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EVALUATING LIBRARY WEBSITE QUALITY AND USER SATISFACTION THROUGH WEBQUAL 4.0 METHOD AND PRIORITY MAPPING IPA

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ABSTRACT

The rapid development of information and communication technology has transformed how users access and utilize digital information sources. In higher education, digital libraries play a crucial role in supporting efficient and accessible academic activities. The Universitas Pendidikan Indonesia (UPI) Library website serves as a primary platform for students to access digital source materials. However, initial observations revealed performance issues affecting user satisfaction. This study evaluates the website's quality using Webqul 4.0 framework and Importance-Performance Analysis (IPA) to assess satisfaction and improvement priorities. A quantitative descriptitive-verificative method with purposive sampling was applied, and data were analyzed using SPSS across three Webqual 4.0 dimensions. Results show that overall performance is good, *though Usability Quality* scored the lowest with indicator "ease of use features" 66.6% and "attractiveness of design website" 61.7%. The IPA identified two improvement priorities: ease of learning to use the website and completeness of information. Ordinal logistic regression revealed that all three Webqual 4.0 dimensions significantly and positively influence 78.3% *User Satisfaction* by using Nagelkerke R^2 calculation.

Keywords: Website Quality, Importance-Performance Analysis (IPA), User Satisfaction, Webqual 4.0, Technology, Digital Library, Education

INTRODUCTION

The rapid advancement of information and communication technology (ICT) has transformed how information is collected, processed, and disseminated across sectors. Digital platforms such as websites as now enable structured and efficient in providing information for solving problems that is available for personal, business, and governmental use (Hastuti et al., 2024)

In higher education, digital technology has redifined how students access and use learning resources.Traditional printed materials are increasingly replaced by digital media (Trioctavia et al., 2025). Studies by Sutikno & Khoirunisa (2025) and Maharsi & Marintan (2024) revealed that most students prefer digital libraries for their conevenience and time efficiency, with over 69% relying on online catalogs.

Digital libraries have revolutionized access to information by allowing users to obtain learning resources flexibility and remoteky, They provide multiple-benefits, including faster research capabilities, a wider range of materials such as e-books, journals, and multimedia content (Maesaroh, 2020). As one of the leading higher institutuions in Indonesia, Universitas Pendidikan Indonesia (UPI) has integrated technological innovation into academic and research services through its library website and variety of digital services and these services aim to support UPI's vision of fostering innovation in education and research while expanding public access to knowledge (Universitas Pendidikan Indonesia, 2025).

Although digital libraries have transformed access to learning resources, they still face challenges such as adapting to user needs, keeping collections updated, and competing with other online platforms (Subekti & Pratama, 2024). Factors like software and hardware limitations, as well as UI and UX design, also influence in user satisfaction (Sonianto & Novianto, 2024).

These digital library challenges are also evident in the UPI Library website, where 63% of users reported dissatisfaction from *Figure 1* primarily due to slow website performance (33.3%) and difficulty of user (25.9%).

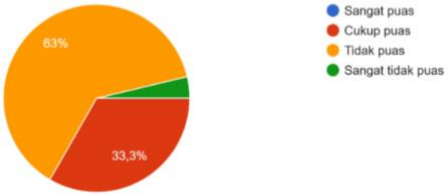

Figure 1. User Satifaction Survey with UPI Library Website Quality

These findings reveal that while the website offers many digital services, there remain a noticeable gap between user expectations and the actual perofrmance of the system Therefore, a more in-depth and systematic analysis is required to identify priority areas for improvement and ensure that the website delivers a service experience aligned with user needs and expectations.

Previous research about UPI library website by Hardiyanto et al., (2021) analyzed the correlation between usability, information quality, and service interaction quality in library websites and found significant but moderate relationships among these factors. However, the study was limited to correlational analysis and did not evaluate the direct influence of each variable on user satisfaction or improvement analysis. Similarly, Handika et al., (2022) used Webqual 4.0 and Importance-Perfomance Analysis (IPA) to assess e-learning platforms, identifying that although performance was generally good, some key attributes such as usability, clarity of interaction, and website aesthetics still fell below user expectations, and the limitation from this research is not analyzing the website quality and its influence to user satisfaction.

This research conduct to analyzes the quality of Universitas Pendidikan Indonesia (UPI) library website using the Webqual 4.0 framework, which provides a multidimensional assessment through *Usability Quality*, *Information Quality*, and *Service Interaction Quality*. Each dimension is treated as an independent variable to examine its specific influence on user satisfaction, offering a more detailed understanding of the website's performance. addition the research employes the IPA to identify priority areas for improvement.

METHOD

This study adopts a descriptives-verificative quantitative design. The population includes UPI students who accessed the library website in the last six months, with a total sample of 350 respondents selected through purposive sampling. Data were collected using a questionnaire based on 21 indicators representing three webqual dimensions: Usability Quality, Information Quality, and Service Interaction Quality. Each indicator was measured using a 5-point Likert scale for both Importance and Performance. Validity and reliability test confirmed acceptable consistency ($\alpha = 0.945$ for performance, $\alpha = 0.904$ for importance).

Data analysis included Derived Satisfaction (GAP analysis) to assess the difference between importance and performance scores, Importance-Performance Analysis (IPA) to map service priorities, and Ordinal Logistic Regression to determine the effect of Webqual variables on user satisfaction.

Descriptive Analysis

Based on the analysis, the *Usability Quality* variable showed the lowest performance among the three Webqual 4.0 dimensions, indicating that some user experience indicators still need improvement. In contrast, *Information Quality* achieved the highes performance score, followed by *Service Interaction Quality.*

a). Usability Quality

Among the Webqual 4.0 dimensions, from *Table 1* Usability Quality showed the lowest performance because idnicators in thsi dimension still have value below average accumulation. The weakest indicators were US5 (website design quality, 61.71%) and US4 (ease of using features, 66.57%). These results indicate that users still find the web less appealing and difficult to use.

b). Information Quality

The Information Quality from *Table 1* shows that quality is generally high, several indicators still showed lower results. The IQ4 indicator (speed of information updates) only reached 70%, which is crucial since an information system must produce accurate and timely outputs to avoid workflow disruptions (Stair & Reynolds, 2016). Another low-performing indicator, IQ6 (completeness of information), scored 79.4%, showing that some data provided are still incomplete.

c). Service Interaction Quality

The Service Interaction Quality variable from *Table 1* obtained indicates a high-quality interaction. This finding aligns with the SERVQUAL theory, particularly the Assurance dimension emphasizing security, competence, and trust (Tjiptono & Chandra, 2016). In this context, it reflects how the UPI Library website protects user data and ensures safe digital interactions.

However, two indicators showed lower performance: SI4 (ease of interaction with administrators) at 81.4% and SI5 (availability of personalization space) at 61.7%. The low SI4 score indicates a weakness in the Responsiveness aspect of SERVQUAL, referring to service responsiveness to user needs (Tjiptono & Chandra, 2016). Limited communication access suggests users feel less supported. The library management confirmed they are developing an AI-based chatbot to improve user communication.

Table 1. UPI Library Website Quality Performance

Indikator	1	2	3	4	5	Total scale 4 and 5
	%	%	%	%	%	
US1	1.7	6.0	14.0	44.9	33.4	78.3
US2	0.8	4.5	11.4	43.1	40.0	83.1
US3	2.0	5.71	10.9	44.3	37.1	81.4
US4	2.0	11.7	19.7	40.9	25.7	66.6
US5	6.0	16.0	16.3	36.9	24.9	61.7
US6	1.7	9.43	15.4	48.0	25.4	73.4
US7	1.7	1.43	7.7	45.1	44.0	89.1
IQ1	0.85	4.85	12.2	51.7	30.3	82.0
IQ2	0.57	2.57	7.14	53.4	36.3	89.7
IQ3	0.57	2.57	5.71	46.5	44.6	91.1
IQ4	3.71	9.42	16.8	36.8	33.1	70.0
IQ5	1.14	3.42	12	52.2	31.1	83.4
IQ6	2.28	6.57	11.7	49.1	30.3	79.4

IQ7	1.1	4.6	12.0	45.7	36.6	82.3
SI1	1.71	6	14	44.8	33.4	78.3
SI2	0.85	4.57	11.4	43.1	40.0	83.1
SI3	2	5.71	10.8	44.2	37.1	81.4
SI4	2	11.7	19.7	40.8	25.7	66.6
SI5	6	16	16.2	36.8	24.9	61.7
SI6	1.7	9.4	15.4	48.0	25.4	73.4

User Satisfaction Analysis

Based on the GAP analysis between performance and the importance level. The findings show that among the three variables, Usability Quality falls into the "Dissatisfied" category after being compared with importance scores, indicating that several aspects of this variable still do not meet user expectations.

The satisfaction overview shows on *Table 2*, based on GAP analysis between importance and performance, shows that US4 (ease of using features without errors) falls under the "Less Satisfied" category, while US5 (attractive website design) is rated "Dissatisfied.". Information Quality and Service Interaction Quality are categorized as "Very Satisfied," with the highest alignment found in IQ2 (information relevance to user needs), IQ3 (information reliability), and SI3 (data privacy protection). These findings support the Derived Satisfaction concept, which explains that user satisfaction depends on both expectations and perceived performance (Tjiptono & Chandra, 2016).

Table 2. User Satisfaction Classification based GAP Analysis

Code	Avg. Performance	Avg. Importance	Results	Category
US1	4.6	4.02	0.58	Satisfied
US2	4.54	4.17	0.37	Very Satisfied
US3	4.58	4.09	0.49	Satisfied
US4	4.56	3.77	0.79	Less Satisfied
US5	4.52	3.59	0.93	Dissatisfied
US6	4.46	3.86	0.6	Satisfied
US7	4.68	4.28	0.4	Very Satisfied
IQ1	4.57	4.06	0.51	Satisfied
IQ2	4.57	4.22	0.35	Very Satisfied
IQ3	4.65	4.32	0.33	Very Satisfied
IQ4	4.53	3.85	0.68	Less Satisfied
IQ5	4.58	4.09	0.49	Satisfied
IQ6	4.6	3.99	0.61	Satisfied
IQ7	4.53	4.12	0.41	Very Satisfied
SI1	4.61	4.07	0.54	Satisfied
SI2	4.64	4.1	0.54	Satisfied
SI3	4.62	4.23	0.39	Very Satisfied
SI4	4.51	4.02	0.49	Satisfied
SI5	4.47	3.78	0.69	Less Satisfied
SI6	4.62	4.17	0.45	Very Satisfied

Importance-Performance Analysis

The quadrant analysis using the Importance–Performance Analysis (IPA) method was carried out to determine which aspects of the UPI Library website should be prioritized for improvement on *Figure 2.*

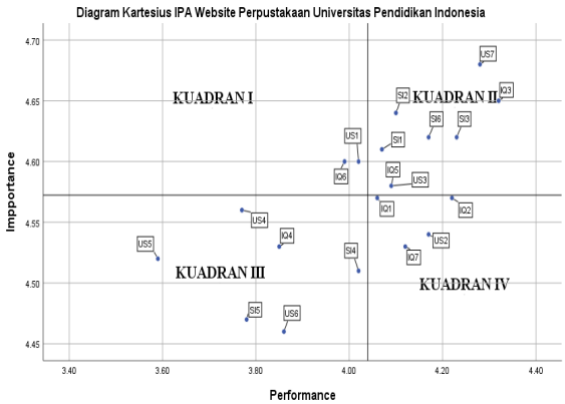

Figure 2. Cartesian Diagram IPA UPI Library Website Quality

a). Quadrant I (High Importance – Low Performance) include US1 (ease of learning to use) and IQ6 (completeness information). These should be prioritized for improvement, as users find them critical but underperforming.

b). Quadrant II (High Importance – High Performance) comprises indicators such as SI3 (data privacy protection), SI2 (secure interaction), SI6(giving services as its promised), SI1(good reputation), US3(ease of navigation), US7(giving positive

experiences),and IQ3 (information reliability), IQ5(ease of understanding information) representing the website's main strengths that should be maintained.

c). Quadrant III (Low Importance – Low Performance) contains features US5(web design), US4(ease of use features), US6(fungsional compatibility), IQ4(speed of updated information), SI4(easy to communicate with administrator), SI5 (personalization).

d). Quadrant IV (Low Importance – High Performance) shows aspects such US2(clear instruction on using features), IQ1(accuracy of information), IQ2(relevancy of information), IQ7(format suitability).

Ordinal Logistic Regression

a) Goodness-of-Fit

Table 3. Goodness-of-Fit

Indeks	Chi-Square	Df	Sig.
Deviance	401.749	961	1.000

Based on the analysis results in *Table 3* the Deviance *Chi-Square* value of 401.749 is smaller than the table value of 1033, and the significance value (Sig.) 1000 is greater than the significance level (α) 0.05. Therefore, **H_0 fails to be rejected**, indicating that the model is considered appropriate or *fit* with the data.

b) Nagelkerke (R2)

Table 4. Nagelkerke R^2 Test

Indeks	Nilai
Nagelkerke	0.783

The Nagelkerke R^2 value in *Table 4* shows value = 0.783, meaning that 78.3% of the variation in user satisfaction can be explained by three Webqual dimensions, while 21.7% is influence by other factors. This aligns with Hidayat et al., (2024) who found that 58.5% of user satisfaction variation was explained by similar variables.

Hypothesis Testing

Table 5. Wald Test

Variable	W_k	X^2_{tabel}	Sig.	α	Decision
US	51.201	3.824	0.000	0.05	H_0 rejected
IQ	37.991	3.284	0.000	0.05	H_0 rejected
SIQ	27.988	3.823	0.000	0.05	H_0 rejected

H1 not rejected: Usability Quality significantly affects user satisfaction (W = 51.201 > 3.824; Sig. < 0.05).
H2 not rejected: Information Quality significantly affects user satisfaction (W = 37.991 > 3.284; Sig. < 0.05).
H3 not rejected: Service Interaction Quality significantly affects user satisfaction (W = 27.998 > 0.05).

Table 6. Likelihood Ratio Test

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	843.935			
Final	401.79	442.187	3	0.000

H4 accepted: Simultaneous testing using the Likelihood Ratio (G^2 = 442.187 > 7.185; Sig. < 0.05) confirms that all three variables collectively influence user satisfaction.

CONCLUSION

The performance of UPI Library website demonstrates generally good results across three dimension of Webqual 4.0. High performing aspects include the *website's usefulness* to users, *clear feature instructions*, *reliable* and *relevant information*, protection of personal data, and service delivery that meets expectations. However, several indicators still show weak performance, such as the website's visual design, difficulty using certain features, slow information updates, incomplete content, limited interaction with administrators, and lack of personalization options aligned with user preferences. User satisfaction results through GAP between performance and importance, reveals that users are highly satisfied with *Information Quality* and *Service Interaction Quality*, especially in *information relevance*, *reliability*, and *data privacy protection*. Satisfaction with *Usability* remains low due to *difficulties in using features* and an *unattractive interface*. Based on IPA analysis, improvement should focus on two priority indicators: *ease of learning to use the website* and *information completeness*. Other low performing indicators such as *ease of use feature*, *attractiveness of design web*, *speed updated information*, *functional suitability*¸ *easy to communicate with administrators*, and *personalization* should be monitored for long-term improvement. The regression analysis confirm that three Webqual 4.0 dimensions have a positive and significant effect on *User Satisfaction* both individually and simultaneously.

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