signals. They

proposed a balanced set of measurement consisting of non-financial measures in addition to financial measures called Balanced Scorecard (BSC), where performance is measured along four dimensions/ perspectives: Financial, Customer, Internal Business Process, and Innovation and Learning. It translates strategy into performance measures and targets and helps organization to focus on what must be done to create break-through performance. To ensure strategy gets implemented, they proposed five principles for building strategy focused organization such as:

(i) Translating strategy to operational terms by strategy mapping and showing cause and effect linkages between measures, (ii) Aligning organization's strategy: with resources, departments and business units, (iii) Making strategy everyone's everyday job by communication of organization vision to everyone, creating strategic awareness, aligning personal objective to and incentive compensation with organization plan, (iv) Making strategy a continuous ongoing and never ending process. The budgeting processes are to be linked with strategy, and (v) Mobilizing change through executive leadership to drive transformation. They have carried out a survey where only 15 per cent out of 500 responses had shown breakthrough results as they have made BSC as integral part of strategic planning processes.

Neely and Adams (1998) conceptualized a Performance Prism framework which depicts the measurement as the

Performance measure is a metric to quantify the efficiency and/or effectiveness of an action.

Performance measurement is a process of quantifying the efficiency and effectiveness of an actions.

Performance measurement system is set of metrics to quantify both the efficiency and effectiveness of an action.

The traditional enterprise performance management system were based on financial and cost parameters, which did not give true picture as to how enterprise business is moving and are lacking in strategic focus.

Comprehensive strategic performance management system incorporated various dimensions of measures such as measures of quality, efficiency, productivity, market share, customer satisfaction, innovation, employee satisfaction in addition to financial measures and gave a balance view of enterprise performance.

process of gathering management intelligence. Performance prism is a 3-dimensional model having 5 facets for delivering stakeholders value. The facets are:

(i) Stakeholders satisfaction: who are stakeholders and their needs, (ii) Strategies: what strategy to be adopted to satisfy stakeholders needs, (iii) Processes: what are the required process to execute these strategies, (iv) Capabilities: what capabilities needed to operate and enhance these processes, (v) Stakeholders contribution: what stakeholders' contributions are required to develop and maintain these capabilities.

Researchers have studied the effect of EPM implementation, and its causes of success and failures. Martinez and Kennerley (2005) studied EPM implementation in energy companies in Europe and found mix positive and negative effects. Eight positive effects of EPM found were: focus on important aspects, business improvement, customer satisfaction improvement, productivity increase, alignment of operation with strategy, employee satisfaction improvement, continuous culture improvement, and company reputation improvement. On the other hand, seven negative effects observed were: time consuming, considerable investment, bureaucratic, over-complicated measures, misleading prioritization, mechanistic and monotonous. 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 reason for not achieving the benefits were: non-linking measures to strategy, non-validation of cause and effect relationship, non-setting right performance target, and incorrectly measuring i.e. statistical validity and reliability of measures.

Strategic Flexibility

External and internal environment of an enterprise is not static but is constantly changing. Bititci *et al.* Proposed a dynamic performance measurement systems. It consist of external environment monitoring system, internal environment monitoring system, a review system to decide internal objectives and priorities, and an internal

deployment system to deploy the revised objectives and priorities to critical parts of the system. Sushil (2005) described the flexible strategy framework to manage continuity and change in the industry as large number of leading enterprises are facing tremendous turbulence. Continuity forces are customer base, infrastructure, technology, core competence, culture etc and change forces are globalization, competition, new opportunities, customer needs, new technology, merger and acquisition and government policies.

Information System Flexibility

Gebauer and Schober (2005) studied the information system flexibility and the performance of business processes at length and presented a decision model to guide the investment

having two types of information system flexibility: (1) flexibility to use such as system functionality, data base, user interface and processing capacity, and (2) flexibility to change such as technical staff availability, system integration, use and upgrade of the information system etc. The model objectives included other business process characteristics of uncertainty, variability and time-criticality to minimize overall investment and operational costs of the information system throughout the system lifetime.

Stakeholder flexibility due to e-business has been studied in an auto company in India (Dwivedi, 2003). The key to

Lagging performance measures/indicators (also known as outcome KPI) are those measuring output of past activity. Leading performance indicators (also known as value driver KPI) measure those activities having significant impact on lagging indicators. It measure activity in current state or future state (number of sales meetings scheduled in next two weeks) & gives more time to managers to adjust behaviour to influence desired outcome..

Flexibility is the degree to which an organization has a variety of managerial capabilities and the speed at which they can be activated, to increase the control capacity of management and improve the controllability of the organization"

Strategic flexibility is necessary to compensate for strategic changes which originate in the indirect environment but reach it via component of direct environment of the organization (Eppink).

Information system (IS) flexibility has several dimensions such as compatibility, functionality, data transparency, connectivity, technical and functional skill and technology management. It is positively correlated with mass customization, market position and innovativeness of the organization (Byrd and Turner, 2001).

success in new economy are; data, information, knowledge, interaction, technology, trust, and the relationship but flexibility provides business sustenance in face of dynamic and unpredicted environment. The flexibility for stakeholders to business and from business to stakeholders in e-business environment has been examined. Ramaraj (2010) has presented a conceptual models, which will help to assess the capability of an information system to respond to technological

and business changes, to identify dimensions of information system flexibility, to measure it, and to develop managerial guideline for information system flexibility management.

Research Objectives

The objectives of the study are to explore the factors influencing the effectiveness of enterprise performance management system (EPMS) in driving improvements in the

organization, the effectiveness areas, and to suggest an EPMS effectiveness model.

Research Methodology

The macro variables contributing to EPMS effectiveness considered are extent of strategy planning, strategic flexibility, effective strategy implementation, comprehensiveness of EPM system design, performance reporting and feedback mechanism, information system flexibility, and EPMS implementation issues. The dimensions of EPMS effectiveness measured are strategic alignment, strategic monitoring, financial perspective, customer perspective, internal business process perspective, and learning and growth perspective.

Based on research objectives, research hypothesis have been designed. Accordingly, research questionnaire was designed and pilot tested wherein six-point scale (1 for strongly disagree to 6 for strongly agree) has been adopted. Primary data was collected through questionnaire survey. The questionnaire was distributed in paper format as well as through email to all respondents in upstream oil industry in India. Out of 500 questionnaires distributed to 15 oil companies, 139 responses from senior and middle level executives from 10 companies, both from public as well as private, were received.

Research Hypothesis

Effectiveness of Enterprise Performance Management System is influenced by; (i) The extent of strategy planning

(ii) Strategic flexibility, (iii) Effective strategy implementation, (iv) Comprehensiveness of EPMS design, (v) Effective performance reporting and feedback mechanism, (vi) Information system flexibility, and (vii) EPMS implementation issues.

Data Analysis and Interpretation

The questionnaire data received from 139 respondents across 10 upstream oil companies has been analyzed using SPSS package ver. 12.0 for various statistical analysis such as data validation, exploratory factor analysis, reliability analysis, univariate analysis, correlation analysis, and regression analysis.

Dimensions of EPMS Effectiveness are Strategic Alignment, Strategic Monitoring, Financial Perspective, Customer Perspective, Internal Business Process Perspective, and Learning and Growth Perspective.

Exploratory Factor Analysis using principal component extraction with varimax rotation has been carried out for EPMS independent variables by taking factor loading of 0.7 for each of the macro variables separately. A total 16 independent micro factors have been derived, considering cumulative per cent more than seventy five. The results are summarized below in Table 1.

Univariate analysis for macro independent variables (7), micro independent factor variables (16), and micro dependent variables (6) was carried out and the result is shown in Table 2. The mean (on 6-point scale) ranged from 3.53 to 5.03 and standard deviation from 0.93 to 1.46, which gives enough confidence in mean value as indicative data.

EPMS Effectiveness has been studied from six perspectives namely; strategic alignment (ESA), strategic monitoring

Table 1: Factor Analysis of EPMS Independent Variables

Macro Variables	Micro Factors	Micro Factor Name	Eigen value	Per cent of Variance	Cumulative Per cent
Strategy Planning (SP)	SP1	Vision and Mission Clarity	2.387	59.668	59.668
	SP2	Setting of Strategic Goals	0.724	18.090	77.758
Strategic Flexibility (SF)	SF1	Impact of Globalization/ Liberalization	6.456	49.658	49.658
	SF2	In-house Capabilities	1.229	9.453	59.112
	SF3	External drivers	1.086	8.353	67.465
	SF4	e-Business Impact	0.858	6.596	74.061
Strategy Implementation (SI)	SI1	Alignment with Operational Goals	6.048	60.478	60.478
	SI2	Resource Allocation	0.973	9.725	70.203
Performance Measurement System Design (SM)	SM1	Selection of Dimension and Measures	10.610	70.731	70.731
	SM2	Customized EPMS	0.808	5.387	76.118
Performance Reporting and Feedback (PR)	PR1	Performance Reporting and Feedback	3.965	79.299	79.299
Information System Flexibility (IF)	IF1	EPMS Functionalities	4.608	65.831	65.831
	IF2	IT Flexibility	0.823	11.750	77.581
EPMS Implementation Issues (MI)	MI1	Effective EPMS Implementation	11.066	69.161	69.161
	MI2	Top Management Support	0.703	4.395	73.556
	MI3	Quality of Data Flow	0.702	4.386	77.942

(ESM), financial perspective (EFP), customer perspective (ECP), internal business process perspective (EBP), and learning and growth perspective (ELP). Univariate analysis of micro dependent variables is exhibited in Table 3. The mean and median values are close, which means it is close to normal distribution. Mean values are in range of 3.92 to 4.26.

Correlation analysis between EPMS micro independent variables (16 nos.) and micro dependent effectiveness variables (6 nos.) has been carried out and exhibited in Annexure I. It shows strong correlation between EPMS independent factors and EPMS dependent effectiveness factors (correlation coefficient in most cases is observed to be 2-tailed i.e. at 99 per cent confidence level).

Regression Analysis

Stepwise regression analysis using probability of F (entry level 0.05 and removal at 0.10, excluding cases listwise for missing values) for each EPMS dependent micro variables with EPMS independent micro variables has been carried out. The regression summary is shown in Table 4.

Following inferences can be drawn from Table 4. Coefficient of multiple determination (R^2) in most cases are above 0.60 i.e. 60 per cent of variation in dependent variables are explained by the independent variables except

Table 2: Descriptive Statistics for EPMS Macro Independent Variables

(6-point scale) N = 139

S. No.	Macro Independent Variables	Mean	Median	Std. Dev.
1	Strategy Planning (SP)	4.53	4.50	0.80
2	Strategic Flexibility (SF)	4.47	4.54	0.77
3	Strategy Implementation (SI)	4.35	4.50	0.83
4	EPMS Design (SM)	3.82	3.87	1.00
5	Performance Reporting & Feedback (PR)	3.85	4.00	1.18
6	Information System Flexibility (IF)	4.27	4.29	0.92
7	EPMS Implementation Issues (MI)	3.77	4.00	1.06

Table 3: Descriptive Statistics for EPMS Micro dependent Variables

(6-point scale) N = 139

S. No.	Dependent Micro Variables	Mean	Median	Std. Dev.
1	Strategic Alignment (ESA)	3.92	4.00	1.12
2	Strategic Monitoring (ESM)	4.02	4.33	1.09
3	Financial Perspective (EFP)	4.26	4.40	1.13
4	Customer Perspective (ECP)	4.19	4.40	1.33
5	Internal Business Process Perspective (EBP)	3.98	4.10	0.96
6	Learning and Growth Perspective (ELP)	4.07	4.14	0.89

in case customer perspective (ECP), where R^2 is 0.46. Significance of F is less than 0.01 in all six cases, i.e. all the 6 models are overall good at confidence limit of 99 per cent. Significance of t is < 0.01 (above 99% confidence level) i.e. all the independent factors are strongly correlated with dependent variables and significant in the models. Based on above analysis, following interpretations are being made:

- The values of correlation coefficient are high i.e. correlation between independent micro variables and dependent micro variables of EPMS effectiveness are high. (Refer Annexure I). EPMS effectiveness has been measured in terms of strategic alignment, strategic monitoring, financial perspective, customer perspective, internal business process perspective, and learning and growth perspective.
- At macro level, the predictors of EPMS effectiveness are: EPMS implementation issues, strategy implementation, strategic flexibility and information system flexibility, strategy planning, EPMS design, and performance reporting and feedback.
- Major predictors of EPMS effectiveness are effective EPMS implementation, strategic flexibility, and information system flexibility.
- Predictors of strategic alignment are effective EPMS implementation, vision and mission clarity, and performance reporting and feedback.
- Predictors of strategic monitoring are effective EPMS implementation, selection of dimensions and KPIs, sufficient EPMS functionality, and impact of globalization and liberalization.
- Predictors of financial perspective are effective EPMS implementation, EPMS functionality, quality of data, external drivers, and information technology flexibility.
- Predictors of customer perspective are external drivers, sufficient EPMS functionality, impact of globalization and liberalization, and setting strategic goals.
- Predictors of internal business process perspective are effective EPMS implementation, impact of globalization and liberalization, and sufficient EPMS functionality.
- Predictors of learning and growth perspective are effective EPMS implementation, resource allocation, and impact of globalization/liberalization.
- The hypotheses for macro and micro variables have been tested and partly proven to establish relationships among research variables, which in turn led to the development of validated model exhibited in Figure 1.

Conclusions and Recommendations

The enterprise performance management system (Figure 1) should be considered as an integrated system comprising

Table 4: Summary of Regression Analysis

EPMS Dependent Effectiveness Factor	R ²	Std Error	F	Sig. of F	EPMS Independent Factor (predictors)	B	t	Sig. of t
ESA	0.710	0.611	110.20	0.000	Const	-0.159	-0.501	0.617
					MI1	0.625	7.476	0.000
					SP1	0.203	2.829	0.005
					PR1	0.198	2.512	0.013
ESM	0.808	0.488	92.632	0.000	Const	-0.045	-0.170	0.865
					MI1	0.472	5.833	0.000
					SM1	0.222	2.961	0.004
					IF1	0.356	4.077	0.000
					SF1	0.223	3.568	0.001
					IF2	-0.128	-2.398	0.018
					SF2	-0.129	-2.131	0.035
EFP	0.577	0.748	36.291	0.000	Const	0.488	1.450	0.149
					MI1	0.252	2.219	0.028
					IF1	0.477	3.768	0.000
					MI3	0.159	2.373	0.019
					SF3	0.233	2.841	0.005
					IF2	-0.204	-2.420	0.017
ECP	0.459	0.995	28.443	0.000	Const	0.224	0.456	0.649
					SF3	0.631	5.784	0.000
					IF1	0.474	4.162	0.000
					SF1	-0.333	-2.721	0.007
					SP2	0.190	2.416	0.017
EBP	0.669	0.559	91.073	0.000	Const	0.410	1.527	0.129
					MI1	0.450	5.728	0.000
					SF1	0.187	2.928	0.004
					IF1	0.238	2.806	0.006
ELP	0.642	0.539	80.694	0.000	Const	0.715	2.953	0.004
					MI1	0.384	5.202	0.000
					SI2	0.225	3.791	0.000
					IF1	0.217	2.441	0.016

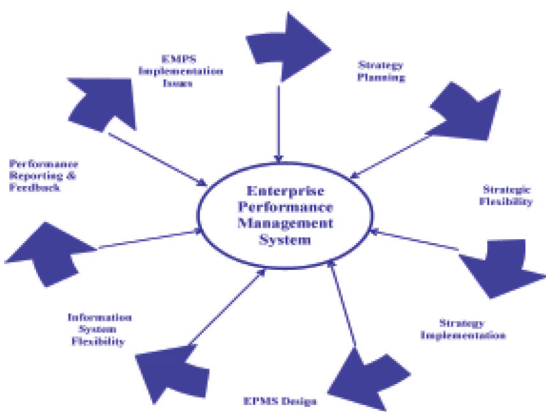


Figure 1: Validated EPMS Effectiveness Model at Macro Level

seven facets such as strategy planning, strategic flexibility, strategy implementation, EPM system design, performance reporting and feedback, information system flexibility, and EPMS implementation issues, which impact effectiveness of enterprise performance management system in driving performance improving. The major predictor of effectiveness is implementation issues. The EPMS effectiveness are to be measurement along six perspectives of strategic alignment, strategic monitoring, financial perspective, customer perspective, internal business process perspective, and learning and growth perspective. In today's business environment, where turbulence and uncertainty have increased, two types of flexibilities such as strategic flexibility and information system flexibility have been incorporated in the EPMS model and its effect on EPMS

effectiveness has been studied. The hypotheses have been proved and at micro level, predictor of effectiveness emerged are vision and mission clarity, strategic goals setting, impact of globalization and liberalization, in-house capability, external drivers, resource allocation, selection of KPIs and dimensions, performance reporting and feedback, sufficient EPMS functionality, information technology flexibility, effective EPMS implementation, and quality of data.

Limitations of the Research

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

Questionnaire survey was carried out from senior and top management and did not include operational managers. It was distributed to government owned and private owned companies, but only a few private oil companies responded.

The role of strategic flexibility and information system flexibility in EPMS effectiveness has been explored in the study. Other types of flexibility such as organizational, operational, marketing, and HR flexibilities were not covered.

Implication for Researchers and Practitioners

The current research provides an important empirical step towards understanding the enterprise performance management system and its effectiveness. The study presents an empirical analysis that emphasizes the key drivers impacting EPMS effectiveness. The study has contributed to the literature and identified the role of implementation issues, strategic flexibility, and information system flexibility on EPMS effectiveness. The model developed has demonstrated its practical application in upstream oil industry in India.

Suggestion for Further Work

Few suggestions for further research work are made as follows:

- Proposed model may be tested for oil sector, both upstream and downstream in India and other countries.
- Future research work may also include operational managers in addition to senior and top management.
- Study may include more private organizations and comparison may be done between public sector and private sector oil organizations.
- Role of other types of flexibilities such as organizational, operational, manufacturing, functional, marketing and HR flexibilities need to be researched further.

References

Atkinson *et al.* (1997). The Stakeholders Scorecard, *Sloan Management Review*.

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

Bourne M., Neely A., Mills J. and Platts K.(2003). Implementing Performance Measurement Systems: A Literature Review, *Intl. J. of Business Performance Management*, 5(1).

Camp R.C. (1989). *Benchmarking: The Search 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.

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

Eccles, R.G. and Pyburn, P.J. (1992). Creating a Comprehensive System to Measure Performance, *Management Accounting (US)*, Oct, 41-44.

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

Govindarajan V. and Gupta A.K. (1985). Linking Control Systems to Business Unit Strategy: Impact on Performance, *Accounting, Organizations and Society*, 10(1):51-66.

Hayes R.H. and Clark K.B. (1986). Why Some Factories are More Productive than Others, *Harvard Business Review*, Sep-Oct, 66-73.

Ittner C.D. and Larcker D.F. (1997). Quality Strategy, Strategic Control Systems and Organizational Performance, *Accounting, Organizations and Society*, 22:293-314.

Ittner C.D. and Larcker D.F. (1998). Are Non-financial Measures Leading Indicators of Financial Performance? An Analysis of Customer Satisfaction, *J. of Accounting Research*, 1-35.

Ittner C.D. and Larcker D.F. (1998). Innovations in Performance Measurement: Trends and Research Implications, *J. of Management Accounting Research*, 10:205-238.

Ittner C.D. and Larcker D.F. and Randall T. (2003). Performance Implications of Strategic Performance Measurement in Financial Services Firms, *Accounting, Organizations and Society*, 28(7-8):715-741.

Johnson H.T. and Kaplan R.S. (1988). *Relevance Lost: The Rise and Fall of Management Accounting*, Harvard Business School Press, Boston, MA.U.S.A.

Kaplan R.S. (1983). Measuring Manufacturing Performance: A New Challenge for Managerial Accounting Research, *Accounting Review*, 58(4):686-705.

Kaplan R.S. (1984). Yesterday's Accounting Undermines Production, *Harvard Business Review*, 62:95-101.

Kaplan R.S. and Cooper R. (1998). *Cost and Effect: Using Integrated Cost Systems to Drive Profitability and Performance*, Harvard Business School Press, Boston, MA., U.S.A.

Kaplan R.S. and Norton D.P. (1992). The Balanced Scorecard: Measures that 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.

Kaplan R.S and Norton D.P. (2001). *Strategy Focused Organization*, Harvard Business School Press, Boston, MA., U.S.A.

Lynch R.L. and Cross K.F. (1995). *Measure Up!*, 2nd edition, Blackwell Publishers, Cambridge, M.A., U.S.A.

Manzoni J.F. The Need for a New High Performance Management Control Paradigm, in Epstein, M.J. and Manzoni, J.F. Performance Measurement and Management Control: A Compendium of Research, 2002.

Neely A.D. (1998). Measuring Business Performance, *The Economist Book*, London, U.K.

- Neely A.D. (1999). The Performance Measurement Revolution: Why Now and What Next?, *Intl. J. of Operations and Production Management*, 19(2):205-28.
- Neely A.D., 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 Literature Review and Research Agenda, *Intl. J. of Operations and Production Management*, 15(4):80-116.
- Neely A.D., Richards A.H., Mills J.F., Platts K.W. and Bourne M.C.S. (1997). Designing Performance Measures: A Structured Approach, *Intl. J. of Production and Operations Management*, 17(11):1131-1152.
- Quinn J.B. (1978). Strategic Change: Logical Incrementalism, *Sloan Management Review*, Fall, 7-21.
- Ridgway V.F. (1956). Dysfunctional Consequences of Performance Measurements, *Administrative Science Quarterly*, 1(2):240-247.
- 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.
- Simons R. (1995). *Levers of Control: How Managers Use Control Systems to Drive Strategic Renewal*, Harvard Business School Press, Boston, MA., U.S.A.
- Simon R. (2000). *Performance and Control System for Implementing Strategy: Text and Cases*, Upper Saddle River, NJ, Prentice Hall.
- Stewart T. (1997). *Intellectual Capital: The New Wealth of Nations*, Nicholas Brealey, London.
- Stewart G. (1995). Supply Chain Performance Benchmarking Study Reveals Keys to Supply Chain Excellence, *J. of Enterprise Information Management*, 38-44.
- 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.
- Toni, De and Tonchia S.(2001). Performance Measurement Systems: Models, Characteristics and Measures, *Intl. J. of Operations and Production Management*, 21:46-70.
- Turney P.B.B. and Anderson B. (1989). Accounting for Continuous Improvement, *Sloan Management Review*, 30(2):37-48.
- Waterhouse J. and Svendsen A. (1998). Strategic Performance Monitoring and Management: Using Non-Financial Measures for Corporate Governance, *Canadian Institute of Chartered Accountant*.
- HBR (1998). Measuring Corporate Performance.
www.balancedscorecard.org

Annexure I

Correlation between EPMS Independent Micro Variables and Dependent Micro Variables

	Strategic Alignment	Strategic Monitoring	Financial Perspective	Customer Perspective	I.B. Process Perspective	L&G Perspective
	ESA	ESM	EFP	ECP	EBP	ELP
SP1	.462 **	.482 **	.391 **	.313 **	.394 **	.402 **
SP2	.394 **	.386 **	.372 **	.341 **	.401 **	.390 **
SF1	.553 **	.598 **	.481 **	.287 **	.572 **	.473 **
SF2	.524 **	.539 **	.431 **	.327 **	.582 **	.528 **
SF3	.547 **	.569 **	.538 **	.573 **	.590 **	.547 **
SF4	.438 **	.403 **	.376 **	.267 **	.347 **	.441 **
SI1	.532 **	.521 **	.492 **	.424 **	.483 **	.579 **
SI2	.453 **	.474 **	.419 **	.379 **	.445 **	.547 **
SM1	.757 **	.810 **	.649 **	.510 **	.675 **	.673 **
SM2	.276 **	.350 **	.239 **	.323 **	.346 **	.248 **
PR1	.757 **	.783 **	.601 **	.426 **	.690 **	.644 **
IF1	.733 **	.796 **	.680 **	.554 **	.735 **	.735 **
IF2	.402 **	.477 **	.379 **	.355 **	.448 **	.435 **
MI1	.817 **	.852 **	.695 **	.497 **	.788 **	.743 **
MI2	.769 **	.775 **	.632 **	.427 **	.747 **	.644 **
MI3	.507 **	.500 **	.550 **	.401 **	.528 **	.540 **

** Correlation is significant at the 0.01 level (2-tailed).

Key Questions

1. What are different types of measures to be adopted for enterprise performance measurement?
2. What are various dimensions of performance measurement?
3. What are relevant flexibilities to be considered in enterprise performance management?
4. What, in your opinion, are various EPMS implementation issues and critical success factors that will contribute to EPMS effectiveness in your organization?
5. Are there any inter-relationship among major contributing factors and effectiveness dimensions of EPMS in your organization?
6. How you will help your organization to improve enterprise performance by focusing on factors contributing to EPMS effectiveness?



Mohd Akhtar, B.Tech., DCM, M.Tech.(IE&M), and pursuing Ph.D., Certification: OCP, PMP, Membership: Life Member of CSI and GIFT; Member of NGO: FFIE, Mumbai, FEAST, Delhi., Ph: 91-9968282260, Chief Manager, Oil and Natural Gas Corporation Limited, New Delhi. **Professional Achievements:** He has been involved in design and implementation of Balanced scorecard and Dashboard, Business Analytics, Data warehousing, Process improvement, Productivity studies, System and procedure design, Inventory control, Cost optimization, IT system design and development, System and database administration, and IT management. **Publications:** Published two papers, presented four papers in international / national conferences and contributed one chapter in a book. **Community & Social Service:** Involved with few NGOs and working on issues of educational improvements, micro-finance, interest-free banking, financial supports to the needy for medical treatment, cycle rickshaw, small business, daughters marriage, scholarship, open education, career guidance and counseling and employment assistance.



Prof. (Dr.) Raj Kumar Mittal, M.A. (Eco), MBA, PhD, Ph: +91-591-2360222, Vice Chancellor, Teerthanker Mahaveer University, Moradabad, U.P., India. Professor R.K. Mittal is presently the Vice Chancellor of the Teerthanker Mahaveer University, Moradabad (U.P.). Earlier he was the Dean, University School of Management Studies, Guru Gobind Singh Indraprastha University, Delhi. He obtained his Ph.D. in Economics and his areas of interest in teaching include; economic environment of business, financial institutions and managerial economics. He has more than 20 years of rich experience in the field of education, research and administration. He has published more than 60 research articles in professional journals and has supervised 8 Ph.D. theses.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.