
Linking assembling to order to customer satisfaction in the south African automobile supply chain industry

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Abstract.

They have been many supply chain postponement strategies kinds of research, however, the majority have focussed on inventory management and lead time (Pu & Quan; 2010). As the major contributor to the country economy, the South Africa automobile industry is at the centre of job creations and economic growth, thus addressing many social ills such as inequality, unemployment's, poverty and crime to name a few. It is therefore imperative to satisfy the customers to expect growth of the industry, which translates into job creation and economy growth and life improvement. This research explores the link between the assembly to order and customer satisfaction in the South African automobile supply chain. A cross-sectional survey was undertaken, using the closed-ended question to collect quantitative data from 384 respondents working for the car dealerships, which were analysed to test the formulated hypothesis linking the postponement strategy ATO to customer satisfaction. The findings have revealed that indeed customer's inputs through the process potentially improve the customers' satisfaction, by improving the five service quality variables (Yarimoglu, 2014) namely the tangibles, the responsiveness, the empathy, assurance, reliability. The main recommendations to the key players at this level of the chain is to improve their customer's relationship management and mine more information or input from the end customers which they have access to, through the customers decoupling point, ATO, by means of marketing and market research so that their customers can be satisfied and remain loyal. This research could thus improve the marketing and customer relationship strategy and grow the South African automobile market share, securing jobs and creating some.

Keywords: Service quality, customer satisfaction, customer loyalty, South African automobile market share

Introduction

According to the definition provided by the Council of Supply Chain Management Professionals (2015) SCM refers to the planning, management of processes within the sourcing and procurement, conversion, and all logistics management activities. That process encompasses the coordination as well as the collaboration among partners, who are suppliers, intermediaries, third-party service providers, and customers. A supply chain entails the fulfilment of a customer order through parties in the chain acting directly or indirectly (Meindl, 2013:13), processing goods or services from the upstream starting with the supplier to the downstream, to the end user (Mangan, Lalwani, Butcher & Javadpour, 2012:10). The main reason of the postponement strategy is to delay the customer order decoupling point until the order is received or at least a piece of more accurate information about the specificity of the product, in a bid to increase the highest customer fulfilment of the product.

The facts that characterised the current global market are customer needs uncertainty, with product lifecycle becoming shorter, demand for the service level of delivery and lead time of the product to be improved. To better serve the market and these increasing consumer needs, companies segment the market much more detailed, competition among businesses is switched toward the customer-based race. It is becoming a trend for modern organisations pursuing new competitive advantages to provide the customer with the customised product, to fully satisfy its needs in all aspects. In this regard, companies intend to seek kinds of strategies to alleviate competitive pressure from market and end-customer, to strengthen its core competence. During the process of exploring new strategies, postponement emerges after years of negligence by academics and company, and catches their eyes, with the development of manufacturing technology and methodology of management. The concept of postponement is about delaying activities (all kinds involved in the whole supply chain) until specific attributes of demand can be

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Problem statement

Statistics South Africa (2018) has reported a 27.7 percent unemployment rate in the second quarter of 2018, which has increased compared to the 26.7 percent from the previous period. To make the matter worst, there have been job losses and more still looming. Daniel (2018) reported 69 000 losses in just four months from March 2018 to June 2018. All these point out in the wrong direction for the country, and therefore all should put the effort together to solve the passive crisis which the country is going through. Besides, according to the quarterly review of 1st quarter 2019 release by NAAMSA, the Capacity utilization levels for cars has never reached 100% despite the strive of the government to create more jobs and the high unemployment and poverty. Those capacities utilizations were reported to be 68% in 2013 which dropped to 67% in 2014. The 2015 heightened a bit to 80.4%, then drop to 78% in 2016, rose slightly to 78% in 2017, again to 82% in 2018 and 95% in first quarter of 2019, although some efforts can be commended here, more should be done especially given the current economic situations and the unemployment which required a very aggressive strategy to get the economy back on track.

Aim of the research

This research aims to investigate the use of postponement strategy as customers' satisfaction enablers in the automotive supply chain in South Africa. The completion of the aforesaid is by correlating the services quality and customers' satisfaction, taking the view that the purpose of postponement is mainly to offers better service to customers while remaining profitable, competitive and sustainable

Literature review

The automotive industry is a major contributor to the South African economy. Addressing the challenges in managing a network in the South African automotive industry, shall contribute to the improvement of this critical sectors, sustain and create a more needed job in this country with a 27.5% unemployment rate. A report published by the SCIR (2009) has revealed that the automotive industry players in South Africa are neither collaborative enough nor market sensitive or reacting to changes. In the same vein, Naude (2009:99) has postulated that producing cost-effective and responding swiftly, and reliability to the market demand of the developed world is a significant challenge faced by the South African automobile industry. The relevance of the postponement in the automotive manufacturing industry is its important link to customer satisfaction. The implementation of the postponement strategy has lately become a very powerful tool for supply chain customer satisfaction. This view is echoed by Kisperska-Moron and Swierczek (2011) who advocated that contemporary supply network should be customer satisfaction focus and therefore required some dynamic configuration to achieve the said satisfaction, among which the postponement strategy

Assembly postponement concept as customer satisfaction enhancer

Wong and Ahlborn (2008) have identified many postponements advantages among which improving customer satisfaction is ranking first, then others such as improvement of order fulfilment, reduction of inventory level, reducing obsolescence, reduction of costs for manufacturing, purchasing and transport which are further transfer to the client for satisfaction.

The Customer Order Decoupling Point

The Customer Order Decoupling Point (CODP) is referred to as the point in the value chain for a product linked to a specific customer order, which is also called the order penetration point. Depending on the level in the supply chain, it can be called make-to-stock (MTS), assemble-to-order (ATO), make-to-order (MTO) and engineer-to-order (ETO). This paper is interested in the Assembly To Order, which is initiated by the dealership, regarded as the client of the assemblers or the manufacturer on the automobile supply chain (Olhager, 2012).

Customer expectations and value-ology in the automobile supply chain

According to Feussi (2018: 3292), customer expectations have evolved and have become the most striking results of manufacturing progress, challenging the assemblers to offer a unique product in the shortest lead time. He has further revealed that it is now possible for consumers' to demand highly customised products, and now not settling for those products produce in generically, and those should not just be affordable and deliver on time, but ultimately meet the customers' expectation which requires his input. Feussi (2018: 3291) has define postponement strategy in the automobile supply chain in South Africa as the delay of any activities related to the services or product in the supply network awaiting to receive the customers'

orders or at least the intention to customised the product, which is in opposition in starting the manufacturing of the product in anticipations of future orders.

Kelly, Johnston and Danheiser (2017) have coined the concept of Value-ology, which is the scientific study of customer added value. The value-ology entails the quest to unleash the customer value through the aggregate objective analysis to uncover the customers' value add, a creative acumen for a customer value proposition that is congruent to his or her expectation.

From the above two paragraphs, customer's expectation is the main determinant of the value-ology of the customer value proposition. To be able to meet that expectation, the supplier is required to have an outstanding customer relationship management which takes into consideration the input from the customers and in the is the case the end-user.

Research methodology

A cross-sectional study method, using an explanatory design with mixed approach trough scientifically tested and valid instrument for postponement strategy, the questionnaire that has five dimensions, whit respect to various customers decoupling points, has assisted in data collection from various strata. As a supply chain in which customers that represented the population was clustered according to their position on the supply network, the stratified non-proportionate sample was used to collect information from 375 according to the Solovin's formula of sample size calculation. Descriptive statistics, inferential statistics, correlations analysis, and test of significant mean differences will be performed for the research hypothesis testing.

Hypothesis and Hypothesis testing

H0: There is no statistical relationship between postponement (ATO), that could lead to improvement of the of service quality.

Presentation of results and interpretations:

The quantitative study was carried out on the dealership, using the assembly postponement (Assembly to order) as the independents variable and customer's satisfaction as the dependent variable and mitigated by the company size. It was found that the smaller the company size, the more accentuated the belief that more customers' inputs result in a higher level of satisfaction. The contributions from the customers into the process and products are making translate into a better understanding of the customer's expectation and better alignment and a higher degree of suppliers meeting those expectations.

Table1 A: Crosstab: Business size * Fitting certain accessories according to my clients preferences could have improved the sincerity and the accuracy

Count

	Fitting certain accessories according to my clients preferences could have improved the sincerity and the accuracy			Total
	Yes	Unsure	No	
Business size Small	136	16	12	164
Medium	190	0	7	197
Big	14	0	0	14
Total	340	16	19	375

The above cross-tabulation table is performed between the size of the dealership and the impact of assembly postponement (ATO) on customers' satisfaction (reliability). Out of the 375 samples, 340 agree that agreed that ATO could improve customer's satisfaction. Sixteen small dealerships were not sure, 12 infirmed. It was reported that twelve small businesses and seven medium businesses infirmed that, the A.T.O could have improved customer satisfaction (reliability). The sample size for this test was 375 made of 164 small businesses, 197 medium businesses, and 14 big businesses. A chi-square test was further

performed to verify whether or not there is a relationship between the business size and ATO improving customer satisfaction.

Table 1B: Chi-Square Tests

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.768 ^a	4	.000
Likelihood Ratio	32.276	4	.000
Linear-by-Linear Association	12.741	1	.000
N of Valid Cases	375		

a. 2 cells (22.2%) have expected count less than 5. The minimum expected count is .60.

To measure the extent to the postponement (ATO) could lead to the improvement of service reliability, a Pearson chi-square test was performed, and the result was interpreted as follow. The P-value, which has been labelled as Asymp. Sig. (2-sided) in the table has a value 0.000, which is. ($P=0.000 < 0.001$) and a Pearson chi-square value of 25.768, a degree of freedom equal to 4. This result ($P=0.000 < 0.001$) shows very strong evidence against the null hypothesis, which is ATO does not correlate to customer satisfaction in favour of the alternative hypothesis. With a degree of freedom that is equal to 4, it should be inferred that eight in the final calculation of the statistic are free from vary. H_0 that has been tested if is there no statistical relationship between postponement (ATO), that could lead to improvement of the of service reliability, a critical element of dealer satisfaction. The test has rejected the null hypothesis, is thus accepted in accordance with the result of the test that was performed.

Table 1C: Symmetric Measures

Symmetric Measures

	Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Interval by Interval Pearson's R	-.185	.045	-3.627	.000 ^c
Ordinal by Ordinal Spearman Correlation	-.229	.044	-4.538	.000 ^c
N of Valid Cases	375			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

The person chi-square has reveal a very strong evidence of association between respondent business size and service. There is a relationship between respondent age and his satisfaction been improved by his involvement been improved by ATO of the car, the strength of that relation is tested by the spearman correlation. The Spearman Correlation is -0.229 which according to Dancey and Reidy (2004) implies a weak relationship. Given the fact that $-0.229 < 0$, the improvement of service reliability of service decrease monotonically with the customers the company size.

Table 2 A: Business size * Fitting certain accessories according to my client could have improved the visual appealing and be more convenient

Count

	Fitting certain accessories according to my client could have improved the visual appealing and be more convenient			Total
	Yes	Unsure	No	
Business size Small	132	24	8	164

Medium	188	0	9	197
Big	14	0	0	14
Total	334	24	17	375

Table 2A shows the cross-tabulation between the size of the dealership and the impact of assembly postponement (ATO) on tangible, customers' satisfaction. Out of the 375 samples, 334 agree that agreed that ATO could improve customer's satisfaction. Twenty-four small dealerships were not sure, 8 infirmed. Eight small businesses and 9 medium businesses have infirmed that the ATO could improve customer satisfaction (tangible). The sample size for this test was 375 made of 164 small businesses, 197 medium businesses, and 14 big businesses. A chi-square test was further performed to verify whether or not there is a relationship between the business size and ATO improving customer satisfaction.

Table 2B: Chi-Square Tests

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	33.995 ^a	4	.000
Likelihood Ratio	43.468	4	.000
Linear-by-Linear Association	10.774	1	.001
N of Valid Cases	375		

a. 2 cells (22.2%) have expected count less than 5. The minimum expected count is .63.

In table above, the extent to which the postponement (ATO) could lead to the improvement of service tangible, a Pearson chi-square test was performed, and the result was interpreted as follow. The P-value, which has been labelled as Asymp. Sig. (2-sided) in the table has a value 0.000, which is. ($P=0.000 < 0.001$) and a Pearson chi-square value of 33.995, a degree of freedom equal to 4. This result ($P=0.000 < 0.001$) shows very strong evidence against the null hypothesis, which is ATO does not correlate to customer satisfaction in favour of the alternative hypothesis. With a degree of freedom that is equal to 4, it should be inferred that four in the final calculation of the statistic are free from vary. H_0 that has been tested if is there no statistical relationship between postponement (ATO), that could lead to improvement of the of service tangible, a critical element of dealer satisfaction. The test has rejected the null hypothesis, is thus accepted in accordance with the result of the test that was performed

Table 2C: Symmetric Measures

Symmetric Measures

	Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Interval by Pearson's R	-.170	.047	-3.326	.001 ^c
Ordinal by Spearman Correlation	-.233	.045	-4.628	.000 ^c
N of Valid Cases	375			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

a. Based on normal approximation.

The person chi-square has reveal a very strong evidence of association between respondent business size and service. There is a relationship between respondent age and his satisfaction been improved by his involvement been improved by ATO of the car, the strength of that relation is tested by the spearman correlation. The Spearman Correlation is -0.233 which according to Dancey and Reidy (2004) implies a

weak relationship. Given the fact that $-0.233 < 0$, the improvement of service reliability of service decrease monotonically with the customers the company size.

Table 3A: Business size * Fitting certain accessories according to my clients preferences could have improved the interaction and respect.

Crosstab

Count

		Fitting certain accessories according to my client's preferences could have improved the interaction and respect.			Total
		Yes	Unsure	No	
Business size	Small	116	36	12	164
	Medium	170	9	18	197
	Big	10	0	4	14
Total		296	45	34	375

The above table shows the cross-tabulation between the size of the dealership and the impact of assembly postponement (ATO) on customers' satisfaction (responsiveness). Out of the 375 samples, 296 agreed that ATO could improve customer's satisfaction (responsiveness). Thirty six small dealerships were not sure, 12 infirmed. Twelve small businesses, 18 medium businesses and 4 big businesses have infirmed that the ATO could improve customer satisfaction (responsiveness). The sample size for this test was 375 made of 164 small businesses, 197 medium businesses, and 14 big businesses. A chi-square test was further performed to verify whether or not there is a relationship between the business size and ATO improving customer satisfaction.

Table 3B:Chi-Square Tests

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	80.072 ^a	8	.000
Likelihood Ratio	90.381	8	.000
Linear-by-Linear Association	31.870	1	.000
N of Valid Cases	375		

a. 6 cells (40.0%) have expected count less than 5. The minimum expected count is .15.

Presented on table above, is the extent to which the postponement (ATO) could lead to the improvement of service responsiveness. A Pearson chi-square test was performed, and the result was interpreted as follow. The P-value, which has been labelled as Asymp. Sig. (2-sided) in the table has a value 0.000, which is. ($P=0.000 < 0.001$) and a Pearson chi-square value of 80.072, a degree of freedom equal to 8. This result ($P=0.000 < 0.001$) shows very strong evidence against the null hypothesis, which is ATO does not correlate to customer satisfaction in favour of the alternative hypothesis. With a degree of freedom that is equal to 4, it should be inferred that four in the final calculation of the statistic are free from vary. H_0 that has been tested if is there no statistical relationship between postponement (ATO), that could lead to improvement of the of service responsiveness, a critical element of dealer satisfaction. The test has rejected the null hypothesis, is thus accepted in accordance with the result of the test that was performed

Table 3C: Symmetric Measures

Symmetric Measures

	Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.

Interval	by Pearson's R	-.292	.047	-5.895	.000 ^c
Ordinal	by Spearman	-.326	.050	-6.667	.000 ^c
Ordinal	Correlation				
N of Valid Cases		375			

- Not assuming the null hypothesis.
- Using the asymptotic standard error assuming the null hypothesis.
- Based on normal approximation.

The person chi-square has reveal a very strong evidence of association between respondent business size and service. There is a relationship between respondent age and his satisfaction been improved by his involvement been improved by ATO of the car, the strength of that relation is tested by the spearman correlation. The Spearman Correlation is -0.326 which according to Dancey and Reidy (2004) implies a moderate relationship. Given the fact that $-0.326 < 0$, the improvement of service responsiveness of service decrease monotonically with the customers the company size.

Table 4 A: Business size * Fitting certain accessories according to my clients preferences could have improve the trust level and enhance the support

Crosstab

Count

	Fitting certain accessories according to my clients preferences could have improve the trust level and enhance the support			Total
	Yes	Unsure	No	
Business size Small	128	12	24	164
Medium	162	25	10	197
Big	10	0	4	14
Total	300	37	38	375

The cross-tabulation above, performed between the size of the dealership and the impact of assembly postponement (ATO) on customers' satisfaction (assurance). Out of the 375 samples, 300 agreed that ATO could improve customer's satisfaction (assurance). Twelve small dealerships while up to 24 infirmed. The sample size for this test was 375 made of 164 small businesses, 197 medium businesses, and 14 big businesses. A chi-square test was further performed to verify whether or not there is a relationship between the business size and ATO improving customer satisfaction.

Table 4B: Chi-Square Tests

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	52.195 ^a	6	.000
Likelihood Ratio	61.573	6	.000
Linear-by-Linear Association	25.256	1	.000
N of Valid Cases	375		

a. 3 cells (25.0%) have expected count less than 5. The minimum expected count is .90.

Presented on the table above, is the extent to which the postponement (ATO) could lead to the improvement of service assurance. A Pearson chi-square test was performed, and the result was interpreted as follow. The P-value, which has been labelled as Asymp. Sig. (2-sided) in the table has a

value 0.000, which is. ($P=0.000 < 0.001$) and a Pearson chi-square value of 52.195, a degree of freedom equal to 6. This result ($P=0.000 < 0.001$) shows very strong evidence against the null hypothesis, which is ATO does not correlate to customer satisfaction in favour of the alternative hypothesis. With a degree of freedom that is equal to 4, it should be inferred that six in the final calculation of the statistic are free from vary. H_0 that has been tested if is there no statistical relationship between postponement (ATO), that could lead to improvement of the of service assurance, a critical element of dealer satisfaction. The test has rejected the null hypothesis, is thus accepted in accordance with the result of the test that was performed

Table 4C: Symmetric Measures

Symmetric Measures

	Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Interval by Pearson's R	-.260	.049	-5.197	.000 ^c
Ordinal by Spearman Correlation	-.228	.052	-4.515	.000 ^c
N of Valid Cases	375			

- Not assuming the null hypothesis.
- Using the asymptotic standard error assuming the null hypothesis.
- Based on normal approximation.

The person chi-square has reveal a very strong evidence of association between respondent business size and service assurance. There is a relationship between respondent age and his satisfaction been improved by his involvement been improved by ATO of the car, the strength of that relation is tested by the spearman correlation. The Spearman Correlation is -0.228 which according to Dancey and Reidy (2004) implies a weak relationship. Given the fact that $-0.228 < 0$, the improvement of service assurance of service decrease monotonically with the customers the company size.

Recommendations from the findings /managerial impacts

The research findings have considerable practical implications on the automobile supply network, which lead to the following recommendations. Most importantly the supply chain communication should be improved, extended to the end-users who are at the centre of the supply chain hence all the others players relying mostly on the end-user for their business continuity and survival. As the adverse impact of the 4IR is looming, few South African bank already received the waves forcing them into job cuts, this impact is set to be extended to the automotive industry network as the e-commerce gain popularity, and the networking which is the main characteristic of the 4IR is expanding exponentially.

As the e-commerce and the globalisation spraying across the globe coupled with the 4IR, many supply networks are shaken, and the south automobile supply network is not immune from that wave. Many jobs and business are at stake if not prepare to integrate the necessary changes to remain resilient. Many companies are said to be competing for trough supply chain, and the dealers are suppliers are vulnerable to the impact of the fourth industrial revolution as everything from the spare to the whole car, second hand and brand new online. Customer's satisfaction is thus imperative to ensure not just loyalty which might be traditionally base on lack of choices, should from now on be rooted in customer satisfaction. In line with the hiking unemployment which stands at almost 30% in South Africa, but can be exacerbated by the lack of skill as professional has some cases mentioned the non-employability of the South African force due to lack of skill or poor alignment to the labour market.

Postponements strategies should be prioritised as the customer satisfaction enhances and retention tools in the automobile sector, which only is the pride of South Africa as carmakers but also its contribution to the economy GDP and job creations if very important to be overlooked. As suggested, the postponements strategy has already on the South Africa automobile supply network; however, the most critical component of the chain, which is the end-users has not been given the attention it deserves. Engineer To Order, Manufacturer To Order, Assembly To Order have so far been well implemented. Unfortunately, the Make To Stock, the variable of full speculation is not a real postponement strategy because there is no substantial input from the end-users, as the 4IR give the end-users more choices, measures should be

taken to accommodate this critical component of the network. Understanding it would have been difficult to achieve considerable input to the process and product design from the end-user, the 4IR offers an opportunity that can be used to reach customers and has more input but also that can be a threat if not properly managed, given the extensive networking. These actions should be carried out on a regular customer satisfaction survey, market and marketing research as the most appropriate mass communication with the customers.

The inputs from the customers will give the supply network and the industry more knowledge of customer's what expectations for what segment of clients. Understanding customers' expectation is the cornerstones of customers' value add, customer retention and loyalty and satisfaction. As proposed by the framework offers by this study on how to enhance customer satisfaction using postponement strategy across the supply network. Since improving satisfaction through postponement strategy is income level specific, job status specific and age range specific, the automotive supply network needs to deploy more resources and emphasise more on the middle-income level, working adult age from 25 to 45 years old and. Full speculation should be revisited to realigned the end-users expectation and organisation strategy while using the technology to remain affordable on the market the network services and to explore the new market.

Conclusion

The main objective of this paper was to establish the between customer's satisfaction enhancement and customers' satisfaction, through the postponement strategy along with the supply chain network with the main focus on the assembly to order. It was hypothesizing that they are a positive relationship between postponement strategy, namely the assembly to order and customer satisfaction in the automotive network. A considerable sample of 384 that was chosen using the Slovincs formula was surveyed, and the analysis of the data process to test the hypothesis was undertaken. IT Wa found the ATO could potentially improve customer's satisfaction as it has improved the service and product quality.

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