ISSN 2409-2665
Journal of Logistics, Informatics and Service Science
Vol. 10 (2023) No.1, pp.72-93
DOI:10.33168/JLISS.2023.0205

Applying Ordinal Logistic Regression to Analyze the Service Confidence for an Air Conditioner Service Center

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Abstract. The purpose of this research was to use the statistical method known as ordinal logistic regression to investigate the impact of various variables of interest on customer service confidence at automotive air conditioning repair centers. By gathering information from 449 customers (after missing data was removed), including those who use buses, trucks, and cars that bring air conditioning repair. The questionnaire assesses satisfaction using a Likert scale with five possible responses for the following factors: customer expectations, technician skill, responsiveness, confidence in service, and perceived value. The study started with a data reliability test using the Cronbach alpha test. The Chi-square test was used to evaluate this hypothesis; the null hypothesis was accepted, and the parallelism assumption was given statistical significance ($p > 0.05$), leading to the conclusion that customer expectations affect service confidence because they were found to be significant for independent variables by chi-square test analysis. However, it was discovered that only 28.3% of the variables of interest could explain the impact and the relationship between them ($R^2 = 0.283$), indicating that there may be other factors besides those examined in this study that affects customers' confidence in the quality of the services they obtain. When analyzing the relationship between the two additional, moderation analyses have shown that gender and vehicle type does not influence how the significant factors are correlated with service confidence. The study's implications will encourage service center managers understand the influence of variables that can improve customer confidence. Furthermore, this study supports managers in better comprehending and understanding customer behavior so they may outperform their competitors in providing superior services and ensuring the longevity of their business.

Keywords: ordinal logistic regression, bus air conditioner, service confidence, customer expectations, perceived value

1. Introduction

Service organization must prioritize customer confidence in both its products and services. The reliability of sensitive customer service is influenced by a variety of circumstances, which is the main cause of firms' failure to accurately meet their needs. We think that the organization's commitment to building and maintaining a sustainable service confidence is what has led to service excellence and a reputation at the best. It is important to increase customers ' confidence in the aspects of quality, delivery, and price in various industries, including health care, beauty, restaurants, and insurance as well as. However, there are various levels of confidence in products and services due to varying customer expectations, which is due to the fact that the level of confidence is influenced by the knowledge gathered from prior deliveries. Customers' perceived confidence as well as their sensitivity to interpersonal influence affects both the perceived benefit and the perceived cost differentially (Lee & Ma, 2012). Business organizations are recognized to make an effort to provide a variety of products and services that connect to consumer behavior. Therefore, customer perception is the first priority when planning a marketing strategy. Customers will be satisfied if the company provides high-quality service (Sunarsi et al., 2019). Customer satisfaction leads to higher product/service demand and improved organization or brand reputation (Choudhary et al., 2011). Meeting technical standards and functional quality are two key distinctions in perceived service quality, with the former indicating that a service's suitability for its intended application should also be considered (Mwegerano et al., 2012). When we talk about how bus air conditioning repair service centers' service aspects relate to one another and what effect they have, not only is high technical service quality delivery required, but there is also a requirement for extended customer support. To determine whether the service's ability to meet customer requests would be impacted by technician skills, process design, or service processes. Additionally, the organization's after-sales service strategy will be founded on a level of confidence high enough to encourage customers to be satisfied in the end. Expectations of customers have a significant impact on customer satisfaction (Lartey, 2015). Services and product support are becoming more important components in getting customers to be satisfied (Kumar & Kumar, 2004). Nevertheless, confidence can still distinguish between people. Among the categories for product-decision making and the purchasing processes (Bearden et al., 2001). In this study, the research gap was determined by a review of the variables that can affect service reliability. whereas other researchers investigated whether an automotive air conditioning repair service facility needed to consider factors other than profitability as a result, there is a need for study on the impact on customer

confidence, such as in-depth inquiry, opening up space for innovation, encourage collaboration in working together, etc.

Right now, there is a lot of competition for bus air conditioning repair companies from different competitors. Customers are always looking for alternatives due to their shifting needs to reduce the cost of repair services, for instance, choosing a small shop that is widely available since their services are less expensive, or even extending the maintenance term for a longer period of time, etc. Service centers need to understand customer dynamics and actual needs in order to adapt their competitive strategies to be able to create service procedures that foster trust in comparison to competitors. With this study, we intend to determine how some important factors affect the relationship between those factors and service center confidence. This will help executives to identify the particular problem until they can design a strategy approach that promotes confidence in service work and, eventually, business sustainability.

2. Literature Review

2.1. Technician skill

In order to provide consumers with quality services, such as troubleshooting and timely repair planning, technicians' expertise and abilities are important. It takes practice and study to become excellent. Depending on their level of expertise and the basic skill for the job, technicians can provide varying levels of service (Chen et al., 2016). The key to providing excellent service is to have a skilled workforce that understands the needs of the customers. This will enable you to outperform your competitors in terms of product quality. Even highly experienced technicians result in substantial labor expenditures for the company. Employers must carefully look into the effects of soft skill development and training in order to give their staff the tools they need to do the necessary duties (Lok et al., 2021). As a result, there must be a great performance in response to the organization. Skill management gets more difficult when tasks require abilities from many specialist fields at varying degrees (Fırat & Hurkens, 2012). Today, many firms are attempting to develop a positive image of technicians in order to attract customers and establish confidence in their service decisions. We might say that technicians are valuable organizational resources as Gutjahr et al., (2008) using a hybrid goal of maximizing financial rewards and personal development. This is a good motivation strategy for employees. Regardless of the type of training content, team training was found to be effective for enhancing team performance results (Salas et al., 2008). Because we believe that a great staff can help customers develop trust.

2.2. Responsiveness

Customer responsiveness is the ability of your business to address customer service issues and swiftly deliver the services required. Organizations must rely on their resources and competencies to adopt appropriate, flexible, responsive, and timely actions to unanticipated hazards in order to compete in a dynamic business environment (Hamzah et al., 2022). The responsiveness of the team in the company is another aspect that impacts trust in the customer service team will continuously monitor our work and discover fault every step of the way. As a result, both internal and external service procedures must be responsive. When a measure is examined using one of these techniques, its internal responsiveness will rely on the personalized treatment being utilized as well as the specific outcomes being used to assess treatment efficacy. To define the second component of responsiveness, we use the term "external responsiveness (Husted et al., 2000). The speeds at which your employees start the conversation as well as the time it takes them to complete the customer's request are both considered in this. We may have several options to respond to customers, such as email, phone calls, social media, and etc, each having a distinct outcome. The term, according to Holweg (2005), entails making an effort to promptly please customers. a business's rational foundation. Along with product availability and order fulfillment lead times, customer expectations differ by market. Customers desire quick response time, especially in the service industry.

2.3. Service process

The challenge of ensuring long-lasting service quality, designing the internal service processes to be simple and efficient is something that all executives must consider, so that we can trace back when there is a customer complaint. Although the availability of a wide range of ready-made software, not all service jobs can be accommodated by it. Management is therefore a stage that directs the service process to achieve its objectives, including quality and sales results. Operations, marketing, human resources, information technology, and other disciplines are all used in service design research, which is inherently multidisciplinary (Hill et al., 2002). The operational, organizational, and technological challenges involved in creating new services are considered as well (Froehle et al., 2000). Right now, everyone within the organization must recognize the emphasis on processes or procedures. The service process must be fast, accurate, concise and easy. If we keep the customer's expected waiting time longer, it should have a negative effect on the customer's will expectations and lower satisfaction (Kumar, 2005). The customer service procedure must be quick, precise, clear, and simple. Long-term service delivery for businesses can be aided through process improvement. To save costs, a lot of businesses have outsourced certain of their business procedures to other enterprises (Fernandez & Aman, 2021). Customers contribute to the service process as well as serve as a source of innovation. One aspect of providing quality service is creating an environment where internal processes are automatically monitored for

delivery time and cost (Pyon et al., 2011). Better customer service procedures, on the other hand, may contribute to increased trust and reduce complaints from customers. According to Johnston (2001), effective complaint management should increase operational effectiveness, as well as financial performance. Hong et al., (2020), denoted that customer relationship maintenance strategy, improved after-sales service satisfaction, and specialized service offerings are all becoming more important in the changed maintenance and repair service market environment.

2.4. Customer expectations

In the past, customers have anticipated the bare minimum in terms of good service and reasonable prices, but in the present, they have considerably greater expectations in terms of proactive service and individualized interactions. Any group of behaviors or activities that customers anticipate while interacting with a company are referred to as customer expectations. Parasuraman et al., (1991) denoted that customer expectations are changing and may alter over time and from one service process to the next for a given customer. Ojasalo, (2001) explains how ambiguous, implicit, and irrational expectations work. After that, it describes how systematic management of these hopes raises the possibility of achieving long-term customer happiness. In the purchasing process, trust is an essential factor of buyer behavior (Iriani et al., 2023). To make sure that they are reasonable and that the business can meet them, the expectations of the customers must be influenced by the business (Robledo, 2001). Learning more about your customers will increase your likelihood of comprehending their requirements and expectations as well as helping you identify the best strategies for providing exceptional customer service. Vollero et al., (2021) studies have demonstrated that customers' expectations for online services are always changing. It's interesting to see that higher customer expectations seem to be spilling over from online to offline service. Therefore, it's interesting to research customer expectations to get ready for any implications for the company.

2.5. Perceived value

Customer perceived value is a term used frequently in marketing and branding organizations. The concept of customer perceived value maintains that the success of a product or service is mainly determined by whether customers believe it can meet their goals and needs. According to Lapierre, (2000) specified that the company must have the knowledge and skills to analyze the actual value of the customer and earn a return on the perceived value delivered to the customer. There is still much to understand about the impact of service recovery on consumer views of integrity, satisfaction, and intention (Maxham & Netemeyer, 2002). Meanwhile, Lin et al., (2005) informed that according to theory, the notion of perceived value as a formative construct should be considered. Despite attention, there are still questions around how to operationalize perceived worth empirically (Parasuraman

& Grewal, 2000). The concept of generating value for service and delivering that value to customers are two concepts that business organizations really have to study. Pérez & Bosque, (2015) noted that the factors of the company's credibility, expertise, and credibility all affect customers' perceptions in very different ways. Despite the fact that the principles of customer perceived value and how it can help us better understand how customers behave when making purchases have been well-established (Zauner et al., 2015). The organization must focus on and take into account building as policy the measurement for customer perceived value. It is not just an evaluation of the service's results, but also of how the service is offered. Consequently, the benefits of the product may be observed in its distinctiveness. And the extent to which the customer's expectations and wants are met (Anisa & Tjhin, 2023).

3. Methodology

3.1. Conceptual Framework and Hypothesis Development

The purpose of this study, which was inspired by prior research, was to determine how these three important criteria have an impact on customer confidence in the quality of the services they acquire, 5 groups exist: (1) Technician skill (2) Responsiveness (3) Service process (4) Customer expectations and (5) Perceived values are all shown in Figure 1. We will apply a statistical technique called ordinal logistic regression to analyze the empirical data under the assumptions in which each set of components will affect the confidence of the service in any dimension. We also constructed a moderator variable called type of vehicles to investigate how this variable affects the relationship between customer expectations and service confidence, gender to investigate the relationship between perceived value and service confidence. Hunneman et al., (2015) studied was the basis for their discussion on the significance of store satisfaction measurements in regard to several aspects, specifically confidence in service quality. In our research, a comparable conceptual approach was also employed.

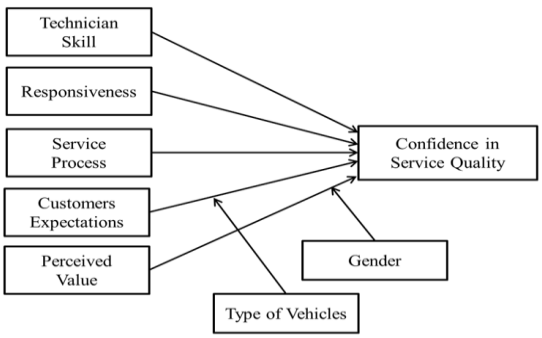

Fig. 1: Conceptual framework

The impact of technician skill on satisfaction and confidence in the service is important to the company, especially for service centers that must positive influence who require technical skills. It is common knowledge that well-trained specialists will produce high-quality work due to their skill and experience. In order to conduct inspection, maintenance, repairs, and replacement tasks properly, maintenance workers must be skilled technicians (Au-Yong et al., 2015). Lack of experience and knowledge are the key obstacles to good maintenance management (Kangwa & Olubodun, 2003). So, we assume that hypothesis as following -

H1, There is significant relationship between Technician skill and service quality confidence.

In many firms, a quick response to customer requests is emphasized in the relationship between responsiveness and service quality confidence. According to study by (Monnet & Teboul, 2007), the type of business determines the level of responsiveness. One could argue that the requirements for response time at an emergency department versus an air conditioning repair company are different. (Kim & Lee, 2010) explained that collaborations in the supply chain will help the performance of responsiveness was consistent with (Kim et al., 2006) finding that exchanging workloads with each other provides better responsiveness, although in today's business-centric world of satisfaction, the vast majority of customers want a quick response precise and concise to reduce waiting times, especially in service work. (Theoharakis & Hooley, 2003) suggests using measurements that ask respondents to evaluate both how quickly customers receive their orders and how quickly they respond to their requirements. So, therefore, we setup the hypothesis as following-

H2, There is significant relationship between service responsiveness and service quality confidence.

A high degree of customer satisfaction can be made possible by the service process and confidence. The majority of academics are currently attempting to determine if processes and outcomes are equally essential to customer needs in research that integrates service processes and service outcomes, which is relatively contemporary (Dabholkar & Overby, 2005). As of study by (Bebko, 2000), the proportion of the tangible service process, the non-tangibility of the service, and the level of the intangible service process should all be distinguished. According to Cherbakov et al., (2005), business transition includes a change in service speed as well as external pressure, a role that is compatible with modern business. We can see that the level of service confidence is significantly influenced by an effective and efficient service delivery methodology. Therefore, the two factors' relationship model will develop in a way that maximizes customer satisfaction. So, therefore, we setup the hypothesis as following-

H3, There is significant relationship between service process and service quality confidence.

Customer expectations are the measure of satisfaction that demonstrates the link between satisfaction and confidence in the provided service. Though the customer has higher expectations than what is actually provided, even if acceptable service can be provided, the job's goal has not been accomplished. Customers are more likely to recommend businesses when they have had a good experience (Baier et al., 2020; Maxham & Netemeyer, (2002). There is a possibility that we may argue that the constraints of hope are impassable. Therefore, it is essential that we measure customer expectations in order to build and offer services that are in keeping with their demands. Feineet et al., (2019) referred to the use of technology to help with the service. Despite the enormous potential, many customers fall within their expectations, resulting causes service failures. The company needs to evaluate itself in relation to others to make sure it is not becoming behind in what others are doing. The best course of action for a company is to evaluate the external environment in order to comprehend the changes in customer expectations (Yaacob & Abas, 2011). Since customer expectations are known to change over time, it is useful to establish a correlation between expectations and confidence in order to achieve satisfaction. So, therefore, we setup the hypothesis as following-

H4, There is significant relationship between customer expectations and service quality confidence.

We may require customers to grasp the value of our products and services, therefore we must build them to the best of our abilities in order to raise awareness and ultimately drive confidence, which is what, makes a business sustainable and competitive. According to the customer loyalty strategy, everyone in the firm must produce perceived value. To estimating customer satisfaction indirectly by measuring perceived service quality (Baier et al., 2020). We will research the impact of these factors on service confidence in order to develop knowledge of perceived value. So, therefore, we setup the hypothesis as following:

H5, There is significant relationship between perceived value and service quality confidence.

H6, Type of vehicles moderates the relationship between customer expectations and service quality confidence.

H7, Gender moderates the relationship between perceived value and service quality confidence.

3.2. Data sampling

We gather the data through interviewing staff or receptionists, filling out or responding to online questionnaires, and collecting questionnaires from customers who bring their cars to the service center to have their air conditioners repaired.

This requires that the customer must have utilized the service at least once time. Based on calculations by Naing et al. (2006), who explained that if this proportion is larger than 5% (n/N > 0.05), we have used the formula:

$$n = \frac{NZ^2P(1-P)}{d^2(N-1)+Z^2P(1-P)}$$

When n = Sample size

N = Population size (2280 customers)

Z = Statistic for level of confidence (1.96)

P = Expected proportion (50%)

d = Precision (5%)

$$n = \frac{(2280)(1.96)^2(0.5)(0.5)}{(0.05)^2(2279)+(1.96)^2(0.5)(0.5)} = 400$$

The study's minimal sample size objective was 400. A total of 449 surveys were conducted.

3.3. Data source

The collecting information from Sahamontol Solutions (Thailand) co., ltd. This business represents DENSO air conditioners in Thailand. According to the source, the bus and truck air conditioning repair service center has a location in Thailand. From January to June of 2022, data was collected. The company's basic information is that it is a service center that provides air conditioning maintenance services for various types of vehicles such as buses, trucks, and so on, with customers who are private companies and retail users who bring a variety of automobiles to receive services. The questionnaire data will be primary data collected from the employees who repaired the car and the person in charge of bringing the vehicle for repair. This is supposed to be very useful information in research. The conditions for data collection are: (1) Must be a customer who has used this service center's repair service at least once; (2) The most recent use of the service could be less than 6 months. So, therefore, the data is more thorough and comprehensive.

3.4. Variables setting

Identification of variables in each aspect to be utilized in the analysis and developing questions in accordance with the research on the impact on service work, as shown in Table 1.

Table 1: Variables setting

Variables	Indicators
Technician skill	How confident are you with the Technicians' knowledge and skills?
Responsiveness	How confident are you in the Service staff's ability to serve all customers promptly?
Service procedure	How certain are you about the service procedure?
Customer expectations	What level of service did you prefer from the Service Center?
Perceived value	What was your expected cost-per-value for the service center?
Confident in Service	How confident are you in the service?

3.5. Respondents information evaluate

To evaluate the respondent's data, we primarily utilize a statistical approach known as ordinal logistic regression. The ordinal response in the customer survey example comes from the question asking customers how satisfied they are with the company's service performance (Lawson & Montgomery, 2006). Ordinal logistic regression is a technique that can be employed. This utilizes SPSS version 21, the data is separated into two sections: the respondents' basic information and their level of satisfaction with each of the four variables. The Likert scale with 5 levels is used as a measure in this section. According to preliminary data, total 449 respondents, 68.2% of the respondents were men, 55.7% had bachelor's degrees, and 74.8% income between 15,000 and 60,000 per month. Table 2, shows that buses were the vehicles that required air conditioning repairs the most with a ratio of 50.3%.

Table 2: Respondents basic Information.

Variables	Frequency	%
Gender		
Male	306	68.2
Female	143	31.8
Education		
Below bachelor's degree	129	28.7
Bachelor's degree	250	55.7
Higher than bachelor's degree	70	15.6
Income		
Below 15,000	46	10.2
15,001 - 30,000	141	31.4
30,001 - 60,000	195	43.4
More than 60,001	67	14.9
Vehicle Type		
Passenger Car	96	21.4
Buses	226	50.3
Truck Refrigerator	127	28.3

3.6. Reliability confirmation

We confirmed the research by utilizing a tool called Cronbach's alpha to test the survey data. Internal consistency, or how closely related a group of variables are to one another, is measured by Cronbach's alpha. In the resulting reliability rating it has a coefficient between 0 and 1 and when approaching 1 is considered reliable. We know that alpha is one of several methods for assessing the reliability of data collected from tools used to assess data reliability (Barbera et al., 2020). Anyway, Shalihin et al., (2022) suggest that we can accept reliability of the questionnaire is assumed when Cronbach's alpha reaches value >0.7. According to Taber, (2018) denoted that selecting 0.7 as an "acceptable" criterion emphasizes the need for accuracy in research decision-making, and despite popular belief and frequent reporting, no acceptable standard values or criteria for alpha are described.

Table 3: Reliability test

Items	Corrected item-total correction for each item.	Cronbach's Alpha if Item Deleted
Technician skill	0.389	0.779
Responsiveness	0.496	0.751
Service procedure	0.686	0.704
Customer expectations	0.644	0.711
Perceived value	0.535	0.741
Confident in Service	0.418	0.769
Cronbach's alpha value	0.777	

4. Results and Discussions

The identification of the factors influencing customer confidence in the bus air conditioner service center was examined at as we applied the ordinal logistic regression model. The table 3 summarizes the analysis findings for the predicted model. The order of confidence in service in the study and the dependency variable resulting from assumptions led to the employment of the ordinal logistic regression method. According to Pyon et al., (2011), the ordinal logistic regression model implies that the explanatory variable and the dependent variable have a relationship. The logit and cloglog links, which are the two main link functions examined by Chen & John, (2004), used in ordinal regression analysis to build specialized models. When employing logit as a Link function, the order logistic regression analysis model can provide the logit function equations like Equations below (Agresti, 2003).

$$\pi_i = P\{Y = 1 | X_1 = x_1, X_2 = x_2, \ldots, X_p = x_p,\} = \frac{e^{\beta_0+\beta_1 x_1+\cdots+\beta_p x_{p1}}}{1 + e^{\beta_0+\beta_1 x_1+\cdots+\beta_p x_{p1}}}$$

$$1 - \pi_i = P\{Y = 0 | X_1 = x_1, X_2 = x_2, \ldots, X_p = x_p,\} = \frac{1}{1 + e^{\beta_0+\beta_1 x_1+\cdots+\beta_p x_{p1}}}$$

When π_i : The possibility of detecting the phenomenon under investigation.

Table 4: Parallelism hypothesis test

Model	-2Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	438.239			
General	396.674	41.565	42	0.490

As of Table 4, when utilizing logit as a link function to analyze the data and test the link between a combination of independent variables and a dependent variable, it was discovered that if the model has just one constant. There will result in the value -2LL= 438.239, while a model with independent variables and constants will result in -2LL = 396.674. This means that an independent model is preferable than a model with a single constant. The Chi-square test was used to evaluate this hypothesis; the null hypothesis was accepted and the parallelism assumption was given as statistical significance ($p > 0.05$), there is every type of dependent variable, there is a corresponding regression coefficient. As of pseudo R-square result, it can be viewed as the total variance of the dependent variable, or how much it deviates from the mean. As of R^2 is 0.283, meaning that the variable of interest in this experiment can only explain 28.3% of the relationship. In other words, there are factors outside those studied that influence on confident in service.

Table 5: Goodness of fit

Model	Chi-Square	df	Sig.
Pearson	434.040	422	0.332
Deviance	324.905	422	1.000

As of Table 5, the difference between the observed and predicted values of the model is used to assess the model's appropriateness. This led to the assumption that the null hypothesis was accepted and that the model was consistent with the assumption that $p > 0.05$ (Pearson value is 0.332) was statistically significant. The model accurately depicts the data.

As of table 6, when the p-values for some variables were less than 0.05, the significance threshold was determined to be statistically significant. According to the interpretations chosen as the final category, the study's reference category was created. Three category of threshold are significant. While service process is not significant, technician responsiveness and skill only have one category of significance, two categories of perceived value are significant, and customer expectations have significant values in every category. Customer satisfaction was determined to be moderate (P-value <0.05), when we examined at the results of the technician's skills, this finding impacted 2.7 times as compared to other satisfaction levels and it was discovered that there will be a moderate level of satisfaction with responsiveness, which is 2.4 times more than other levels of satisfaction. Customer expectations are quite high and just marginally (0.3 times) differ from other categories of satisfaction.

Table 6: Value parameter estimation

	Estimate B Coefficients	Std. Error	Wald	df	Sig.	Exponential B Values
Threshold						
Confident in Service = 1	-8.214	0.821	100.092	1	0.000	0.000
Confident in Service = 2	-2.765	0.394	49.259	1	0.000	0.063
Confident in Service = 3	0.313	0.360	0.754	1	0.385	1.368
Confident in Service = 4	3.229	0.552	34.182	1	0.000	25.254
Location						
Technician Skill =2	-1.068	0.912	1.370	1	0.242	0.344
Technician Skill =3	0.988	0.306	10.460	1	0.001	2.686
Technician Skill =4	0.021	0.280	0.006	1	0.942	1.021
Technician Skill =5	0[a]	-	-	0	-	
Responsiveness = 3	0.872	0.367	5.652	1	0.017	2.392
Responsiveness = 4	0.150	0.272	0.304	1	0.582	1.162
Responsiveness = 5	0[a]	-	-	0	-	
Service Process =2	3.908	2.059	3.603	1	0.058	49.799
Service Process =3	0.554	0.453	1.495	1	0.221	1.740
Service Process =4	0.499	0.316	2.487	1	0.115	1.647
Service Process =5	0[a]	-	-	0	-	
Customer Expectations =2	-2.609	1.102	5.603	1	0.010	0.074
Customer Expectations =3	-1.406	0.392	12.847	1	0.000	0.245
Customer Expectations =4	-1.204	0.312	14.924	1	0.000	0.300
Customer Expectations =5	0[a]	-	-	0	-	
Perceived Value =2	-3.231	0.679	22.618	1	0.000	0.040
Perceived Value =3	-0.902	0.417	4.676	1	0.031	0.406
Perceived Value =4	-0.186	0.424	0.192	1	0.661	0.830
Perceived Value =5	0[a]	-	-	0	-	

a. This parameter is set to zero because it is redundant.

Additional, to determine whether an independent variable's impact on the dependent variable is consistent at various levels of an additional independent variable, moderation analysis is performed (moderator). In other words, it is used to determine if the moderator will affect how strongly the independent and dependent variables are correlated. Two tables, ANOVA and Coefficients, will be shown with the results of the linear regression analysis.

Table 7: ANOVA[a] of customer expectations

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	28.078	2	13.039	29.315	0.000[b]
Residual	198.372	446	445		
Total	224.450	448			

a. Dependent Variable: confidence in service
b. Predictors (Constant): Expectation, INT_1

As Table 7, the one-way ANOVA examines the means of the groups in question and evaluates whether any of them are statistically significantly different from one another. In this case, the one-way ANOVA shows significance (Sig. = 0.000).

Table 8: Coefficients of customer expectations

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error			
(Constant)	1.618	0.161		10.054	0.000
INT_1	0.002	0.030	-.0.002	-0.054	0.957
Expectations	0.316	0.041	0.341	7.655	0.000

As Table 8, we can see that the interaction term (INT_1) has a P-value of 0.957. Since the P-value is greater than 0.05, we can consider that the moderator variable expectations has no an effect on the relationship between independent variable customer expectations and dependent confidence in service.

Table 9: ANOVA[a] of perceived value

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	31.735	2	15.868	36.722	0.000[b]
Residual	192.715	446	432		
Total	224.450	448			

a. Dependent Variable: confidence in service
b. Predictors (Constant): perceived value, INT_2

As Table 9, the one-way ANOVA examines the means of the groups in question and evaluates whether any of them are statistically significantly different from one another. In this case, the one-way ANOVA shows significance (Sig. = 0.000).

Table 10: Coefficients perceived value

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error			
(Constant)	1.620	0.145		11.158	0.000
INT_2	-0.024	0.031	-.0.034	0.777	0.437
Perceived Value	0.357	0.042	0.374	8.517	0.000

As Table 10, we can see that the interaction term (INT_2) has a P-value of 0.437. Since the P-value is greater than 0.05, we can consider that the moderator variable perceived value has no an effect on the relationship between independent variable perceived value and dependent confidence in service.

5. Limitation and Future Study

There are several limits to this study, and each one opens up new possibilities for further study. Most previous researchers concentrated on other industries such as airlines, finance, and hotels. In the manufacturing sector, the automotive sector will be explored. As a result, reviewing the literature is difficult. The second concern is that collecting information may result in inconsistencies in analysis because respondents are drivers, which may make the perspective of the opinion less meaningful. If there are more researchers, it will be required to focus on developing questionnaires for business owners or executives in the future. This research, however, will serve as a blueprint for future advancement.

6. Conclusions

This research aims to examine how technician skill, responsiveness, service process, customer expectations, and perceived value contribute to confidence in service. First of all, it's general knowledge that all kinds of after-sales services in today's business, especially in the automobile sector, are highly competitive. Based on the study of factors interested in how they affect the after-sales service of bus air conditioners, refrigerated trucks, and automobiles on confidence in service, we need to build our competitiveness to be higher than competitors continuously. The Parallelism Hypothesis Test revealed that the ordinal logistic regression analysis model was consistent and dependable (P value >0.05). Consequently, it was determined that the study was interesting and that the independent and dependent variables were both suitable and consistent. We also discovered that the data used in the experimental design is reliable as a result of testing with goodness of fit, even though the results of the R2 study showed that only 28.3% of the dependent variable accounted for the correlation, indicating that there were external variables that could be studied further. As we look more closely to each variable, we start to notice that the majority of the important variables have a favorable impact on everyone's confidence in the service. Let's discuss each of the first factors that technician skill

which we are all aware of contributes to the excellence of air conditioning repair service. Customer satisfaction will be directly impacted by how the customer perceives the issue was handled by knowledgeable technicians. Knowing that a technician's abilities are important indicates that the customer is really satisfied with the quality of the air conditioning repair service (Wu et al., 2017). Customers' positive impressions of and interactions with service technicians at the point of contact with the company can be linked to their desire to repurchase and willingness to provide feedback to the company (Leri & Theodoridis, 2019). The following sequence is responsiveness. The level of satisfaction was moderate. It's because the customer's interest is more than everyone imagined. You'll find that there are many aspects to creating service responsiveness in accordance with Richey et al., (2002), and that these factors are crucial to ensuring customer confidence and satisfaction. Hamenda, (2018), finding that perceived value only partially mediates the relationship between customer satisfaction and service quality, perceived value completely mediates the relationship between customer satisfaction and price fairness. The responsiveness view includes five dimensions, each of which a service provider may emphasize to varied degrees. They are resilience, improvisation, agility, flexibility, and adaptability. The customer believed that the service process, which the statistical analysis determined to be non-significant, had the least impact on the quality of the service. As a result, we can emphasize that from the perspective of the customer, the service process is a challenge for the business because it must be finished before the recipient experiences it. Customers expect quality service from us to demonstrate that their choice to bring their vehicles for air conditioning repair to a service center at there is a standard, so expect good results. This makes customer expectations the most significant variable in this research. The reason why responsive expectations from us will result in a positive relationship between service providers and service recipients is because the service center is capable of providing precise and accurately respond to requests and help solve difficulties that customers encounter. As previous studied by Gwinneret al., (1998), defined that relationship benefits, according to this viewpoint, relate to the benefits that a company can deliver to customers if its understanding of those customers improves after a firm has maintained its relationship with those customers for a set amount of time through relationship development. Any company organization that offers any kind of after-sales service must not only distinguish itself from competitors but also create perceived value in its services. So, those customers finally feel confident that the value of our work exceeds their expectations

When the relationship between the two moderators, vehicle type and perceived value, was considered, there was no effect on the relationship between the input variable and the dependent variable because the p-value was higher than 0.05. Only one issue will be considered, but all tasks will be taken into consideration. That is, every component evaluated influences confidence in all services. In the conclusion,

after-sales service will ensure the sustainability of the company with a strategy that is established, good quality service can be provided to customers that meet their demands or exceed their expectations, regardless of the company. As a result, the integrity of the service must be professionally taken into account into account in a professional manner throughout the entire procedure. In the context of value, benefits are what customers acquire in exchange for a product or service, whether they are practical, emotional, or spiritual advantages (Farida & Ardyan, 2018). Customers become loyal to companies when they receive excellent customer service from front-line staff members, which enhances the professional image (Utama et al.,2023). Additionally, there are examples of service presentations that are clearly different from those of competitors, such as air conditioning inspections before to repairs, the presentation of reports of significant values in air conditioning performance analysis, an extension of the warranty period for loyal customers, flexibility in repairing or replacing parts, etc. Beginning with the quality service that customers can receive as soon as they approach the service center and obtaining outstanding help from the employees, customers will be satisfied and loyal (Khonglumtan & Srisattayakul, 2022). The company will feel encouraged by returning customers since they are a reflection that customer satisfaction levels are high enough to foster customer retention. Additionally, this research has constraints that do not allow for the analysis of many criteria, including cost, simplicity of scheduling an appointment, lead time for delivery, and location. As a result, in the future, there must be research participants who are interested in developing the design. For further adoption, a broader range of data should be collected.

References

Agresti, A., & Min, Y. (2004). Effects and non-effects of paired identical observations in comparing proportions with binary matched-pairs data. *Statistics in medicine*, *23*(1), 65-75

Anisa N. & Tjhin U., (2023). Factors affecting customer loyalty moderated by switching cost on the customer satisfaction of digital streaming services. *Journal of System and Management Sciences,* 13(1), 1-20

Au-Yong, C. P., Ali, A. S., & Ahmad, F. (2014). Optimising maintenance cost performance with skilled technicians. Structural Survey, 32(3), 238-245

Baier, L., Kühl, N., Schüritz, R., & Satzger, G. (2020). Will the customers be happy? Identifying unsatisfied customers from service encounter data. *Journal of Service Management.*32(2), 265-288

Barbera, J., Naibert, N., Komperda, R., & Pentecost, T. C. (2020). Clarity on Cronbach's alpha use. *Journal of Chemical Education*, 98(2), 257-258.

Bearden, W. O., Hardesty, D. M., & Rose, R. L. (2001). Consumer self-confidence: Refinements in conceptualization and measurement. *Journal of consumer research*, 28(1), 121-134

Bebko, C. P. (2000). Service intangibility and its impact on consumer expectations of service quality. *Journal of services marketing*, 14(1), 9-26

Chen, C. K., & John Jr, H. (2004). Using Ordinal Regression Model to Analyze Student Satisfaction Questionnaires. IR Applications, Volume 1, May 26, 2004. *Association for Institutional Research (NJ1)*

Chen, X., Thomas, B. W., & Hewitt, M. (2016). The technician routing problem with experience-based service times. Omega, 61, 49-61

Cherbakov, L., Galambos, G., Harishankar, R., Kalyana, S., & Rackham, G. (2005). Impact of service orientation at the business level. *IBM Systems Journal*, 44(4), 653-668

Choudhary, A. I., Asif, M., Choudhry, R. M., Siddique, Z., & Mughal, A. (2011). Impact of after sale service characteristics on customer satisfaction. *Information management and business revie*w, 3(6), 360-365

Dabholkar, P. A., & Overby, J. W. (2005). Linking process and outcome to service quality and customer satisfaction evaluations: An investigation of real estate agent service. *International journal of service industry management*, 16(1), 10-27

Farida, N., & Ardyan, E. (2018). The driving of customer loyalty: relational approach, perceived value and corporate image. *International Journal of Business & Society*, 19(1)

Feine, J., Morana, S., & Gnewuch, U. (2019). Measuring service encounter satisfaction with customer service chatbots using sentiment analysis

Fernandez, D., & Aman, A. (2021). The Challenges of Implementing Robotic Process Automation in Global Business Services. *International Journal of Business and Society*, 22(3), 1269-1282

Fırat, M., & Hurkens, C. A. (2012). An improved MIP-based approach for a multi-skill workforce scheduling problem. *Journal of Scheduling*, 15(3), 363-380

Froehle, C. M., Roth, A. V., Chase, R. B., & Voss, C. A. (2000). Antecedents of new service development effectiveness: an exploratory examination of strategic operations choices. *Journal of Service Research*, 3(1), 3-17

Gutjahr, W. J., Katzensteiner, S., Reiter, P., Stummer, C., & Denk, M. (2008). Competence-driven project portfolio selection, scheduling and staff assignment. Central European Journal of Operations Research, 16(3),281-306

Gwinner, K. P., Gremler, D. D., & Bitner, M. J. (1998). Relational benefits in services industries: the customer's perspective. *Journal of the academy of marketing science*, 26(2), 101-114

Hamenda, A. (2018). An integrated model of service quality, price fairness, ethical practice and customer perceived values for customer satisfaction of sharing economy platform. *International Journal of Business and Society*, *19*(3), 709-724

Hamzah, N., Maelah, R., & Saleh, O. M. (2022). The moderating effect of human capital on the relationship between enterprise risk management and organization performance. *International Journal of Business and Society*, 23(1), 614-632

Hill, A. V., Collier, D. A., Froehle, C. M., Goodale, J. C., Metters, R. D., & Verma, R. (2002). Research opportunities in service process design. *Journal of Operations Management*, 20(2), 189-202

Holweg, M. (2005). The three dimensions of responsiveness. *International Journal of Operations & Production Management*, 25(7), 603-622

Hong, J., Kim, B., & Oh, S. (2020). The relationship benefits of auto maintenance and repair service: A case study of Korea. *Behavioral Sciences*, 10(7), 115

Hunneman, A., Verhoef, P. C., & Sloot, L. M. (2015). The impact of consumer confidence on store satisfaction and share of wallet formation. *Journal of Retailing*, 91(3), 516-532

Husted, J. A., Cook, R. J., Farewell, V. T., & Gladman, D. D. (2000). Methods for assessing responsiveness: a critical review and recommendations. *Journal of clinical epidemiology*, 53(5), 459-468

Iriani1 A., Hendry, Manongga D.,Wijono S., & Suhariyadi , (2023),the impacts of e-service, price, trust and comfort on loyalty with the mediation of customer satisfaction of Gojek. *Journal of System and Management Sciences*, 13(1), 637-665

Johnston, R. (2001). Linking complaint management to profit. *International journal of service industry management*, 12(1), 60-69

Kangwa, J. & Olubodun, J. (2003). An investigation into home owner maintenance awareness, management and skill-knowledge enhancing attributes. *Structural Survey*, 21(2), 70-78

Khonglumtan T. & Srisattayakul P., (2022), the effects of service quality on customer loyalty for a study of bus air conditioner service center's customer satisfaction using structural equation modeling (SEM). *Journal of System and Management Sciences*, 12(6), 220-238

Kim, D., & Lee, R. P. (2010). Systems collaboration and strategic collaboration: their impacts on supply chain responsiveness and market performance. *Decision Scie*nces, 41(4), 955-981

Kim, D., Cavusgil, S. T., & Calantone, R. J. (2006). Information system innovations and supply chain management: channel relationships and firm performance. *Journal of the academy of marketing science*, 34(1), 40-54

Kumar, P. (2005). The competitive impact of service process improvement: Examining customers'waiting experiences in retail markets. Journal of Retailing, 81(3), 171-180

Kumar, R., & Kumar, U. (2004). A conceptual framework for the development of a service delivery strategy for industrial systems and products. *Journal of Business & Industrial Mar*keting

Lapierre, J. (2000). Customer-perceived value in industrial contexts. *Journal of business & industrial marketing*, 15(2/3), 122-145

Lartey, F. M. (2015). Increasing promoters in the residential broadband service industry: Relationship between customer satisfaction and loyalty using ordinal logistic regression (Doctoral dissertation, Capella University)

Lawson C, Montgomery DC.(2006). Logistic regression analysis of customer satisfaction data. *Quality and reliability engineering international*, 22(8):971-84

Lee, H. H., & Jin Ma, Y. (2012). Consumer perceptions of online consumer product and service reviews: Focusing on information processing confidence and susceptibility to peer influence. *Journal of Research in Interactive Marketing*, *6*(2), 110-132

Leri, I., & Theodoridis, P. (2019). The effects of the winery visitor experience on emotions, satisfaction and on post-visit behaviour intentions. *Tourism Review*, 74(3), 480-502

Lin, C. H., Sher, P. J., & Shih, H. Y. (2005). Past progress and future directions in conceptualizing customer perceived value. *International Journal of Service Industry Management*, 16(4), 318-336.

Lok, B. L., Cheng, M. Y., & Choong, C. K. (2021). The relationship between soft skills training and development, human resource outcome and firm performance. *International Journal of Business and Society*, 22(1), 382-402

Maxham III, J. G., & Netemeyer, R. G. (2002). Modeling customer perceptions of complaint handling over time: the effects of perceived justice on satisfaction and intent. *Journal of retail*ing, 78(4), 239-252

Monnet, X., & Teboul, J. L. (2007). Volume responsiveness. *Current Opinion in Critical Care*, 13(5), 549-553

Mwegerano, A., Kankaaranta, J., Hämeenoja, O., & Suominen, A. (2012). Perceived after sales service quality: Communication within the service chain. *Quality Technology & Quantitative Management*, 9(4), 407-419

Naing, L., Winn, T. B. N. R., & Rusli, B. N. (2006). Practical issues in calculating the sample size for prevalence studies. *Archives of orofacial Sciences*, *1*, 9-14.

Nugeraha Utma D.,Sumiyati S., Rahyadi I, Zainal Abidin N., Ahmad N., Mauziahh Benjamin A, & Binti Mat Desa W., (2023), Decision Support Model for Evaluating the Customer Service Performance by Mamdani and Multi-stage Rule Base. *Journal of System and Management Sciences*, 13(1), 21-42

Ojasalo, J. (2001). Managing customer expectations in professional services. *Managing service quality: An international Journal*

Parasuraman, A., & Grewal, D. (2000). The impact of technology on the quality-value-loyalty chain: a research agenda. *Journal of the academy of marketing science*, 28(1), 168-174

Parasuraman, A., Berry, L. L., & Zeithaml, V. A. (1991). Understanding customer expectations of service. *Sloan Management Review*, 32(3), 39-48

Pérez, A., & del Bosque, I. R. (2015). The formation of customer CSR perceptions in the banking sector: The role of coherence, altruism, expertise and trustworthiness. *International Journal of Business and Society*, 16(1)

Pyon, C. U., Woo, J. Y., & Park, S. C. (2011). Service improvement by business process management using customer complaints in financial service industry. *Expert Systems with Applications*, 38(4),3267-3279

Richey, R. G., Roath, A. S., Adams, F. G., & Wieland, A. (2022). A responsiveness view of logistics and supply chain management. *Journal of Business Logistics*, 43(1), 62-91

Robledo, M. A. (2001). Measuring and managing service quality: integrating customer expectations. *Managing Service Quality: An International Journal*, 11(1), 22-31

Salas, E., DiazGranados, D., Klein, C., Burke, C. S., Stagl, K. C., Goodwin, G. F., & Halpin, S. M.(2008). Does team training improve team performance? *A meta-analysis. Human factors*, 50(6), 903-933

Shalihin, M. S. E., Sobri, H. A., & Ibrahim, A. (2022). Reliability and construct validity on undergraduate geriatric questionnaire. *Malaysian Journal of Applied Sciences*, 7(1), 66-75

Sunarsi, D., Baharuddin, A., Afni, N., & Patak, A. A. (2019). The effect of service quality and price accuracy on consumer confidence and implications for sales increase. *PINISI Discretion Review,* 3(2), 101-110

Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in science education*, 48(6), 1273-1296

Theoharakis, V., & Hooley, G. (2003). Organizational resources enabling service responsiveness: Evidence from Greece. *Industrial Marketing Management*, 32(8), 695-702

Vollero, A., Sardanelli, D., & Siano, A. (2021). Exploring the role of the Amazon effect on customer expectations: An analysis of user-generated content in consumer electronics retailing. *Journal of Consumer Behaviour*

Wu, S. H., Huang, S. C. T., Tsai, C. Y. D., & Lin, P. Y. (2017). Customer citizenship behavior on social networking sites: The role of relationship quality, identification, and service attributes. *Internet Research*

Yaacob, Z., & Abas, Z. (2011). The effect of intensity of quality management on customer satisfaction. *International Journal of Business & Society*, *12*(2)

Zauner, A., Koller, M., & Hatak, I. (2015). Customer perceived value-Conceptualization and avenues for future research. *Cogent psychology*, 2(1), 1061782