

Influence of Information Quality on Retailer Satisfaction through Supply Chain Flexibility and Supplier Relationship Management in the Retail Industry

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Abstract: Businesses always compete to improve customer satisfaction. A firm engaged in as a distributor as well, always try to provide satisfaction to their customer, in this case, retailer and wholesales. The distributor can improve retailer satisfaction by providing such information that suits retailer requirements in the pursuit that the supply chain flow can move quickly, particularly on the flow of products from the manufacturing ordered by the distributors. This study aims to obtain a relationship between distributors and retailer companies. This study surveyed 100 retailers, and wholesale companies engaged in Fast Moving Consumer Goods (FMCG) and the supplier domiciled in the city of Makassar, South Sulawesi, with revenues of more than IDR 300,000,000. - / year. SmartPLS software version 2.0 was used to test the hypothesis. The results of the study found that information quality can provide a positive increase in improving supplier relationship management. Adequate information quality cannot significantly increase supply chain flexibility and retailer satisfaction. Supplier relationship management built by distributors can have an impact of 0.611 on supply chain flexibility in retail and retail satisfaction companies of 0.367. The stronger distributor and retailer relationship can increase distributor flexibility and retail satisfaction. Supply chain flexibility built by distributor companies can have a significant impact on retailer satisfaction of 0.463. This research provides an improvement in the development of supply chain management theory, in particular, building relationships with customers.

Keywords: Information quality, retail satisfaction, supplier relationship management, supply chain flexibility.

Introduction

Increasing the intensity of competition is very fast in the business environment forcing organizations to optimize the performance of efficient supply chains in order to meet service levels that have an impact on increasing customer satisfaction [1]. Supply chain management aims to improve supply chain performance that is efficient and effective throughout the supply chain process from the procurement of raw materials, the process of transforming raw materials into finished goods, delivery of finished products to distributors and subsequently to end users.

Shaharudin [2] said that globalization now requires the ability to adapt to changes in customer demand that always happens. The company must also innovate continuously to produce high-value products according to the needs of end users. The value of products and services provided by the company to customers determines the company's competitiveness. The best supply chain requires an approach that

can integrate from suppliers, manufacturers, distributors and retailers effectively and efficiently. A good supply chain shows the extent to which companies are able to serve customers through the supply of goods or services at the right time, in the right place with minimal costs. Supply chain management is an effective method and approach to improve service and efficiency of existing supply chains. Rapid market changes, increasingly fierce competition, and demand for better services, are new challenges for companies. Companies, in increasing competitiveness, must optimize every stage of the value creation process from the supply of raw materials to end-user services by implementing a practical supply chain [3].

Alshikhi and Abdullah [4] states that data is important for companies related to business development for management. The company's business environment changes rapidly all the time related to changes in customer demand, the presence of new competitors, and changes in the company's organizational capabilities. Corporate management needs to take action to anticipate these changes. In the business world, the availability of data is very important in providing quality (information quality) to help company management make forecasting and decision making [5]. Quality data and available on time provide important value for company management to

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determine the company's strategy and improve supply chain performance. Basically, data obtained from customers and then processed into quality information in improving supply chain performance and ultimately increasing customer satisfaction. High quality information can increase retailer satisfaction [6]. Research conducted by Mcknight *et al.* [7] states that quality information about ordering goods from customers can increase customer satisfaction. Thus, the quality of information is very important for company management. With the presence of quality information, management can understand the internal and external conditions of the company at certain times so that management can make decisions quickly and accurately. To maintain a good level of information quality in the organization, the company needs to conduct an audit related to the quality of information in the company [8].

The availability of integrated information within a company enables the company to coordinate between functions efficiently and effectively. For example: the coordination that occurs between the marketing function with the planning of production inventory control, the coordination of the marketing function with the warehouse function in the company, the coordination of the marketing function with the costing function and others. Information available and integrated with external parties such as company suppliers, enables suppliers to prepare materials or goods needed by the company [9]. Integration of company information with suppliers enables collaboration between companies and suppliers and provides benefits for both parties. Research conducted by Whipple *et al.* [10] states that collaboration with external parties can provide a competitive advantage for companies. The successful implementation of supply chain management through supplier relationship management by the company is able to integrate the company with its suppliers [11]. Collaboration between suppliers and companies will improve company performance through a significant reduction in operational costs, and ultimately, increase the company's competitive advantage [12].

Sáenz [13] also states that a close relationship with the supplier will be able to increase flexibility and accelerate the process of product recognition because the supplier can prepare material requirements adequately. The instability of suppliers in providing materials also impacts the stability of the company's production system, especially in the procurement of materials and sub-materials. This condition makes it difficult for companies to deliver products to customers as promised. Companies in the face of supply and demand uncertainty, make the company must be able to minimize production costs but also must be in

accordance with demand in terms of production volume in a short time. Changes that occur in the supply chain flow require rapid adaptation by increasing flexibility to cope with rapid changes. In anticipating changes that occur, companies need to increase innovation and use of information technology in accordance with needs. The use of information technology in the company will be able to be used by corporate customers by accessing the company to be able to reduce the uncertainty that occurs [14]. In connection with dynamic and unstable customer demand, the company's supply chain must have flexibility in serving customers. The company must be able to respond quickly to changes - changes that occur both from the type of product and the requirements that apply in the paper manufacturing industry. Angkirwang *et al.* [15] states that companies that are able to control the market provide certainty for internal companies and their suppliers. Santos-Vijande *et al.* [16] also said that if an organization is able to achieve a high level of flexibility then the organization will be able to respond to changes in customer demand. The company's ability to meet varied customer demands through the high flexibility of the supply chain will increase customer satisfaction. In order to increase this flexibility, many companies actively collaborate with suppliers through sharing quality information effectively and continuously.

From the description above, previous studies have conducted research on the influence of constructs separately and directly. This study examines the effect of information quality on retailer satisfaction through supplier relationship management and supply chain flexibility as mediation.

Methods

Supply Chain Management

Supply chain management is an approach built by the company to integrate suppliers, manufacturers, distributors, retailers, and customers with the aim of increasing customer value at an efficient cost. Flow in a supply chain involves many business activities from suppliers to producers and customers [17]. Supply Chain Management (SCM) is the management, regulation, planning, control, and the realization of products, ranging from design and purchasing through production and distribution to the final consumer in accordance with market demand resulting in a cost effective [18].

Afolayan *et al.* [19] said that the supply chain is a network, which connects several parties such as suppliers, retailers, distributors, and manufacturing sites. Supply chains can be categorized based on

channel relationships as (a) direct supply chains, (b) extended supply chains and (c) final supply chains consisting of interrelated flows for information, materials / services and cash flows. Research conducted by Abdeen and Sandanayake [20] defines supply chain management as management of upstream and downstream supply chain activities by coordinating material, information and financial flows to achieve sustainable competitive advantage and optimize customer value. Supply chain management is a system-based approach that views the entire supply chain by looking at synchronizing operational and strategic capabilities between companies and focusing on creating customer value [3].

Supply Chain Flexibility

Supply Chain Flexibility (SCF) is defined as the ability of a company to be responsive, react, and change so that the organization can meet changing market demands [15]. Supply chain flexibility as a company's ability, both internally and externally. In the case of external operations, it shows a cooperative relationship between the company and its suppliers and distributors as the main customers. The flexibility referred to is in terms of responding to uncertainty of supply and demand without having to incur additional costs and time [21].

Flexibility can also be defined as the ability to meet diverse customer expectations with little sacrifice in terms of time, energy, cost, as a consequence of change but in the end the company is able to maintain competitive advantage [22]. With today's increasing global complexity, it is very important to have a flexible supply chain network in adapting to changing demands and the environment. Supply chain flexibility as the ability of the supply chain to react and accommodate changes by making rapid adjustments in aspects of the production process, capacity, stock turnover, ramp-up time, and cycle time. Shoja *et al.* [23], stated that company flexibility is needed in responding to uncertain situations and product diversification. The supply chain must be flexible enough to be able to respond to variations in demand. Indicators Supply chain flexibility used in this study are the presence of products in various sizes, products in various type /choices, rapid introduction of new products, rapid product improvement, and good logistics performance.

Information Quality

Quality measures the extent to which information shared between organizations meets the needs of the organization. The availability of quality information plays an important role in the success of a company [24]. Companies that have implemented an integrated information system in the internal company

are able to get a good and accurate internal picture to determine the steps forward [25]. Information held by the company can also contribute to improving the company's performance.

The quality of information owned by the company certainly can support company management in determining the right business process decisions to add value to the company [26]. Information quality is an important aspect in information management because it will determine the level of quality produced in an organization. Nagarajan *et al.* [27] said the quality of information refers to the accuracy, adequacy, timeliness, and credibility of information exchanged among company partners. Pearson [28], information quality refers to the state of the actual data in terms of accuracy, timeliness, and consistency. Indicators Information quality used in this study include accurate, timely, complete, reliable and concise

Supplier Relationship Management

Supplier Relationship Management (SRM) is defined as a business process that manages all contracts between an organization and its suppliers [29]. The company builds good partnerships with its main suppliers in a coordinated and collaborative manner in order to be able to overcome the problems faced by the company. Active supplier participation in creating corporate value by increasing cost efficiency and providing competitive products and sharing risks will contribute greatly to the company in developing innovative products and increasing product market share [30]. Supplier relationship management is an opportunity to build on success from strategic sources and initiatives in involving developing partnership relationships with key suppliers aimed at reducing costs, innovating new products, and creating value for both parties. This collaboration can be achieved if it is based on a commitment to collaborate for mutual benefits in the long run. Amoako-Gyampah *et al.* [29] said that SRM is very important because it will increase product life cycle becomes longer, product quality improvement, process innovation, and heterogeneity of customer demand.

The supplier relationship management that the company has built with the supplier intensively is able to provide benefits to both parties to generate profits in the long run [31]. SRM provides a competitive advantage because companies can utilize existing resources together [32]. A strong partnership in SRM is very important for both parties (buyer-suppliers) because the partnership enables companies to anticipate changes in demand patterns, inflationary pressures, currency fluctuations, and government policies, which create conditions of

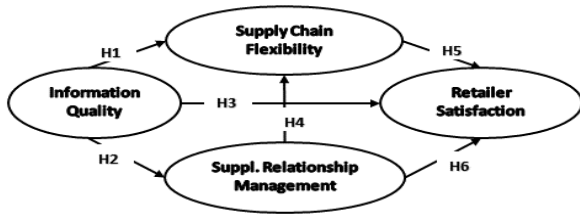


Figure 1. Research model.

supply uncertainty [33,34]. The indicators of supplier relationship management used in this study are sharing information market demand with suppliers, communicating intensively with suppliers, collaborating productively, and forming joint teams in solving operational problems.

Retail Satisfaction

Retailer satisfaction is defined as the ability of the product or service provider to provide the needs or desires of customers in accordance with or exceeding expectations [35]. Kumar [36] states the same thing, that retailer satisfaction is the company's ability to provide services in meeting or exceeding retailers' expectations. Poushneh and Vasquez [37] said that customer satisfaction is not only pleasure from the experience of consuming, but also the experience gained is at least as good as what customers should have. Retailer satisfaction is considered as a response given by retailers to service providers, whether retailers' expectations for products / services before purchase are consistent with the actual products / services obtained after purchase [38].

Satisfaction is a perception given as a whole and can be directly evaluated. consumers compare a product or service with the ideal standard promised to customers. Achievement satisfaction depends on the extent to which products and services meet or exceed customer expectations. In today's highly competitive market conditions, management focuses on retaining customers, so customer satisfaction is one of the differentiating factors compared to competitors [39]. Satisfaction is a psychological reaction related to previous experience with a comparison between expected and perceived performance [40].

Satisfaction is measured through a single transaction, or series of interactions with a product from time to time. The satisfaction dimension can be related for example to the ratio of price to value, quality, loyalty, or delivery performance [13]. El-Adly [41] in his research said that satisfied customers are one of the main goals sought by service organizations. With the achievement of customer satisfaction will provide positive comments by word of mouth, long-term loyalty, and contribute to sustainable profitability. Indicators of retailer satisfaction used in this

study are product quality, product variance, products have good value for money, salesman service, salesman knowledge, product prices, and delivery performance.

Research Hypothesis

Based on the description above can be arranged research hypothesis according to Figure 1.

- H1: Information quality affects supply chain flexibility.
- H2: Information quality affects supplier relationship management.
- H3: Information quality affects retailer satisfaction
- H4: Supplier relationship management affects supply chain flexibility.
- H5: Supply chain flexibility affects retailer satisfaction
- H6: Supplier relationship management affects retailer satisfaction

Research Methods

Quantitative research is an approach to test objective theory by testing the relationship between variables. Quantitative research methods are also used as a scientific approach to managerial and economic decision making. This research is a causal study that explains the causal relationship between variables as in the research model, namely the effect of Information Quality on Retail Satisfaction through Supply Chain Flexibility and Supplier Relationship Management (Figure 1).

The analysis technique uses Structural Equation Model (SEM) with partial least square (PLS) method and smartPLS software tools. This study uses PLS because it carries out a simultaneous analysis process of multiple variables and a limited number of samples [42]. This research model is expected to be able to test the hypothesis of the relationship between variables in order to understand the factors that influence retail satisfaction on retail SMEs in Makassar City, South Sulawesi while making an implication that the results will approach the terms of a measurement that will be described through a research design.

The population is the whole subject of research, if someone wants to examine all the elements that exist in the research area, then the research is a population study or population study or census study. The population is a collection of individuals with qualities and characters that have been determined by researchers. The sample is a portion of the subjects in the population studied, which is certainly able to represent the population representative. The sample is part or representative of the population studied.

The sampling technique in this research is non-probability sampling, and purposive sampling. Purposive sampling is a technique with certain considerations. The selection of a group of subjects in purposive sampling, is based on certain characteristics that are considered to have a close connection with the characteristics of the population that have been known previously. In other words, the sample units contacted were adjusted according to criteria based on the research problem. Filling out the questionnaire is only in the area of South Sulawesi, so that the respondents selected according to the object of research. The sample in this study has the following considerations are 100 small-scale businesses in the city of Makassar and surrounding areas that are engaged retail Fast Moving Consumer Goods (FMCG), and have suppliers from the city of Makassar, South Sulawesi.

Results and Discussions

Characteristics of the Respondents

The object of this study is the MSME retailer or in this study referred to as a wholesaler in the field of Fast-Moving Consumer Goods (FMCG) in the city of Makassar and surrounding areas. Researchers distributed as many as 100 questionnaires in the form of hardcopy and softcopy through Google Forms that met the research sample criteria, namely the wholesaler SMEs of Fast-Moving Consumer Goods (FMCG) in Makassar City and surrounding areas. Researchers limit the object of research in the micro, small and medium enterprise (MSME) industries. This industry consists of three categories, namely micro, small and medium. Researchers limit only to the category of small businesses that move in the industry Fast Moving Consumer Goods (FMCG) and have annual income (turnover) above IDR 300,000,000 to a maximum of IDR 2,500,000,000 per year. This income restriction criterion is included in the small business group. Another criterion needed is that each business unit has at least 10 suppliers from the city of Makassar. Based on the results of 100 respondents wholesaler of Fast Moving Consumer Goods (FMCG) in Makassar and surrounding areas obtained, it is known that all respondents have a turnover per month that reaches more than IDR 300,000,000./year and this is in accordance with the characteristics of the sample required.

Evaluation of the Outer Model

The first analysis to do is to test the validity and reliability of the measurement model (outer model). Table 1 shows the test results of each indicator of research variables. Indicator validity measure is the convergent validity (factor loading) value of the

indicator with the minimum value received that is 0.5.

In Table 1, the first variable, Information Quality, is measured by 5 indicators. The first indicator is accurate information about the change in demand (accurate) (IQ1) with a weighting factor of 0.553. A second indicator is the information provided on time (timely) (IQ2) with a weight factor of 0.805. The third indicator, which is the order quantity information, reflects actual market demand (reliable) (IQ3) with a weighting factor of 0.836. The fourth indicator, the available information can be used directly without re-working (concise) (IQ4) with a weighting factor of 0.811.

The fifth indicator, the overall information exchange that occurs includes the required information (complete) with a weighting factor of 0.774. The results of loading factors of the five indicators of information quality show the results of the correlation between the indicators with the variables have fulfilled convergent validity because all loading factors exceed 0.5.

The second variable, supply chain flexibility is measured by five indicators. The first indicator, suppliers are able to provide products of various sizes (SCF1), with a loading factor of 0.633. The second indicator is the supplier is able to provide products with various types / options (SCF2) with a factor weight of 0.583. The third indicator is that suppliers are able to quickly introduce new products (SCF3) with a factor weight of 0.692. The fourth indicator is that suppliers are able to quickly make product improvements (SCF4) with a factor weight of 0.814. The fifth indicator is the supplier has good logistical performance (SCF5) with a factor weight of 0.755. The results of loading factors from the 5 indicators supply chain flexibility show that they have values acceptable convergent validity with all loading factors exceeding 0.5.

The third variable, supplier relationship management is measured by four indicators. The first indicator, sharing market demand information with the main supplier (SRM1), has a factor weight of 0.795. The second indicator have a lot of face-to-face communication in relationships (SRM2), with a factor weight of 0.840. The third indicator is often to stimulate productive discussion in relationships (SRM3) with a factor weight of 0.820. The fourth indicator is forming a joint team in solving operational problems (SRM4) with a factor weight of 0.682. The Loading factor of the four indicators of supplier relationship management shows the result of convergent validity that meets the limits of all loading factors exceeding 0.5.

Table 1. Test convergent validity of the indicator

No	Variable	Indicators	Loading factor	Decision
1	Information Quality	Accurate	0.553	Valid
		Timely	0.805	Valid
		Complete	0.836	Valid
		Reliable	0.811	Valid
		Concise	0.774	Valid
2	Supply Chain Flexibility	Products in various sizes	0.633	Valid
		Products in various types / choices	0.583	Valid
		Rapid introduction of new products	0.692	Valid
		Rapid product improvement	0.814	Valid
		Good logistics performance	0.775	Valid
3	Supplier Relationship Management	Sharing information market demand with suppliers	0.795	Valid
		Communicating intensively with suppliers	0.840	Valid
		Collaborating productively	0.820	Valid
		Forming joint teams in solving operational problems	0.682	Valid
4	Retailer Satisfaction	Products quality	0.780	Valid
		Products variance	0.698	Valid
		Products have good value for money	0.682	Valid
		Salesman service	0.720	Valid
		Salesman knowledge	0.823	Valid
		Product prices	0.597	Valid
		Delivery performance	0.617	Valid

The fourth variable, retailer satisfaction is measured by 7 indicators. The first indicator is product quality (not defective) (RS1) with a factor weight of 0.780. The second indicator is product choice (RS2) with a factor weight of 0.698. The third indicator is the product has good value for money (RS3) with a factor weight of 0.682. The fourth indicator of salesman treatment (RS4) with a factor weight of 0.720. The fifth indicator is salesman knowledge (RS5) with a factor weight of 0.823. The sixth indicator is product price (RS6) with a factor weight of 0.597. The seventh indicator is logistical performance (RS7) with a factor weight of 0.617. The results of loading factors of 7 indicators of retailer satisfaction show the results of the correlation between the indicators with the variables have fulfilled convergent validity because all loading factors exceed 0.5

Table 2 shows the results of calculation of composite reliability of each variable, namely: information quality, supply chain flexibility, supplier relationship management and retail satisfaction. The three variables have the lowest composite reliability value of 0,826, so it can be said that the measurement model is reliable with value OF composite reliability above 0.60 as the minimum acceptable limit. Convergent Validity test and composite reliability have been fulfilled so the research hypothesis test can be continued.

Table 2. Test reliability of the variable

Variable	Composite reliability	Decision
Information quality	0.872	Reliable
Supply chain flexibility	0.826	Reliable
Supplier relationship management	0.866	Reliable
Retailer satisfaction	0.873	Reliable

Evaluation of the Inner Model

Testing the structural model or inner model is done by calculating the path coefficient of each relationship of two constructs. Path coefficient and t-statistic values indicate the level of significance that will be used in hypothesis testing. The relationship between the two variables is declared significant if the t-statistic value exceeds 1.96, which means that the significance level is less than 5%. In addition to the T-statistics generated by PLS, the results of the iteration carried out by PLS yielded original samples, sample means and standard deviations. Original sample is a beta standardized score that is used to see the predictive nature of independent variables on the dependent variable. Sample mean is the average value of the sample produced from the iteration process. Standard deviation is a standard error [42].

Table 3 shows the results of the analysis of the path coefficient and t-statistics. The path coefficient of the influence of information quality on supply chain

Table 3. Inner model test results between variables

Inner Test Model	Original sample (O)	Sample mean (M)	t- Statistics
Information Quality -> Supply Chain Flexibility (H1)	0.138	0.167	0.798
Supplier Relationship Management -> Supply Chain Flexibility (H4)	0.611	0.619	3,745
Information Quality -> Supplier Relationship Management (H2)	0.565	0.593	5.296
Information Quality -> Retailer Satisfaction (H3)	0.161	0.170	1.010
Supply Chain Flexibility -> Retailers Satisfaction (H5)	0.367	0.106	2,272
Supplier Relationship Management -> Retailer Satisfaction (H6)	0.463	0.446	2.624

flexibility (H1) of 0.138 with a t-statistic value of 0.798 does not exceed the t-statistic of 1.96. These results indicate that information quality does not affect supply chain flexibility. This research hypothesis is not supported by empirical data on the MSME retailer industry.

This research is different from research conducted by Youn *et al.*, [14] and Tarigan *et al.*, [3] which says that companies that exchange quality information with supply chain partners will have better opportunities to make their supply chains more flexible. However,

the results of this study are supported by research conducted by Marinagi *et al.* [43] which says that there is no influence between information quality on retailer satisfaction. This result is possible for the MSME retailer industry because basically this business unit has not used information as a way of doing business. The SMEs still use the conventional approach in running their business.

The path coefficient of the influence of supplier relationship management on supply chain flexibility (H4) is 0.611 with a t-statistic value of 3.745. These results support previous research which says that supplier relationship management affects supply chain flexibility. With a good relationship between buyers and sellers, the company will be able to serve customers in a flexible manner [13,15], especially related to the time, volume, and type of product. Supplier relationship management influences supply chain flexibility in the wholesaler industry. Previous studies also revealed that human and organizational factors play an important role in realizing the goal of manufacturing flexibility and close relationships with suppliers are likely to be able to increase flexibility in product variance, product quantity variance and new products [13].

The path coefficient of the influence of information quality on supplier relationship management (H2) is 0.565 which has a t-statistic of 5.296. This means that information quality affects supplier relationship management for wholesalers in Makassar. The

amount of information shared, and the accuracy and quality of the information shared can show a good collaborative relationship between a company and a supplier [3,29]. That way, suppliers can clearly know what product specifications the company wants through the quality of information shared [28].

The path coefficient of the influence of information quality on retailer satisfaction (H3) is 0.161 with a t-statistic value of 1.010 and less than 1.96. These results indicate that information quality does not directly influence retailer satisfaction. This study contradicts the research of Khan *et al.* [44] which says that quality information has a strong impact on customer satisfaction. However, the results of this study are in line with research conducted by Deyalage and Dushyantha [45] which says that there is no influence information quality especially the quality of information about the product to customer satisfaction. In the MSME industry in Makassar this can only happen that the quality of information does not affect retailer satisfaction. The reason is that MSMEs in the environment under study have not used information to be a driver of their business. But they still run their business conventionally.

The path coefficient influence of supply chain flexibility on retailer satisfaction (H5) is 0.367 with a t-statistic value of 2.272. The fifth hypothesis is that supply chain flexibility influences acceptable retailer satisfaction. Supply chain flexibility affects retailer satisfaction [13,27]. Previous studies also revealed that in increasing satisfaction, flexibility in supply chains is needed, namely having the ability to provide products and/or services according to individual customer requests [18].

The path coefficient of the influence of supplier relationship management on retailer satisfaction (H6) is 0.463 which has a t-statistic of 2.624. Supplier relationship management affects retailer satisfaction. Supplier relationship management can affect customer satisfaction, improve relations with suppliers, and can for increase producer satisfaction [29,31]. Therefore, supplier relationship management in

products can increase customer satisfaction and improve the quality products themselves. Another finding of this study is the mediating role of supplier relationship management and supply chain flexibility on the relationship of information quality to retail satisfaction.

There are three important findings related to the presence of two supplier relationship management mediation variables and supply chain flexibility. First, the results of the analysis note that the quality of information does not affect supply chain flexibility. Based on these results, it can be concluded that supply chain flexibility does not mediate the relationship of information quality to retailer satisfaction. Second, the results of the analysis show that information quality affects supplier relationship management and supplier relationship management affect retailer satisfaction. From these findings it can be concluded that supplier relationship management mediates the effect of information quality on retailer satisfaction. Third, as explained above, that the quality of information affects supplier relationship management, and supplier relationship management affects supply chain flexibility, and supply chain flexibility affects retailer satisfaction.

It can be concluded that the quality of information also indirectly affects customer satisfaction through supplier relationship management and supply chain flexibility. Based on the results of the analysis above and by combining direct and indirect effects, it can be concluded that the quality of information is very important to improve because it can directly or indirectly increase retailer satisfaction. These results provide in-depth insights for MSME practitioners to use a quality information system in running MSME businesses in the Makassar region.

Conclusion

The initial purpose of this study was to examine the effect of information quality on retailer satisfaction through supplier relationship management and supply chain flexibility. Based on the results of the analysis and discussion conducted conclusions can be drawn. Of the six hypotheses proposed, 4 of them are supported by empirical data while the other two hypotheses are not supported by empirical data. Information quality does not affect supply chain flexibility. Information quality affects supplier relationship management. Information quality does not directly affect retailer satisfaction. Supplier relationship management affects supply chain flexibility. Supply chain flexibility affects retailer satisfaction. Supplier relationship management affects retailer satisfaction. Another finding from this study is that information quality has an indirect effect on retailer

satisfaction both through supplier relationship management and supply chain flexibility. The results of this study can provide insights or bases that can be used by practitioners in increasing retailer satisfaction by using a quality information system, implementing supplier relationship management and supply chain flexibility. This research can also contribute to the development of research in the field of supply chain management in the days to come.

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References

1. Diabat, A., and Theodorou, E., A Location–Inventory Supply Chain Problem: Reformulation and Piecewise Linearization, *Computers & Industrial Engineering*, 90, 2015, pp. 381–389.
2. Shaharudin, M. R., Rashid, N. R. N. A., Wangbenmad, C., Hotrawaisaya, C., and Wararatchai, P., A Content Analysis of Current Issues in Supply Chain Management, *International Journal of Supply Chain Management*, 7(5), 2018, 199-212.
3. Tarigan, J. H. T., Siagian, H., and Bua, R. R., The Impact of Information System Implementation to the Integrated System for Increasing the Supply Chain Performance of Manufacturing Companies, *IOP Conference Series Materials Science and Engineering*, 473(1), 2019, 012050.
4. Alshikhi, O.A., and Abdullah, B. M., Information Quality: Definitions, Measurement, Dimensions, and Relationship with Decision Making, *European Journal of Business and Innovation Research*, 6(5), 2018, 36-42.
5. Torres, R., and Sidorova, A., Reconceptualizing Information Quality as Effective Use in the Context of Business Intelligence and Analytics, *International Journal of Information Management*, 49, 2019, 316–329.
6. Chen, C.-C., and Chang, Y.-C., What Drives Purchase Intention on Airbnb? Perspectives of Consumer Reviews, Information Quality, and Media Richness, *Telematics and Informatics*, 35(5), 2018, 1512–1523.
7. McKnight, D.H., Lankton, N. K., Nicolaou, A., and Price, J., Distinguishing the Effects of B2B Information Quality, System Quality, and Service Outcome Quality on Trust and Distrust, *The Journal of Strategic Information Systems*, 26 (2), 2017, 118–141.
8. Azemi, N. A., Zaidi, H., and Hussin, N., Information Quality in Organization for Better Decision Making, *International Journal of Academic Research in Business and Social Sciences*, 7(12), 2018, 429-437.

9. Baihaqi, I., and Sohal, A. S., The Impact of Information Sharing in Supply Chains on Organisational Performance: An Empirical Study, *Production Planning & Control*, 24(8–9), 2013, 743–758.
10. Whipple, J. M., Wiedmer, R., and Boyer, K. K., A Dyadic Investigation of Collaborative Competence, Social Capital, and Performance in Buyer–Supplier Relationships, *Journal of Supply Chain Management*, 51(2), 2015, 3–21.
11. Tarigan, Z. J. H., Siagian, H., and Suprpto, W., The Effect of Middle Manager Engagement on SCM Performance through ERP System and SCM Practices, *Proceedings of 2019 the 9th International Workshop on Computer Science and Engineering, Hong Kong*, 2019, 47–51.
12. Barua, P., The Moderating Role of Perceived Behavioral Control: The Literature Criticism and Methodological Considerations, *International Journal of Business and Social Science*, 4(10), 2013, 57–59.
13. Sáenz, M. J., Knoppen, D., and Tachizawa, E. M., Building Manufacturing Flexibility with Strategic Suppliers and Contingent Effect of Product Dynamism on Customer Satisfaction, *Journal of Purchasing and Supply Management*, 24(3), 2018, 238–246.
14. Youn, S. H., Yang, M. G. M., Kim, J. H., and Hong, P., Supply Chain Information Capabilities and Performance Outcomes: An Empirical Study of Korean Steel Suppliers. *International Journal of Information Management*, 34(3), 2014, 369–380.
15. Angkiriwang, R., Pujawan, I. N., and Santosa, B., Managing Uncertainty through Supply Chain Flexibility: Reactive vs. Proactive Approaches, *Production & Manufacturing Research: An Open Access Journal*, 2(1), 2014, 50–70.
16. Santos-Vijande, M. L., López-Sánchez, J.A., and Trespalacios, J.A., How Organizational Learning Affects a Firm's Flexibility, Competitive Strategy, and Performance, *Journal of Business Research*, 65(8), 2012, 1079–1089.
17. Grimm, C., Knemeyer, M., Polyviou, M., and Ren, X., Supply Chain Management Research in Management Journals: A Review of Recent Literature (2004–2013), *International Journal of Physical Distribution & Logistics Management*, 45(5), 2015, 404–458.
18. Dubey, R., Gunasekaran, A., Papadopoulos, T., Childe, S. J., Shibin, K. T., and Wamba, S. F., Sustainable Supply Chain Management: Framework and Further Research Directions, *Journal of Cleaner Production*, 142 (2), 2017, 1119–1130.
19. Afolayan, A., White, G. R. T., and Mason-Jones, R., Why Knowledge Acquisition is Important to Effective Supply Chain Management: The Role of Supply Chain Managers 'as Knowledge Acquisitors, *Conference on British Academy of Management (BAM) at Newcastle*, 2016.
20. Abdeen, F. N., and Sandanayake, Y. G., Facilities Management Supply Chain: Function, Flows and Relationship, *Procedia Manufacturing*, 17, 2018, 1104–1111.
21. Yu, K., Cadeaux, J., and Luo, B. N., Operational Flexibility: Review and Meta-analysis, *International Journal of Production Economics*, 169, 2015, 190–202.
22. Blome, C., Schoenherr, T., and Eckstein, D., The Impact of Knowledge Transfer and Complexity on Supply Chain Flexibility: A Knowledge-based View, *International Journal of Production Economics*, 147(part B), 2014, 307–316.
23. Shoja, A., Molla-Alizadeh-Zavardehi, S., and Niroomand, S., Adaptive Meta-heuristic Algorithms for Flexible Supply Chain Network Design Problem with Different Delivery Modes, *Computers & Industrial Engineering*, 138, 2019, 106108.
24. Zhou, H., Shou, Y., Zhai, X., Li, L., Wood, C., and Wu, X., Supply Chain Practice and Information Quality: A Supply Chain Strategy Study, *International Journal of Production Economics*, 147 (part C), 2014, 624–633.
25. Gorla, N., Somers, T. M., and Wong, B., Organizational Impact of System Quality, Information Quality, and Service Quality, *The Journal of Strategic Information Systems*, 19(3), 2010, 207–228.
26. Davis, D. F., and Golicic, S. L., Gaining Comparative Advantage in Supply Chain Relationships: The Mediating Role of Market-Oriented IT Competence, *Journal of the Academy of Marketing Science*, 38, 2010, 56–70.
27. Nagarajan, V., Savitskie, K., Ranganathan, S., Sen, S., and Alexandrov, A., The Effect of Environmental Uncertainty, Information Quality, and Collaborative Logistics on Supply Chain Flexibility of Small Manufacturing Firms in India, *Asia Pacific Journal of Marketing and Logistics*, 25(5), 2013, 784–802.
28. Pearson, A., Tadisina, S., and Griffin, C., The Role of e-Service Quality and Information Quality in Creating Perceived Value: Antecedents to Website Loyalty, *Information Systems Management*, 29(3), 2012, 201–215.
29. Amoako-Gyampah, K., Boakye, K. G., Adaku, E., and Famiyeh, S., Supplier Relationship Management and Firm Performance in Developing Economies: A Moderated Mediation Analysis of Flexibility Capability and Ownership Structure, *International Journal of Production Economics*, 208, 2019, 160–170.
30. Lambert, D., and Schwieterman, M., Supplier Relationship Management as a Macro Business Process, *Supply Chain Management*, 17 (3), 2012, 337 – 352.
31. Mumelo, J., Selfano, O. F., and Onditi, A. L., Influence of Supplier Relationship on Performance of Small-scale Enterprises in Bungoma Town, Kenya, *International Journal of Business and Social Science*, 8(3), 2017, 57–66.

32. Lii, P., and Kuo, F.-I., Innovation-oriented Supply Chain Integration for Combined Competitiveness and Firm Performance, *International Journal of Production Economics*, 174, 2016, 142-155.
33. Zhang, Q., and Cao, M., Exploring Antecedents of Supply Chain Collaboration: Effects of Culture and Interorganizational System Appropriation, *International Journal of Production Economics*, 195, 2018, 146-157.
34. Yang, Q., Zhao, X., Yeung, H. Y. F., and Y. Liu, Y., Improving Logistics Outsourcing Performance through Transactional and Relational Mechanisms under Transaction Uncertainties: Evidence from China, *International Journal of Production Economics*, 175, 2016, 12-23.
35. Gallan, A. S., Jarvis, C. B., Brown, S. W., and Bitner, M. J., Customer Positivity and Participation in Services: An Empirical Test in a Health Care Context, *Journal of the Academy Marketing Science*, 41, 2013, 338-356.
36. Kumar, K. S., Expectations and Perceptions of Passengers on Service Quality with Reference to Public Transport Undertakings, *The IUP Journal of Operations Management*, 11(3), 2012, 67-81.
37. Poushneh, A., and A. Z. Vasquez-Parraga, A. Z., Discernible Impact of Augmented Reality on Retail Customer's Experience, Satisfaction and Willingness to Buy, *Journal of Retailing and Consumer Services*, 34, 2017, 229-234.
38. Low, W. S., Lee, J.-D., and Cheng, S.-M., The Link between Customer Satisfaction and Price Sensitivity: An Investigation of Retailing Industry in Taiwan, *Journal of Retailing and Consumer Services*, 20(1), 2013, 1-10.
39. Chopra, K., Empirical Study on Role of Customer Service in Delivering Satisfaction at Branded Retail Outlets in Pune, *Procedia Economics and Finance*, 11, 2014, 239 - 246.
40. Hirata, E., Service Characteristics and Customer Satisfaction in the Container Liner Shipping Industry, *The Asian Journal of Shipping and Logistics*, 35(1), 2019, 24-29.
41. El-Adly, M. E., Modelling the Relationship between Hotel Perceived Value, Customer Satisfaction, and Customer Loyalty, *Journal of Retailing and Consumer Services*, 50, 2018, 322-332.
42. Ghozali, I., and Latan, H., *Partial Least Square: Concepts, Techniques, Applications using Smart PLS 3.0 for Empirical Research*, BP UNDIP. Semarang, 2015, pp. 35-105
43. Marinagi, C., Trivellas, P., and Reklitis, P., Information Quality and Supply Chain Performance: The Mediating Role of Information Sharing, *Procedia-Social and Behavioral Sciences*, 175, 2014, 473-479.
44. Khan, S. A., Liang, Y., and Shahzad, S., An Empirical Study of Perceived Factors Affecting Customer Satisfaction to Repurchase Intention in Online Store in China, *Journal of Service Science and Management*, 8(3), 2015, 291-305.
45. Deyalage, P. A., and Kulathunga, D., Factor Affecting Online Customer Satisfaction: The Sri Lankan Perspective, *International Journal of Business and Management*, 14(2), 2019, 87-98.