



Online Claim and Guarantee Mechanism for Electronics Peripheral in Urban Country

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Abstract. According to consumer protection law, business actors must provide good services, including post-transaction services. Most of the current warranty claim process is still done conventionally, where consumers must come to the store to bring their documents and goods and ask the officer for the repair process. Analytical results showed that 45% of consumers needed to realize the importance of the warranty card, so they did not store it properly. Consumers need help finding good quality repair services when the claim process is rejected. Moreover, the repair service provider needed a suitable platform to market its business. Therefore, this research was conducted to build a system to assist with the warranty claim process and search for repair services for consumer needs based on SNI 7229:2007 about General Provisions for After-Sales Service. The application was implemented using MySQL and PHP. As a result, all roles of users showed a good response. Company officers were able to trace warranty data and process claims. Repair service providers receive good appraisals of their work, which affects their business's promotion. Consumers feel helped regarding warranty card storage, transparent claims process, and repair services suggestions based on the damage to their electronic goods.

Keywords: After-sales service, Electronics peripherals, Online guarantees claim, Repair service.

1 Introduction

The Industrial Revolution 4.0 brings human life closer to technology [1] and strengthens the dominance of the digital generation, which requires everything instantly [2]. It is shown by the increasing number of applications for everyday needs, such as buying fresh food ingredients without the need to go to the market [3], consulting doctors without face-to-face interaction [4], seeking online courses [5], and ordering food online [6]. One of the most noticeable parts of the industrial revolution is the automation and integration of processes and services [7] that can save time and reduce the cost of processing transactions.

Business to Consumer (B2C) business model is a process of directly buying and selling goods and/or services from the seller to the consumer. It needs an after-sales service system to maintain good long-term relationships with its customers even after

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M. Hartono et al. (eds.), *Proceedings of the 4th International Conference on Informatics, Technology and Engineering 2023 (InCITE 2023)*, Atlantis Highlights in Engineering 21,
https://doi.org/10.2991/978-94-6463-288-0_41

the purchase, following the initial offer and agreement [8]. According to the SNI 7229:2007 document issued by the Indonesian National Standardization Agency (2007) regarding General Provisions for After-Sales Service, after-sales service can be divided into two categories, namely services provided during the warranty period and post-warranty [9]. The services provided during the warranty period can be done easily by coming to the designated official office and submitting a claim for damage to goods [10]. Meanwhile, repairs after the warranty period expires are relatively more difficult because people must find repair services on their own in the field, where they can't be sure of the quality or skill of the service providers [11].

Currently, digitizing the process of buying retail goods has been widely used in Indonesian society. The development of this system generally focuses on the main system in the company but pays less attention to the quality of the after-sales service system [12]. By adopting current technology with existing systems, the integration of the main system with digital after-sales services will be of added value for the company, which can increase customer loyalty [8], [13], and can accelerate socio-economic development in developing countries [14], such as Indonesia [15]. Most of the after-sales research focuses on investigating service quality frameworks to improve their services. Customer Survey, SERVQUAL, SERVPERF, Mystery Shopping, Customer Effort Score (CES), and Customer Satisfaction Index (CSI) are a few examples of approaches and methods that can be utilized to evaluate and measure services. SERVQUAL is the ideal match for this approach because it is extensively utilized by a variety of business types, basic measurement, reliable, and has already been measured by other researchers [16][17]. Only a small amount of research in Indonesia is focused on developing warranty and repair systems. For example, Rachmanita [10] set a system for submitting warranty claims at electronic stores, with limited services explicitly provided for goods that still have a warranty period. On the other hand, Utami [11] and Kusumastuti [18] made a way to find repair services through a marketplace.

Therefore, in this study, we proposed an integrated after-sales service system in the retail sales system by paying attention to the service factor on the SERVQUAL dimension. The after-sales services discussed include the warranty claim process and assistance with the repair process needed after the expired warranty period. This system is expected to help system users obtain information related to warranty claims in real time and accurately to increase reliability, responsiveness, and assurance of product success. In addition, with this system, it is hoped that it can help repair service providers provide adequate marketing media for their services.

2 Research Methodology

The proposed approach was concerned with identifying SERVQUAL parameters from existing research [17]. The interview process from the existing condition in industrial condition was essential to find the correlation between the real problem and the quality attribute of service. After finding the critical parameters, the early-stage

system was designed to determine the data structure of the system and the flow process. Software construction is developed to simulate the finding and solution technology to improve the quality of service. The approach consists of the following procedure for Software Development Life Cycle based on the Waterfall approach [19]:

1. Identification of SERVQUAL quality attributes from relevant literature
2. Finding conditions with after-sales problems nowadays.
3. Analysis of problem and quality attribute of service with SERVQUAL dimensions.
4. Determining the requirement that is visible in the existing industrial environment.
5. Development of a system that meets with requirements
6. A Review process to measure the improvement of service quality.

System design is done by building data design [20], process design [21], and interface design. The system will be construct at the implementation stage using MySQL to record transaction data and Firebase Realtime Database for the notification delivery process. PHP is used as a programming language. System validation is carried out using a black-box testing system [22], where the user tries the system and is asked to fill out a questionnaire as an assessment of the quality of the system.

3 Result and Discussion

3.1 Problem Identification based on SERVQUAL Parameters

SERVQUAL[17] has five quality dimensions to measure service: reliability, assurance, tangibles, empathy, and responsiveness (Table 1). These metrics have been widely adapted to service quality research for numerous industries and regions. Observations and interviews with electronic business players, service providers, and consumers of electronic devices. Several important points related to the existing condition are also linked to the SERVQUAL metric to see the condition level of the service.

- Initial Process of Warranty Claim (P1)

Warranty claims are made conventionally, where consumers are required to have a warranty card and purchase receipt. The process can be started by sending photo proof of purchase receipt, warranty card, and condition of the goods, accompanied by an explanation of the damage suffered by the goods. Then, if there is a possibility that the warranty can be accepted, the consumer is asked to come to the specified warranty location.

- Repair Process with Warranty (P2)

The officer is obliged to check the goods' condition to determine whether the warranty claim is accepted or not. If the goods can be repaired through the warranty process, the goods will be brought by the officer, and the consumer will receive a receipt. When the goods are repaired, the officer will contact the consumer to pick up the goods. During the waiting period, consumers can contact the officer who received the warranty claim to know the progress of the repair. On the other hand, if the officer must confirm the repairs made, for example, an additional fee is charged because the warranty claim does not cover it, the of-

ficer is obliged to contact the consumer. If the consumer refuses, the warranty claim will be canceled.

- Repair Process without Warranty (P3)

If the officer does not accept the warranty claim or the consumer cancels the claim due to additional costs, the consumer can seek independent repair services in the community.

- Ignorance regarding the importance of the warranty card (P4)

45% of consumers don't realize the importance of a warranty card, so they don't keep it. In addition, the warranty note was printed using a thermal printer, so the writing faded over time.

- Gap in user knowledge with goods owned (P5)

A few consumers about 29% do not understand the damage to their electronic goods. When they must look for repair services, some of them do not know where to go and are not sure about the quality of the repair services they find, in terms of the quality of workmanship and the honesty of the service provider. In addition, in terms of price, consumers find it difficult to judge whether the price charged by the repair service is standard or not.

- Monitoring of warranty claims is not clear (P6)

The inconvenience expressed by consumers in the warranty claim process is that the process of monitoring goods is carried out by contacting customer service through the operator. Hence, consumers find it difficult to independently know the progress of repairs. However, there's no difference between individual repair services and make a warranty claim at the shop of purchase, even though the warranty period is still there.

- Lack of information for repair services from shop buyers (P7)

The expectation of consumers from the process of repairing electronic goods is the availability of repair services recommended by the store so that they become more comfortable in making repairs to their goods.

Table 1. Mapping SERVQUAL versus Existing Condition

Parameters	Definition	Descriptions
Reliability	The ability to perform the promised service dependably and accurately	Service procedures are still not structured and measured
Assurance	The knowledge and courtesy of employees and their ability to convey trust and confidence	Lack of management and customer knowledge regarding the claim procedure
Tangibles	The appearance of physical facilities, equipment, personnel, and communication materials	Does not have a static and standard structure and procedure
Empathy	The provision of caring, individualized attention to customer	Low concern and attention to the customer because of undeveloped structure and

		standard of the claim procedure
Responsiveness	The willingness to help customers and provide prompt service	Communication procedures for the maintenance process are not responsive because consumers need to contact the operator

From Table 1., show two critical processes that become the main focuses in after-sales in this research: procedures and standards for warranty claims and repair service facilities. The goods warranty card does not need to be stored and carried during the claim registration process. The brand of an electronic item stores the purchase invoice and the machine number of the electronic device purchased by a customer so that the supply chain can be monitored in an integrated system from the point of manufacture to the point of delivery. Additionally, consumers must track the progress of modifications made to their claims. For brands of consumer electronics, it is necessary to compile information from professionals who can aid in the repair process and who have received training or certification from institutions, so that consumers can locate reputable repair services and collaborate with stores or brands. Each repair service's knowledge is automatically calibrated to the brand and product's quality.

3.2 Purposed System and Data Design

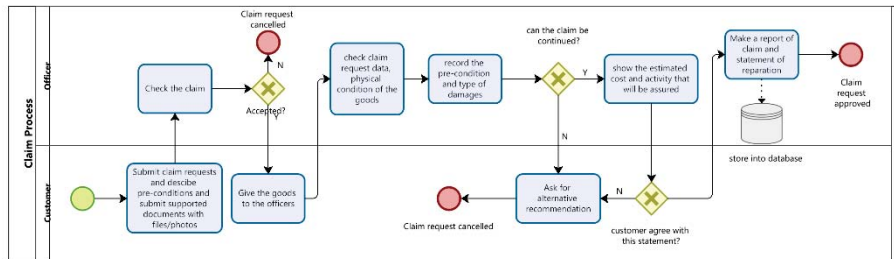


Fig. 1. Business Flow of Warranty Claim Process

The process design uses Business Process Modeling Notation (BPMN). The design process carried out in the warranty claim process can be seen in Figure 1. The claim process begins with the consumer inputting the required documents in the claim process, such as the purchase receipt number or warranty number, accompanied by photos of the condition of the goods and an explanation of the damage. If the warranty card is lost, customer must request into Sales division to track the number of warranty number from their date's purchase and the customer's name. The requirement officer who receives the claim submission will check the sales data and warranty limit according to the information provided by the consumer. Appropriate documents enable the consumers to send the goods to the designated location. The officer will check the goods according to the explanation that has been given previously. Afterward, the

officer will bring the goods, and consumers can monitor progress through the application. If the warranty terms do not cover additional costs from the repair process, the officer will send a notification via the application. If the consumer is willing to pay, the officer will make a claim. In addition, the claim can be rejected by the officer or canceled by the consumer. In that case, the consumer can request a recommendation for repair services through the system. The system provides recommendations for repair services based on the type of damage the officer has recorded.

Data design is made in the form of an Entity Relationship Diagram (ERD) using MySQL Workbench 8 (Figure 2). Overall, the claim and repair system are integrated with the goods sales system, including sales, returns, and shipping logistics. In this publication, the data design shown is the part that only relates to the claim and reparation system. In this ERD, there are two main processes, namely warranty claims and ordering repair services. In addition, it also records the areas of expertise possessed by the repair service, problems encountered in warranty claims, and the category of problems encountered in each type of product. This data is used as a basis for determining consumer recommendations for repair services.

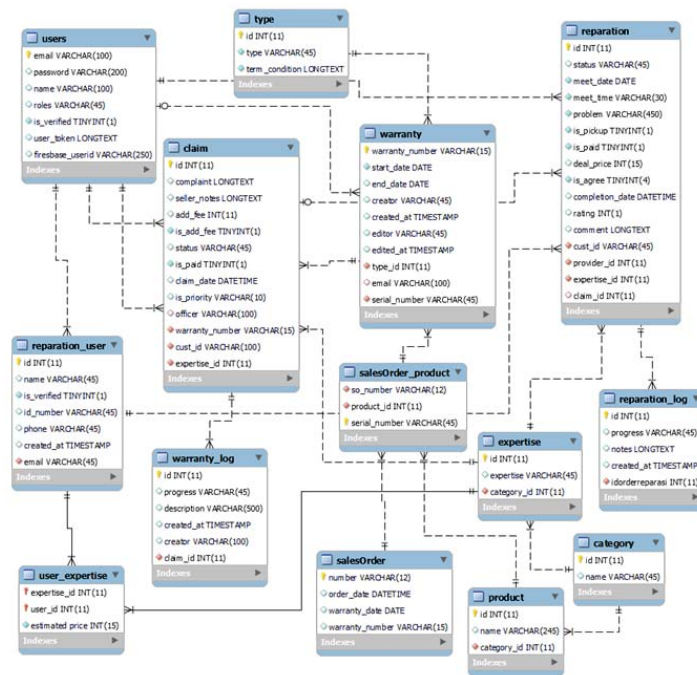


Fig. 2. Data Design of System

At the implementation stage [23], the system was built using MySQL to record transaction data, Firebase Realtime Database for the notification delivery process, and PHP as a programming language. Implementation of warranty management is carried out using Model View Controller [24] in Laravel to facilitate and make the process

more structured. The process will be started by creating a resource controller named GuaranteeController and the model named Guarantee first. Then, the submission process by consumers can be done by selecting a product from the transaction history. After that, consumers can input a description good's condition from the early report with description of the damage and photos of the goods (Figure 3). When the claim has been submitted, the consumer can monitor the claim's progress on the application they have, as seen in Figure 4.

Details of the guaranteed submission from the officers in the company can be seen in Figure 5. This form shows the progress of the claim submission made, as well as the status of the submission. If there is a change in the status of the claim submitted, the system will send a notification to the consumer (Figure 6).



Fig. 3. Claim submission



Fig. 4. Claim detail

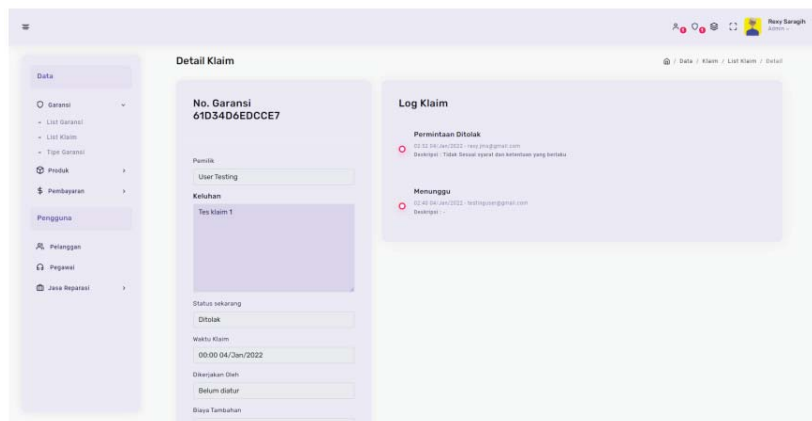


Fig. 5. Claim Details Form

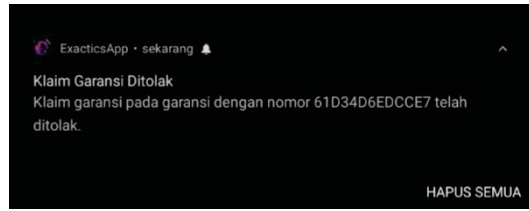


Fig. 6. Claim Notification



Fig. 7. Selection of repair services



Fig. 8. Repair detail

The implementation of the selection of repair services can be seen in Figure 7. In the process, consumers can choose a repair service provider according to the area of expertise of the repair service provider and the condition of the damaged goods, the location of the repair service provider, the estimated price, and the rating of the repair service provider. After the consumer chooses a repair service that is considered appropriate, the consumer can send a repair request by inputting a photo of the item's condition and a description of the damage experienced. The repair service provider will receive a notification for each new job received, which he or she can accept or reject. In addition, they can input work progress for accepted jobs, as seen in Figure 8. Payment processing is implemented using the MidTrans library [25] on the app-level build.gradle (Figure 9). After transactions are completed, consumers are asked to provide an assessment in the form of a rating (Figure 10). The rating data of the repair service provider will be used to determine the recommendations of the repair service provider for consumers.

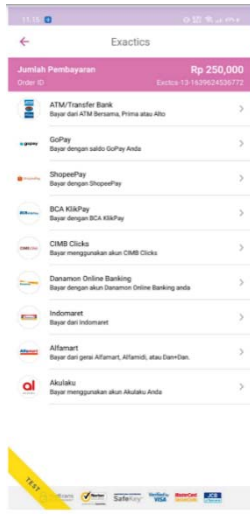


Fig. 9. Payment process



Fig. 10. Rating

BlackBox testing is performed to ensure that the system has been functioning properly. There are three categories of users: company officers, service providers, and consumers. The research team asked the three users to utilize the system with a preset scenario. Consumers were asked to complete a system evaluation questionnaire, while company officers and service providers were interviewed and asked to respond to several questions. Officers of the company have a favorable opinion of the system because it facilitates efficacy in terms of the duration of warranty claims. The reason is that consumers can check the status of their claims through the application at any moment, eliminating the need to visit the store or ask an employee. Similarly, warranty card storage and warranty validation can be performed digitally to reduce human error.

Feature of software product evaluated with five dimensions of Service Quality Aspect. This study tried to find out correlation between function that answer the five service Quality Aspect. The illustration describe on Table 2. Repair service providers feel helped by the existing features because it can help them promote the services provided. They can use the rating and comment features to convince potential consumers to choose the services to be used. In addition, structured problem categorization can help service providers describe their expertise. Some things that consumers consider added value are the ease of warranty claims, where they do not need to keep a warranty card. This system is proven to increase consumer loyalty to related brands [26], [27]. In addition, recommendations for repair services are considered to help consumers choose a repair place according to the problems at hand, considering that many consumers do not clearly understand the damage they experience.

Table 2. Result of Benefit Feature with Deep Analysis and Design

Parameters	Descriptions	Existing Condition
Reliability	Service procedures are still not structured and measured	P1, P2, P3
Assurance	Lack of management and customer knowledge regarding the claim procedure	P5
Tangibles	Does not have a static and standard structure and procedure	P1, P2, P6
Empathy	Low concern and attention to the customer because of undeveloped structure and standard of the claim procedure	P3, P4
Responsiveness	Communication procedures for the maintenance process are not responsive because consumers need to contact the operator.	P6, P7

4 Conclusion

The quality of warranty claim service needs attention so that consumers feel satisfied and loyal to the related business. SERVQUAL-driven analysis is one of the alternative analysis methods that can be used to increase customer satisfaction. The analysis procedure focuses more on the system's essential requirements. From this case study, the process of digitizing warranty claims was carried out through application development to assist consumers in filing their electronic goods warranty cards, reminders for warranty limits, and submitting warranty claims online. If the claim is approved, the consumer comes to the office to check the condition of the goods and will get information regarding the damage. However, when the system does not approve the claim, consumers can search for a repair service provider that matches the damage experienced through the same application by considering the quality of work, estimated price, location, and other filters. The results showed a good response from all types of users. Company officers can trace warranty data and the claim process. Repair service providers receive good appraisals of their work, which affects their business's promotion. Consumers feel helped in terms of warranty card storage, transparent claims process, and repair services suggestions based on the damage to their electronic goods. Furthermore, the scenario of how to communicate with customer to follow-up and track report claim must be analyze deep to measure the effectiveness of the system in helping customers to claim after-sales service.

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Atlantis Highlights in Engineering
Editor-in-Chief: Zheng Zheng

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Proceedings of the 4th
International Conference on
Informatics, Technology
and Engineering 2023
(InCITE 2023) · Volume 21

OPEN ACCESS

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ISSN 2731-7927

ISSN 2589-4943 (electronic)

Atlantis Highlights in Engineering

ISBN 978-94-6463-287-3

ISBN 978-94-6463-288-0 (eBook)

<https://doi.org/10.2991/978-94-6463-288-0>

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