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The Effect of Supply Chain Management Practices on Strategic Flexibility: Applied Study on the Jordanian Manufacturing Companies

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Abstract
The purpose of this study is to identify the impact of supply chain management practices on the strategic flexibility of Jordanian manufacturing companies listed in Amman stock exchange and working in international markets, which amount (47) companies. The sample of study composed of (93) managers working in the target companies. In order to achieve the study objectives, the researcher designed a questionnaire consisting of (32) paragraph to collect the required data from study sample. The multiple regression analysis was used to testing the hypotheses. Empirical results found that the supply chain management practices has a positive impact on strategic flexibility, and the highest impact was for the relationship with customers, while the lowest impact was for the quality of information sharing. Also the study results found that the information sharing level has the highest impact on market flexibility and the strategic partnership with supplier has the highest impact on production flexibility, while the relationship with customers has the highest impact on competitive flexibility.
Keywords: Supply Chain Management, Supply Chain Management Practices, Strategic Flexibility, Market Flexibility, Production Flexibility, Competitive Flexibility.

1. Introduction`

In the recent years manufacturing companies faces unmatched degree of change because of high uncertainty in business environment (Singh & Oberoi, 2013). Due to this fickle and turbulent in business environment (Yang & Li, 2011) argue that companies encounter an unpredictable environment characterized by quick changes in technologies, large differentiation in customer demand and strong variations in materials supply. As a result of unpredictable changes in competitive environment, the success of companies become depends on their ability to deal with this changes, and most of these companies adopted many practices like just in time delivery, processes reengineering, quality management, and automation to stay competitive in their markets, but these practices do not create sustainable competitive advantage, it is only contribute to continuous improvement, therefore manufacturing companies must shift their attention towards strategic flexibility (Lau, 1996) to obtain new forms of competitive advantage that enabling them staying in the global race as well market (Gerwin, 1993; Jordan and Graves, 1995; Upton, 1995).

Many scholars like (Aaker and Macarenhas, 1984; Eppink, 1978; Harrigan, 1985; Shimizu and Hitt, 2004) recognized the need of manufacturing companies to develop flexibility at strategic level in order to deal with the external pressure posed by continual changes in expectations of customers, changing trends of markets and actions of competitors. Strategic flexibility is a very significant instrument that provides manufacturing companies working in increasingly unstable markets and uncertain environment with the ability to modify the level of capacity rapidly, customize their products, develop and introduce new products more rapidly, and to respond more quickly to competitive threats.

Supply chain can be an important source of strategic flexibility; it is composed of all an organizations functional units from purchasing (procurement) to production and distribution to warehouse or final customers. Management of supply chain and its practices enables manufacturing companies to interact with its key suppliers and customers, and as a result of this interaction and flow of information among supply chain partners manufacturing companies can deal with its turbulent and uncertain environment through quickly response to the changes in customer expectations and demands, technologies, markets trends, and actions of competitors; and benefit from external opportunity and counter the competition threats, where supply chain management considered as a set of processes exploited to efficiently integrate manufacturers, suppliers, warehouses and stores so that merchandise is produced and distributed in the right quantities, to the right locations and at the right time (Mehta, 2004).

Through reviewing the literature there is no studies measured the effects of supply chain management practices on flexibility at strategic level, most of the previous studies focused on measuring the impact of supply chain management practices on competitive advantage, organizational performance, and flexible system practices like (Li et al., 2006; Hsu et al., 2009; Siddiqui, Haleem & Sharma, 2012; Yap & Tan, 2012) and others emphasis on

the flexibility related to the supply chain itself and its impact on firm performance like (Sanchez & Perez, 2005). In order to fill this gap in the literature this study aims to test empirically the effects of supply chain management practices on strategic flexibility for Jordanian manufacturing companies listed in Amman stock exchange and working in international markets to answer the study main question: what is the effects of supply chain management practices on strategic flexibility?.

2. Literature review

2.1 Supply Chain Management practices

There are numerous definitions for the concept of supply chain management (SCM) in the literature. Siddiqui, Haleem and Sharma (2012) defined it as the configuration, coordination and continuous improvement of an organized set of operations. Gunasekaran et al. (2008) termed supply chain management as the entire interchange of information and movement of goods among suppliers and ultimate customers, including manufacturers, distributors, retailers, and any other companies within the supply chain. Also supply chain management defined as a circle that begins with customers and finish with customers; through the loop flow all materials, finished goods, information, and transaction's (Mohanty & Deshmukh, 2005). Vickery, Jayaram, Droge and Calantone (2003) described supply chain management as the strategic management of individual firms as a single entity in order to bring a product or service to the market. Mentzer, Dewitt, Keebler, and Min (2001) considers supply chain management to be a systematic, strategic coordination of the traditional business functions for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole. Ellaram and Cooper (1990) defined supply chain management as an integrative philosophy to manage the overall flux of distribution channels from suppliers to final users.

The practices of supply chain management defined as the set of activities undertaken by a company to promote effective management of its supply chain (Li et al., 2006). And the notion of supply chain management practices contain approved vision and goal, sharing of information, collaboration, long term relationship and agreed supply chain leadership (Min and Mentzer, 2004).According to (Otto and Kotzab, 2003) Supply chain management practices considered as a strategic partnership among suppliers and retailers.

Previous literature has identified several dimensions of supply chain management practices. Chong et al. (2010) identified management of customer relationship, management of demand, management of supplier relationship, performance of service, management of capacity and resource, management of order process, and management of information and technology as a supply chain management practices. According to (Narasimhan et al., 2008) supply chain management practices consist of: information technology and sharing, integration of supply chain, relationship with supplier, just-in-time, geographical proximity, and relationship with customer. Koh et al. (2007) classified supply chain management practices into strong relationship with customers, strategic partnership with suppliers, e-procurement, just-in time, benchmarking, and outsourcing. According to (Ellram, Tate, & Billington, 2007) supply chain management practices include: managing customer relationship, managing service delivery, managing capacity and skills, flow of cash and information. Li et al. (2006) categorized supply chain management practices from the following dimensions: customer relationship, strategic partnership with supplier, postponement, sharing of information, quality of information.

In reviewing and consolidating the literature, the following dimensions: strategic partnership with suppliers, relationship with customers, information sharing level, and quality of information sharing, are selected for measuring supply chain management practice in this study.

2.1.1 Strategic Partnership with Suppliers

Strategic partnership with supplier is defined as the long-term relationship among the company and its key suppliers (Li et al., 2006). According to (Balsmeier & Voisin, 1996; Noble, 1997; Stuart, 1997; Monczka et al., 1998; and Sheridan, 1998) strategic partnership with supplier created to increase the operational and strategic capabilities of individual participating companies to help them attain important advantages. Supplier strategic partnership raise shared benefits between the partners in one or more main strategic areas like markets, products, and technology (Yoshino & Rangan, 1995).

2.1.2 Relationship with customers

According to (Tan et al., 1998; and Claycomb et al., 1999) the relationship with customers includes all practices that are used for the purpose of managing their complaints, improving their satisfaction, and creating with them a long-term relationship. Customer relationship management considered as a significant component of supply chain management practices (Nobel, 1997; and Tan et al., 1998). Magretta (1998) argue that close relationship with customer enables companies to maintain loyalty of customer, expand the value it offers to its customer, and differentiate its products from their competitors.

2.1.3 Information Sharing Level

Monczka et al. (1998) refers level of information sharing to the extent to which proprietary and important information is communicated between the partners of supply chain. According to (Mentzer, Min and Zacharia, 2000) the nature of Shared information can differ from tactical to strategic and from logistics activities

information to information about general markets and customers. In supply chain relationship, sharing of information considered as most important component (Lalonde, 1998).

2.1.4 Quality of Information Sharing

According to (Moberg et al., 2002; and Monczka et al. 1998) quality of information sharing contains such features as the timeliness, accuracy, credibility, and adequacy of information interchanged. Quality of shared information is a significant aspect of effective supply chain management (Feldmann & Muller, 2003).

2.2 Strategic Flexibility

The term strategic flexibility has no commonly agreed definition, so there are different definitions of strategic flexibility tended to reflect the diverse perspectives taken by different researchers (Roberts & Stockport, 2009). According to (Snachez, 1995) strategic flexibility include the organizations abilities to responding quickly to the opportunities and environmental changes. While (Bhandari et al., 2004) see that the concept of strategic flexibility indicates to the organization ability to developing new products, and entering new markets and new industries. Kastsuhiko & Hitt (2004) defined strategic flexibility as the organization capability and ability to identify the changes in the external environment and responding for it quickly. Roberts and Stockport (2009) described strategic flexibility as a ways by which organizations can become more successful and this proposes that organizations choice, develop and adjust strategic choices in order to keep up with a continually changing business environment.

Previous literature has identified several measures and dimensions of strategic flexibility. Gerwin (1987) suggest that the flexibility can be measured based on machine level, production function level, product level, and the aggregate level for the organization. Stalk, Evans and Shulman (1992) categorized strategic flexibility from the following dimensions: speed, acuity, consistence, innovativeness, and agility. Bhandari et al. (2004) classified strategic flexibility into flexibility in introducing products, flexibility in technology, and flexibility in dealing with other companies. According to (Toni & Tonchia, 2005) dimensions of strategic flexibility includes the scope of strategic choices, diversity of new business, and the speed of moving from business to another. Abbott and Banerji (2003) identified market flexibility, production flexibility, and competitive flexibility as dimensions of strategic flexibility. In reviewing and consolidating the literature we can consider the dimensions identified by (Abbott & Banerji, 2003) as the most comprehensive classification for strategic flexibility, therefore it is adopted in this study.

2.2.1 Market Flexibility

Das (2001) recognized market flexibility as the ability of companies to respond to or influence market changes. Grewal and Tanshuhaj (2001) defined market flexibility as the ability of companies to reevaluate and adjust its marketing efforts in a short time in order to response to changing circumstances of business environment. The dimensions of market flexibility include: market share, quickly response for customer demands, and entry to new markets.

2.2.2 Production Flexibility

Production flexibility reflects a firm's ability to produce / introduce services and goods in most key markets around the world, at a competitive price, with a little period of time. In developing strategic flexibility it is a critical choice where to locate production activities and coordinating it (Abbott & Banerji, 2003). The dimensions of production flexibility include: modifying the current products, producing new products, and changing the capacity level.

2.2.3 Competitive Flexibility

According to (Abbott & Banerji, 2003) competitive flexibility give a companies the ability to compete effectively in highly competitive markets that characterized by uncertain demand and speed technological changes, and it is considered as a significant tool to exploit the opportunities and face the competitors threats. Allen and Pantzalis (1996) termed competitive flexibility as the company's ability to respond for the unique needs of customers, and diagnosis the changes in business environment to adapt with it. The dimensions of competitive flexibility include: diagnosing the changes in external environment, identifying the competitive prices, and reducing the production cost.

3. Study Hypotheses

The research is mainly aimed at investigating the effect of supply chain management practices on strategic flexibility. Therefore, the main hypothesis is:

Ho: There is no effect with statistical significant at ($\alpha \leq 0.05$) of supply chain management practices on strategic flexibility. This hypothesis generates the following sub-hypotheses:

H01: There is no effect with statistical significant at ($\alpha \leq 0.05$) of supply chain management practices on market flexibility.

H02: There is no effect with statistical significant at ($\alpha \leq 0.05$) of supply chain management practices on production flexibility.

H03: There is no effect with statistical significant at ($\alpha \leq 0.05$) of supply chain management practices on

competitive flexibility.

4. Methodology

According to the nature of this study and its objective which included the identification of the effect of supply chain management practices on strategic flexibility from the perspectives of managers and head of divisions in the target companies the researcher used both the descriptive methodology by reviewing the literature related to the study variables and analytical methodology by analyzing the data collected through the questionnaire distributed.

4.2 Study Population and Sample

The population of the study composed of (47) Jordanian manufacturing companies listed in Amman Stock Exchange and working in the international markets. The size of the study sample was (93) manager and head of division who's their working nature related to the strategic planning, marketing and production areas within the target companies. The characteristics of the study population introduced in table (1) and the characteristics of study sample introduced in table (2).

Table1. The characteristics of study population

Variable	Category	Number of companies
The age of Company	Less than (5) years	-
	From (5) to less than (10) years	21
	From (10) to less than (15) years	18
	(15) years and above	8
Number of international markets the company works in it	Less than (5) market	2
	From (5) to less than (10) market	30
	From (10) to less than (15) market	11
	(15) market and above	4
Total		**47**

Table2. The characteristics of study sample

Variable	Category	Frequency	Percentage
Gender	Male	88	94.6
	Female	5	5.4
Years of experience	Less than (5) years	-	-
	From (5) to less than (10) years	5	5.4
	From (10) to less than (15) years	17	18.3
	From (15) to less than (20) years	48	51.6
	(20) years and above	23	24.7
Age	From (18) to (25) years	-	-
	From (26) to (32) years	-	-
	From (33) to (40) years	41	44
	(41) years and above	52	56
Total		**93**	**100%**

4.2 study Instrument

The study instrument was developed by reviewing the literature, and the questionnaire consisted of three parts: The first part covers the demographic variables of the study population and sample, such as the age of company and the number of markets that working in it and the gender, position title, years of experience and the age of respondents. The second part includes the items related to the supply chain management practices which adopted from (Li et al., 2006). The third part covers the perceived strategic flexibility of the company. The answers to the second and third part of questionnaire relied on a Likert's Scale, ranging from strongly disagree (1); disagree (2); moderately agree (3); I agree (4); and strongly agree (5).

4.3 Instrument Validity

The researcher consulted some academicians and experts during the preparation phase of the research and according to their opinions the questionnaire is fit to the current study.

4.4 Instrument's Reliability

The researcher tested data reliability to ensure producing dependable results and reliability for the measurement instrument. Reliability was determined by the Chronbach alpha test. The alpha value was (0.84), and this value is excellent because it is higher than the acceptable value of (60%), implying consistency among responses and instrument reliability (0.84).

5. Results and Discussion

5.1 Data Presentation

The means and standard deviations for the respondent's answers on the questionnaire items related to supply chain management practices and strategic flexibility introduced in table (3) and table (4). Under each table the results was interpreted and discussed.

Table 3.The means and standard deviations for the respondent's answers on the questionnaire items related to supply chain management practices.

Strategic partnership with supplier	**Means**	**Standard deviation**
1. Our company and our supplier solve problems mutually on regular basis.	3.55	0.877
2. Our company has constant programs of improvement that involve our main suppliers.	3.67	0.892
3. Our company involves our main suppliers in its planning process and activities of goal setting.	3.63	0.912
4. Our company effectively includes our main supplier in the process of new products development.	4.07	0.883
Average	**3.73**	
Relationship with customer	**Means**	**Standard deviation**
5. Our company often interacts with customers to set reliability, responsiveness and other standard for us.	3.75	0.862
6. Our company often measure and assess the satisfaction of customers.	3.87	0.847
7. Our company often identifies the future expectations of customer.	3.63	0.951
Average	**3.75**	
Information sharing level	**Means**	**Standard deviation**
8. Our company informs our partner about the changing needs in advance.	3.77	0.817
9. Our partners participates proprietary information with our company.	3.75	0.769
10. Our partners remain our company fully informed about the subjects that influence our work.	3.78	0.960
11. Our partners participate with our company the business knowledge of core business processes.	3.67	0.897
12. Our company and our partner interchange information that assists creation of business planning.	3.64	0.829
13. Our partners and our company remain each other informed regarding the changes that may influence the other partners.	3.71	0.942
Average	**3.72**	
Quality of information sharing	**Means**	**Standard deviation**
14. There is timely interchange of information among our partners and our company.	3.81	0.869
15. There is accurate interchange of information among our partners and our company.	3.73	0.918
16. There is complete interchange of information among our partners and our company.	3.61	1.01
17. There is adequate interchange of information among our partners and our company.	3.63	0.882
18. There is reliable interchange of information among our partners and our company.	3.70	0.843
Average	**3.70**	

As shown in table (3) the results indicate that the Jordanian manufacturing companies apply supply chain management practices with high degree. Also the results from table (3) indicate that the target companies in their strategic partnership with supplier emphasis on including their main suppliers in the process of new products development (mean 4.07) but on other hands there is less emphasis on solve problems mutually on regular basis with suppliers (mean 3.52). Also the results show that the target companies interested in measure and assess the satisfaction of customers (mean 3.87) in their relationship with customer, but there is less attention in identifying the future expectations of customer (mean 3.63). And the results from table (3) related to information sharing level dimension also show that the partners of target companies remain it fully informed about the subjects that influence their work (mean 3.78), but there is less emphasis on interchange information that assists creation of business planning (mean 3.64). Finally, the results from table (3) related to quality of information sharing

dimension indicate that there is high level in timely interchange of information among target companies and their partners (mean 3.81) but there is low level in complete interchange of information among target companies and their partners (mean 3.61).

Table 4.The means and standard deviations for the respondent's answers on the questionnaire items related to strategic flexibility.

Market Flexibility	**Means**	**Standard deviation**
19. Our company intends to increase the number of international markets that works in it.	3.61	0.952
20. Our company offers new products from time to time.	3.42	0.833
21. Our company intends to modify the quantity of inventory from finished products.	3.79	0.810
22. Our company modifies its products continuously to fit with requirements and needs of the market that works in it.	3.82	0.941
23. Our company able to response for the renewed needs of customers in different markets.	3.88	0.867
Average	**3.70**	
Production Flexibility	**Means**	**Standard deviation**
24. Our company able to modifying the characteristics of current products to fit the requirements of customers.	3.83	0.819
25. Our company able to modifying the production capacity level in order to satisfy the customer demands.	4.10	0.795
26. Our company able to develop its manufacturing system.	3.71	0.896
27. Our company has high capability to produce in one country and export to other countries.	3.98	0.871
Average	**3.90**	
Competitive flexibility	**Means**	**Standard deviation**
28. Our company able to identifying the changes in the different markets environment that works in it.	3.82	0.956
29. Our company modifies the prices according to the international requirement.	3.92	0.827
30. Our company able to decrease the costs of production according to the changes in the demand quantity in different markets.	3.86	0.944
31. Our company responding quickly to the renewed needs of customers.	3.62	0.938
32. Our company able to exploitation of opportunities and confrontation the threats of competitors.	3.58	0.857
Average	**3.76**	

As shown in table (4) the results indicate that the Jordanian manufacturing companies achieved high level of strategic flexibility comparing to their competitors. Also the results from table (4) show that the paragraph (Our company able to response for the renewed needs of customers in different markets) has the highest mean (3.88) in market flexibility dimension and the paragraph (Our company able to modifying the production capacity level in order to satisfy the customer demands) has the highest mean (4.10) in production flexibility dimension and the paragraph (Our company modifies the prices according to the international requirement) has the highest mean (3.92) in competitive flexibility dimension.

5.2 Hypotheses Testing

In order to testing the study hypotheses a multiple regression was used. Table (5) presents the model summary and table (6) presents ANOVA analysis and tables (7, 8 and 9) presents beta and t values for the study hypotheses.

Table 5.The Model Summary

Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of The Estimate**
1	0.852	0. 731	0.685	0.357

*Predictors: (Constant), Strategic partnership with supplier, Relationship with customers, Information sharing level, Quality of information sharing.

As shown in table (5) the results indicate that the value of R square is (0.731) which means that the model explains (0.734) from the variance in the dependent variable (strategic flexibility) by supply chain management practices.

Table 6.ANOVA Analysis

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	305.670	4	41.509	1015.357	0.000
	Residual	19.352	89	0.037		
	Total	325.022	93			

*Predictors: (Constant), Strategic partnership with supplier, Relationship with customers, Information sharing level, Quality of information sharing
**Dependent Variable: Strategic Flexibility
As shown in table (6) the results indicate that the value of (F) is (1015.357) with significant (0.000) which is lower than the specified value (0.05) so the model is fit and acceptable.

Table 7.Beta and t values for the main hypothesis

Model	Unstandardized Coefficients		Standardized Coefficients	t.	Sig.
	B	Std. Error	Beta		
1 (Constant)	0.063	0.052			
Strategic partnership with supplier	0.507	0.024	0.531	32.562	0.000
Relationship with customers	0.515	0.027	0.546	34.912	0.000
Information sharing level	0.439	0.019	0.465	26.318	0.000
Quality of information sharing	0.420	0.017	0.457	21.740	0.000

*Dependent Variable: Strategic Flexibility
As shown in table (7) the results of multiple regression analysis indicate that the supply chain practices effects strategic flexibility. The values of beta and t-tests show that the strategic partnership with supplier, relationship with customers, information sharing level, and quality of information sharing has a positive impact on strategic flexibility at ($\alpha \leq 0.05$). And the highest impact was for the relationship with customers (beta 0.546), then strategic partnership with supplier (beta 0.531), then information sharing level (beta 0.465), and the lowest impact was for the quality of information sharing (beta 0.457).

Table 8.Beta and t values for the first sub hypothesis

Model	Unstandardized Coefficients		Standardized Coefficients	t.	Sig.
	B	Std. Error	Beta		
1 (Constant)	0.056	0.047			
Strategic partnership with supplier	0.397	0.017	0.419	22.630	0.000
Relationship with customers	0.453	0.019	0.471	26.948	0.000
Information sharing level	0.483	0.021	0.502	28.114	0.000
Quality of information sharing	0.374	0.015	0.395	19.509	0.000

* Dependent Variable: Market Flexibility
As shown in table (8) the results of multiple regression analysis indicate that the supply chain practices effects market flexibility. The values of beta and t-tests show that the strategic partnership with supplier, relationship with customers, information sharing level, and quality of information sharing has a positive impact on market flexibility at ($\alpha \leq 0.05$). And the highest impact was for the information sharing level (beta 0.502), then relationship with customers (beta 0.471), then strategic partnership with supplier (beta 0.419), and the lowest impact was for the quality of information sharing (beta 0.395).
Table 9.Beta and t values for the second sub hypothesis

Model	Unstandardized Coefficients		Standardized Coefficients	t.	Sig.
	B	Std. Error	Beta		
1 (Constant)	0.067	0.054			
Strategic partnership with supplier	0.428	0.018	0.447	26.150	0.000
Relationship with customers	0.425	0.018	0.441	25.103	0.000
Information sharing level	0.401	0.016	0.424	23.219	0.000
Quality of information sharing	0.397	0.015	0.416	22.507	0.000

* Dependent Variable: Production Flexibility
As shown in table (9) the results of multiple regression analysis indicate that the supply chain practices effects production flexibility. The values of beta and t-tests show that the strategic partnership with supplier, relationship with customers, information sharing level, and quality of information sharing has a positive impact on production flexibility at ($\alpha \leq 0.05$). And the highest impact was for the strategic partnership with supplier (beta 0.447), then relationship with customers (beta 0.441), then information sharing level (beta 0.424), and the

lowest impact was for the quality of information sharing (beta 0.416).

Table 10.Beta and t values for the third sub hypothesis

Model	Unstandardized Coefficients		Standardized Coefficients	t.	Sig.
	B	Std. Error	Beta		
1 (Constant)	0.061	0.049			
Strategic partnership with supplier	0.214	0.016	0.231	18.190	0.000
Relationship with customers	0.296	0.017	0.319	20.864	0.000
Information sharing level	0.193	0.014	0.216	14.974	0.000
Quality of information sharing	0.188	0.013	0.201	13.703	0.000

* Dependent Variable: Competitive Flexibility

As shown in table (10) the results of multiple regression analysis indicate that the supply chain practices effects competitive flexibility. The values of beta and t-tests show that the strategic partnership with supplier, relationship with customers, information sharing level, and quality of information sharing has a positive impact on production flexibility at ($\alpha \leq 0.05$). And the highest impact was for the relationship with customers (beta 0.319), then strategic partnership with supplier (beta 0.231), then information sharing level (beta 0.216), and the lowest impact was for the quality of information sharing (beta 0.201).

6. Conclusion and Recommendations

The present study examined the impact of supply chain management practices namely (strategic partnership with supplier, relationships with customers, information sharing level, and quality of information sharing) on strategic flexibility which include market flexibility, production flexibility, and competitive flexibility. Empirical results found that the supply chain management practices has a positive impact on strategic flexibility, and the highest impact was for the relationship with customers, while the lowest impact was for the quality of information sharing. Also the study results found that the information sharing level has the highest impact on market flexibility and the strategic partnership with supplier has the highest impact on production flexibility, while the relationship with customers has the highest impact on competitive flexibility. Based on the study results manufacturing companies must adopt supply chain management practices as a key source of strategic flexibility to obtain sustainable competitive advantage.

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