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RESEARCH ARTICLE

ACHIEVING COMPETITIVE ADVANTAGE THROUGH SUPPLY CHAIN PERFORMANCE MEASURES

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ABSTRACT

Purpose: The goal of this study was to assess how competitive advantage can be achieved through supply chain performance measures. **Methodology:** A quantitative descriptive research approach was used in the study. The procurement specialists from Airtel Zambia, MTN, and Zamtel mobile communications businesses were chosen using the purposive sampling technique. Version 26 of the Statistical Package for Social Science (SPSS) was used to analyze the data. **Results/Conclusion:** The study found that that Price/cost enhances competitive advantage as demonstrated by mean value of 4.28 and a standard deviation of 1.180. Further, the research found that Quality enhances competitive advantage of an organization as shown by an average value of 4.72 and a standard deviation of 1.203. Similarly, it was discovered that delivery dependability enhances competitive advantage as shown by mean value of 4.05 and standard deviation of 0.918. Additionally, the study found that Product Innovation enhances competitive advantage. This was shown by an average value of 4.31 and a standard deviation of 1.740. Lastly, the research established Time to Market enhances competitive advantage as indicated by an average value of 4.49 and a standard deviation of 0.815.

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INTRODUCTION

Supply chain management (SCM) is the control of the flow of information, goods, services, and capital between the various links in the supply chain in order to maximize customer satisfaction and strengthen competitiveness (Bititci *et al*., 2018). SCM addresses the difficulties involved in delivering goods and services at the best possible price and at the appropriate time. Businesses started to understand that making their whole supply chain competitive is more important than simply increasing internal efficiency (Wang *et al*., 2007). Understanding and using supply chain management (SCM) is now a must for maintaining competitiveness in the global market and increasing profitability. Sometimes businesses question whether they are working as hard as their rivals, who may be the market leader yet still provide high-quality items or keep their prices low while making a higher profit. In this situation, it is necessary to evaluate the effectiveness of supply chain activities and look for ways to enhance them (Parker, 2017). Best practices and benchmarking enter the picture at this point. Benchmarking aids in determining the elements necessary for success. It also shows the elements that are less significant yet use up more resources. Setting new benchmarks is necessary since the business environment is constantly changing quickly. Companies do not compete, as the saying goes; nonetheless, their supply networks do. It is essential for a business to assess the effectiveness of its extended supply chain and make adjustments to it in order to fulfill end-customer demands.

Supply chains must continuously develop in order to succeed in the current competitive climate; as a result, they are key performance indicators. Performance evaluation in the context of SCM helps promote communication and integration amongst participants in the supply chain.

LITERATURE REVIEW

The capacity of a company to establish a defendable position in relation to its rivals is referred to as competitive advantage. Delivering value to the consumer is becoming increasingly important in today's cutthroat business environment. Competition, on the other hand, is viewed as a movement-based battle that relies on foresight and rapid responses to shifting consumer demands. Competition may raise product quality, lower prices, and speed up delivery of goods or improve customer service, among other things (Parker, 2017). Organizations must move more quickly in production, assembly, distribution, and supply to achieve this goal. Superior competencies that are used to provide customer value and obtain cost and/or differentiation advantages, leading to market share and profitability performance, are the source of competitive advantage. Companies find it challenging to win the battle only based on one's own ability in the current context of global competitiveness, considering the rapid advancement of technology and high consumer expectations (Parker, 2017). The development of supply chain partnerships between businesses and the coordination of the partners are of utmost

importance in this circumstance. Additionally, a lot of businesses find it difficult to explain the cost of quality in their supply chains, while a lot of businesses fail to recognize the expense of varied quality levels from their suppliers. A corporation must take care of every component of the supply chain, including individual procedures and supplier selection, in order to produce a high-quality product, which is one of the competitive advantages (Franca *et al*., 2010). The primary function of supply chain management is management of Capacity, output, flexibility, creativeness, and data are some aspects of supply chain performance based on supply chain procedures and processes that directly affect competitive advantage. So, one of the key concerns for businesses looking to gain a competitive edge is increasing supply chain performance. For the majority of suppliers, manufacturers, and the associated retailers, consistently increasing performance of the supply chain has become a vital problem in order to obtain and preserve competitiveness. Companies are putting more emphasis on partnerships with suppliers as a way to spread risks and improve business processes through the development of shared inter-organizational routines and joint skills as a result of increasing competitive pressure and the rapid pace of technological change. By concentrating on their core capabilities and putting a limited number of capable suppliers in charge of their marginal operations, businesses are improving their capacity for innovation and competitiveness. Many businesses place a strong emphasis on quality as a way to sustain long-term market competitiveness. They have a solid reputation for representing future market share for new clients and preserving market share for long-term customers. Additionally, enhancing quality may result in long-term cost savings (Ramaa *et al*., 2019).

The competitive advantage of the supply chain is in the higher value that is delivered to consumers by controlling the material flow from suppliers to the end customer by establishing and maintaining connections with all of the supply chain actors and partners upstream and downstream. By combining supply chain objectives, supply chain procedures, and management commitment to the supply chain operations, the entire supply chain strategy should be created and accepted. By coordinating, synergizing, and working together to combine these three aspects, the supply chain competitive advantage may be attained. The overall business plan should be consistent with the supply chain management strategy. The resource-based view, customer value theory, profitability of the enterprise, resource advantage theory, and comparative advantage theory are some of the different premises that may be used to study the idea of competitive advantage. Competitiveness in the supply chain is seen as a crucial technique for obtaining the upper hand. Fast technical advancements, globalization, and widespread information technology use have made supply chain competitiveness a strategic priority for businesses today. The strategic emphasis of the supply chain necessitates alliance formation, operation reengineering, renovation, or improvement, and strategy development (Bititci *et al*., 2018). In a highly competitive market context, supply chain competitiveness is the real survival strategy. For a supply chain to be competitive, its many parts must be integrated and coordinated in order to work together as a team toward a common goal. Competitiveness in the supply chain is attainable via the combined efforts of manufacturers, suppliers, and distributors. Efficiency in delivery, customer satisfaction, improved product quality, profitability, improved responsiveness, shorter lead times, demand fulfillment, optimal facility utilization, etc. can all contribute to supply chain competitiveness. For supply chain competitiveness, Verma and Seth (2011) suggested a conceptual framework. According to the description, supply chain competitiveness needs certain input components and produces specific results from a supply chain. According to the description, SCC requires the following inputs: mass customization, customer orientation, process orientation, demand management, and strategic partnerships. It also calls for agility, coordination, collaboration, and cooperation among partners. While supply chain competitiveness will produce results like increased customer value, customer happiness, capacity to adapt quickly to changes, innovation, profitability, and, eventually, a competitive edge. It is also thought that factors such as socioeconomic pressures, cultural forces, consumer demands, financial and capital forces, governmental regulations, behavioral forces, etc., have an impact on the whole phenomenon of supply chain competitiveness. According to La Londe and Powers (1993), greater communication and information exchange will increase supply chain competitiveness. Bititci *et al*., (2018) discussed the customized logistics idea to offer the client higher value from the standpoint of operations strategies and operational effectiveness. A customized logistics system that meets consumer demands may add uniqueness to customer service. Deliveries of tangible goods ought to be packaged with services. Simply differentiating your product's basis doesn't provide you a competitive advantage. Fisher (1997) suggested that choosing a supply chain style that is primarily functional or primarily inventive depends on the nature of the products. The major functional character of items needs the supply chain operations to be "physical efficient," while the primary inventive nature of products, such as fashion products, requires the supply chain processes to be "market responsive." For the supply chain to remain competitive, agility, flexibility, and responsiveness are required. Supply chain partners may work together to achieve this. The competitive strategy emphasis has shifted away from mass manufacturing and toward cost reduction through lower unit costs. Prior to the 1970s, cost-effectiveness was the main emphasis for competitive advantage, and throughout that time, the quality paradigm dominated strategic considerations.

The strategic emphasis switched to "reliability and speed of delivery" in the 1980s, but quality and cost-cutting were kept as essential components to remain competitive. The major strategic focus of the present time is managing cost effectiveness, quality management, and waste reduction while maintaining a competitive position based on the flexibility and agility of supply chain activities. The ability to produce and market a range of goods with lower costs, greater quality, and shorter lead times, as well as having characteristics like adjustable lot sizes to provide value for customers, is referred to as agility. For the supply chain participants to coordinate and work together, the agility emphasis demands specific attention (Parker, 2017). In order to obtain a competitive edge in the supply chain, information sharing, cooperative decision-making, sharing incentives, and benefits are also addressed in the literature on supply chain competitiveness (Lorentz, 2008; Anbanandam *et al*., 2011; Barratt, 2004). (Lehoux *et al*., 2010). It is essential for members of the supply chain to work together and integrate resources from both inside and outside of their business' borders in order to accomplish the shared goals of all supply chain participants and to maintain supply chain competitiveness (Lorentz, 2008). Some important facilitators and factors that contribute to supply chain cooperation include "top management commitment," "information sharing," "trust among supply chain participants," "long-term partnerships," and "risk and reward sharing" (Ramaa *et al*., 2019). Vertical and horizontal collaboration are the two basic forms of supply chain cooperation. The capacity of supply chain partners to exchange resources and expertise with suppliers, customers, and internal cross-functional cooperation is a component of vertical collaboration.Collaboration between competitors and non-competitors to exchange capabilities and expertise is an example of horizontal integration. Collaboration can occur based on the number of factors.

Metrics for measuring the performance of the external supply chain to gain a competitive edge: The metrics constitute the cornerstone of any supply chain performance assessment system. Unfortunately, the majority of conventional methods for evaluating an individual's performance are not useful for maximizing supply chain earnings (Lapide, 2018). Traditional measurements can cause problems since they are not integrated and lack a strategic focus. In many supply chains, it is frequently discovered that there is an inability to link measurement operations with the entire supply chain strategy. Due to this issue, isolated measures have to be developed, which leads to outputs that are more closely related to local businesses than the whole supply chain. According to Gunasekaran *et al*. (2001), many businesses employ a high number of performance measurements while knowing that fewer would be more effective at meeting their needs. The issue with supply chain performance measurement appears to be that many businesses add new measures without first determining if the ones already in place are still

appropriate for the overall supply chain strategy. In order to achieve the new goals of supply chains, new metrics for supply chain management must be developed, according to a number of writers (Keebler, 2015; Lambert & Pohlen, 2001; Neely *et al*., 2005; Simatupang & Sridharan, 2002). As a result, typical topics like costs, time, quality, and flexibility will be shown in this chapter's supply chain metrics. These qualities were picked because they contain several crucial supply chain management-related considerations. Although there are additional options, including financial and non-financial measurements, the features chosen are thought to provide the best overall picture of supply chain metrics. Examples of potential supply chain management strategies are given below (Coyle *et al*., 2003; Neely *et al*., 2005).

Cost: Transportation expenses, inventory carrying costs, material handling costs, administrative costs, days sales outstanding, cost to service, cash-to-cash cycle time, total delivered cost, cost of goods, inventory turns, days sales outstanding, cost of excess capacity or cost of capacity deficit. Productivity improvement depends on both internal and external cost reduction in the supply chain. According to (Bititci *et al*., 2018), many organizations fail to focus their efforts on the region that incurs the highest costs. Instead, they focus on bringing down the price of direct labor. Examples of what are typically referred to as indirect purchase expenses were offered by Lee (2015). These expenses include those related to acquiring, handling goods, storage, finances, supplier management, administration, and development. Cost and the performance measure price are closely related. Price is becoming a more crucial order-winning factor, according to Correa (2015), notably during the product life cycle's development, maturity, and saturation phases.

Time: On-time delivery, delivery dependability, quicker turnaround times, delivery service, delivery frequency, delivery synchronization, delivery speed, etc. are only a few of the performance sub-measures related to delivery. Delivery dependability refers to the capacity to provide the requested goods by the scheduled time. Therefore, on-time delivery (OTD) is a top priority for both the production and distribution functions. According to Hill (2000), this characteristic frequently serves as a qualification in commercial settings. According to research of the Indian car industry (Bititci *et al*., 2018), the majority of respondents listed supply delivery lead time, historical rejection rate, geographic closeness, and dependability as the most important criteria for choosing a supplier. Organizations that routinely miss the OTD deadline generally encounter a problem and must act fast to fix it before consumers switch to another alternative. According to Cohen *et al*., (2017), a corporation gains business by being able to fulfill orders more swiftly than rivals or by meeting deadlines when few or no competitors can. According to him, there are two views on the subject of delivery speed. One is when the forward order load, or the order backlog on the manufacturing capacity, makes it difficult to meet the process lead time, even though it is less than the delivery time required by customers. In this case, the process lead time to complete the order is longer than the required delivery time. When the process lead time exceeds the customer delivery requirement, the second viewpoint is used. Organizations choose which sub measures of delivery—such as delivery from suppliers, delivery inside their own organization, or delivery to customers—are most relevant to measure.

Quality: Since the late 1970s, quality, according to Collis and Hussey (2013), has taken center stage. Several businesses, though, have fallen short in this market. According to Wang *et al*., (2007), the term "quality" has been defined broadly to include a number of qualities, which has led to a lack of comprehension and a consequent lack of direction. Companies' incapacity to identify the quality dimension(s) that would produce the greatest results in certain markets is one reason why they are unable to compete in the quality domain. Garwin is a well acknowledged researcher who offered eight characteristics of excellence. Customer experience overall, procedural accuracy, flawless order fulfillment, prompt delivery, full order, correct product selection, damage-free, accurate invoice, forecast accuracy, or planning accuracy (Berrah and Chivlle, 2017).

Flexibility: Flexibility is "the degree to which a corporation intends to adjust to market changes, e.g., material increases in demand," according to one definition. Alternatively, flexibility is the management of responding to changes in demand by holding onto resources like as time, money, materials, people, plants, and suppliers until they are expressly needed, as stated by Bhagwat and Sharma (2007). Both definitions define flexibility as the capacity to adapt to the specific needs of each customer. This is a comprehensive performance metric that takes into account factors such as demand growth (volume), product mix, order handling (time), order size, etc. According to Collis and Hussey, (2013), in some markets, a company's capacity to adapt to surges in demand plays a significant role in securing orders. Japanese automakers serve as a good case study for flexibility since they have developed and are still developing a manufacturing system that can adapt to the specific needs of each client. Slack in 1991 identified four categories of system flexibility, with each category having a range and response that can be measured. These categories are volume flexibility (the capacity to alter the output level of produced products), delivery flexibility (the capacity to alter scheduled delivery dates), mix flexibility (the capacity to alter the variety of products produced), and new product flexibility (Parker, 2017).

These measure examples might be continually expanded upon, but in order to really apply them in supply chain performance measurement systems, it is also necessary to take into account how closely connected the metrics are to one another. Due to the significant interdependencies with the environment that most firms are a part of, it is crucial that the businesses recognize that their success is only partially under their control (Chen et la, 2016). In order for businesses to analyze the overall performance of the supply chain and to enhance the internal business processes that have a significant influence on competitiveness, supply chain performance measurement systems must thus mix integrated and non-integrated data. Such a performance monitoring system will contribute to improving the understanding and visibility of the supply chain's interdependencies (Wang *et al*., 200). In addition to assisting businesses in identifying the areas that need the most improvement in relation to consumer expectations, more visibility also makes it possible to integrate and optimize inter-company activities effectively, thus enhancing the performance of the supply chain. Since the focus is on supply chain optimization generally, it presents a difficulty that certain businesses' internal efficiency may suffer (Berrah and Chivlle, 2017).

As a result, measurements are required that can quantify the advantages and disadvantages of the associated functional changes and cost trade-offs. Metrics must also offer a foundation for allocating advantages among supply chain players because realignment benefits some enterprises while harming others. Supply networks must offer incentives that supply chain participants truly appreciate in order to enable benefit sharing and promote striving for a great overall performance. Since businesses are better able to identify subpar performance in terms of time or quality, many supply chain metrics place a major emphasis on non-financial factors. Additionally, financial measurements are utilized to strengthen nonfinancial measures' shortcomings and supply chain performance monitoring systems with financial outcomes. With the use of such measurements, supply chain members may assess one other's performance in relation to the overall goals, allowing awards and punishments to be determined by customer or supply chain concerns rather than internal optimization.

METHODOLOGY

This research was carried out in Lusaka, Zambia. The focus of the study was the mobile telecommunications sector, which included Zamtel, MTN Zambia, and Airtel Zambia. The descriptive research approach was used. The three mobile service providers' procurement departments were the intended responders. The suggested sample size was 36 procurement professionals in total, according to Kothari. Purposeful selection of the study's sample size was made.

Table 1. Supply chain performance measures' effect on competitive advantage

Statement	Mean	Std. Deviation	Kurtosis	Skewness
Price/cost enhances competitive advantage	4.28	1.180	0.523	1.052
Quality enhances competitive advantage	4.72	1.203	1.421	0.782
Delivery Dependability enhances competitive advantage	4.05	0.918	0.635	0.810
Product Innovation enhances competitive advantage	4.31	1.740	1.201	0.693
Time to Market enhances competitive advantage	4.49	0.815	0.708	1.209

Source: Field Data (2022)

Version 20.0 of the Statistical Package for Social Sciences (SPSS) was used to examine the research field's data.

RESULTS

The respondent were asked to rate their level of agreement or disagreement to the supply chain performance measures' effect on competitive advantage on the scale of 1 to 5 where 1=strongly disagree, 2=disagree, 3=neutral, 4= agree and 5=strongly agree. The results are shown below. According to the results shown in Table 1, respondents agreed that Price/cost enhances competitive advantage as demonstrated by mean value of 4.28 and a standard deviation of 1.180. Further, the participants strongly agreed to the statement that Quality enhances competitive advantage of an organization as shown by an average value of 4.72 and a standard deviation of 1.203. Similarly, the respondents agreed to the assertion that delivery dependability enhances competitive advantage as shown by mean value of 4.05 and standard deviation of 0.918. Furthermore, the participants in this research agreed to the statement that Product Innovation enhances competitive advantage. This was shown by an average value of 4.31 and a standard deviation of 1.740. Finally, in respect to the statement that Time to Market enhances competitive advantage, respondents strongly agreed as indicated by an average value of 4.49 and a standard deviation of 0.815. The Skewness ranged from 0.693 to 1.209 while kurtosis ranged from 0.523 to 1.421. Both the Skewness and kurtosis fall in the range of +2 and -2 which according to Mugenda and Mugenda (2015) is a normal distribution pattern. Therefore, this implies that the data did not deviate from normalcy.

CONCLUSION

A common initial step in performance evaluation is to examine how order-related tasks are carried out. The order-entry mechanism, order lead-time, and order traversal path must all be taken into account in order to do this. Non-conformities and the time needed to complete various tasks, or "sub-processes," within the function are two additional metrics that might be used. In manufacturing enterprises, the production process is frequently an activity that has a significant influence on production cost, quality, and speed of delivery. Accordingly, the production process has to be monitored, controlled, and improved, with appropriate metrics defined under the following three headings: variety of goods and services, capacity utilization, and efficiency of scheduling approaches. Functional measures are the name for these kinds of measurements. Functional measurements, which are not supply chain measures per se, show how well a certain activity or function of the chain is doing, for example, flexibility (mix) of production, which is the capacity to manufacture a wide range of various goods efficiently. The implementation of SCMs within an organization, according to Holmberg (2000), necessitates the expansion of the internal perspective on performance measures to include both "inter-functional" and "partnership" perspectives as well as the avoidance of a self-centered and inward-looking management approach. Additionally, there are metrics that reflect the efficiency of numerous connected head-processes. It is appropriate to monitor metrics including cost (total cost), quality (parts per million faults, or PPM), non-conformities, and delivery lead-time. These metrics, also known as internal integrated measures, show performance within the company across functional boundaries, such as quality (conformance), which is the production of goods whose operating characteristics satisfy predetermined performance requirements; Using cost-effective operations, process technology, and/or scale economies, it is possible to reduce the overall cost of production (labor, materials, and operational expenses); Delivery (speed) refers to the capacity to reduce the amount of time that elapses between the receipt of a client order and the actual delivery, but it is debatable whether this qualifies as a supply chain performance indicator. It is obvious that several methods should be used to gauge Supply Chain (SC) performance in achieving competitive advantage. It appears appropriate to employ the supply chain processes of plan, source, make, deliver, and return when gauging SC performance. Additionally, there should be both quantitative and qualitative measurements as well as financial and non-financial metrics. SCM should be assessed on several levels. Since non-financial indicators can provide more information than the fundamental financial metrics, it is crucial to produce more of them. It might be difficult to quantify the overall SC performance. But even if it's difficult, it is still doable.

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