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Performance Model Development for Indian SMEs

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ABSTRACT
The present paper describes research undertaken to evaluate the appropriateness of strategic performance measurement (PM) system and processes for small- and medium-sized Indian enterprises (SMEs). An evaluation is undertaken of three case studies to facilitate a performance model for the strategic improvement. This evaluation resulted in the identification of a process, based on its congruency to the theoretical model adopted. Data collected from SMEs is analyzed. The paper concludes with a number of recommendations to facilitate the application of model for SMEs.

Introduction

SMEs stand for Small and Medium Enterprises. European Commission (2005) defined SME as:
Micro Entities: companies that have less than 10 employees
Small Enterprise: Companies that has less than 50 employees
Medium Enterprise: Companies that has less than 250 employees

According to Indian government (between 2014 and 2015), there are 522895 SMEs and 953 large enterprises in India, which means 91.8% of Indian companies are SMEs. Also most of the SMEs are under the state government and situated in different industrial area of cities. Indian SMEs take apart 63.2% of persons employed and 55.5% value added in India. The enterprises in India are mainly SMEs, and they contribute a lot to the economy of India. There are major differences between SME and large organization according to the study of Hudson et al. (2001):

1. Personalized management, with little devolution of authority
2. Severe resource limitation in terms of management, manpower and finance
3. Reliance on small number of customers, operating in limited market
4. Flat, flexible structures
5. High innovatory potential
6. Informal, dynamic strategies

In addition to these differences, Hudson & Smith (2007) further described the factors that impact on performance measurement most: First, the organizational culture of SMEs is generally adhocracy i.e. they are flexible, dynamic and willing to take risks to succeed however SMEs lack in shortage of resources. Secondary, the competitive environment of SMEs are adaptable i.e. they can adopt market changes however they are not able to lead the market. Finally the management of SMEs is generally owner-manager, so it can lead to low strategic awareness and low planning activities. Argument et al. (1997) argued as cited in Hudson & Smith (2007) SMEs of the automotive sector have the less emphasize on the strategic development. According to Lee et al. (2000) SMEs have the benefit for good coordination between management and employees.

Improvement and innovation require the organizational learning while SMEs have the limited resources and constraints internally and externally. Hudson & Smith (2007) argued that SMEs due to their limited resources work less with strategically aligned performance measurements however on the other hand due to their simple structure they can better work with strategically aligned performance measurements. McAdam (2000) also talked about continuous alignment of performance measurements with SMEs strategy.

Performance Measurements

The meaning of performance in term of business management is what extent the certain operation fulfils the objective of customers' or market's requirements (Naimi et al. 2005). Santos et al. (2002) argued organizational success is related to the flexibility of the company to design and implement performance management. Evans & Lindsay (2005) defined the measurement as "the act of quantifying the performance dimensions of products, service, processes and other business activities." Robson (2004) states that accurate performance measurement can provide guidelines and direction for improvements; it gives the opportunity to improve the production efficiency. According to Santos et al. (2002) the relationship between the performance measures is neglected by the organizations and literature still lack in highlighting the importance of this relationship. Neely & Bourne (2000) argued performance measurement failure could be the result of either poorly designed measures or lack of implementation. Slack et al. (2009) performance measurement provides the information to judge the status of operations.

There are three important areas while working with performance measures. First there could be number of factors but what factors to include, second the importance of factors and third the detailed measures to work with. Folan & Browne (2005) are of the view that performance measurements are evolving and becoming complex due to wider focus on area of intra and inter organizational.

Meyer (2002) stated seven purpose of performance measurement: look ahead, look back, motivate, compensate, roll up, cascade down and compare. He also figured out that these seven purposes are critical to large and complicated organization. On the other hand for SMEs, only four purposes

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are needed: look ahead, look back, motivate and compensate (Meyer, 2002). The early strategic performance measurements for enterprise were focused on financial measures only (Veen-Dirks, 2010. and Hudson & Smith 2007). The production has become more and more complex today, using financial as the only dimension is not enough, it is important to introduce non-financial measurements to reflect the different dimensions of production (Veen-Dirks, 2010). Generally, the non-financial measures for SMEs can be more detailed specified into: quality, time, flexibility, customer satisfaction and human resource (Hudson et al. 2001).

Problem Formulation

The literature review and limited empirical investigations are conducted in the area of production performance measurements and management to formulate the problem as **Follows:**

How can small and medium enterprises (SMEs) improve their production performance management?

The problem formulated looks for SMEs practices of assessing, follow up and improving production performance with respect to strategic alignment, shortages in production performance measurements, benchmarking and result utilization practices.

Purpose and Relevance

The purpose of study is to develop a model for assessing, follow up and improving the production performance of Small and Medium Enterprises. A comprehensive model will be developed based on the literature study and its applicability will be checked through multiple case studies. The model for production performance management will work for assessing, follow up and improving the production performance. Organizations are forced to adopt changes, to enhance the performance of their practices and to provide better customer value at minimum possible cost. It is the need of time to work more for SMEs to improve their performance for making them competitive. Determinants of the performance are required to work more as there is a need of latest development in this area. Garengo et al. (2005) stated that there exists literature on performance measurements in SMEs however it lacks in em practices of performance measurements have yet to be discovered by literature. There also exist gaps in theoretical development that could be supplemented by the empirical investigation. The thesis will provide an opportunity for researchers and SMEs industry to assess and analyse current production performance and identify the areas of improvements. It will also be supplementing empirical investigation gaps that exist in SMEs literature.

Data Sources and Data Collection Methods

Ghauri and Gronhaug (2005) explained sources of data as a carrier of data or information, which mainly be classified as primary and secondary data. The research problem focus decides the data collection methods between quantitative and qualitative. Data collection method depends on the research problem faced by a researcher. Research objectives will be a deciding factor for choosing the quantitative or qualitative method and both the methods are not mutually exclusive. According to Gray (2009) qualitative data could be gathered through a number of sources, mainly the interviews and observations. Interviews could be qualitative or quantitative based on the structure of interview. According to Tomas (2011) semi-structured interview has the benefits of both structured interview and unstructured interview. Semi-structured interview use a list of issues taking place of fixed questions so that it has good freedom and clear structure.

Model Development

The model development chapter presents a comprehensive model for production performance management. The model is categorized into three section; strategy, operation and performance management. Performance management is the area of concern which includes performance measurement design model, benchmarking and result utilization. The outcomes of result utilization steps are used for production performance improvements.

Table 1. Concepts of developed model

Concepts	Requirement from SMEs	Al-Najjar et al. 2004	Al-Najjar & Kans, 2006	Gomes & Yasin, 2011	Neely et al. 2000	Developed Model
Strategy						
Strategy Alignment	●	○	●	○	●	●
Measurement Design						
Identify Measurement Areas(diagnosis)	●	●	●	●		●
Multi Perspective	●	●	●			●
Multi Measurement Dimension		○		●		
Detailed Measures Selection	●	●	●			●
Policy Selection	○		●	●		
Benchmarking						
Internal and External Benchmarking	●	○	●			●
Result Utilization						
Continuous Improvement	○	●	●			●

● = Strong Correlation. ○ = Week Correlation.

The developed model based on important concepts and these concepts are necessary from SMEs perspectives. It has been shown in table above that each concept is strongly or weekly correlated as found in literature studied and these are explained below. The developed model takes all the concepts with strong correlation.

Strategy alignment: Improvements require performance measurements for SMEs to be strategically aligned. Hudson & Smith (2007) argued that the structure and culture of SMEs are different from each other and with large companies.

Identify measurement areas: The diagnosis of the situation identifies the measurement areas that may have been potential for improvements; therefore, better identification leads to more effective resource utilization of SMEs (Gomes & Yasin, 2011).

Multi-perspective measurements: According to Hudson & Smith (2007) first SMEs are limited in resources in terms of finance, manpower and management. Second SMEs normally have lesser market share and rely on close customer relationship. Third, SMEs have a loose organizational structure which is a threat for organizational effectiveness.

Detailed measure's selection: For SMEs there is limitation when selecting the detailed measures because of the less availability of data. McAdam (2000) mentioned that measures should be kept minimized, but these should contribute to improve performance.

Internal and external benchmarking: According to Gomes & Yasin (2011) benchmarking is a critical step for continuous improvements. Especially for SMEs, it can produce efficient and reliable information on strengths and weaknesses of performance.

Dimension measurement: all the aspect of business can be covered by six major dimensions: quality, time, customer satisfaction, finance, flexibility and human resources. Dimensions should be chosen appropriately to reflect the company strategy.

Measurement policy establishments: The well-established policy for each KPI is an essential step for getting an accurate measurement results (Slack et al. 2009).

Continuous improvement: According to the concept of never ending improvement, the measurements and analysis of measurement results are to provide direction for improvements (Al-Najjar & Kans, 2006 and Oakland, 2003).

Model For Production Performance Management

The model developed in the study is comprehensive, based on all important concepts identified in 1 tables and possible to implement in SMEs. It highlights the key areas that can help SMEs to improve the production performance management. Developed model works on continuous cycle that erases ineffectiveness from the production process due to strategic alignment, appropriate measure's selection, benchmarking the practices and utilizing the performance measurement results for production performance improvements.

The Figure 1 below shows the structure of developed model for production performance management; which consist the activities of assessing, following up and improving production performance. The model is divided into three important functional areas: strategy, operations and performance management area. The performance management process flows across these areas. The company's strategy is upstream and belongs to the activity of top management. Production objectives and production process comes under operations, developed by the company according to the strategy. Assessing, follow up and improvement of production performance is the specified activity for company to manage their production performance.

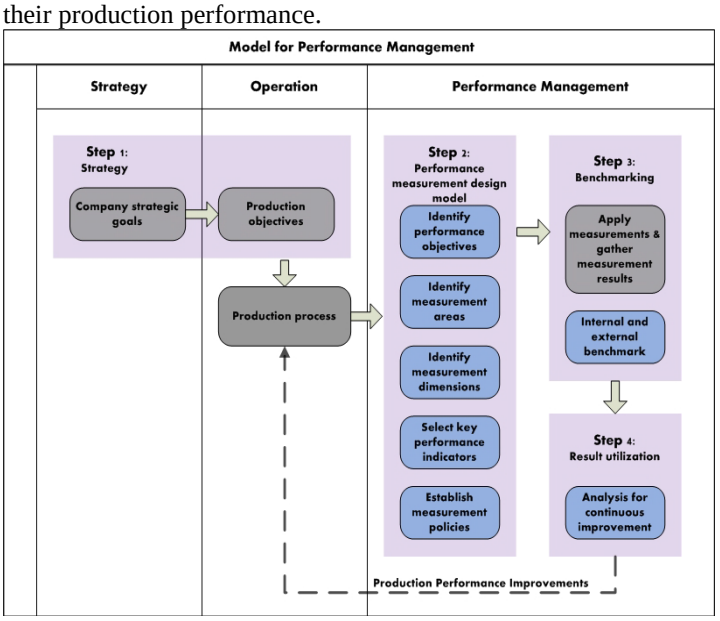

Figure 1. Developed model for production performance management

The model starts with step 1 strategy. This is a step for studying of companies' vision, mission, strategies and production objectives. Step 1 is necessary input for Step 2 and strategic alignment ensures the accurate translation of strategy into the actions. Step 2 is performance measurement design model that identifies the detailed measures and measurement policies for the production process. The detailed measures are applied in the production process to get improved measurement results.

Step 3 is benchmarking that sets internal and external benchmarks. The benchmarks of step 3 and measurement results are used as input for step 4 that is result utilization. Step 4 works with analyzing, concluding and suggesting the improvement activities for continuous improvement of production performance. The model works as continuous process and tries to improve the production performance due to its comprehensiveness.

Case Analysis Representation

Each case analyzed in the above section is represented in the form of table 2 in the following section. Four symbols have been used to show the intensity of implementation of important concepts.

Table 2. Case analysis representation

Developed Model	Case1	Case 2	Case 3
Strategy			
Strategic Alignment	◐	●	○
Measurement Design			
Identify Performance Objectives	○	●	○
Identify Measurement Areas (diagnosis)	●	●	●
Identify Measurement Dimensions	●	●	●
Identify KPIs	○	●	◐
Establish Measurement Policies	◐	●	●
Benchmarking			
Internal Benchmarking	×	○	○
External Benchmarking	×	○	×
Result Utilization			
Continuous Improvement	◐	●	◐
Measurement Perspectives			
Multi-perspective Measurements	○	○	○

●: Good Level Implementation ◐: Medium Level Implementation
○: Poor Level Implementation ×: No Implementation

Data gathered form cases with respect to developed model are explained below:

Step 1. Strategy

The case companies has the mission of being one of the leading manufacturers of the sector, produce environment friendly machines and provide better customer support. The strategy includes producing environment friendly machines with high availability and maintainability with a trusted network of dealers. The production objectives include producing high quality machines to meet the customer requirements, on time delivery of the machines as scheduled and to reduce wastages in the production processes.

Step 2. Performance measurement design model

The case company working dimensions consists on the aspect of quality, finance and time. The case company's measurement perspective involves technical and economic perspectives, while organizational perspective is not measured. The employees were satisfied and motivated with management policies. The main KPIs discussed by the management were: total cost of each component, numbers of customer complain, number of failure in testing and production time for each process. Specialized measures for production process and production cost, while measures for equipment effectiveness were not observed.

Testing department works with set of measurement policies, each machine is tested for a specific time in the real environment and under real work load to check all the important functions of machine. The testing of each production process also has certain policy, tools and responsible person of tests are clarified. For KPIs like customers complain and total cost of each component, they have measurement policies however these policies are not well documented.

Step: 3 Benchmarking

Internal and external benchmarks were not observed during the case company visit. The case company has the idea of benchmarking however they have not set some benchmark to achieve. Experience of the personnel's for performing a specific task is somehow is used for other employees to perform the similar task and it is not well documented or followed continuously however compared when needed.

Step: 4 Result Utilization

The case company believes in the importance of continuous improvement activities. The data gathered from product testing and customer complaints are analyzed for finding the root causes and to fix the problems so no future threats. Quality problems have been given the importance as it affects customer satisfaction, delivery time is also kept at high priority level however there were lack of improvement in production cost measurement.

Case Analysis

Analysis for cases with respect to developed model is presented below:

Step: 1 Strategy

The case companies have clear mission, strategies and production objectives and there exist a correlation between mission, strategies and production objectives. Good correlation between strategies and implementation lead objectives achievement. Mainly, three production objectives identified i.e. high quality machines, schedule delivery and to reduce production losses. The detail measures needed to be designed for achieving production objectives.

Step: 2 Performance Measurement Design Model

There was no clear distinction found between production objectives and performance objectives, both of these terms were inter related with each other. The case company has identified certain performance objectives in accordance with production objectives; however they are not well quantified into specified direction. The KPIs with which the case company is working are limited in numbers and there exists the possibility that limited number of KPIs may not reflect the actual production performance. Limited knowledge about the current level of performance makes it difficult to work with improvement activities. Well established measurement policies make it easy to implement KPIs effectively. Most of the measurement policies for KPIs are well established as testing department set their measurement policies. There existed the evidence that certain measurement policies are not clear which can make the KPIs implementation less effective.

Step: 3 Benchmarking

Benchmarking provides a possibility to look at standards to improve the lacking areas. The benchmarking practices are not utilized in case company, so somehow it becomes difficult to compare current practices with the desired level or with competitor performance to identify the weak areas. Personal experience was not documented properly may not always be used for improvements. Factors like size of case company, lack of data and resources availability make it difficult to utilize benchmarking practices.

Step: 4 Result Utilization

Analyse measurements, identify the real cause and do corrective actions is the essence of all the efforts made for improvements. The case company uses the performance measurement results for improvements in production process. Cross functional and production meeting are the way to analyse the progress and to work with continuous improvements.

Conclusions

Strategy defines how SMEs can achieve their mission and goals. The production performance management should be one part of the SMEs activities that contribute to the company strategy. The developed model breaks down the production performance management into the activities of production performance measurements and production performance improvements. The concept of strategy alignment is emphasized in the developed model to design measurements reflecting the strategy. It can improve SMEs production performance management by better achieving of their strategic goals through strategic aligned measures. The developed model also improves the production performance management of SMEs by applying the concept of performance benchmarking and effectiveness of improvement measures. It can easily identify the strength and weaknesses in the production by comparing the performance internally and externally. It also provides a possibility to look at the effectiveness of improvement activities by comparing their outcome with the standards or benchmarks.

Improving production performance management for SMEs not only require designing accurate measurements however also to work with continuous improvements. The results obtained through measurements needed to be analysed, disturbances identified required to work with and further actions are needed to be planned by prioritizing the improvement activities.

Case Study and Model Applicability

It has been observed during case studies that there exist the practices or some deviation for transforming the strategy into the accurate performance measures. It has also been observed that SMEs were working with limited technical and economic measures while organizational measures have not been defined. It could be concluded that performance measure should be defined based on strategy and there is need of clear alignment between strategy and performance measures. The developed model step 1 gives emphasis on strategic aligned measures for Production process. The performance measurement design step 2 of the developed model consists of five sub steps; performance objectives, measurement areas, measurement dimensions, KPIs and measurement policies. The purpose of the step 2 is to identify accurate KPIs and measurement policies that reflect the production objectives and lead to strategy. Cases were lacking in identification of accurate performance objectives and KPIs for improving the production performance. It was due to lack of specialized skills as SMEs faces this problem. Performance objectives narrow down the improvement area and this leads focus on specialized area and not to deviate from required results. Identification of accurate performance objectives will make the later steps easy to follow in the developed model and improve production process effectiveness. Slack et al. (2009) also emphasized on well-defined strategy for KPIs selection. It could be concluded that well developed performance objectives will make it possible to identify accurate KPIs. It could be argued that SMEs need to work with benchmarking even though they find it difficult for them to work with, so step 3 of the model have its worth to be the part of the developed model.

Result utilization step of the developed model works with the analysis and suggestive actions for continuous improvements. Table 2 indicates a good correlation of continuous improvement concept in case companies visited. The model comprises of four steps and each step applicability was checked in case companies and confirmed by SMEs practices with strong or weak correlation. The table 2 in analysis indicates the intensity of important concept implementation. This ensures internal validity, external validity and reliability of the developed model.

Criticism and Suggestion for Future Research

It could be argued that the developed model applicability was checked at generalized level it does not go in details. Like benchmarking is one of the important step of the developed model it is said benchmarking practices should be utilized, however it has not been discussed how to work with benchmarking same with other steps of the developed model. The allocated time was used to check the applicability of developed model in three case studies to make it more generalized however the time could also be used to make this model applicable into one case study to see the specialized application and outcomes of developed model. It could be suggested that model could be tested practically in case study to identify the specialized applicability of the model. A large scale questionnaire could be conducted to get the idea about model steps and practices of SMEs with respect to developed model.

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