Supply Chain Management Performance Scorecard for Pharmaceutical Business-A Route to Operational Excellence

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Abstract: This research paper focus to investigate the supply chain operational performance and its potential factors that constitute an efficient supply chain operational performance in India particularly in Pharmaceutical Businesses. In order to execute, the Supply Chain Management Score Card has been utilized as a self-evaluation tool for pharmaceutical companies. The Supply Chain Management Score Card focuses on four decisive areas, namely- Company Strategy, Planning and Execution Capability, Logistics Performance and Information Technology Method on Implementation. The numbers of participating companies are from India (50), China (30), Switzerland (5), United States of America (10) and United Kingdom (5). The scores in each assessment area were compared between all countries. Subsequently, factor analysis has been conducted by using the result of Supply Chain Management Score Card, in order to identify the significant factors that established the operational performance of Supply Chain Management in each country. The result of factor analysis indicated that the structure in generating successful Supply Chain Management in Indian and Chinese Pharmaceutical businesses were considered similar in aspect of Supply Chain Management realization, strategy and utilization of Information Technology along the chain. Finally, the correlation between the extracted factors and financial bottom lines was conducted, which indicated that the improving Supply Chain Management performance brought positive impact on financial outcome, especially when Information Technology utilization in cooperation with Supply Chain Management organizational strategy.

Keywords: Supply Chain Management, Score Card, operational analysis, Factor analysis, Pharmaceutical business, Information Technology, correlation.

1. Introduction

Indian Pharmaceutical business is evolving globally to compete and positioned its stake in these fragmented market. The major issue relates with their supply chain management in identifying, monitoring and measuring their operational activities. Adding value in terms of excellence in manufacturing segment has already made its mark, but supply chain management is still not able to make its place in building and adding value in pharmaceutical business due to its complexity.

2. Objectives

The performance scorecard for pharmaceutical business is aligned with Management Information System (MIS) to give visibility to the system. To improve their operational processes, identification the silos and constraints within each and different teams is done. Scorecard is made for Indian pharmaceutical company, which can go on pilot testing. There is a need of performance scorecard to have a track on supply chain activities within the organization. While identifying performance key indicators, different Supply Chain Management performance metrics have been reviewed and distributed into four perspectives. This helps top management to evaluate Supply Chain Management performance in a much-balanced way from all angles of business [1]. The study argues that despite considerable research in supply chain management in recent years, a number of important problems have not yet received adequate attention, including: the factors influencing the successful implementation of performance measurement systems for supply chains; the forces shaping their evolution over time; and, the problem of their ongoing process [2]. The research presents an overview and evaluation of the performance measures used in supply chain models and also presents a framework for the selection of performance measurement systems for pharmaceutical supply chains [3]. Once factors or determinants are identified, supply chain collaboration is critical to achieving the integration of partners for performance impact [4]. This study used case study research design and semi structured interviews to collect data from few business leaders working in Indian and Chinese pharmaceutical organizations and possessing successful experience in using SCM strategies to reduce high costs [5].

3. Way of approach

The methodology used for scorecard preparation, grounded on the activities prescribed in the monthly report of management information system (MIS). The in-depth study of Management Information System (MIS) is required to have a clear portrait for the need of factors to cover in the scorecard to

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Table 1
Communalities (only positive components written)

	Initial
Process Operations	1.00
Development Operations	1.00
Financial Operations	1.00
Supplier's Operations	1.00

	Initial
No. of products	1.00
No. of materials	1.00
No. of samples collection	1.00
No. of assessments	1.00

Extraction Method: Principal Component Analysis

Table 2
Total variance explained

Component	Rotation Sum of Squared Loadings		
	Total	% of Variance	Cumulative %
1	3.023	27.485	27.485
2	2.209	20.084	47.569
3	1.543	14.678	62.247
4	1.154	10.492	72.739

Component	Rotation Sum of Squared Loadings		
	Total	% of Variance	Cumulative %
1	2.578	23.988	23.988
2	2.167	19.238	43.226
3	1.785	16.159	59.385
4	1.267	12.024	71.409

be in-line with the Supply chain Management's business objectives. The process of making scorecard made easy with going through four different perspectives, which covers all the Key Performance Indicators (KPI) of the internal supply chain department. The four factors are Process Operations, Development Operations, Financial Operations and Supplier's Operations. The next stage is to understand the sub-factors within the main factors for each particular team. The identification of sub-factors in align with MIS, are monitor precisely to keep them in one main factor that defines the relationship with given perspective. Few interviews conducted with the each team members to know their day-to-day activities and the constraints within it. As sourcing and procurement are two key sub departments in pharmaceutical supply chain management department, different scorecards are made depending on attributes or working methodology for each sub functional department. In each factor and team combination, values are indicated in percentages of achievement of expected performance for all sub functional departments. Total value indicates the overall performance of sub functional team in relate with all factors, and leave a door for improvement on continuous path of operational excellence. In addition, both sourcing and procurement, total score is used to identify the overall performance of Supply chain Management Department of Pharmaceutical Company. Factor analysis approach using SPSS is used to identify important factors or determinants for

sourcing and procurement teams to have better correlation.

4. Factors or Determinants for supply chain management teams

This table shows the actual factors that were extracted. If you look at the section labeled "Rotation Sums of Squared Loadings," it shows you only those factors that met your cut-off criterion (extraction method). In this case, there were four factors with total Eigen values greater than 1. SPSS always extracts as many factors initially as there are variables in the dataset, but the rest of these didn't make the grade. The "% of variance" column tells you how much of the total variability (in all of the variables together) can be accounted for by each of these summary scales or factors. Factor 1 account for 27.485% of the variability in all variables, and so on. Major impact of all 4 components in procurement scenario is more than 72% while in case of sourcing team; it is more than 71%. This factor analysis approach has given direction to find key performance indicators for procurement and sourcing teams. As the values of 4 factors or components derived for sourcing and procurement teams are above 1.00 and their variances between each other are within expected ranges, factors or determinants are said to be feasible to demonstrate as key performance indicators for accessing the overall performance of Supply Chain Management Department.

Table 3
Key Performance Indicators (KPI) for Procurement and Commercial Team

S. No.	Factor \ Team	Procurement							Commercials	Total
		Domestic Raw Material	Imported Raw Material	Bulk Solvents	Capex	Services	Fuels & Lab Consumables	Consumables & Stationary		
1	**Process Operations**									
2	**Development Operations**									
3	**Financial Operations**									
4	**Supplier's Operations**									
	Total									

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Table 4
Key Performance Indicators (KPI) for Sourcing Team

S. No.	Factor \ Team	Sourcing		Total	Overall Performance
		New Product Development	Alternative Vendor Development		
1	No. of products				
2	No. of materials				
3	No. of samples collection				
4	No. of assessments				
	Total				

Furthermore, for commercials, same procurement determinants or factors are used as it demonstrates very small part of supply chain management cycle.

5. Overall performance

The Table 3 and Table 4 shows the performance indicators for overall performance.

6. Conclusion

The performance scorecard aligned well with major key performance indicators and management information system. The comparison done is on monthly and quarterly information availability and the type of activity. The activities, which might still not included in Management Information System is not there in the final scorecard. This may include few errors in monitoring the performance of Supply Chain Management department. There are some uncertainties in monitoring and implementing performance scorecard for supply chain department due to different factor consideration for sourcing teams than procurement and commercials. This final scorecard may improve in future, with the improved information through Management Information System. The major constraint in scorecard planning, are the activities, which are not measurable. To solve such issues, techniques like ranking comparison, grounded on the percentage performance can be used.

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