

Analysis of Customer Satisfaction Towards Digital Banking Services using Technology Acceptance Model Method

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Abstract

The digitalization of banking services has enabled customers to conduct various transactions quickly and efficiently through digital platforms such as telephone banking, SMS banking, internet banking, and mobile banking. This ease of access has brought great benefits to customers, such as reducing the time and cost of conducting banking transactions. However, the adoption of digital banking services does not always run smoothly. Customer satisfaction with these services is a key factor in determining the success of implementing this technology. To analyze customer satisfaction, the Technology Acceptance Model (TAM) method can be used. The TAM method can be used as a basis for evaluating factors that influence technology acceptance, such as Perceived Usefulness (PU) and Perceived Ease of Use (PEU), which ultimately contribute to customer satisfaction and loyalty. The results obtained from this study are a website to analyze customer satisfaction with digital banking services using the TAM method.

Keywords: website, customer satisfaction, digital banking services, TAM method

1. Introduction

The development of information technology in the last decade has driven major changes in various sectors, including banking. The digitalization of banking services has enabled customers to conduct various transactions quickly and efficiently through digital platforms such as telephone banking, SMS banking, internet banking, and mobile banking. This ease of access has brought great benefits to customers, such as reducing the time and cost of conducting banking transactions [1]. The banking industry is one of the most dynamic sectors and plays an important role in the global economy. The development of information technology has had a significant impact on the way banks operate and interact with customers [2]. In an effort to improve the quality of service and customer satisfaction, banks around the world have adopted various management information systems [3]. One of the most significant changes is the emergence of digital banking, which allows customers to access and manage banking services through digital devices, such as computers, mobile phones, and mobile phones. These digital banking services include various platforms such as mobile banking, internet banking, SMS banking, and telephone banking, which make it easier for customers to conduct transactions anytime and anywhere without having to visit a bank branch office. However, the adoption of digital banking services is not always smooth. Customer satisfaction with these services is a key factor in determining the success of implementing the technology. Several studies have shown that customer satisfaction is influenced by various factors, including ease of access to services, fees or rates charged, completeness and usefulness of available features, and the level of security offered by the service [4].

Digital banking also affects the way banks interact with customers. Unlike traditional banking which relies on direct interaction, digital banking changes this paradigm by presenting more automated and technology-based services. This affects customer behavior patterns, where convenience and ease of use are the main factors in determining the level of satisfaction with the service [5]. Therefore, this study aims to analyze how customer acceptance of digital banking services affects their satisfaction. The Technology Acceptance Model (TAM) can be used as a basis for evaluating factors that influence technology acceptance, such as Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), which ultimately contribute to customer satisfaction and loyalty.

Technology Acceptance Model (TAM) is one of the most widely used theoretical frameworks to evaluate technology acceptance. TAM identifies two main factors that influence technology acceptance, namely Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). These two factors influence user attitudes towards technology (Attitude Towards Using - ATU) and intentions to use it (Behavioral Intention to Use - BIU), which ultimately can affect user satisfaction [6].

This study aims to analyze the effect of digital banking services on customer satisfaction in the banking sector using the TAM method. By understanding how customers accept and use digital banking services, banks can identify areas that need improvement and develop more

effective strategies to improve customer satisfaction [7]. This study is expected to provide a significant contribution to academic literature and practitioners in the banking sector in optimizing the use of digital banking services to improve service quality and customer satisfaction. As part of this research, the results of the customer satisfaction analysis will be incorporated into a web-based application developed using Laravel. Thus, this research not only provides theoretical insights into the acceptance of technology among bank customers, but also provides practical tools for banks to improve their services through the use of Laravel-based websites [8].

2. Literature Review

2.1. Digital Banking Services

Digital banking services are services provided by banks through digital platforms. Digital banking services refer to the various ways in which banks provide their services through digital platforms, allowing customers to make transactions and access banking information online. These services include:

1. **Internet Banking**
Internet banking allows customers to access banking services through the internet network. Through this system, customers can make various transactions such as checking balances, transferring between accounts, paying bills, and managing finances independently without having to visit a physical bank.
2. **Mobile Banking**
Mobile banking makes it easy for customers to access banking services through applications on mobile devices (smartphones or tablets). The advantage is that it provides access to banking services anytime and anywhere, and allows customers to make transactions in a more flexible and faster way.
3. **Telephone Banking**
Telephone Banking is a banking service that allows customers to make financial transactions and access information related to their accounts via telephone, be it a mobile phone or a landline. This service makes it easy for customers who do not have direct access to the internet or who prefer to use the telephone as a means of transacting, without having to come to a bank branch.
4. **SMS Banking**
SMS Banking is a banking service that allows customers to make transactions and receive banking information via short messages (SMS) sent to registered mobile phone numbers.

2.2. Technology Acceptance Model

Technology Acceptance Model (TAM) is a theoretical framework developed by Davis (1989) to understand the factors that influence the acceptance and use of technology. TAM identifies two main factors that influence technology acceptance, namely Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). These two factors influence the user's attitude towards technology (Attitude Towards Using - ATU) and the intention to use it (Behavioral Intention to Use - BIU), which can ultimately affect user satisfaction [9].

In the context of digital banking services, the application of TAM can help banks understand how customers accept and use the banking technology offered. By knowing customer perceptions of the usefulness and ease of use of digital banking services, banks can:

1. **Identify Customer Needs:** Understanding the factors that are considered important by customers can help banks design services that are more in line with customer needs and expectations.
2. **Improve Services:** Banks can develop strategies to improve the perception of usefulness and ease of use of digital services, such as providing relevant and user-friendly features, and providing training or technical support to customers.
3. **Improving Customer Satisfaction:** By increasing PU and PEOU, banks can increase customers' positive attitudes and intentions to use digital banking services, which can ultimately increase customer satisfaction and loyalty.

2.3. Customer Satisfaction

Customer satisfaction is one of the key indicators of a bank's success in providing services to its customers. This satisfaction reflects the extent to which the services provided by the bank are in accordance with customer expectations and needs. Customer satisfaction is very important because it can affect customer loyalty, retention, and word of mouth recommendations. Customer satisfaction is influenced by their experience in using digital banking services, including PU, PEOU, ATU, and BIU. Banks that can provide digital banking services that meet customer expectations will increase customer satisfaction and loyalty [10].

To measure customer satisfaction, this study used a questionnaire designed with questions that measure the level of customer satisfaction with various aspects of digital banking services. These questions are arranged on a 5-point Likert scale, ranging from "very dissatisfied" to "very satisfied".

3. Research Method

Technology Acceptance Model (TAM) is used to analyze customer satisfaction data on digital banking services. This model was developed by Davis (1989) and is one of the most popular models for understanding technology acceptance. TAM evaluates customer perceptions of two main variables, namely Perceived Ease of Use (PEU) and Perceived Usefulness (PU), and how these two variables affect satisfaction and intention to use (Intention to Use) of digital banking services. TAM evaluates the influence of PEU and PU on the intention to use (Behavioral Intention to Use - BI) and actual use (Actual System Use - AU) of digital banking services. The relationship between variables in TAM can be expressed in the following table:

Table 1: Variables in the TAM Method

No	Variable	Question
1	Perceived Ease of Use (PEU)	Transaction services are very informative and easy to use.
2		Digital banking services provide a fast response.
3		Customers can make transactions quickly and easily through the digital services provided.
4		The digital service application is designed with a user-friendly interface, making it easy for customers to navigate and use the available features.
5	Perceived Usefulness (PU)	Digital banking services guarantee the security and privacy of customer data.
6		Digital services are ready to assist customers in resolving problems or questions related to the use of the application.
7		Customers can monitor balances, transaction history, and manage their accounts efficiently.
8		Digital applications provide real-time notifications for every transaction made.
9		The application is equipped with a sophisticated security system, including two-factor authentication, data encryption, and suspicious activity monitoring to protect customer information.
10		The use of digital services reduces the time required to make transactions compared to traditional methods.
11		Customers can access services at any time, without the limitations of bank operating hours.
12		Customers have full control over their finances with the ability to monitor transactions directly.

The results of the analysis of data collected through an online survey using Google Form show several important findings related to customer perceptions of digital banking services. The following are details of the analysis results based on the variables evaluated:

1. **Ease of Use:** Customers generally feel that digital banking services are easy to use, but there are some complaints regarding navigation and user interface.
2. **Usability:** Most customers feel that digital banking services are very useful, especially in terms of accessibility and convenience.
3. **Security:** Security is one of the main concerns of customers, with some customers worried about potential security risks.
4. **Service Features:** The features provided by digital banking services are considered quite complete, but there is a request for additional features such as transaction notifications and spending analysis.

The questionnaire filled out by respondents was using a Likert scale with an interval size. The Likert scale is used to measure the attitudes, opinions and perceptions of a person or group of people about social phenomena. The Likert scale used in this study uses a five-point scale with categories, namely: score 1 for very dissatisfied answers, score 2 for dissatisfied answers, score 3 for quite satisfied answers, score 4 for satisfied answers, and score 5 for very satisfied answers.

Table 2: Scale Category Table

Score	Statement
5	Very Satisfied
4	Satisfied
3	Quite Satisfied
2	Not Satisfied
1	Very Dissatisfied

Data collected from 100 respondents through an online survey can be seen in the following table. This table shows the scores for each question given based on a Likert scale (1-5), which reflects the respondents' perceptions of digital banking services.

Table 3: Respondent Survey Table

Respondents	Customer Satisfaction Variable Analysis											
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
1	5	4	4	5	5	5	4	4	4	5	4	4
2	5	5	4	5	4	4	4	5	5	5	4	5
3	4	4	5	4	5	4	4	5	4	4	5	5
4	5	5	5	4	5	4	4	5	5	4	5	5
5	4	4	5	5	5	4	4	5	4	5	4	4
6	5	4	4	4	4	4	5	5	5	4	5	4
7	5	5	4	5	4	5	5	5	4	5	5	4
8	5	5	5	4	4	4	5	5	4	5	4	4
9	4	4	4	4	5	5	5	4	5	5	5	5
10	4	5	4	4	4	5	5	4	5	4	5	5
11	4	5	4	5	5	5	4	4	4	5	4	5
12	4	5	4	5	5	4	5	5	5	4	5	4
13	4	5	4	5	5	5	4	4	4	4	4	4
14	5	5	5	4	5	5	4	5	5	5	5	5
15	5	4	4	4	5	4	5	4	5	4	4	4
16	5	4	5	4	4	5	5	4	4	5	5	5
17	4	4	5	5	5	4	5	4	5	5	5	5
18	5	4	4	4	4	5	4	5	4	5	5	4
19	5	5	5	5	4	5	4	5	4	4	4	5
20	4	5	4	5	4	5	4	5	4	5	5	4
21	5	5	5	5	5	4	4	5	4	5	4	5
22	5	4	4	4	5	5	5	5	5	4	5	4
23	4	4	4	4	5	5	4	4	5	5	5	5
24	5	4	5	5	5	5	4	5	4	5	4	5
25	5	4	5	5	5	5	5	4	5	5	4	5
26	5	5	5	5	5	5	4	5	5	4	5	4
27	5	4	4	4	5	4	4	5	4	5	5	5
28	4	4	4	5	4	5	4	5	4	5	4	5
29	5	4	4	4	5	5	5	5	5	5	5	5
30	4	5	4	4	5	5	4	4	5	4	5	4

31	4	5	5	5	4	4	4	4	4	5	4	5
32	4	4	5	4	4	4	4	4	4	5	4	5
33	4	5	4	4	5	4	5	4	5	5	5	4
34	5	4	5	5	4	4	4	5	5	5	5	5
35	4	4	4	5	5	4	5	4	5	4	4	5
36	4	4	4	5	4	5	4	5	4	5	5	5
37	5	4	4	5	4	5	4	5	5	5	4	5
38	4	4	5	5	4	5	4	4	5	4	5	5
39	4	5	5	4	4	5	5	5	4	4	4	5
40	4	5	5	5	5	5	4	5	5	5	4	5
41	5	4	5	5	5	4	5	5	4	4	5	5
42	4	4	4	4	4	5	5	4	4	4	5	4
43	5	5	4	4	5	5	4	4	5	5	5	5
44	4	4	4	5	5	5	4	5	5	4	5	4
45	5	5	4	4	4	5	5	5	5	5	4	4
46	4	5	4	4	4	5	5	4	4	5	4	4
47	5	5	4	5	4	5	5	5	4	5	4	5
48	4	4	5	5	4	5	5	5	4	4	5	4
49	4	4	5	5	5	5	5	5	4	5	4	4
50	5	5	4	5	5	4	5	4	4	4	5	5
51	4	4	5	5	5	5	5	5	5	5	5	5
52	4	5	4	4	4	5	4	4	5	5	5	5
53	4	4	5	5	5	4	4	4	4	4	5	5
54	4	5	4	4	4	4	5	5	5	4	5	4
55	4	5	5	4	4	5	5	4	4	4	4	4
56	5	4	5	4	4	5	5	4	5	4	4	5
57	4	4	5	5	4	4	4	5	4	5	5	5
58	5	5	5	4	4	4	4	4	4	5	5	5
59	4	5	5	4	5	5	4	4	4	5	4	4
60	5	4	5	5	4	4	5	4	4	4	5	4
61	5	5	4	5	4	5	5	5	5	4	5	4
62	4	4	5	4	4	4	4	4	4	4	5	5
63	5	5	5	5	4	5	5	4	4	5	4	5
64	4	4	5	4	4	5	4	5	5	5	4	5
65	5	4	5	5	4	4	4	4	4	4	5	4
66	5	4	4	5	5	5	4	5	5	4	5	5
67	5	4	4	4	4	5	4	5	5	5	5	5
68	4	5	4	4	4	4	4	5	5	4	5	5
69	4	5	5	4	5	4	5	4	4	4	5	4
70	4	4	5	4	4	4	5	5	5	4	4	5
71	4	4	5	4	4	4	5	4	5	5	5	4
72	4	5	4	4	4	5	4	4	5	5	5	5
73	5	4	4	5	4	4	4	4	5	5	4	4
74	4	4	4	5	4	5	5	4	5	4	5	5
75	5	4	5	5	4	5	4	5	4	4	4	4
76	4	4	5	5	4	5	5	5	4	5	4	5
77	4	4	4	4	5	4	4	5	5	5	4	4
78	4	4	5	4	4	4	5	4	5	4	5	4
79	4	4	4	4	5	4	5	4	4	5	5	4
80	4	4	5	5	5	5	5	4	5	5	4	5
81	5	4	5	5	4	5	5	4	5	4	5	5
82	4	5	5	5	5	4	5	4	4	5	4	4
83	5	4	5	5	5	5	4	4	4	4	4	5
84	4	4	5	5	5	4	4	4	4	5	5	5
85	5	5	4	4	5	4	4	4	5	5	4	4
86	5	4	4	4	5	5	5	4	5	5	5	5
87	4	5	5	4	5	4	4	4	5	5	5	5
88	4	5	4	4	5	5	5	5	5	4	4	4
89	4	4	4	5	5	4	5	4	5	4	5	4
90	4	5	5	5	5	5	4	4	5	5	5	4
91	5	4	4	5	5	4	5	5	5	4	5	5
92	4	5	5	5	4	5	5	4	5	5	5	4
93	5	5	5	4	4	4	4	4	4	4	5	4
94	4	5	4	5	5	5	5	4	5	4	4	5
95	5	5	4	4	5	4	4	5	4	4	5	5
96	4	4	5	4	4	5	4	4	4	4	5	5
97	5	4	5	4	4	4	5	5	4	5	5	4
98	4	5	4	5	5	4	4	4	4	5	4	4
99	5	5	5	5	4	5	4	4	4	5	4	5
100	4	5	4	5	5	5	5	5	4	5	4	4
Total	444	445	451	453	450	457	449	447	451	457	459	457

Calculation for each variable in the TAM method:

1. PEU, covers questions P1 to P4, so that:

$$PEU = (444 + 445 + 451 + 453) / 400 = 4.4825$$

$$\text{In percentage} = 4.4825 * 100 / 5 = 89.65\%$$

2. PU, covers questions P5 to P12, so that:

$$PU = (450 + 457 + 449 + 447 + 451 + 457 + 459 + 457) / 800 = 4.53375$$

$$\text{In percentage} = 4.53375 * 100 / 5 = 90.675\%$$

From the results of the questionnaire above, the following information can be obtained:

1. A PEU value of 89.65% means that digital banking services are very easy to use and the available features can also be easily understood by customers.
2. A PU value of 90.675% means that digital banking services are very useful for customers and can increase the efficiency of customers' time.

4. Results and Discussion

4.1. Results

This customer satisfaction analysis application for digital banking services using the Technology Acceptance Model (TAM) method is designed with the Laravel framework. The application can be run through a browser by typing the URL: localhost:8000 so that the system will display the home page of the system, namely the Login page as shown in the following image:

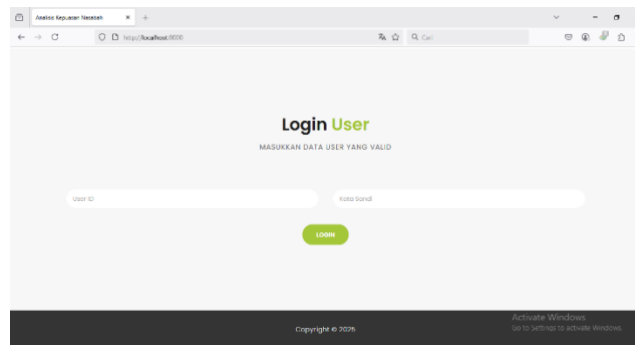


Fig. 1: System Login Page

Users must enter valid user data in order to use the system. Users who can use this system consist of two types, namely customer users and admin users. Customer users can provide feedback to the system. Meanwhile, admin users can upload questionnaire data into the system to be processed and obtain conclusions regarding the analysis of customer satisfaction with digital banking services. If the login process using the customer user is successful, the system will display the Home User page as shown in the following image.

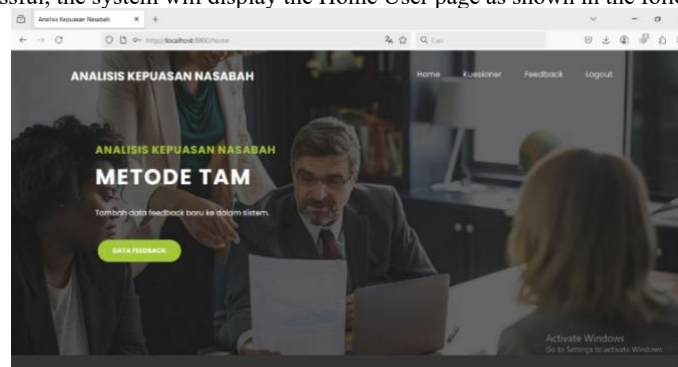


Fig. 2: User Home Page

On the Home User page, there are several menus that can be used, namely:

1. Home Menu, functions to display the Home User page.
2. Questionnaire Menu, functions to display the Questionnaire page.
3. Feedback Menu, functions to display the Feedback List page.
4. Logout Menu, functions to close the customer section system and return to the Login page.

To carry out the questionnaire filling process, the customer user can access the Questionnaire menu, so that the system will display the Questionnaire page as shown in the following image:

Fig. 3: Questionnaire Page

To display the feedback list, the customer user can access the Feedback menu, so that the system will display the Feedback page as shown in the following image:

Fig. 4: Feedback List Page

On the Feedback List page, users can see a list of feedback given by other users. In addition, users can also provide new feedback to the system. The way to do this is by clicking the Provide Feedback button so that the system will display the Input Feedback page as shown in the following image:

Fig. 5: Feedback Input Page

On this Input Feedback page, users can enter the feedback they want. After that, users can click the Save button to save the feedback data they entered. Meanwhile, if the login process with the admin user is successful, the system will display the Home Admin page as shown in the following image:

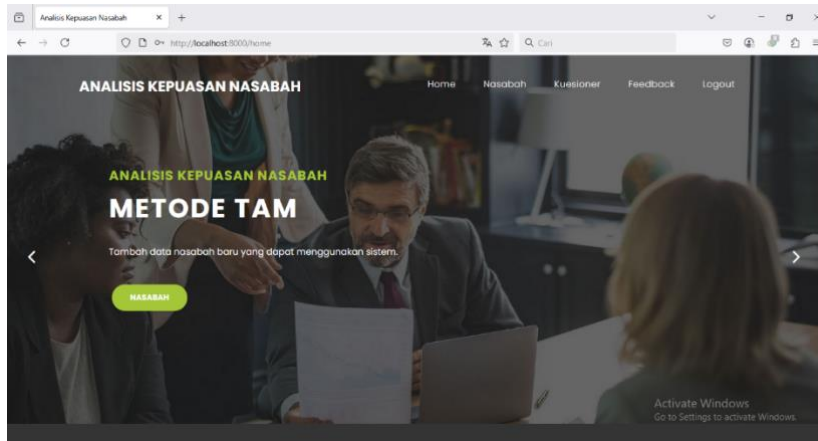


Fig. 6: Admin Home Page

On the Home Admin page, there are several menus that can be used, namely:

1. Home menu, functions to display the Home Admin page.
2. Customer menu, functions to display the Customer List page.
3. Questionnaire menu, functions to display the questionnaire results.
4. Feedback menu, functions to display the Feedback List page.
5. Logout menu, functions to close the admin section system and return to the Login page.

If the admin user wants to display a list of customers registered in the system, they can access the Customer menu so that the system will display the Customer List page as shown in the following image:

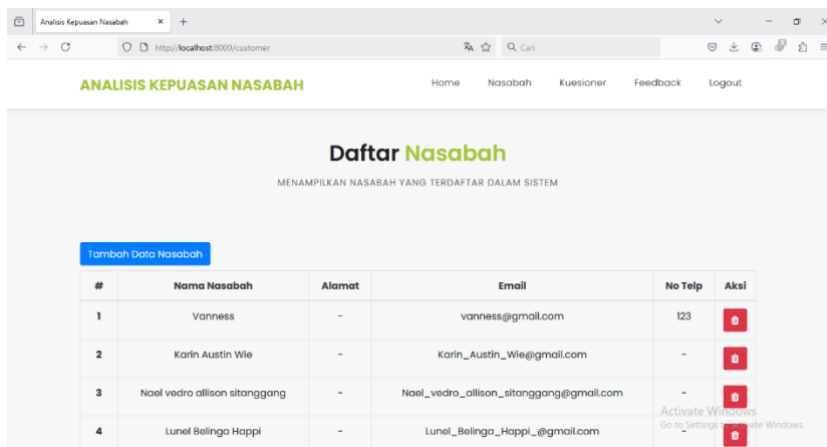


Fig. 7: Customer List Page

On the Customer List page, the admin user can see the customer data registered in the system. If the admin user wants to enter new customer data, they can click the Add New button, so that the system will display the Customer Input page as shown in the following image:

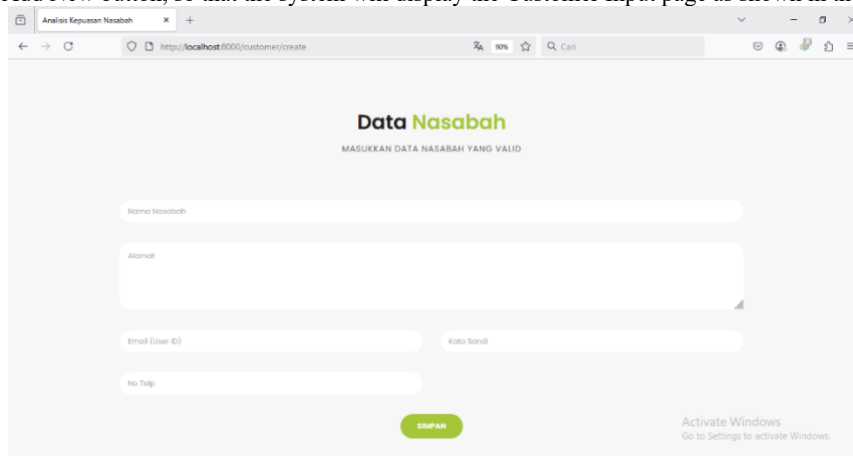


Fig. 8: Customer Input Page

On the Customer Input page, the admin user can enter new customer data that can use the system. After that, the admin user can click the Save button to save the data. Meanwhile, if the admin user wants to see the results of the questionnaire obtained, they can access the Questionnaire menu, so that the system will display the Questionnaire Results page as shown in the following image:

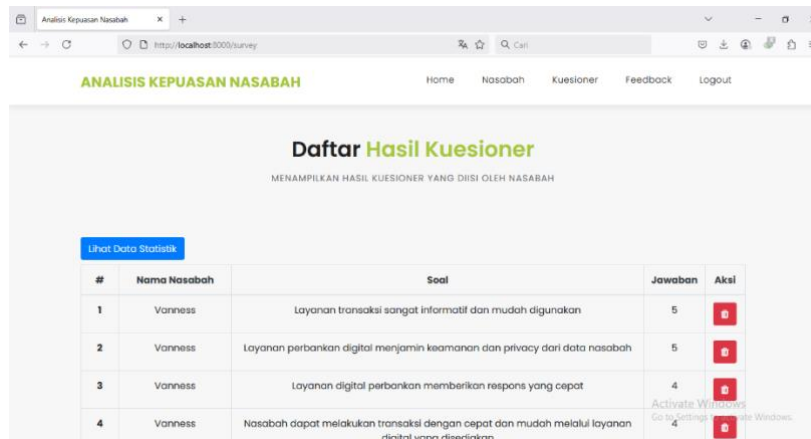


Fig. 9: Questionnaire Results Page

On this Questionnaire Results page, the admin user can see the information that can be obtained from the results of this questionnaire. To see statistical data from the questionnaire results, you can click the View Statistical Data button so that the system will display the Statistical Results page as shown in the following image:

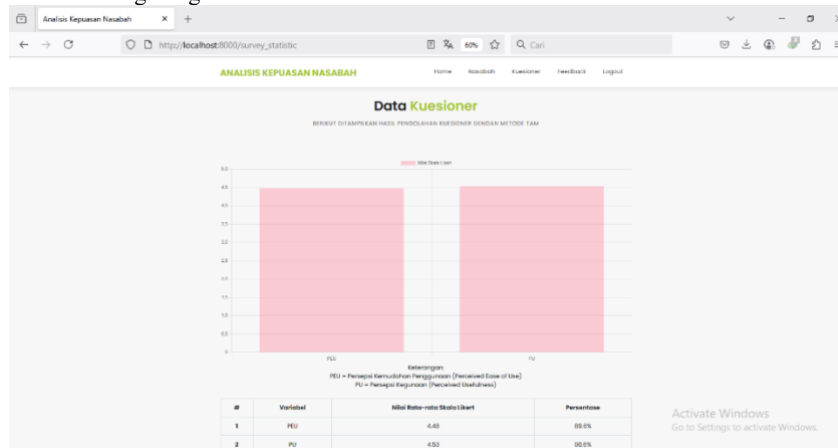


Fig. 10: Statistics Results Page

Finally, to display the feedback list, the admin user can access the Feedback menu, so that the system will display the Feedback page as shown in the following image:

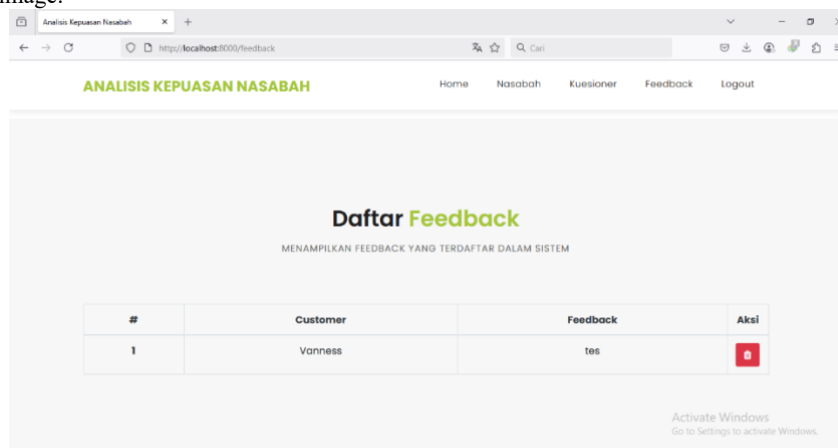


Fig. 11: Feedback List Page

On the Feedback List page, admin users can see a list of feedback given by other users.

4.2. Discussion

The advantages of the application for analyzing customer satisfaction with digital banking services using the Technology Acceptance Model (TAM) method are:

1. The application is able to display the results of the analysis of the questionnaire using the TAM method.

2. The application provides a feature to add feedback from customers so that admins can find out suggestions and criticisms from customers regarding their digital banking services.

Meanwhile, the disadvantages of the application for analyzing customer satisfaction with digital banking services using the Technology Acceptance Model (TAM) method are:

1. The application does not have a feature for adding new admin user data, so it is not possible to add admin users who can use the system.
2. The application does not provide a feature for customers to carry out the registration process themselves.

5. Conclusion

After completing the application of customer satisfaction analysis towards digital banking services using the Technology Acceptance Model (TAM) method, the author draws the following conclusions:

1. The application is able to display the results of the analysis of the questionnaire using the TAM method.
2. The application provides a feature to add feedback from customers so that the admin can find out suggestions and criticisms from customers regarding their digital banking services.

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