



Analysis of the Implementation of E-Service Quality Based Chatbots to Improve Academic Services in the Management Study Program at UPN "Veteran" Jawa Timur

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ARTICLE INFO

Keywords: Chatbot, Discord, e-Service Quality, Student Satisfaction, Academic Service

Received : 16, July

Revised : 30, July

Accepted: 27, August

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ABSTRACT

This study analyzes the implementation of an e-Service Quality-based chatbot integrated with the Discord application to improve academic services in the Management Study Program at UPN "Veteran" Jawa Timur. Using a quantitative descriptive method, data were collected through surveys of 95 students and analyzed using the Customer Satisfaction Index (CSI) and Importance Performance Analysis (IPA). The study evaluates variables including e-service quality, chatbot usability, and student satisfaction during the 2025 observation. The results show a CSI score of 74.2%, indicating student satisfaction. However, some service aspects such as personalization and responsiveness require improvement. This research implies that chatbot-based automation can enhance efficiency, accuracy, and responsiveness in academic services.

INTRODUCTION

In the current era of digital transformation, higher education institutions are expected to deliver technology-driven services to improve academic efficiency and student satisfaction. However, many universities still encounter challenges such as delayed information, limited administrative transparency, and ineffective communication, leading to dissatisfaction among students (Regita, 2023)). As a response to these problems, automation through chatbot technology emerges as an innovative solution to streamline academic services. Chatbots, which function as AI-based virtual assistants, have shown the potential to provide real-time, accurate, and accessible support services for students, regardless of time and location (Fitria & Simbolon, 2023).

The integration of chatbots into widely used platforms such as Discord creates new opportunities to optimize service quality in a user-friendly environment. Discord, initially popular among gamers, has evolved into a multifunctional communication tool that supports both synchronous and asynchronous interactions, making it a strategic channel for academic service automation (Wahyuningsih & Baidi, 2021). This study highlights the gap between students' growing expectations for seamless digital services and the current state of academic services in the Management Study Program at UPN "Veteran" Jawa Timur, where a preliminary survey revealed that only 5.1% of students felt very satisfied with existing services.

This research contributes to the body of knowledge by capturing a niche sample management students in an Indonesian public university and evaluating their experience with a chatbot system built upon the e-Service Quality (e-ServQual) framework. Furthermore, this study applies a combined methodological approach using Customer Satisfaction Index (CSI) and Importance Performance Analysis (IPA), offering a robust assessment of both performance and student expectations. The novelty of this research lies in integrating Discord-based chatbot services within the context of academic administration, which has rarely been explored in previous studies (Dora & Asmar, 2023; Pérez et al., 2020; Wijayanto et al., 2024)

Thus, this paper aims to evaluate whether the implementation of an e-ServQual-based chatbot integrated with the Discord application can effectively improve the efficiency, responsiveness, and transparency of academic services in the Management Study Program at UPN "Veteran" Jawa Timur.

LITERATURE REVIEW

Total Quality Management (TQM)

Total Quality Management is a continuous management system aimed at meeting and exceeding customer expectations by focusing on quality improvement across all organizational processes. It emphasizes customer orientation, continuous improvement, full participation, and evidence-based decision-making (Londa et al., 2024). In the context of this research, students are regarded as the main customers whose satisfaction reflects the overall quality of academic services. By applying TQM principles, academic service processes can be enhanced to align with student needs and expectations.

Electronic Service Quality (e-ServQual)

Electronic Service Quality refers to the extent to which an online system or application can facilitate efficient and effective service delivery to users (Tobing, 2022). The dimensions include website design, reliability, responsiveness, security, trust, and personalization (Halim et al., 2023). This theory is used to measure the quality of chatbot-based academic services implemented via Discord.

Chatbot

Chatbot focuses on how well users can interact with and benefit from chatbot systems. Key elements include interface appearance, content clarity, and ease of use, which together enhance user experience and satisfaction (Kasmayanti et al., 2023). In academic services, an effective chatbot reduces administrative workload and increases accessibility.

Student Satisfaction

Student satisfaction is a subjective evaluation of students' experiences with academic services, reflecting how well the institution meets their expectation (Wong & Chapman, 2023). Satisfaction is measured through service accuracy, willingness to reuse, and the likelihood of recommending the service to peers (Priyambudi & Handayani, 2024).

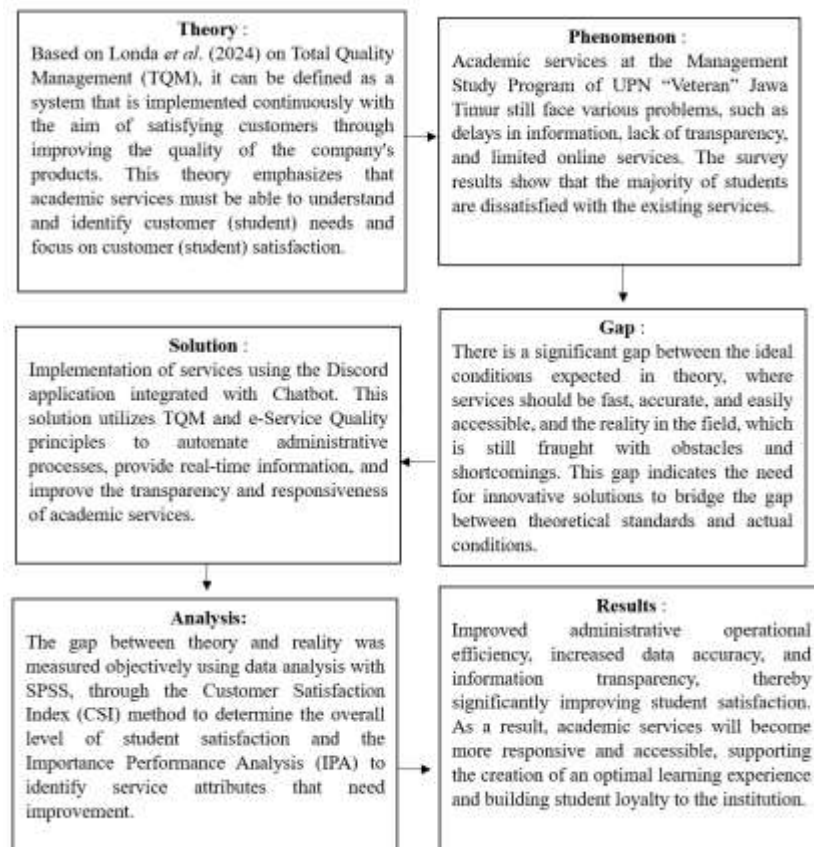


Figure 1. Conceptual Framework

METHODOLOGY

This study employed a quantitative descriptive approach to evaluate the quality of academic services based on the implementation of a Discord-integrated chatbot. The research was conducted in the Management Study Program of Universitas Pembangunan Nasional “Veteran” Jawa Timur. The population consisted of 1,947 active students from cohorts 2021 to 2024. Using the Slovin formula with a 10% margin of error, a sample of 95 students was selected as respondents.

Data were collected through a structured questionnaire assessing three main variables: e-Service Quality, chatbot usability, and student satisfaction. Each variable was measured using established indicators adapted from previous studies. Data validity and reliability were tested using SPSS. The overall level of student satisfaction was analyzed using the Customer Satisfaction Index (CSI), while Importance Performance Analysis (IPA) was used to identify key areas for service improvement.

RESEARCH RESULTS

To assess the implementation of the chatbot-based academic service, several statistical tests were conducted following the research methodology. The steps of analysis included validity and reliability tests, calculation of the Customer Satisfaction Index (CSI), and Importance Performance Analysis (IPA). Each step is explained below:

Validity and Reliability Test

Table 1. Validity Test Results Level of Importance

Statement	R Calculation	R Table	Description
Statement i.1	0,643	0,202	Valid
Statement i.2	0,642	0,202	Valid
Statement i.3	0,547	0,202	Valid
Statement i.4	0,629	0,202	Valid
Statement i.5	0,531	0,202	Valid
Statement i.6	0,629	0,202	Valid
Statement i.7	0,562	0,202	Valid
Statement i.8	0,603	0,202	Valid
Statement i.9	0,597	0,202	Valid
Statement i.10	0,697	0,202	Valid
Statement i.11	0,778	0,202	Valid
Statement i.12	0,733	0,202	Valid

Table 2. Validity Test Results Level of Performance

Statement	R Calculation	R Table	Description
Statement p.1	0,702	0,202	Valid
Statement p.2	0,643	0,202	Valid
Statement p.3	0,612	0,202	Valid
Statement p.4	0,555	0,202	Valid
Statement p.5	0,580	0,202	Valid
Statement p.6	0,586	0,202	Valid
Statement p.7	0,600	0,202	Valid
Statement p.8	0,691	0,202	Valid
Statement p.9	0,633	0,202	Valid
Statement p.10	0,576	0,202	Valid
Statement p.11	0,593	0,202	Valid
Statement p.12	0,801	0,202	Valid

A validity test was conducted using the Pearson Product-Moment correlation to ensure each item in the questionnaire accurately measured the intended construct. All items showed $r\text{-count} > r\text{-table}$ (0.202), indicating that they are valid.

Table 3. Reliability Test Results

Statement	Cronbach's Alpha Value	Description
Statement on Level of Importance	0,865	Reliable
Statement on Level of Performance	0,864	Reliable

Reliability was tested using Cronbach's Alpha, resulting in: Importance Level: 0.865 and Performance Level: 0.864. Both exceed the threshold of 0.60, proving that the instrument is reliable.

1. Customer Satisfaction Index (CSI)

To determine the overall student satisfaction level, the CSI was calculated using the following steps:

Step 1: Mean Importance Score (MIS) and Mean Satisfaction Score (MSS)

$$MIS = \frac{\sum_{i=1}^n Y_i}{n} \quad MSS = \frac{\sum_{i=1}^n X_i}{n}$$

Step 2: Weight Factor (WF)

$$WF = \frac{\sum_{i=1}^n Y_i}{\sum MIS} \times 100\%$$

Step 3: Weight Score (WS)

$$WS_i = WFi \times MSS$$

Step 4 : CSI Value

Table 4. Calculation Results for All CSI Attributes

Number	Attribute	MIS	WF	MSS	WS
1.	Website Design	3,85	0,08	3,74	0,29
2.	Reliability	4,10	0,08	3,88	0,31
3.	Security and Speed of service	4,07	0,08	3,91	0,31
4.	Responsiveness	4,05	0,08	3,88	0,31
5.	Trust	4,15	0,08	3,87	0,30
6.	Personalization	4,13	0,08	3,82	0,30
7.	Appearance	4,04	0,08	3,96	0,31
8.	Content	3,93	0,08	3,89	0,31
9.	Usability	3,86	0,08	3,98	0,31
10.	Accuracy of Service	3,85	0,08	3,69	0,29
11.	Interest in Reusing	4,01	0,08	3,87	0,30
12.	Willingness to Recommend	3,95	0,08	3,9	0,31
Σ		47,99	1	46,39	3,71

$$CSI = \left(\frac{\Sigma WS}{5} \right) \times 100\%$$

$$CSI = \left(\frac{\Sigma 3,71}{5} \right) \times 100\% = 74,2\%$$

Table 5. CSI Level Criteria

Number	Value	Description
1	81% - 100%	Very Satisfied
2	66% - 80,99%	Satisfied
3	51% - 65,99%	Quite Satisfied
4	35% - 50,99%	Quite Dissatisfied
5	0% - 34,99%	Dissatisfied

Based on the above steps, the CSI result was 74.2%, which falls into the "Satisfied" category based on Table 5.

Importance Performance Analysis

IPA was used to determine which service attributes are priorities for improvement. The suitability level (TK) was calculated for each indicator using:

$$TK_i = \frac{X_i}{Y_i} \times 100\%$$

Table 6. Average Performance and Importance Scores

Number	Attribute	Performance Level (X)	Importance Level (Y)	X Average	Y Average
1.	Attributes	356	365	3,74	3,84
2.	Website Design	369	390	3,88	4,10
3.	Reliability	372	387	3,91	4,07
4.	Security and Speed of service	369	385	3,88	4,05
5.	Responsiveness	368	395	3,87	4,15
6.	Trust	363	393	3,82	4,13
7.	Personalization	377	384	3,96	4,04
8.	Appearance	370	374	3,89	3,93
9.	Content	379	367	3,98	3,86
10.	Usability	351	366	3,69	3,85
11.	Accuracy of Service	368	381	3,87	4,01
12.	Interest in Reusing	371	376	3,90	3,95

These results were plotted into four quadrants using a Cartesian diagram to identify which indicators should be maintained and which should be improved.

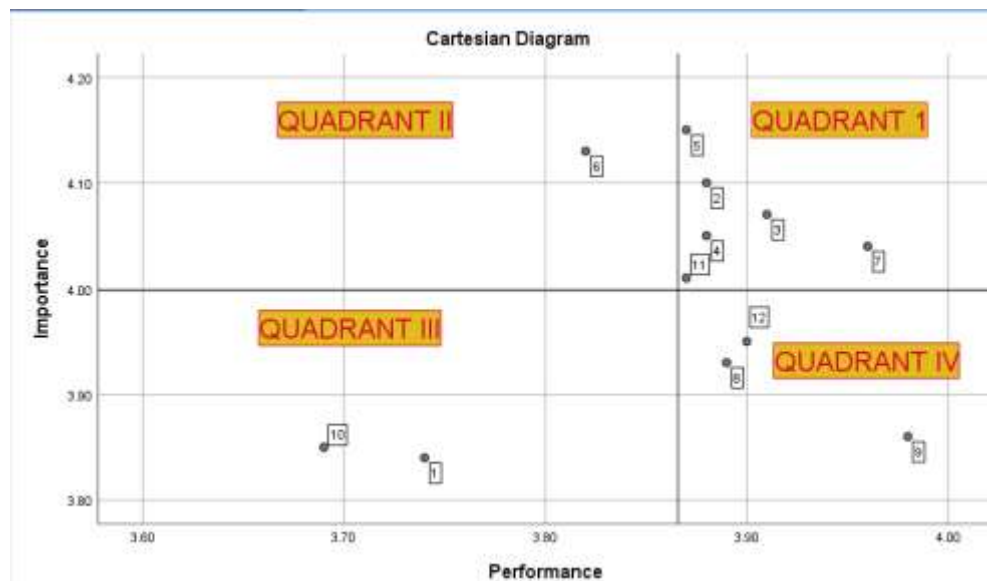


Figure 2. Cartesian Diagram

Quadrant II (high importance, low performance) contained the Personalization indicator, meaning it is a priority for improvement. Other attributes fell into Quadrant I (keep up the good work), Quadrant III (low priority), or Quadrant IV (possible overkill).

DISCUSSION

This study shows that the implementation of Discord-based academic services integrated with Chatbot has a positive impact on the satisfaction of

students in the Management Study Program at UPN “Veteran” Jawa Timur. This is reflected in the Customer Satisfaction Index (CSI) score, which falls into the “Satisfied” category. Although it has not yet reached the “Very Satisfied” category, this achievement indicates that the use of technology has successfully addressed most of the students' needs in terms of academic services. This aligns with the perspective of Fitria & Simbolon (2023) who state that technology can assist users in fulfilling their needs.

The e-ServQual indicators, which include website design, reliability, security, service speed, responsiveness, trust, and personalization, generally received positive ratings from respondents. The Mean Satisfaction Score (MSS) and Mean Importance Score (MIS) values indicate that students consider these attributes important and are satisfied with their performance. However, in the Importance Performance Analysis (IPA) method, some attributes such as trust, reliability, and responsiveness are still in the Primary Priority Quadrant, meaning that although they are important, their implementation is not yet optimal.

This condition indicates that although students are satisfied overall, they still expect improvements, particularly in the accuracy of chatbot responses, the TKarity of information provided, and service speed. Therefore, improving the chatbot system to provide consistent, fast, and accurate information should be prioritized.

In the Chatbot variable, the indicators for appearance, content, and usage received high Level of Suitability (TK), with the usage attribute achieving the highest TK. This indicates that students feel comfortable and find it easy to use the chatbot, both in terms of interface and interaction. Interactive aspects, personalization, and ease of navigation are the main strengths in enhancing the user experience. This is reinforced by Subandi & Tarigan (2022) research, which shows that good service can increase student satisfaction.

However, despite receiving positive evaluations, there are areas for improvement that can be leveraged to further optimize the experience. For example, increasing the variety of chatbot features, adjusting the language style to be more communicative, and enhancing the ability to answer more complex questions would provide significant added value for users.

Student satisfaction indicators such as content, usage, and willingness to recommend show good scores, but the attributes of service accuracy and website design remain in the Low Priority Quadrant with relatively lower importance and performance values. This indicates that while the chatbot service is functional, there is a perception that accuracy and response speed have not fully met student expectations.

CONCLUSION AND RECOMMENDATIONS

Conclusion based on the results of research conducted on the analysis of technology-based academic service quality using the e-Service Quality approach in the Management Study Program of the Faculty of Economics and Business at UPN “Veteran” Jawa Timur, as well as data processing using the Customer Satisfaction Index (CSI) and Importance Performance Analysis (IPA) methods, the following conclusions can be drawn:

1. The use of a chatbot integrated into the Discord application has made a significant contribution to improving the efficiency, accessibility, and speed of academic services. This is evidenced by the student satisfaction index (CSI) score falling within the "Satisfied" category. This means that most students feel that the use of chatbots has made it easier for them to obtain academic information quickly and independently, without having to rely on staff operating hours.
2. The use of chatbots also demonstrates effectiveness in providing interactive, responsive, and user-friendly services. This is reflected in the "usage" attribute, which received the highest level of suitability, exceeding student expectations.
3. Although its contribution is positive, the results of the Importance Performance Analysis (IPA) identified that there are still several important attributes such as trust, responsiveness, and reliability that students consider very important but whose performance is not yet optimal. This indicates that technological contributions need to be balanced with improvements to service features to ensure that chatbot implementation fully addresses user needs.
4. The chatbot in Discord has supported more digital and sustainable academic services. This aligns with the institution's efforts to promote digital transformation and bring services closer to students. This implementation is one of the concrete steps in improving the quality of academic services with a cost-effective and easily scalable technological approach.
5. Overall, the use of chatbots not only contributes to user satisfaction but also strengthens the direction of academic service innovation in higher education. This study demonstrates that academic services can be significantly improved through the use of simple yet effective technology.

Recommendation based on the results of the research conducted, the following recommendations can be made as follow-up to the findings and analysis in this study:

1. The Management Study Program at the Faculty of Economics and Business, UPN "Veteran" Jawa Timur, is expected to continuously improve the quality of its academic services, particularly in the use of chatbots based on the Discord application. This is important to address, as there are still several service indicators that do not fully align with student expectations, despite the research findings indicating that overall student satisfaction levels are currently in the "satisfied" category. Improvements in service quality regarding trust, speed, reliability, and responsiveness should be a top priority to ensure that technology-based academic service systems can provide a more optimal experience for students.
2. This study is expected to serve as a foundation for further research aiming to examine the utilization of digital technology in academic services.

It is recommended that future research:

1. Include additional variables relevant to the evaluation of technology-based systems, such as user engagement, digital literacy, or use the Technology Acceptance Model (TAM) framework to assess the extent to which students accept and are willing to use chatbots, through variables such as perceived usefulness and perceived ease of use.
2. Employ mixed methods to delve deeper into students' perceptions and experiences, both quantitatively and qualitatively, for example through interviews or focused group discussions (FGDs).
3. Developing chatbots with more adaptive and contextual artificial intelligence (AI) technology support, so that they not only serve basic questions but are also able to provide solutions according to user needs.
4. Applying research to different study programs or institutions as a form of comparison and context expansion, to assess the effectiveness of chatbots in a broader academic environment.

ADVANCED RESEARCH

This study has several limitations that should be acknowledged. First, the research was limited to a single study program within one university, which may restrict the generalizability of the findings to other faculties or institutions with different academic structures and service systems. Second, the scope of technology implementation was confined to a chatbot integrated with the Discord platform; future studies may explore comparisons between multiple platforms or broader AI-based service systems. Third, this research relied solely on quantitative data, which, while statistically robust, may not fully capture the depth of student experiences and perceptions.

For future research, it is recommended to conduct similar studies across various academic programs and institutions to validate the model's applicability. Additionally, a mixed-methods approach combining quantitative surveys with qualitative interviews or focus groups would provide deeper insights into user expectations and experiences. Incorporating models such as the Technology Acceptance Model (TAM) could also enrich the theoretical perspective, especially regarding user behavior and adoption factors in digital academic services.

ACKNOWLEDGMENT

The author would like to express sincere gratitude to the academic supervisors, Dr. Wiwik Handayani, S.E., M.Si., and Mr. Nurkholish Majid, S.E., M.M., for their invaluable guidance, suggestions, and encouragement throughout the preparation of this research paper. Appreciation is also extended to the lecturers and examiners at the Faculty of Economics and Business, Universitas Pembangunan Nasional "Veteran" Jawa Timur, for their insightful feedback and constructive input.

The author also acknowledges the support of all fellow students in the Management Study Program who participated in the survey and contributed to the success of this research. Finally, special thanks to family and friends who continuously provided moral support and motivation.

This research was conducted independently and did not receive any external financial grants.

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