

CRITICAL ATTRIBUTES ON SUPPLY CHAIN STRATEGY IMPLEMENTATION: CASE STUDY IN EUROPE AND ASIA

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ABSTRACT

This case study research aims to compare the performance of the implementation of supply chain management (SCM) strategies within Asian and European Companies. The case study measures company's opinions of supply chain strategy implementation through utilization of Sense and Response methodology. Critical Factor Index (CFI), Balanced Critical Factor Index (BCFI) and Scaled Critical Factor Index (SCFI) are used in this study to represent the result of comparison between European and Asian companies. From the analysis of comparison of all Sense and Response models, it can be concluded that there are differences and similarities of critical attributes that affecting supply chain strategy implementation in Asian and European companies. There are two attributes that have consistent trend for both regions; innovation and organization structure.

In this research the analysis of supply chain strategy implementation was made for the needs of manufacturing industry. Suggestions for future research are multiple case studies in different industry areas in global business environment. The results provide a guideline to the company to measure the right attributes for making the right decision in a dynamic environment. It also provides good knowledge for companies to implement supply chain strategies, the main approaches to implement it and the main challenges in supply chain strategy implementation. Supply chain strategy implementation was analyzed in the European and Asian companies. This research shows that there are several developing areas for companies when implementing supply chain strategies.

KEYWORDS

supply chain management, sense and respond, strategy implementation.

Introduction

Research problem

Supply chain management (SCM) is a management concept of the 2000's. It includes divisions from the management concepts of the previous decades. Many definitions for SCM have been presented. SCM has been and is still regarded as a synonym for logistics, supply and SC control. Today the broader definition determined by the Global Supply Chain Forum is generally accepted as a norm [1, 2]:

“Supply Chain Management (SCM) is the integration of key business processes from end user

through original suppliers that provides products, services, and information that add value for customers and other stakeholders”

To develop supply chain and to run and operate supply chain smoothly it is extremely important to integrate supply chain strategy to the whole supply chain. Supply chain strategy is the key element of planning operational daily work. According to preliminary research it seems that this research area is unique.

The research goal can be captured as following:

The goal is to deepen knowledge in supply chain strategy implementation in the manufacturing industry.

The research problem is presented as a question:
How to implement supply chain strategy in the manufacturing industry?

Sub question:

Is there any difference between the performance of the implementation of supply chain management in Asia and Europe?

Research paradigms

Eisenhardt (1989) defines case study research as a research strategy that aims at understanding the internal dynamic of an individual case [3]. Case study research is aiming at understanding comprehensive and relevant phenomena of real life. In that case the endeavour is to study the phenomena in their genuine context. Interface between the phenomenon and context is not often clear, which complicates the work of a researcher [4].

Case study research is regarded as a good research method when the research problem can be described with the help of questions how and why. The method is very useful when a researcher cannot control the target. Furthermore, it is useful when the focus is on concurrent events in a real time manner especially when the border between the event and context is not clear. There are three types of case study research: explorative (seeking to find out more about a phenomenon) research, descriptive research and explanatory research. The purpose of explorative research is to obtain information regarding a phenomenon, find new ideas and possible research problems. In explorative research, already existing information is collected and sorted. The aim of descriptive research is to provide as accurate image of an individual, group, situation or phenomenon as possible. In the research the focus is not in clarifying connections between phenomena or factors interpreting behaviour, but only in describing a situation. The aim of explanatory research is to explain causal relations between phenomena and testing related hypotheses [4].

Supply chain management

Supply Chain Operations Reference model (SCOR) which was defined in the Supply Chain Council (2005), defined a SC as follows [5]:

“The supply chain encompasses every effort involved in producing and delivering a final product, from the supplier’s supplier to the customer’s customer. Five basic processes – plan, source, make, deliver and return – broadly define these efforts, which include managing supply and demand, sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and

order management, distribution across all channels, and delivery to the customer”.

Supply Chain Council (2005) defined that there are four basic processes in the SC: plan, source, delivery and return. Plan refers to processes that balance aggregate demand and delivery requirements. Sources are processes that transform product to a finished state to meet planned or actual demand. Delivery is a process in which the finished goods are delivered to a customer. Return is defined as processes associated with returning or receiving returned products [5, 6].

SCM encompasses co-operation of various functions between suppliers and customers. Most essential divisions of SCM are those of managing business relations and managing customers. Actual competition takes place along the whole SC when companies involved in the SC have the prerequisites for competitive operations. From the point of view of the SC, moving the orders upstream or downstream does not make the aggregate more competitive. Costs are divided – with respect to the whole SC – by the price requested from the client. Logistics cannot be replaced with help of SCM, but both of the philosophies – logistics and SCM – need to be discussed in tandem with each other [7].

According to Treville (2004), supply integration includes JIT delivery, reduction of the supplier base, evaluating suppliers based on quality and delivery performance, establishing long-term contracts with suppliers, and eliminating paperwork. Demand integration includes increased access to demand information throughout the SC to permit rapid and efficient delivery, coordinated planning, and improved logistics communication. Supply integration is integration that supports the efficient manufacture and delivery of goods. Demand integration stands for integration that supports market mediation with the primary role of demand integration being transfer of demand information to facilitate greater responsiveness to changing customer needs [1, 8].

Stevens (1989) identifies four stages of SC integration [9]:

- Baseline. Fragmented operations within an individual company. Planning very short term, almost reactive.
- Functional integration. Limited integration between adjacent functions. Focusing on the inward flow of goods. Poor visibility of real customer demand.
- Internal integration. Involves integrating the aspects of the SC that are directly under the control of the company.

- External integration. The scope of integration is extended outside the company to embrace suppliers and customers.

The definition of SC integration best acknowledged by its researchers is the following [1, 7]: Supply chain integration is process integration upstream and downstream in the supply chain

Lee (2000) divides SC integration into three dimensions: information integration, coordination as well as resource sharing and organisational relationship linkage. Thus, three main aspects in integration seem to be information integration, organisational or relationship integration and process integration [10].

Case description

The case could be described as a one specific supply chain in a global engineering business. One of the key sub assemblies of case company's products are managed by case supply chain. Product is ready assembly which consists of steel structure and components. The products are tailor-made and every product is customized according customers' needs.

Supply chain is organized globally so that there are three region based supply chains: Europe, APAC and America. In every region there are production locations which are serving supply chain. Production units are joint ventures, own units and also suppliers. The one important characteristic is that the cooperation is extremely deep with the production units in whole supply chain. Every production units are managed like own operations, because before this operations was part of case company own operations.

The interview was done together with the case company's management of the supply chain and with supplier's management. Interviews were done with the supplier's managers to evaluate the case suppliers and with the case suppliers' management's.

Data collection method and data analysis

This study aims to compare the performance of the implementation of supply chain management within two groups of company namely Asian companies and European Companies. There were five respondents represent each group. The interest is to seek for possible similarities of critical attributes to be focus on for improvement. The study also attempted to see possible trend in the implementation of supply chain management (SCM) among both group.

This part presents results of a comparative study that measures organization's opinions regarding business performance from a supply chain management's point of view through utilization of Sense and Response methodology. There are three models used; CFI, BCFI and SCFI to portray the result of comparison between the two groups. Each attribute in the questionnaires is evaluated on how well each attribute have been carried out in their companies, how they see themselves compared to their competitors, and how they see each attribute developing compared to the situation 1 to 2 years before.

Questionnaire

Data collection instrument used for data collection is questionnaire. The questionnaire contains 36 attributes divided into three main categories: SCM strategy themes/approaches, SCM strategy implementation and challenges in SCM strategy implementation. The following table shows the list of all attributes measured in each category.

There are a total of 9 indices needed for all three models which can be obtained from the data collected. In order to calculate all indices, each attribute evaluated through five approaches. The first approach is expectation. In a scale of 1 to 10 which represent lowest to highest expectation; each respondent has to assess the way the attribute expected to perform in the next one to two years. Second approach is experience. As the first approach, experience is measured in a scale of 1 to 10 from lowest level to highest level as according to their experience on performance in the past one to two years.

Third and fourth approaches are direction of development for future and past. Direction of development for future refers to the prediction of development trend for each attribute in the next three years. The prediction is based from company's performance in the past two years. On the other hand, direction of development for past is refers to evaluation of current performance of each attribute as according to their one to two years performance. Each respondent has to determine whether the direction of development for both future and past is worst, same or better.

Next approach is to compare the situation of each attribute towards their competitor. Same as the third and fourth approaches, each respondent also has to determine whether the current performance of each attribute is worst, same or better as compared to their competitor.

Figures Balanced Score Cards (Average of Expectation)

Firstly, the analysis of similarities of attribute to be improved in the future was conducted. As mentioned before, expectation and experience of each attribute was measured in a scale of 1 to 10. The average value for expectation and experience was calculated and presented in a form of bar chart for each group.

According to the analysis, each attribute has more average of expectation value rather than average of experience. The attributes to be improved is determine through the biggest gap value between average of expectation and average of experience. The result demonstrates that both group felt they should improve the performance of “*cost efficiency of supply chain*” and “*lean*”. From the calculation, the gap value is found bigger in Asian group with a value of 2.8 and 2.4 compared to European group with a value of 1.8 and 1.6 respectively for each attribute. It implies the need for improvement is higher in Asian group than European group.

Figure 1 shows variation of expectation from Europe and Asia companies. The attributes were sorted from the highest to smallest value of Europe companies. The number in the graph can be refer in Table 1. The top three attributes that has the biggest gap between Asian and European companies are “Rewarding Implementation Performance”, “Strategy Commitment” and “Early involvement in development, (with suppliers)”.

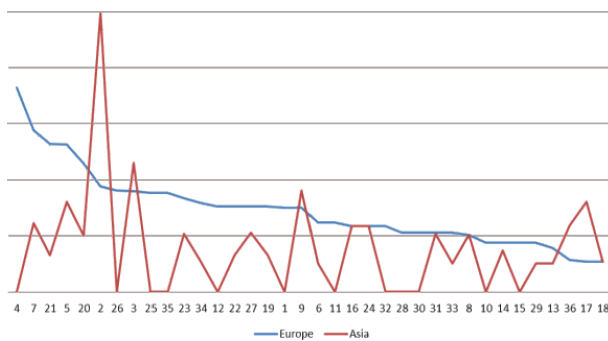


Fig. 1. Variation of expectation for both regions.

Takala and Ranta (2007) have introduced critical factor index (CFI) into the operative management system to steer sense and respond (S&R) theory.

Critical attribute that may support business decision making process could be identify, interpret and evaluate [11]. The following model, BCFI, was developed by Nadler and Takala (2010) by taking the principle of CFI theory into consideration [12]. Later, Liu et al., (2011) developed the SCFI model that accurately models the S&R theory [13].

Table 1
List of Attributes in Each Category.

SCM strategy themes / approaches	
1	Deeper cooperation with selected suppliers
2	Outsourcing own manufacturing to suppliers
3	Innovations
4	Early involvement in development, (with suppliers)
5	Low number of suppliers
6	Cost efficiency supply chain
7	Managing supply chain information
8	Quality development in whole supply chain
9	Supplier development in the supply chain
10	Production flexibility
11	Lean
12	Agile
13	Punctuality
SCM strategy implementation factors	
14	Competency of Organizational Members
15	Implementation Plan
16	Organization Structure
17	Organizational Culture
18	Implementation Leadership
19	Strategy Communication
20	Monitoring, Control & Evaluation
21	Strategy Commitment
22	Strategy
23	Achieving Visible Results
24	Training & Education
25	External Consultants
26	Rewarding Implementation Performance
Challenges in SCM strategy implementation	
27	Strategy formulation
28	Environmental uncertainty
29	Organizational structure
30	Organizational culture
31	Communication
32	Resources allocation
33	Leadership power
34	Awareness of strategy
35	Commitment to strategy
36	Monitoring and development of implementation

Table 2
The design of questionnaire.

Attribute	Scale: 1=low, 10 = high		Direction of development, expectations (future)			Direction of development, experiences (past)			Competitor		
	Expectations (1-10)	Experience (1-10)	Worse	Same	Better	Worse	Same	Better	Worse	Same	Better
Attribute 1											

The following equations are used in the calculations of CFI, BCFI and SCFI models (1)–(9).

$$Importance\ index = \frac{Average\ of\ expectation}{10}, \tag{1}$$

$$Gap\ index = \frac{Average\ of\ expectation - Average\ of\ experience}{10} - 1, \tag{2}$$

$$Development\ index = |(better - worse) * 0.9 - 1|, \tag{3}$$

$$Performance\ index = \frac{Average\ of\ experience}{10} \tag{4}$$

The equations of CFI, BCFI and SCFI models are listed as follows:

$$CFI = \frac{std\{experience\} * std\{expectation\}}{Importance\ index * Gap\ index * Development\ index} - 1, \tag{5}$$

$$SD\ expectation\ index = \frac{std\{expectation\}}{10} + 1, \tag{6}$$

$$SD\ experience\ index = \frac{std\{experience\}}{10} + 1, \tag{7}$$

$$BCFI = \frac{SD\ expectation\ index * SD\ experience\ index * Performance\ index}{Importance\ index * Gap\ index * Development\ index} - 1, \tag{8}$$

$$SCFI = \frac{\sqrt{\frac{1}{n} \sum_{i=1}^n (experience(i) - 1)^2} * \sqrt{\frac{1}{n} \sum_{i=1}^n (expectation(i) - 10)^2} * Performance\ index}{Importance\ index * Gap\ index * Development\ index}. \tag{9}$$

Critical Factor Index (CFI)

According to Takala and Ranta (2007), CFI is a measurement tool to determine the level of criticalness of an attribute towards business performance based from employees, customers and business partners' evaluation [11]. The level of criticalness can be grouped into three categories; most critical, soon to be critical or non-critical.

There are upper and lower limits that determine whether an attribute is in a range of critical, soon to be critical or non-critical. Initially, the average level has to be calculated. If an attribute falls within the range of 1/3 (lower limit) and 2/3 (upper limit) of the average level, it indicates that the attribute

is non-critical. However, if the attribute falls lower than 1/3 of the average level, it is considered critical. Whilst, if the attribute falls upper than 2/3 it means that the attribute is soon to be critical [13]. The following table shows the value of each indicator for this study.

Table 3
Calculated Indicator for the Models.

Item	Formula
Average level	$\frac{100\%}{36\ attributes} = 2.78\%$
Lower limit	$2.78\% + 0.92\% = 3.7\%$
Upper limit	$2.78\% - 0.92\% = 1.9\%$

Table 4
Summary of Calculated CFI for both Future, Past and Competitor Data.

Period	Critical Attributes	Soon to be Critical Attributes
Future	Competency of organizational members Monitoring, control and evaluation Communication Leadership power	Innovations Organization structure
Past	Innovations Quality development in whole supply chain Supplier development in the supply chain Punctuality Competency of Organizational Members Implementation leadership Monitoring, control and evaluation Implementation leadership Monitoring, control and evaluation Strategy formulation Communication Leadership power	–
Competitor	Quality development in whole supply chain Punctuality Competency of Organizational Members Implementation Leadership Monitoring, Control & Evaluation Training & Education Organizational structure Leadership power	–

The researchers have calculated the data results of CFI for both groups; Asian and European. The results are presented by future, past and evaluation towards competitor data. Results of the survey are indicated by “Traffic light bars”. Red, yellow and green bars indicate the status of each attribute. Most critical attribute will be indicated by red color. This is followed with yellow which indicate the attribute that may become critical in the nearest future. The best one is green that are considered non-critical at the moment.

However, the results of the study are going to be presented in a table form as follows.

Table 4 summarizes the result of CFI for both future, past and competitor data. For future data, there are four critical attributes and two potentially critical attributes matched between both groups. However, the number of critical attributes increased with eight additional attributes for past data. Past data does not have any potentially critical attributes. The four attribute that matched between both future and past data are “*Competency of organizational members*”, “*Monitoring, control and evaluation*”, “*Communication*” and “*Leadership power*”. According to the CFI calculation, these attributes are considered critical to be improved at the moment by both groups.

On the other hand, there are eight matches of critical attributes to be focus on towards their com-

petitor. Three out of four attributes matched with the internal critical attribute which are “*Competency of organizational members*”, “*Monitoring, control and evaluation*” and “*Leadership power*”

As previous studies done by Liu and Takala (2012) and Hassan Nikookar et. al (2012), there are a number of attributes resulted “0” index values which does not indicate anything from the real situation. This is the main disadvantage of CFI model due to the “0” standard deviation that commonly occur during data collection [14, 15]. Nevertheless, Nadler and Takala (2010) has developed Balanced Critical Factor Index (BCFI) model which solved the problem encountered by CFI model [12]. The developer of BCFI has manually added “1” to the standard deviation of expectation and experience which has forced the minimal standard deviation becoming “1” to avoid “0” standard deviation.

Balanced Critical Factor Index (BCFI)

According to Toshev R. et al. (2012), BCFI detects the most critical factors affecting the overall company’s performance much more properly and reliably [16]. BCFI is using the same judgment concept as CFI. The calculated indicator in CFI is also used BCFI model to determine the status of criticalness of each attribute. The following figures represent the calculated data results of BCFI for both groups; Asian and European and towards their competitor.

Table 5 summarizes the calculated result of BCFI for both future and past data of Asian and European groups.

According to the table, there are 10 critical attributes matched between both groups. This exceeds the amount of critical attributes generated by CFI model. In CFI model, the same attributes generated as well from future to past data. However, in BC-

FI model there are a few attributes which appear in future data but does not appear in the list of critical attributes in past data. Only two critical attribute matched between future and past data, “*cost efficiency supply chain*” and “*external consultants*” which are also matched for comparison towards competitor.

Table 5
Summary of Calculated BCFI for Future, Past and Competitor Data.

Period	Critical Attributes (Red)	Potentially Critical Attributes (Yellow)
Future	<ul style="list-style-type: none"> Early involvement in development (with suppliers) Cost efficiency supply chain Production flexibility Implementation plan Strategy communication External consultants Strategy formulation Environmental uncertainty Communication Leadership power 	<ul style="list-style-type: none"> Outsourcing own manufacturing to suppliers Organization structure Achieving visible results Training and education Commitment to strategy
Past	<ul style="list-style-type: none"> Deeper cooperation with selected suppliers Innovations Low number of suppliers Cost efficiency supply chain Quality development in whole supply chain Supplier Development in the supply chain Agile Punctuality Competency of Organizational Members Implementation leadership Strategy communication Monitoring, control and evaluation Strategy commitment Achieving visible results External consultants Environmental uncertainty Organizational culture Communication Resources allocation Leadership power Awareness of strategy Commitment to strategy 	<ul style="list-style-type: none"> – –
Competitor	<ul style="list-style-type: none"> Innovations Early involvement in development, (with suppliers) Low number of suppliers Cost efficiency supply chain Quality development in whole supply chain Production flexibility Lean Agile Punctuality Competency of Organizational Members Implementation plan Implementation leadership Strategy commitment External consultants Organizational structure 	<ul style="list-style-type: none"> –

Scaled Critical Factor Index (SCFI)

The third model derived from BCFI is SCFI. SCFI which was developed by Takala et al. (2011) adds trend research to the study. According to Liu Y. and Takala J. (2012), SCFI is more sensitive to dynamic environment changes compared to BCFI [14]. Therefore, SCFI generates more accurate result than BCFI in small sample size case study.

From all SCFI graphs, it can be seen that there are no critical attribute generated by the SCFI model. Almost all attribute considered as potentially to become critical in the nearest future except for a few attributes which are non-critical for the time being.

Comparison for All Models

Each attribute have to be analyzed individually to see the consistency of result from all S&R models. The result for each attribute of past and future values for both Asia and Europe companies are compared to see the trend of changes; either better or worse. Afterward, the trends are compared between all three models to see the consistency of the changes.

The following table demonstrates the way to evaluate the changes of each attribute's value from past to future.

Table 6
The assessment of attribute changes from past to future (Liu et al., 2011)

Past Value	Future Value	Assessment
Good	Good	No change / “.”
Good	Other	Worse
Other	Good	Better
Potentially Critical	Potentially Critical	Better
Critical	Critical	Worse
Potentially Critical	Lower	Better
Critical	Higher	Better
Potentially Critical	Higher	Worse
Under resourced	Lower	Worse

Table in appendixes depicts the comparison results between past and future values for both Asia and Europe companies by using S&R models. The results with consistent trend are marked normally while the inconsistent results are marked with darker shading.

Table 7 lists the attribute that shares similar result which is ‘better’ in all S&R models; CFI, BCFI and SCFI accordingly to Asia and Europe companies. From the list it can be seen that ‘innovation’

and ‘organization structure’ have a consistent result for both region.

Table 7

List of attribute that share similar trend for all model.

Asia	Europe
Outsourcing own manufacturing to suppliers	Innovations
Innovations	Organization structure
Managing supply chain information	Strategy
Quality development in whole supply chain	Achieving visible results
Supplier development in the supply chain	Organizational structure
Punctuality	Organizational culture
Organization structure	
Organizational culture	
Implementation leadership	

Conclusions

This paper aims to compare the performance of the implementation of supply chain management within two groups of company namely Asian companies and European companies. The interest is to gain insight for possible similarities and differences of critical attributes to help decision makers to make adaptive adjustments on operations strategy in dynamic business environment of Asia and Europe. Each model generates different critical attributes. However, as supported by past research, results which are yielded by SCFI model are more accurate than others. According to SCFI model, there are no critical attribute at the moment for both Asian and European companies. The trend indicates positive changes from expectation to experience values. However, almost 95 percentages of all attributes are potentially to be critical in the future. From the analysis of comparison of all S&R models, it can be concluded that there are differences and similarities of critical attributes that affecting supply chain strategy implementation in Asian and European companies. This is understandable as different environments have different point of view. There are two attributes that have consistent trend for both regions; innovation and organization structure.

Appendixes

The comparison results between past and future values for both Asia and Europe companies by using S&R models.

Attributes	Past CFI Asia	Future CFI Asia	Trend	Past CFI Europe	Future CFI Europe	Trend	Past BCFI Asia	Future BCFI Asia	Trend	Past BCFI Europe	Future BCFI Europe	Trend	Past SCFI Asia	Future SCFI Asia	Trend	Past SCFI Europe	Future SCFI Europe	Trend
Deeper cooperation with selected suppliers	-	-	-	C	C	Worse	C	PC	Better	C	C	Better	PC	PC	Worse	PC	PC	Better
Outsourcing own manufacturing to suppliers	PC	PC	Better	Good	Good	-	PC	Good	Better	C	C	Better	PC	Good	Worse	PC	PC	Better
Innovations	C	PC	Better	C	PC	Better	C	PC	Better	C	PC	Better	PC	PC	Better	PC	PC	Better
Early involvement in development, (with suppliers)	-	-	-	PC	PC	Better	C	C	Better	PC	C	Worse	Good	Good	Worse	PC	PC	Better
Low number of suppliers	C	C	Worse	Good	PC	Worse	C	Good	Better	C	PC	Better	PC	PC	Better	PC	PC	Better
Cost efficiency supply chain	-	-	-	C	C	Worse	C	C	Worse	C	C	Worse	PC	PC	Worse	PC	PC	Better
Managing supply chain information	C	PC	Better	Good	Good	-	C	PC	Better	Good	PC	Better	PC	PC	Worse	PC	PC	Better
Quality development in whole supply chain	C	PC	Better	C	C	Worse	C	PC	Better	C	C	Better	PC	PC	Worse	PC	PC	Better
Supplier development in the supply chain	C	Good	Better	C	Good	Better	C	Good	Better	C	C	Better	PC	PC	Worse	PC	PC	Better
Production flexibility	-	-	-	PC	C	Worse	C	C	Worse	PC	C	Worse	Good	PC	Worse	PC	PC	Better
Lean	-	-	-	PC	PC	Worse	C	PC	Better	PC	PC	Better	PC	PC	Worse	PC	PC	Better
Agile	-	-	-	C	C	Worse	C	PC	Better	PC	PC	Better	PC	PC	Worse	PC	PC	Better
Punctuality	C	Good	Better	C	C	Worse	C	PC	Better	C	PC	Better	PC	PC	Worse	PC	PC	Better
Competency of Organizational Members	C	C	Worse	C	C	Worse	C	Good	Better	C	C	Better	PC	PC	Worse	PC	Good	Better
Implementation Plan	-	-	-	PC	C	Worse	C	C	Worse	C	C	Worse	Good	PC	Worse	PC	PC	Better
Organization Structure	C	PC	Better	PC	PC	Better	C	PC	Better	PC	PC	Better	PC	PC	Better	PC	PC	Better
Organizational Culture	C	PC	Better	Good	C	Worse	C	PC	Better	PC	PC	Better	PC	PC	Worse	PC	PC	Better
Implementation Leadership	C	Good	Better	C	C	Worse	C	PC	Better	C	PC	Better	PC	PC	Worse	PC	Good	Better
Strategy Communication	C	C	Worse	Good	PC	Worse	C	C	Worse	C	PC	Better	PC	PC	Worse	PC	PC	Better
Monitoring, Control & Evaluation	C	C	Worse	C	C	Worse	C	PC	Better	C	PC	Better	PC	PC	Worse	PC	PC	Better
Strategy Commitment	C	C	Worse	PC	PC	Worse	C	Good	Better	PC	PC	Better	PC	PC	Worse	PC	PC	Better
Achieving Visible Results	-	-	-	C	PC	Better	C	PC	Better	C	PC	Better	PC	PC	Worse	PC	PC	Better
Training & Education	C	C	Worse	Good	PC	Worse	C	PC	Better	PC	PC	Better	PC	PC	Worse	PC	PC	Better
External Consultants	-	-	-	C	C	Worse	C	C	Worse	C	C	Worse	PC	PC	Worse	PC	PC	Better
Rewarding Implementation	-	-	-	Good	Good	-	PC	Good	Better	C	C	Better	PC	PC	Worse	PC	PC	Better
Performance	-	-	-	Good	C	Worse	C	C	Better	C	C	Worse	PC	PC	Worse	PC	PC	Better
Strategy formulation	C	C	Worse	C	Good	Better	PC	C	Worse	C	C	Worse	PC	PC	Worse	PC	PC	Better
Environmental uncertainty	-	-	-	C	C	Worse	C	C	Worse	C	C	Worse	PC	PC	Worse	PC	PC	Better
Organizational structure	C	C	Worse	PC	PC	Better	C	C	Worse	PC	PC	Better	PC	PC	Worse	PC	PC	Better
Organizational culture	-	-	-	C	PC	Better	C	C	Worse	C	PC	Better	PC	PC	Worse	PC	PC	Better
Communication	C	C	Worse	C	C	Worse	C	C	Worse	C	C	Worse	PC	PC	Worse	PC	Good	Better
Resources allocation	-	-	-	C	C	Worse	C	PC	Better	C	C	Worse	PC	PC	Worse	PC	PC	Better
Leadership power	C	C	Worse	C	C	Worse	C	C	Worse	C	C	Worse	PC	PC	Worse	PC	PC	Better
Awareness of strategy	-	-	-	Good	Good	-	C	PC	Better	C	C	Worse	PC	PC	Worse	PC	PC	Better
Commitment to strategy	-	-	-	Good	PC	Worse	C	PC	Better	C	C	Worse	PC	PC	Worse	PC	PC	Better
Monitoring and development of implementation	Good	C	Worse	C	PC	Worse	C	PC	Better	C	PC	Better	PC	PC	Worse	PC	PC	Better

Indicator: PC=Potentially Critical (yellow), C=Critical (red), -=No change

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