

Designing a Balance Scorecard model for Procurement Performance Assessment in IOTC Using TOPSIS

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Abstract. Balanced Scorecard (BSC) is one of the comprehensive and simplicities performance measurement tools that determine intangible assets of the organization. This instrument is more frequently used in a Strategic Planning than performance assessment. Due to the long domination of traditional management approaches in Iranian service systems, rarely do they utilize a balanced performance measurement tool. The author shows how a Strategy Map is planned for procurement systems and how necessary data are gathered with interviews held with managers who had planned strategies for their organizations and who had not, and analyzed by balance scorecard and a multi criteria decision making (MCDM) technique which is named technique for order preferences by similarity to ideal solution (TOPSIS).

Keywords: Balanced Scorecard (BSC), strategic planning, procurement systems strategy map, Iranian Oil Terminals Company (IOTC), TOPSIS

1. Introduction

In late 1980s, lots of articles were published in management magazines in America and Europe about the inefficiency of different performance measurement tools at companies. [1] In 1987 researches were made by *National Association of Accountants (NAA)* and *Computer Aided Manufacturing-International (CAM-I)* institute in America. It's shown that 60% of 260 accountant managers and 64 executive managers in the US companies are dissatisfied of their performance measurement tools. Due to the extended domination of traditional management approaches in Iranian service systems, not often do they use a balanced performance measurement tool. Most of Iranian service systems are using the financial measures only. This unbalanced system forces the organization not to pay attention to its intangible assets. [3]

After giving general descriptions on the BSC, this article shows the application of this model to build a Strategy Map and then will assess Procurements Performance in Iranian Oil Terminals Company in 2009 and it's variation to 2008 from the views of.

For an organization to function effectively, it has to determine and manage numerous linked activities. [6] The most strength point of BSC is its ability to illustrate the cause and effect relations between strategies and processes through four perspectives: "Financial perspective"; "Customer perspective"; "Internal business process perspective"; "Learning and growth perspective". [5] Based on this reasoning, to achieve its financial benefits, an organization has to take its customers' needs and expectations into account, initially. To do this, service organizations should adopt a process approach when developing and implementing a quality management system. And to have this, it finally needs to increase its personnel's knowledge. [4]

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2. Strategy map using BSC in IOTC

The results of analysis on Iranian service organizations show that seldom do they use any specific strategic planning model. We designed a *Strategy Map* using BSC in IOTC.

There are steps to build a Strategy Map using BSC; first, the organization should recognize its strategic topic and analyze them to find the top 20 percent portions which contribute the organization achieving 80 percents of its goals, in the line of vision. Second, for each theme, relevant initiatives and actions need to be determined.

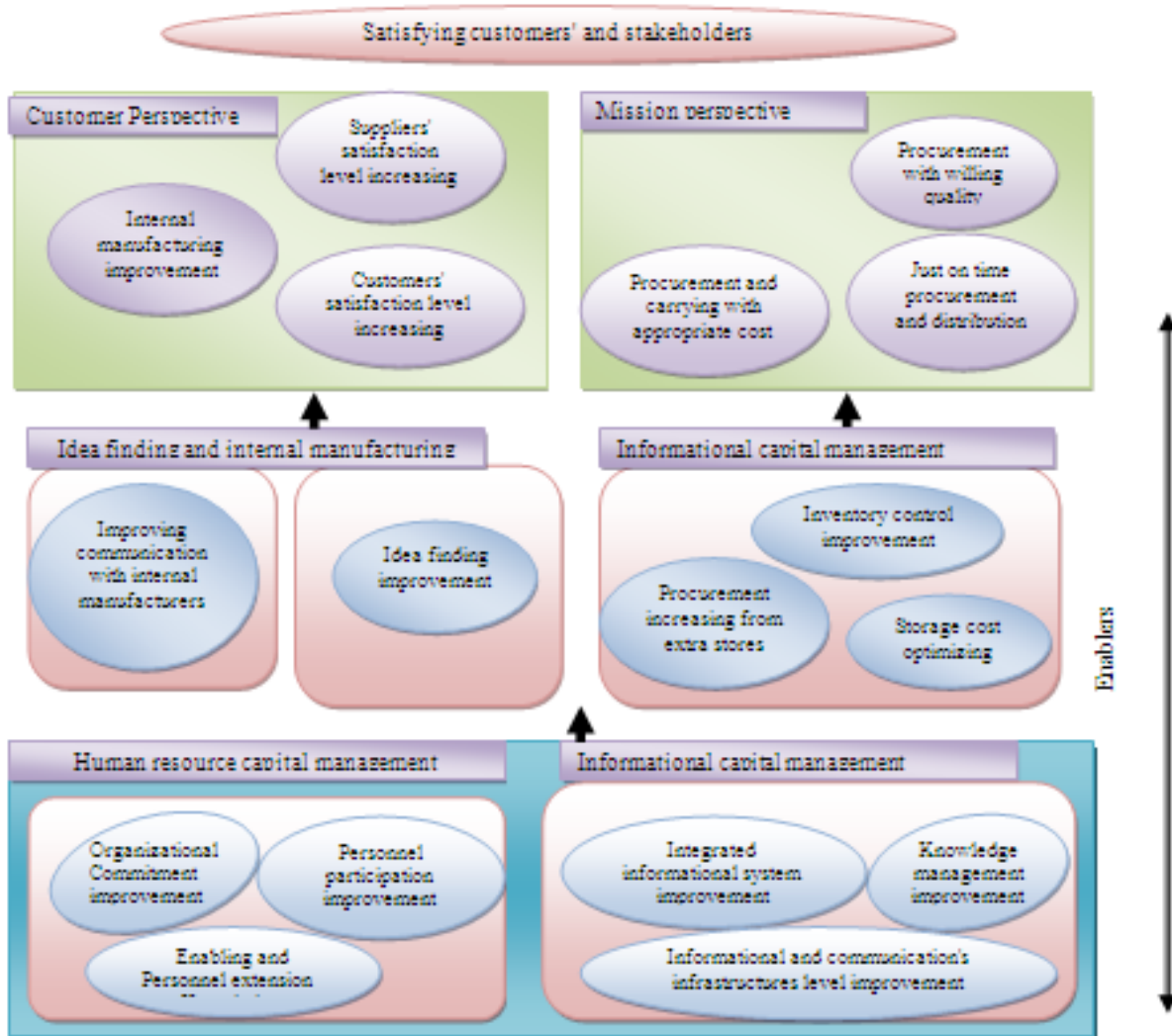


Fig. 1 Procurement's Strategy Map in IOTC.

Finally the cause and effect relations between these initiatives should be mapped in Strategy Map. There is a clearly defined and documented purpose statement and objectives for measuring performance of IOTC.

Satisfying customers' and stakeholders by procuring and holding operational and services section's required items with appropriate cost, speediness and quality is mission of IOTC.

As demonstrated in figure 1, Strategic goals of internal processes standpoint are storage cost optimizing, procurement increasing from extra stores, idea finding improvement, inventory control improvement and improving communication with internal manufacturers. Appropriate measuring of storage cost optimizing is the quantity of extra, stock - out, non relevance or defected items that are illustrated by codes p11, p12, p13 and p14 respectively. Proper measures of inventory control improvement is not in stock (NIS), coded and with no moving items during 3 years that are illustrated by codes p14, p21, p22 and p23 respectively. Proper measuring of procurement increasing from extra stores is number of parts which are supplied from additional storerooms that are illustrated by code p31. Proper measures of idea finding improvement is the number of firms which are assessed and ranked that are illustrated by code p41. Proper measures of improving

communication with internal manufacturers is the fractions of items which are manufactured or restructured in country to whole orders are purchased out of country that is illustrated by code p51 as verified in table 1.

Strategic goals of Growth & learning standpoint are organizational commitment improvement, enabling and personnel knowledge improvement, and personnel participation improvement, integrated informational system promotion, Informational and communication's infrastructures level improvement and Knowledge management improvement. Proper measuring of organizational commitment improvement is amount of fringe benefits, organizational commitment, absence, job rotation, meetings that is figured to solve problems and barriers and personnel's critic which is illustrated by codes L11, L12, L13, L14, L15, L16, L17. Proper measuring of enabling and personnel knowledge promotion is amount of training program, training programs effectiveness, young and wisdom employees employment in top positions, exploitation of old practiced workforce in on (and off) the job training programs which are illustrated by codes L21, L22, L23, L24, L25. Proper measuring of personnel participation improvement is amount of received suggestions and amount of accepted suggestions which are illustrated by codes L31, L32. Suitable measuring of integrated informational system promotion is the fraction of product unique users to all staff, the fraction of automated system users to all staff, converting red tapes to electronic files, speed average in accessing to network, fraction of amount of previous workers who their organizational knowledge is on paper to all of preceding workers which are illustrated by codes L41, L42, L43, L44, L51, L61 as demonstrated in table 1.

In Technique for Order Preference by Similarity to the Ideal Solution (TOPSIS) two artificial alternatives are hypothesized: Ideal alternative: the one which has the best level for all attributes considered. Negative ideal alternative: the one which has the most unpleasant attribute values. TOPSIS selects the alternative that is the closest to the ideal solution and farthest from negative ideal alternative. TOPSIS assumes that we have m alternatives (options) and n attributes/criteria and we have the score of each option with respect to each criterion[8]. After five stages respectively passing through constructing normalized decision matrix, constructing the weighted normalized decision matrix, determining the ideal and negative ideal solutions, calculating the separation measures for each alternative and calculating the relative closeness to the ideal solution, performance of four perspectives in BSC have analyzed and ranked in IOTC along with years 2007, 2008 and 2009, as demonstrated in table 1.

Table 1: Procurement's Strategy Map in IOTC

perspective	Strategic Goals	TOPSIS results(2007)	TOPSIS results(2008)	TOPSIS results(2009)	code	perspective	Strategic Goals	TOPSIS results(2007)	TOPSIS results(2008)	TOPSIS results(2009)	code
Mission	Just on time procurement and distribution	Third	Second	First	M21	Internal processes	Internal manufacturing improvement				M11
							Suppliers' satisfaction level increasing				M12
							Procurement increasing from extra stores				M13
							Storage cost optimizing				M14
							Idea finding improvement				M15
	Procurement and carrying with appropriate cost	Third	Second	First	M21	Internal processes	Inventory control improvement				
							Improving communication with internal manufacturers				
							Organizational Commitment				
	Internal manufacturing improvement	Third	Second	First	M21	Internal processes	Internal manufacturing improvement				
							Suppliers' satisfaction level increasing				
							Procurement increasing from extra stores				
							Storage cost optimizing				
							Idea finding improvement				
Inventory control improvement	Third	Second	First	M21	Internal processes	Inventory control improvement					
						Improving communication with internal manufacturers					
						Organizational Commitment					

L12	Third	Second	First	improvement	M23	M24	M25	M31	M32	M33	C11	C12	C13	C14	C15	First	Second	Third	Procurement with willing quality	Customers' satisfaction level increasing	Customers
L13				Enabling and Personnel knowledge improvement																	
L14				Personnel participation improvement																	
L15				Integrated informational system improvement																	
L16				Informational and communication's infrastructures level improvement																	
L17				Knowledge management improvement																	
L21																					
L22																					
L23																					
L24																					
L25																					
L31																					
L32																					
L41																					
L42																					
L43																					
L44																					
L51																					
L61																					

3. Conclusions

In this paper, a methodology for evaluating performance is proposed. The strengths of the method are further highlighted by extending the investigated example with aspects usually not analyzed by the other methodologies, as a consequence of the arising strategy conflicts in performance assessment. IOTC's procurements performance positions in all of mission, customer and internal processes standpoints are third (in 2007), second (2008) and first (in 2009) via TOPSIS. Besides, in consequence of TOPSIS ranking, IOTC's procurements performance all-purpose positions are third, second and first in 2007, 2008 and 2009, respectively.

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