

Service quality, customer satisfaction and loyalty in automobile maintenance services

Evidence from a developing country

Samuel Famiyeh

Ghana Institute of Management and Public Administration, Accra, Ghana, and
Amoako Kwarteng and Disraeli Asante-Darko
Business School, Ghana Institute of Management and Public Administration,
Accra, Ghana

Abstract

Purpose – The purpose of this paper is to understand the relationship between service quality, customer satisfaction and the loyalty of car owners. The aim is to understand the relative importance of the various service quality dimensions to Ghanaian car owners as to what drive satisfaction and whether this satisfaction has implication on their loyalty.

Design/methodology/approach – The study used a survey of car owners and relied on partial least squares-structural equation modeling to study the relationship between service quality and its impact on customer satisfaction and loyalty. Further moderation analysis based on the number of years of dealing with the mechanic was conducted.

Findings – The result indicates empathy, assurance, responsiveness and tangibles have a significant positive relationship with customer satisfactions. However, the reliability of the mechanic has no significant positive relationship with the satisfaction of customers. The results also indicate that customer satisfaction has a direct positive relationship with customer loyalty. The results further indicate that empathy and reliability of the mechanic have a significant positive relationship with customer loyalty; however, the assurance, responsiveness and tangibles have no significant relationship with customer loyalty. The moderation analysis indicated no significant differences in the hypothesis tested and the length of years of customers dealing with the mechanic.

Research limitations/implications – There is the need for mechanics to provide caring and individual attention to car owners, it is also important for mechanics to understand that customers want their cars to be serviced by mechanics who exhibit knowledge and courtesy and also deliver service in a very responsive manner. The appearance of the workshop, equipment and directions are also very important to customers. It is, therefore, important for mechanics do their best to satisfy these customers for them to remain loyal.

Practical implications – The findings indicate the importance of empathy, assurance, responsive and tangibles in mechanic service delivery. It is, therefore, important for mechanics to consistently provide personal attention, attend to customers in a friendly manner, deliver cars after services, provide information to customers when extra repairs are required and should take the time to explain issues to customers. In addition, it is important for mechanics to screen and employ very courteous employees who can tell customers exactly the kind of services needed as well as communicate effectively on the risks of repairs. Prompt services also seem to be the key to the satisfaction of customers.

Originality/value – The work illustrates and provides some insights and builds on the literature in the area of service quality, customer satisfaction and loyalty from a developing country's environment. This is one of the few research works investigating the issue of service quality, customer satisfaction and customer loyalty in automobile services using data from the sub-Saharan African environment.

Keywords Engineering, Quality, Loyalty, Satisfaction, Maintenance, Mechanics

Paper type Research paper



1. Introduction

The concern of service quality, customer satisfaction and customer loyalty is becoming the most important factor of successful business competition for service providers (Rust *et al.*, 1995; Zeithaml *et al.*, 1996). As the development of service quality has been identified as a key strategy to increase the level of customer satisfaction and the intention for customers to

revisit, providing quality service for customers poses great importance for both retention and customer satisfaction (Lee *et al.*, 2011). Brito *et al.* (2007) investigated the determinants of customer choice of car maintenance after the warranty period. The work focused on the alternative of using branded car dealers, who provide services during the warranty period, or independent garages. They found out that service attributes that determine customer choice of a car maintenance are the ones consumers simultaneously consider important and perceive differences in performance between the service providers. The branded dealers service operation proved to be relatively weak, having only one of these attributes, while being better evaluated in less important ones.

According to Long and McMellon (2004), different service quality dimensions are important in different industries, and research works relating to service quality in the informal automobile sectors have not been explored within the non-western countries. In 2015, Izogo conducted factor analysis and tested for internal scale consistency of the SERVQUAL scale using data collected from a sample of customers of automotive repair services in a village located in Southeastern Nigeria. In this work, Izogo only investigated the diagnostic abilities and dimensional structure of the SERVQUAL using exploratory factor analysis. Izogo and Ogba (2015) further explored the relationship between the service quality dimensions and customer satisfaction/loyalty. In this work, only four of the SERVQUAL dimensions were used excluding assurance in the model. In addition, the authors combined the two dependent endogenous variables, namely customer satisfaction and loyalty, as one construct in the model. Combining these two important dependent variables presents some limitations on as to how the various quality dimensions impact separately on customer satisfaction and loyalty.

Examining all the various dimensions of service quality and its relationship with customer satisfaction and loyalty is, therefore, an interesting area of research in non-western automobile repairs such as Ghana as suggested by Izogo (2015) for two reasons. First, in these countries, a vast majority of these technicians seems to have no formal training certification. This is evident in the work of Osei-Boateng and Ampratwum (2011) who indicated that these mechanics form a strong component of the informal sector in Ghana. In a study conducted by Jaarsma *et al.* (2011) on the Suame Magazine, the heart of the Ghanaian car repair, concluded that the lack of basic modern machinery coupled with the fact that there is no car production plant in Ghana makes the quality of mechanic services an interesting area that needs some investigations. Second, an average of 70,146 used cars is imported into Ghana every year (Modern Ghana, 2008). These cars are used by the majority of the citizenry, and manufacturers of these cars do not have dealers in the Ghanaian environment for routine services. Therefore, an understanding of how the majority of the citizenry select their mechanics who normally have no formal education, certification and not well-equipped workshops as well as modern diagnostic equipment to work with is worth investigating.

This paper, therefore, aims at filling this important gap using data from the two largest cities in Ghana to understand the relationship between service quality, customer satisfaction and loyalty. The idea is to understand the relative importance of the various service quality dimensions to car owners, as well as what drives their satisfaction and loyalty. We make two key contributions to the literature. First, we examine the relationship between the SERVQUAL model and customer satisfaction and loyalty in a completely different environment. Second, we further perform a moderation analysis to assess as to whether there is a significant change based on the number of years of dealing with the mechanic.

The rest of the paper is structured into five main parts. First, we present the literature review and the research hypothesis, together with the conceptual model. This is followed by the research method and the mode of data collection procedures. We then present the data analysis and the main findings from the work. This is followed by the discussions and conclusions.

2. Literature review and the development of research hypothesis

2.1 Service quality and customer satisfaction

Customer satisfaction is referred to as a function of the customer's expectations and perceptions of performance according to the expectancy (Tse *et al.*, 1988) and it is a construct closely related to perceived service quality (Magi and Julander, 1996). A study carried out by Magi and Julander (1996) among a section of grocery stores in Sweden showed a positive relationship between perceived service quality, customer satisfaction and customer loyalty. They indicated that customer satisfaction results from high perceived service quality and this makes the customer loyal. Fen and Meillan (2005) and Su *et al.* found that both service quality and customer satisfaction have a positive effect on customer's re-patronage intentions, showing that both service quality and customer satisfaction have a crucial role to play in the success and survival of any business in the competitive market. Service quality has been classified into five main dimensions – reliability, tangibles, responsiveness, assurance and empathy (Parasuraman *et al.*, 1988).

Service reliability is the consistency in performing the service dependably and accurately (Bouman and Ton van der Wiele, 1992). In the context of this work, reliability will, therefore, be seen as the ability of the mechanic to perform the promised services both in a dependable and accurate manner which, in turn, has a direct positive impact on the satisfaction and loyalty of the customers. Responsiveness according to Bouman and Ton van der Wiele (1992) is the ability to perform the service within an appropriate time scale to customer demand and provide adequate response to service quality. The nature of the response is simply a function of the worth value of time for both the customer and the service provider. Assurance encompasses the conveyance of trust and confidence to the customer. This can be achieved through the exhibition of efficient knowledge dissemination and the courtesy of the mechanic in a car service delivery industry. Tangibles relate to the physical facilities, equipment, the appearance of personnel as well as the appearance of the workshop and the states of equipment in the shop. Customers do not only look out for the service alone but the physical aesthetics play on their minds (Bouman and Ton van der Wiele, 1992; Shahin, 2009). Parasuraman *et al.* (1988) defined empathy as the caring, individualized attention the firm provides for its customers. Empathy is proved to be influential in customer loyalty (Butcher, 2001; Ndubisi, 2006; Ehigie, 2006).

Service quality dimensions described above are found to be a strong predictor of customer satisfaction (Cronin *et al.*, 2000; Pantouvakis and Patsiouras, 2016; Yuen and Thai, 2015). Researchers in different industries have investigated the relationship between service quality and customer satisfaction. Different industries which researchers study are, for instance, telecommunications (Woo and Fock, 1999), restaurants (Gilbert *et al.*, 2004), health (Andaleeb and Basu, 1998), hotel services (Voss *et al.*, 1998), travel agencies (Bitner, 1990), internet services (Kim and Lim, 2001; Van Riel *et al.*, 2001) and multiple industries (Bitner *et al.*, 2000). Cronin and Taylor (1992) concluded that there is a direct influence of service quality on customer satisfaction. Bitner *et al.* (1994) and Anderson *et al.* (1994) also pointed to this link by suggesting that improved service quality will result in a satisfied customer. One of the main purposes of the present study is to understand the impact of the five service quality dimensions on the satisfaction of customers patronizing the services of auto mechanics in Ghana. According to Agyapong (2011), a telecom company in Ghana can be very competitive if they paid attention to the individual needs of the customers. He concluded by suggesting that a reduction in customer attitudinal ambivalence can lead to customer satisfaction. In a confirmatory factor analysis of the service quality dimensions in the mobile telephony industries in Ghana, Nimako *et al.* (2012) found that to be competitive as a telephone company in Ghana, it is important to pay attention to customer relation, which includes responsiveness, assurance and empathy of the service quality dimension. He further confirmed that tangibles, which best describe the extent of the physical and structural appeal of the company, are

extremely important to the satisfaction of the Ghanaian consumer. It is expected that the same relationship will prevail between mechanics in Ghana and their customers. Hence, based on the above arguments, the following hypotheses are proposed:

- H1a.* The empathy of the mechanic has a positive impact on the satisfaction of the customers.
- H1b.* The reliability of the mechanic has a positive impact on the satisfaction of the customers.
- H1c.* The assurance of the mechanic has a positive impact on the satisfaction of the customers.
- H1d.* The responsiveness of the mechanic has a positive impact on the satisfaction of the customers.
- H1e.* The tangibility of the mechanic has positive impact on the satisfaction of the customers.

2.2 Customer satisfaction and customer loyalty

Oliver (1999, p. 34) defined loyalty as “a deeply held commitment to rebuy or re-patronize a preferred product/service consistently in the future, thereby causing repetitive same-brand purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior.” The practice of excellent service quality has been proven that customer satisfaction will significantly lead to customer loyalty (Caruana *et al.*, 2000; Caruana, 2002). Excellence in service quality is, therefore, important to achieve customer loyalty which is the primary goal of business organizations, due to the advantages of customer retention (Ehigie, 2006). Customers are normally said to be pleased because of a beneficial passion which derives from a procedure of evaluating what has been obtained against what was predicted, such as the purchasing choice itself and the needs and wants associated with the purchasing (Van Der Wiele, 2002) and significant positive relationship between customer satisfaction and customer loyalty. Service quality is considered very important because it leads to higher customer satisfaction, profitability, reduced cost, customer loyalty and retention (Chingang and Lukong (2010). Service quality and customer satisfactions are very important concepts that companies must understand in order to be operationally efficient and remain competitive (Modgil and Sharma, 2016). The second objective of the study is to understand the impact of customer satisfaction on the loyalty of customers of auto mechanics. Boohene and Agyapong (2010) identified a positive relationship between the dimensions of service quality and customer loyalty in Ghana in the telecom sector. A study by Iddrisu (2011), based on mobile network portability in Ghana, revealed that service quality variables have a positive influence on customer loyalty through customer satisfaction. This study also established that there exist a direct relationship between customer satisfaction and customer loyalty. We expect this same relationship in the present study; hence, based on the above arguments, the study proposed the following hypothesis:

- H2.* The satisfaction of the owners of the cars that are serviced has a direct positive relationship with their loyalty to their mechanics.

2.3 Service quality and customer loyalty

Zeithaml *et al.* (1996) suggested that customers’ relationship with an organization is strengthened when the customer makes a favorable assessment of the organization’s service quality and weakened when customers make a negative assessment of the organization’s service quality. They argued that such favorable assessment of the quality of services will lead to favorable behavioral intentions like “praise for the company” and expressions of preference for the company over other companies. Customer loyalty is an important objective for strategic marketing planning and represents an important basis for developing

a sustainable competitive advantage. Oliver (1999) indicated a positive relationship between the loyalty of customers and performance of companies. Studies have found that service quality determines customer satisfaction and affects customer loyalty through satisfaction (Cronin and Taylor, 1992; Rust and Oliver, 1994). Datsomor (2012) established that there exists a positive relationship between all the five dimensions of service quality and customer loyalty in terms of the car service delivery in Ghana. The third objective of this study is to understand the impact the five dimensions of quality on the loyalty of customers of auto mechanics who provide services to car owners. Hence, based on the above arguments, we proposed the following hypotheses:

- H3a.* The empathy of the mechanic has a positive impact on the loyalty of the customers.
- H3b.* The reliability of the mechanic has a positive impact on the loyalty of the customers.
- H3c.* The assurance of the mechanic has a positive impact on the loyalty of the customers.
- H3d.* The responsiveness of the mechanic has a positive impact on the loyalty of the customers.
- H3e.* The tangibility of the mechanic has a positive impact on the loyalty of the customers.

Figure 1 summarizes the hypotheses of this study in a conceptual model. The hypothesized relationships between the constructs are all hypothesized as positive (+).

3. Research methods

3.1 Data collection process

A well-structured questionnaire was developed and sent to the various customers of different competing mechanic shops in the two most populated cities in Ghana,

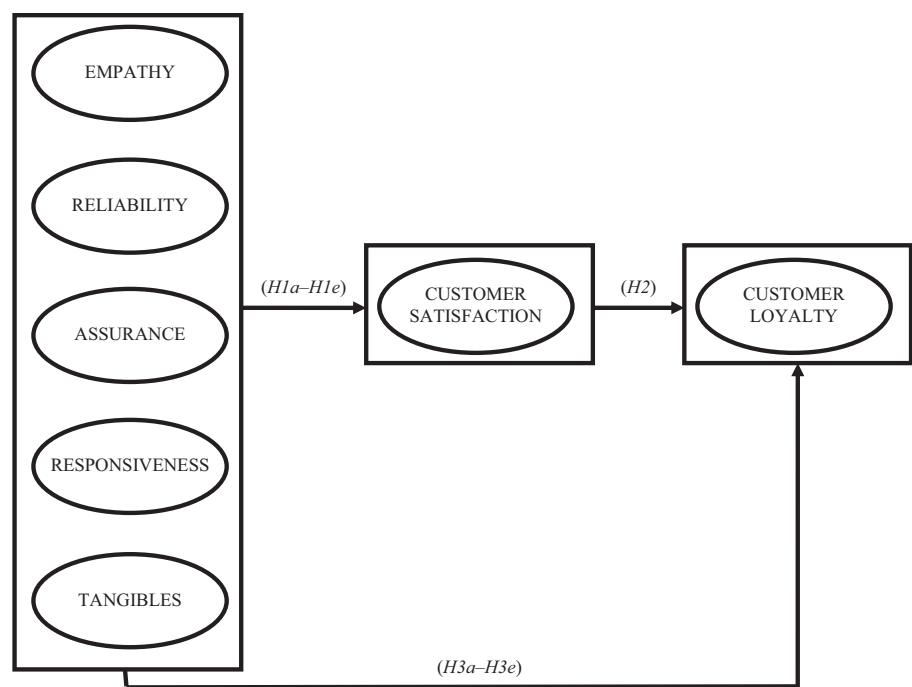


Figure 1.
The conceptual model

namely, Accra and Kumasi. This was done through the assistance of both graduate and undergraduate students pursuing business studies in one of the most recognized business schools in Ghana. Each student was responsible for identifying four individuals who own a car and hand over one questionnaire each to each of them. The car owners are given one to two weeks to complete the survey. The instrument consisted of seven distinct sections, the first five sections dealt with specific questions related to the five dimensions of service quality by Parasuraman *et al.*, 1988 and was contextualized into the car maintenance services. The sixth and the seventh parts were structured based on customer satisfaction and customer loyalty constructs, respectively. All the items were contextualized to the car services operations for easy understanding by those answering them. The last section of the questionnaire addressed the demographic details of the customers. The instrument was pretested with experts in marketing and service operations management as well as practitioners and the feedback received were used to improve the final piece before administering them.

In all, 400 questionnaires were sent out in total, 300 of them went to respondents in Kumasi and 100 went to respondents in Accra. In total, 362 questionnaires were received, representing a response rate of 90.5 percent, however, only 256 were usable due to incomplete, cancellations, etc. Respondents consisted of customers of different backgrounds and ages. Of the 256 respondents, 92 representing 35.9 percent were females, while the rest 164 representing 64.1 percent were males. In terms of age groups, 176 out of the 256 respondents representing 68.8 percent were between the ages of 18 and 40 years, 47 representing 18.3 percent were also between the ages of 41 and 50 years and those above age 50 were 33, representing 12.9 percent. Respondents were also grouped into four main educational levels. Those with high school qualification were 20 representing 7.8 percent, professional qualifications were 30 representing 11.8 percent, post graduate qualifications were 82 representing 32.0 percent and graduates were 124 representing 48.4 percent. In total, 144 of the respondents, representing 56.3 percent, have dealt with their mechanics for less than two years, while the remaining 112 representing 43.7 percent have dealt their mechanics for more than two years.

3.2 Operationalization of the variables

All items were measured on Likert-type scales ranging from 1 “strongly disagree” to 5 “strongly agree.” The service quality items used in the survey questionnaire were adapted and expanded from the previously validated SERVQUAL scale developed by Parasuraman *et al.*, 1988 and contextualized it into the car maintenance or mechanic services. The expanded version of the indicators scale was modified in accordance to capture sector-specific and cultural issues within the context of the study. Service quality was measured using the five main constructs: reliability, tangibles, responsiveness, assurance and empathy – measured across 22 items or service attributes (Parasuraman *et al.*, 1988). The customer satisfaction construct was operationalized using a differential scale similar to other affective interpretations of customer satisfaction (Oliver, 1997; Spreng *et al.*, 1996; Westbrook and Oliver, 1991). The customer loyalty scale draws on the attitudinal and behavioral patronage logic of commitment described by, e.g., Lam *et al.* (2004), Morgan and Hunt (1994) and Zeithaml *et al.* (1996).

The questionnaire was developed by largely adopting constructs suggested in relevant research as it is described below:

- (1) Service quality: the dimensions’ choice was influenced by the works of Parasuraman *et al.* (1988) and Izogo (2015) who summarized and categorized the quality factors identified and contextualized it into capture sector-specific and cultural issues within the context of the study:
 - Empathy – was measured based on the ability of the mechanic to give personal attention to customers, be friendly, delivering cars to customers after repairs,

sharing information and asking whether clients are satisfied with invoices provided after the service.

- Reliability – was measured based on the ability of the mechanic to deal with complaints directly, his/her skillfulness, showing of reliable behavior, giving good advice, provision of error-free repairs, explaining why repairs are needed, provision of checklist and a written estimate.
 - Assurance – was measured on the ability of the mechanic to exhibit courteous behavior, consideration of the customer's interest and informing customers exactly what services can be expected.
 - Responsiveness – was measured based on the ability of the mechanic to keep appointments, performance of only important works, provision of good replacement cars when a customer's car is supposed to stay at the shop, delivering of customer's car outside normal operating times, providing the car at the promised time, operating at convenient hours and answering of customer's call quickly.
 - Tangibles – was measured based on the availability of well-groomed employees, availability of attractive promotion materials, availability of direction signs to the shop, provision of coffee/cocoa/drink while waiting, neatness of the workshop, calling of customers by their names, provision of a seat at a waiting room while providing services, cleaning of the car after maintenance and the provision of enough parking spaces.
- (2) Customer satisfaction – The customer satisfaction construct was operationalized using a differential scale similar to other affective interpretations of customer satisfaction (Oliver, 1997; Spreng *et al.*, 1996; Westbrook and Oliver, 1991). Satisfaction was measured with items such as the overall feeling toward the mechanic and the level of satisfaction with the service provided.
- (3) Customer loyalty – the customer loyalty scale draws on the attitudinal and behavioral patronage logic of commitment described by others (e.g. Lam *et al.*, 2004; Morgan and Hunt, 1994; Zeithaml *et al.*, 1996). Customer loyalty was measured with items such as the possibility of the customer returning to the mechanic for service, committed relationship, recommending to others and always saying positive things about the mechanic.

4. Data analysis and results

4.1 Data analysis

Partial least squares-structural equation modeling (PLS-SEM) was used to study the relationship between service quality and its impact on customer satisfaction and customer loyalty. Structural equation modeling (SEM) is a second-generation multivariate data analysis method that can test theoretically supported linear and additive causal models (Chin, 1998; Statsoft, 2013). PLS-SEM is a soft modeling approach to SEM with no assumptions about data distribution (Esposito Vinzi 2009) and flexible on sample size. PLS-SEM approach seeks to maximize predictive accuracy (R^2) of the endogenous variables while at the same time permitting retention of more indicators for each construct (Hair *et al.*, 2014). On the basis of calculations and modeling, it can be perceived that PLS-SEM path modeling is appropriate to carry on the confirmatory factor analysis which is more reliable and valid (Asyraf and Afthanorhan, 2013). These attributes of PLS-SEM make it an ideal data analysis tool for the current study.

4.2 Reliability and validity analyses

In order to proceed with the analysis, we examined the validity and reliabilities of our items and constructs. To establish convergent validity, we considered the outer loadings of the items as well as the average variance extracted (AVE) of the constructs. Figure 2 and Table I show that factor loadings of items were above the acceptable thresholds, as all items had significant loadings above 0.5 on their associated constructs (Fornell and Larcker, 1981). In Table II, all the AVE values were all above the recommended threshold value of 0.5 (Fornell and Larcker, 1981). Discriminant validity was established using two techniques, namely, cross-loadings and Fornell-Larcker criterion. From Table IV, items seem to load better on the own construct than other constructs satisfying the underlying principles of the cross-loading technique. Also, the Fornell-Larcker criterion compares the square root of the AVE values with latent variable correlations (Fornell and Larcker, 1981). We establish that the square root of all AVEs was greater than the correlations with other constructs (Chin, 1998, Fornell and Larcker, 1981), as shown in Table III, exhibiting discriminant validity. We also ensured that the constructs had high internal consistency by calculating their composite reliabilities (CR) and Cronbach's α (CA) values. Cronbach's α values, as well as the CR values, were all above the recommended threshold of 0.7 (Hair *et al.*, 2014; Nunnally and Bernstein, 1994), as displayed in Table II.

The interpretation of Tables I–IV indicates the satisfaction of all the quality criteria since the psychometric properties of the data set seem appropriate, hence deemed adequate for further analysis.

4.3 Results

In Figure 2, we present the results of both the measurement and the structural models. The bootstrapping procedure using re-samples of 5,000 was used to determine the significance of the path coefficients in the model. The bootstrap results are shown in Table V. We begin the

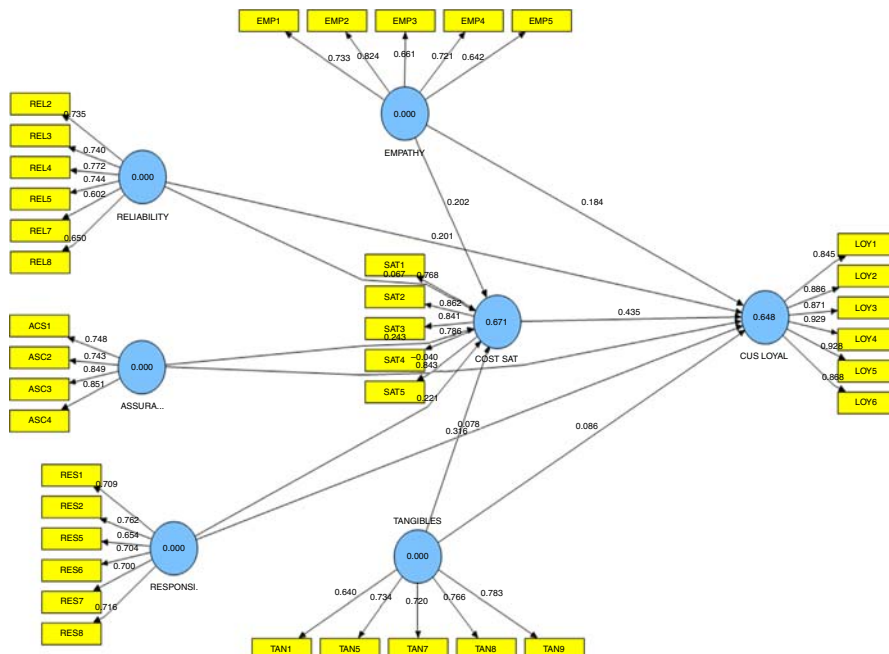


Figure 2.
Results of the
measurements and
structural model

Table I.
Items used in the
model and their
factor loadings

Measures	Assurance	CUS LOYAL	CUST SAT	Empathy	Reliability	Responsiveness	Tangibles
ACS1	0.748						
ASC2	0.743						
ASC3	0.849						
ASC4	0.851						
EMP1				0.733			
EMP2				0.824			
EMP3				0.661			
EMP4				0.721			
EMP5				0.642			
LOY1		0.845					
LOY2		0.886					
LOY3		0.871					
LOY4		0.929					
LOY5		0.928					
LOY6		0.868					
REL2					0.735		
REL3					0.740		
REL4					0.772		
REL5					0.744		
REL7					0.602		
REL8					0.650		
RES1						0.709	
RES2						0.762	
RES5						0.654	
RES6						0.704	
RES7						0.700	
RES8						0.717	
SAT1			0.768				
SAT2			0.862				
SAT3			0.841				
SAT4			0.786				
SAT5			0.843				
TAN1							0.640
TAN5							0.734
TAN7							0.720
TAN8							0.766
TAN9							0.783

Table II.
AVE, composite
reliability, Cronbach's
 α , and R^2 measures

Constructs	AVE	Composite reliability	R^2	Cronbach's α
ASSURANCE	0.639	0.876	–	0.812
CUS LOYAL	0.789	0.957	0.648	0.946
CUST SAT	0.674	0.912	0.671	0.878
EMPATHY	0.517	0.841	–	0.768
RELIABILITY	0.504	0.858	–	0.807
RESPONSIVENESS	0.502	0.858	–	0.802
TANGIBLES	0.533	0.851	–	0.780

analysis of the structural model by evaluating the Pearson's coefficients (R^2). This R^2 is a very important indicator of the portion of the variance of the endogenous variables, customer satisfaction, and loyalty which is explained by the structural model. It also indicates the quality of the adjusted model. According to Cohen (1988), an $R^2 = 2$ percent is classified as

Table III.
Discriminant validity-
Fornell-Larcker
criterion

having a small effect, $R^2 = 13$ percent is classified as having a medium effect and $R^2 = 26$ percent can be classified as having a large effect. Thus, the results in Figure 2 indicate that the model explained 67.1 and 64.8 percent of the variance in customer satisfaction and loyalty, respectively, indicating very large effect on the endogenous constructs.

Constructs	Assurance	CUS LOYAL	CUST SAT	Empathy	Reliability	Responsiveness	Tangibles
ASSURANCE	<i>0.799</i>						
CUS LOYAL	0.513	<i>0.888</i>					
CUST SAT	0.631	0.753	<i>0.821</i>				
EMPATHY	0.440	0.596	0.567	<i>0.719</i>			
RELIABILITY	0.591	0.661	0.644	0.573	<i>0.710</i>		
RESPONSIVENESS	0.456	0.615	0.660	0.490	0.633	<i>0.708</i>	
TANGIBLES	0.503	0.585	0.677	0.352	0.562	0.591	<i>0.730</i>

Note: The italic numbers on the diagonal are the square root of the AVEs

Items	Assurance	CUS LOYAL	CUST SAT	Empathy	Reliability	Responsiveness	Tangibles
ACS1	<i>0.748</i>	0.538	0.555	0.384	0.528	0.404	0.544
ASC2	<i>0.743</i>	0.388	0.510	0.361	0.369	0.400	0.355
ASC3	<i>0.849</i>	0.296	0.441	0.291	0.463	0.321	0.296
ASC4	<i>0.851</i>	0.351	0.468	0.340	0.503	0.297	0.346
EMP1	0.319	0.455	0.470	<i>0.733</i>	0.476	0.311	0.302
EMP2	0.384	0.581	0.500	<i>0.824</i>	0.420	0.449	0.270
EMP3	0.363	0.380	0.345	<i>0.661</i>	0.508	0.396	0.280
EMP4	0.205	0.304	0.280	<i>0.721</i>	0.263	0.253	0.190
EMP5	0.274	0.342	0.378	<i>0.642</i>	0.367	0.317	0.201
LOY1	0.336	<i>0.845</i>	0.539	0.479	0.501	0.493	0.455
LOY2	0.491	<i>0.886</i>	0.691	0.474	0.587	0.525	0.527
LOY3	0.526	<i>0.871</i>	0.636	0.577	0.640	0.538	0.479
LOY4	0.466	<i>0.929</i>	0.709	0.600	0.626	0.583	0.559
LOY5	0.479	<i>0.928</i>	0.717	0.556	0.596	0.569	0.546
LOY6	0.421	<i>0.868</i>	0.702	0.483	0.560	0.564	0.540
REL2	0.432	0.497	0.515	0.408	<i>0.735</i>	0.437	0.500
REL3	0.478	0.551	0.565	0.419	<i>0.740</i>	0.528	0.424
REL4	0.502	0.577	0.525	0.478	<i>0.772</i>	0.576	0.408
REL5	0.404	0.433	0.403	0.509	<i>0.744</i>	0.438	0.252
REL7	0.369	0.341	0.337	0.297	<i>0.602</i>	0.253	0.369
REL8	0.267	0.321	0.298	0.282	<i>0.650</i>	0.378	0.448
RES1	0.349	0.349	0.409	0.253	0.481	<i>0.709</i>	0.443
RES2	0.365	0.425	0.497	0.389	0.481	<i>0.762</i>	0.365
RES5	0.266	0.400	0.413	0.243	0.359	<i>0.654</i>	0.366
RES6	0.339	0.482	0.540	0.393	0.486	<i>0.704</i>	0.528
RES7	0.281	0.489	0.503	0.308	0.476	<i>0.700</i>	0.421
RES8	0.337	0.442	0.410	0.476	0.391	<i>0.717</i>	0.373
SAT1	0.493	0.581	<i>0.768</i>	0.333	0.454	0.551	0.598
SAT2	0.509	0.620	<i>0.862</i>	0.482	0.471	0.551	0.558
SAT3	0.588	0.615	<i>0.841</i>	0.523	0.542	0.502	0.522
SAT4	0.552	0.543	<i>0.786</i>	0.508	0.599	0.529	0.511
SAT5	0.454	0.719	<i>0.843</i>	0.474	0.575	0.575	0.590
TAN1	0.373	0.423	0.497	0.318	0.475	0.492	<i>0.640</i>
TAN5	0.373	0.324	0.461	0.170	0.355	0.354	<i>0.734</i>
TAN7	0.370	0.464	0.504	0.286	0.371	0.433	<i>0.720</i>
TAN8	0.335	0.452	0.509	0.291	0.465	0.430	<i>0.766</i>
TAN9	0.383	0.450	0.493	0.202	0.377	0.436	<i>0.783</i>

Table IV.
Items cross-loadings:
discriminant validity

Note: Significance level: 0.05

Table V.
Hypothesis tested,
path coefficients and
significance levels
from bootstrapping

Constructs	Original sample	Sample mean	SD	SE	t-statistics	p-values
ASSURANCE → CUS LOYAL	−0.040	−0.035	0.053	0.053	0.770	0.442
ASSURANCE → CUST SAT	0.243	0.237	0.062	0.062	3.9349***	0.000
CUST SAT → CUS LOYAL	0.435	0.433	0.071	0.071	6.0968***	0.000
EMPATHY → CUS LOYAL	0.184	0.185	0.055	0.055	3.3467***	0.001
EMPATHY → CUST SAT	0.202	0.206	0.043	0.043	4.7287***	0.000
RELIABILITY → CUS LOYAL	0.201	0.196	0.062	0.062	3.2651***	0.001
RELIABILITY → CUST SAT	0.067	0.070	0.063	0.063	1.067	0.287
RESPONSIVENESS → CUS LOYAL	0.078	0.079	0.065	0.065	1.197	0.232
RESPONSIVENESS → CUST SAT	0.221	0.219	0.056	0.056	3.9649***	0.000
TANGIBLES → CUS LOYAL	0.086	0.087	0.061	0.061	1.405	0.161
TANGIBLES → CUST SAT	0.316	0.319	0.058	0.058	5.4056***	0.000

Notes: *, **, ***Significant at 0.10, 0.05 and 0.01, respectively

As far as the hypothesized relationships are concerned, the results indicate that empathy, assurance, responsiveness and tangibles of the mechanic all have a significant positive relationship with the satisfaction of customers sending their cars for servicing ($\beta = 0.202$, $p = 0.000$), assurance ($\beta = 0.243$, $p = 0.000$), responsiveness ($\beta = 0.221$, $p = 0.000$) and tangibles ($\beta = 0.316$, $p = 0.000$). However, the reliability of the mechanic has no significant positive relationship with the satisfaction of customers ($\beta = 0.067$, $p = 0.287$) accepting *H1a*, *H1c*, *H1d*, *H1e* but rejection *H1b*. The results also indicate that customer satisfaction has a direct positive relationship with customer loyalty ($\beta = 0.435$, $p = 0.000$), satisfying *H2*. The results further indicate that empathy ($\beta = 0.184$, $p = 0.000$) and reliability ($\beta = 0.201$, $p = 0.000$), of the mechanic have a significant positive relationship with customer loyalty. However, the assurance ($\beta = -0.040$, $p = 0.442$), responsiveness ($\beta = 0.078$, $p = 0.232$), and tangibles ($\beta = 0.086$, $p = 0.161$) have no relationship with customer loyalty, accepting *H3a* and *H3b*, but rejecting *H3c*, *H3d* and *H3e*.

4.4 Model predictive relevance Q^2 and effect size f^2

In addition to the evaluation of the R^2 values of the endogenous constructs, we also evaluated the f^2 and Q^2 values. The f^2 , the effect size, is the change in R^2 values when a specified exogenous construct is omitted from the model (Cohen, 1988). This can be used to evaluate whether the omitted construct has a substantive impact on the endogenous constructs or not. The effect size can be calculated as:

$$f^2 = \frac{R^2_{\text{included}} - R^2_{\text{excluded}}}{1 - R^2_{\text{included}}}$$

where R^2_{included} and R^2_{excluded} are the R^2 values of the endogenous latent variable when a selected exogenous latent variable is included or excluded from the model, respectively.

Guidelines for assessing f^2 are that values 0.02, 0.15 and 0.35, respectively, represent small, medium and large effects (Cohen, 1988) of the exogenous latent variable. Hence, from Table VI, apart from assurance and responsiveness, all the exogenous latent variables seem to have some reasonable effect on the endogenous latent variables in the model. Surprisingly, tangibles seem to have a small negative effect on customer loyalty. To further examine the accuracy of our model, we examined the Stone-Geisser's Q^2 value (Geisser, 1974; Stone, 1974). The measure is an indicator of the model's predictive relevance. In the structural model, Q^2 values larger than zero for a certain reflective endogenous latent variable indicate the path models' predictive relevance for this particular construct (Chin, 1998; Henseler *et al.*, 2009; Tenenhaus *et al.*, 2005). The Q^2 values in Table VI were obtained using the blindfolding procedure in PLS 3.0. The same guidelines recommended by Cohen, 1988 are used to assess

the values of Q^2 . The results in Table VI, therefore, indicate Q^2 values of 0.671 and 0.648 for customer satisfaction and customer loyalty, respectively, indicating the very large predictive relevance of these endogenous constructs in the model.

4.5 Moderation analysis – multi-grouping

Moderation analysis in PLS-SEM is a suitable and applicable methodology for comparing research model beyond two groups. Taking the number of years of dealing with a mechanic into account might help further explain the relationship between the service quality dimensions, customer satisfaction, and loyalty and will provide a more accurate context for the variables (Koenig and Larson, 2001; Tix and Frazier, 1998). We, therefore, tested for the presence of moderation in our results using a multi-grouping analysis whereby the data were split into two groups based on the number of years of dealing with the mechanic. Here, we divided the sample into two main groups, customers who have dealt with their mechanic for less than two years and customers who have dealt with their mechanic over two years. The use of multi-group comparisons was to test if the relationships hypothesized in the model will differ from the value of the moderator (Floh and Treiblmaier, 2006; Byrne and Stewart, 2006). To this end, the multi-group analysis was to answer the question as to whether the relationship between the various service quality dimensions and customer satisfaction and loyalty is different among the two groups of customers surveyed.

A bootstrapping procedure using 5,000 samples for each group of data was analyzed for the two groups of customers. For any selected relationship in the structural model, we compare the group-specific bootstrapping results and their corresponding probabilities (p -values). A p -value of less than or equal to 5 percent implies statistically significant group differences in the estimated path model. Surprisingly, in Table VII, it can be seen that all the

Constructs	R^2	Q^2	Customer satisfaction	Customer loyalty
<i>Endogenous latent variables</i>	R^2	Q^2	f^2	f^2
Customer Satisfaction	0.671	0.419	–	–
Customer Loyalty	0.648	0.483	–	–
<i>Exogenous latent variables</i>				
Empathy	–	–	0.133	0.014
Reliability	–	–	0.030	0.039
Assurance	–	–	0.133	0.000
Responsiveness	–	–	0.050	0.008
Tangibles	–	–	0.139	–0.051
Customer satisfaction	–	–	–	0.167

Table VI.
Pearson's coefficients
(R^2), Predictive
relevance (Q^2) and
effect size (f^2)

Constructs	Path coefficients-diff groups 1 and 2	p -value
ASSURANCE → CUS LOYAL	0.124	0.753
ASSURANCE → CUST SAT	0.270	0.064
CUST SAT → CUS LOYAL	0.077	0.361
EMPATHY → CUS LOYAL	0.211	0.113
EMPATHY → CUST SAT	0.117	0.790
RELIABILITY → CUS LOYAL	0.335	0.961
RELIABILITY → CUST SAT	0.152	0.802
RESPONSIVENESS → CUS LOYAL	0.174	0.174
RESPONSIVENESS → CUST SAT	0.091	0.702
TANGIBLES → CUS LOYAL	0.093	0.676
TANGIBLES → CUST SAT	0.002	0.498

Table VII.
Bootstrap results of
the multi-grouping
analysis

p-values were greater than 5 percent meaning that there were no significant group differences in the path estimates, indicating that the relationship between the various quality dimensions and customer satisfaction and loyalty does not differ between the two customer groups.

5. Discussions and conclusions

5.1 Discussions

The findings indicate that quality dimensions such as empathy, assurance, responsiveness, and tangibles are very important to customers. This means the provision of care and individual attention is very important to car owners. It is, therefore, important for mechanics to pay particular attention to customers and should treat them fairly. This seems consistent with the results of Izogo (2015), who identified empathy as the most important dimension of service quality. Assurance and responsiveness as an indicator of customer satisfaction might be due to the fact that in Ghana, most car owners want to send their cars to mechanics who exhibit knowledge and courtesy as well as prompt services. This is really important because on average, most Ghanaians own only one car and it is likely to pose serious inconvenience when there are delays in service. Surprisingly, the results indicate that the reliability of the mechanic seems to have no positive relationship with the satisfaction of the customers, contradicting the work of Izogo and Ogba (2015). This might be due to the fact that on the average, the Ghanaian mechanic is not formally trained and hence customers do not basically assess their mechanics based on skills, behavior, provision of error free services, etc. Barber (2004) found out that in India and many other developing countries, informal training is one of the most dominant processes of skill acquisition of the labor force. In a study conducted by Jaarsma *et al.* (2011) on the Suame Magazine, the heart of the Ghanaian car repair, concluded that the lack of basic modern machinery coupled with the fact that there is no car production plant in Ghana, not forgetting the absence of officially licensed car dealers or other forms of market regulation, creates an environment that makes customers apprehensive to rely on.

The relationship between customer satisfaction and customer loyalty was also highly correlated, indicating that satisfied customers are likely to remain loyal. This is might be a cultural issue and consistent with the findings of Lam and Burton (2006) and Ehigie (2006).

The results also show that empathy has a direct positive relationship with customer loyalty. This is consistent with the findings by Butcher (2001), Ndubisi (2006) and Ehigie (2006). As suggested by Butcher (2001), the friendship between customers and particular service employees has a major influence on the development of customer loyalty. Surprisingly, assurance, responsiveness and tangibles have no relationship with customer loyalty. This indicates that the issue of tangibles such as the appearance of the mechanics and structures is not so important to customers. Amazingly, these findings are contrary to the prior findings in other studies (Jun and Cai, 2001; Joseph *et al.*, 2005; Glaveli *et al.*, 2006).

The findings have some practical implications for mechanics. The findings indicate the importance of empathy, assurance, responsive and tangibles for mechanics in order to remain competitive. It is, therefore, important for mechanics to consistently provide personal attention, attend to customers in a friendly manner, deliver cars after services, provide information to customers when extra repairs are required and should take the time to explain issues to customers. In addition, it is important for mechanics to screen and employ very courteous employees to tell customers exactly the kind of services needed as well as communicate effectively on the risks of repairs. Keeping to promise on service delivery as well as prompt services also seem to be the key to the satisfaction of customers. Last but not the least, the appearance of employees, as well as the workshop itself, seems to be very important to the satisfaction of customers. Empathy and reliability remain the two most important drivers of customer loyalty.

In this study, we focused on small mechanics who are employing about two to twelve workers who service no specific brands. These types of mechanics are all over the country. Future research can, therefore, investigate into the “big giants” say Toyota, Nissan, Volvo etc. where they service only their brand in order to compare the results. Again, this research can also be investigated at the regional level where we have communities with a different cultural background in order to check as to whether culture can change the results.

One limitation of this work is the use of data mostly from only two big cities in Ghana. It is important for other researchers to collaborate and collect data from a wider geographical area, say all the ten regional capitals of the entire West Africa, to investigate as to whether the results could be confirmed. The second limitation is the fact that we never conducted any mediation analysis to confirm as to whether customer satisfaction will mediate the relationship between service quality and customer loyalty in the Ghanaian perspective.

5.2 Conclusions

The concept of service quality, customer satisfaction, and loyalty has been an important research subject for many years now. The present study contributes to the literature by investigating the relationship between the five dimensions of quality and customer satisfaction and loyalty based on mechanics from a different environment. This study used the SERVQUAL scale as the underlying model to examine the relationship between the service quality indicators and customer satisfaction as well as the loyalty of mechanics.

The results indicate the need for mechanics to provide provision of care and individual attention to car owners and it is, therefore, important for mechanics to pay particular attention to customers and to treat them with care. It is also important for mechanics to understand that customers want their cars to be serviced by mechanics who exhibit knowledge and courtesy and also deliver services in a very responsive environment. The appearance of the workshop, equipment and directions are also very important to customers.

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Corresponding author

Samuel Famiyeh can be contacted at: sfamiyeh@gimpa.edu.gh