



Website Quality Evaluation of LKP Bisma Informatika Using a Combination of Webqual 4.0, Fuzzy Analytical Hierarchy Process and Importance-Performance Analysis

***Anop Sudiatmika¹**

Institut Teknologi dan Bisnis
STIKOM Bali,
Indonesia

Gede Angga Pradipta²

Institut Teknologi dan Bisnis
STIKOM Bali,
Indonesia

Roy Rudolf Huizen³

Institut Teknologi dan Bisnis
STIKOM Bali,
Indonesia

***Corresponding author:**

Anop Sudiatmika, Institut Teknologi dan
Bisnis STIKOM Bali, Indonesia.

✉ anopxxx@gmail.com

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Abstract

Background: The development of information technology has progressed significantly, consequently having an impact on the world of education in non-formal institutions such as *Kursus dan Pelatihan* (LKP). Websites are essential for providing information, registration, and engagement to prospective learners. However, preliminary research on the LKP Bisma Informatika website revealed that its content is still incomplete and not up to date.

Objective: This research was conducted to evaluate the quality of LKP Bisma Informatika's website using an integrated approach combining WebQual 4.0, Fuzzy Analytical Hierarchy Process (FAHP), and Importance-Performance Analysis (IPA) methods, and to provide improvement recommendations.

Methods: This study used a quantitative descriptive survey design, with respondents from LKP Bisma Informatika. Data were gathered through questionnaires based on three WebQual 4.0 constructs: usability, information quality, and service interaction quality. FAHP was used to determine priority weights, while IPA examined performance gaps based on user perceptions.

Results: The results show that the website can be significantly improved, particularly in terms of information quality and usability. The most critical improvements needed are website speed, content accuracy, and user interface design. The integration of WebQual 4.0, FAHP, and IPA highlights a utility-based approach for providing effective recommendations to enhance the functionality of the website.

Conclusion: These findings are expected to assist LKP Bisma Informatika in improving its website to better meet user needs and enhance user experience.

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INTRODUCTION

The development of information technology has brought significant changes in various aspects of life, including the education sector (Starko et al., 2022). One of the many information technologies used is information systems. Information systems are not new nowadays. Information systems process data obtained from a company's activities (Darmayadi et al., 2021). The implementations of information systems commonly used are desktop-based and web-based. Web applications, also known as web-based software, have grown rapidly in terms of usage, size, programming language, and complexity.

Initially, web applications were only static and navigation-oriented sites and were mostly

used as online product brochures or company profiles. However, currently, web applications have evolved to become more dynamic, interactive, and task-oriented, and are widely used in information systems, telecommunications, commerce, banking, and various other fields (Zen et al., 2023).

Websites can serve as a communication medium for educational and training institutions to present appropriate information in a timely manner to various interested parties (Gani et al., 2023). The use of websites to support academic activities such as school websites is growing, requiring quality websites, yet website quality evaluation standards are still limited (Islami & Kusumahadi, 2023). Website quality is influenced by its ability to meet needs Mustikarani (2024), usability and ease of use Primanandaa (2024), and content completeness Putra (2023).

Manifestation of this change is the increased use of websites as the primary means for delivering information and services, especially in non-formal educational institutions such as Course and Training Institute (*Lembaga Kursus dan Pelatihan* [LKP]). The website serves as the main gateway for prospective students and the general public to learn more about the services and programs offered by LKP. Therefore, website quality is a crucial factor in determining user appeal and trust (Kouser et al., 2018).

LKP Bisma Informatika, as an institution engaged in information technology education and training, utilizes a website as the main medium to provide information about courses offered, registration, and interaction with prospective students and the community. LKP Bisma Informatika, as a course and training institution, owns and manages a website accessible at <https://bismainformatika.com/> in an effort to meet educational management standards. Initial observation results of the LKP Bisma Informatika website showed that the information provided did not meet the quality criteria for content completeness.

Institutional information and educational administration were not available, the Agenda and Announcements section was still empty, and the Latest News section had not been updated for the last two months. Initial interview results with the Information and Communication Technology Management Team showed that the website still had shortcomings in terms of appearance and information based on oral complaints from website users. Developing a website based on improvement suggestions conveyed through oral complaints would be less effective, as such feedback is subjective.

Based on the results of a questionnaire distributed to 43 users of the LKP Bisma Informatika website, including course participants and participants preparing to take competency tests, it was found that 63% said the website was quite good, 27% said it was good, and 10% said the website was very good. Of the total respondents, 85% said the LKP Bisma Informatika website should be evaluated to be made more informative and better. Several respondents suggested that the LKP Bisma Informatika website still lacked sufficient information. This questionnaire data indicates that the LKP Bisma Informatika website needs to be evaluated and given recommendations for improvement.

In order to develop better websites in the future, it is important to evaluate user perception of website quality for more reliable data. However, to ensure that users continue to have an optimal experience while visiting the website, periodic assessments of website quality are necessary to meet user expectations and requirements. This evaluation is intended not only to assess how well the website meets technical quality standards, but also how users perceive the benefits, ease of use, and satisfaction when accessing it. The results of literature studies and initial interviews with LKP management indicated that no research related to website evaluation has ever been conducted at LKP Bisma Informatika.

To evaluate website quality, this research will use a combination of WebQual 4.0, Fuzzy Analytical Hierarchy Process (FAHP), and Importance-Performance Analysis (IPA) methods. Evaluating website quality is complex because there is no specific evaluation model for academic websites such as university or school websites. Website quality has three benchmark components: usability, information quality, and service interaction quality, all three of which are components of the WebQual method. In its development, the WebQual method is based on the concept of Quality Function Deployment (QFD), which is a process based on the "Voice of the Customer (Ershadi et al., 2020)."

The WebQual method has undergone several developments and has currently reached

version 4.0 (Tarigan et al., 2023). Through the Systematic Literature Review (SLR) method of several previous studies, it is known that the most widely used academic website evaluation instrument is WebQual 4.0, amounting to 46% (I Gede et al., 2024). WebQual 4.0 is the most formal instrument and has been successfully used to assess e-commerce, e-government, and academic websites (Ariestya et al., 2024). Furthermore, WebQual is preferred because WebQual focuses more on website quality.

To more specifically identify indicators that have or have not met user expectations, the Importance-Performance Analysis (IPA) technique is used, which will identify important factors or attributes that must be prioritized by an organization to satisfy its users based on user perceptions and expectations of the website. To evaluate website quality, this research will use a combination of WebQual 4.0 and Importance-Performance Analysis (IPA) methods.

WebQual 4.0 will generate statements from the results of factor analysis in 3 (three) main areas. Importance-Performance Analysis (IPA) will show attributes that need to be improved or reduced so they can be understood from 2 (two) perspectives, namely performance and importance (Haikal et al., 2018). WebQual 4.0 is a framework designed to measure website quality from three main dimensions: usability quality, information quality, and service interaction quality.

The WebQual 4.0 instrument has been used in previous research to evaluate website quality in various domains, for example, the SMA Negeri 1 Balikpapan school website Adi (2020), government-owned websites such as the Tegal City Public Service Information System Zaki (2023), and news portal websites such as Detik.com (Nopitasari & Rudianto, 2023). The importance-performance analysis (IPA) method is an appropriate corrective action method for assessing service quality determinants between performance and expectations (Nasution et al., 2018).

These studies applied the Importance-Performance Analysis (IPA) method with the aim of presenting a comprehensive picture of indicators that need improvement, based on user perceptions and expectations. The application of the IPA method can indeed produce improvement recommendations as a reference for improving website quality. However, it has not been able to determine the importance-level ranking of each dimension and criterion as the most influential factor on website quality, which is also expected in this research.

Quality evaluation that simultaneously prioritizes influential factors requires a multi-criteria method, namely Multi-Criteria Decision Analysis (MCDA), which is the most powerful and accurate approach (Nguyen et al., 2022). There are various MCDA methods used today, including one commonly used to generate rankings based on criteria weights, namely the Analytic Hierarchy Process method, abbreviated as the AHP method (Zlaugotne et al., 2020). The Fuzzy Analytic Hierarchy Process (FAHP) method has been developed to handle uncertainty when evaluating the levels of importance and performance.

The implementation of the integrated FAHP and IPA methods has successfully ranked the importance levels of quality dimensions and criteria, performance measurement, and priority of improvement recommendations, as in research conducted to assess port service quality Nguyen (2022), and to identify occupational health risk factors for fishermen. Based on this explanation, the evaluation of the LKP Bisma Informatika website quality in this study will use WebQual 4.0 dimensions and indicators, combined with Fuzzy Analytical Hierarchy Process and Importance-Performance Analysis methods, so it is hoped that the research can provide a comprehensive evaluation of the LKP Bisma Informatika website quality, and provide appropriate recommendations to improve website performance to be more responsive to user needs.

This study aims to evaluate the website quality of LKP Bisma Informatika using a combination of WebQual 4.0, Fuzzy Analytical Hierarchy Process (Fuzzy AHP), and Importance-Performance Analysis (IPA) methods to produce improvement priorities and importance level rankings for each dimension and criterion as the most influential factors on website quality, while also formulating strategic improvement recommendations. The evaluation is limited to the three main dimensions of WebQual 4.0, namely usability, information quality, and service interaction quality, with research subjects being LKP employees and participants as website users.

This research does not perform parametric tests on performance assessment data assuming the Central Limit Theorem (CLT), and the research output is focused on an evaluation

document in the form of improvement recommendations referring to the Research-Based Web Design & Usability Guidelines and the importance ranking of each dimension and criterion. Theoretically, this research contributes to the development of a website quality evaluation model based on the integration of WebQual 4.0 and IPA, while practically, it provides a reference for managers and stakeholders in formulating website development strategies based on priorities under limited resource conditions.

The novelty of the research lies in the integration of WebQual 4.0, Fuzzy AHP, and IPA, which not only measures website quality but also produces a more comprehensive and focused visual mapping of improvement priorities, specifically in the context of non-formal education, such as LKP. The research objectives are: (1) to evaluate the quality of the LKP Bisma Informatika website across the three WebQual 4.0 dimensions (usability, information quality, and service interaction quality); (2) to determine the priority weight of each dimension and criterion using Fuzzy AHP; and (3) to identify priority areas for improvement and formulate evidence-based recommendations using IPA.

METHOD

Type of Research

This is a quantitative research with a survey design and descriptive approach aimed at providing a quantitative description of population opinions through sampling, enabling the study to answer descriptive research questions. Data were obtained through a questionnaire adapted from the WebQual 4.0 dimensions and indicators, then analyzed statistically using data processing software to produce findings in accordance with the research objectives. The descriptive approach is used to present objective, number-based interpretations regarding the website quality of LKP Bisma Informatika, including user satisfaction levels, improvement recommendations, and importance rankings of dimensions and criteria most influencing website quality. Website quality measurement is carried out using three main WebQual 4.0 variables, namely usability, information quality, and service interaction quality.

Research Procedure

The research flow process from eleven stages in this study is described next.

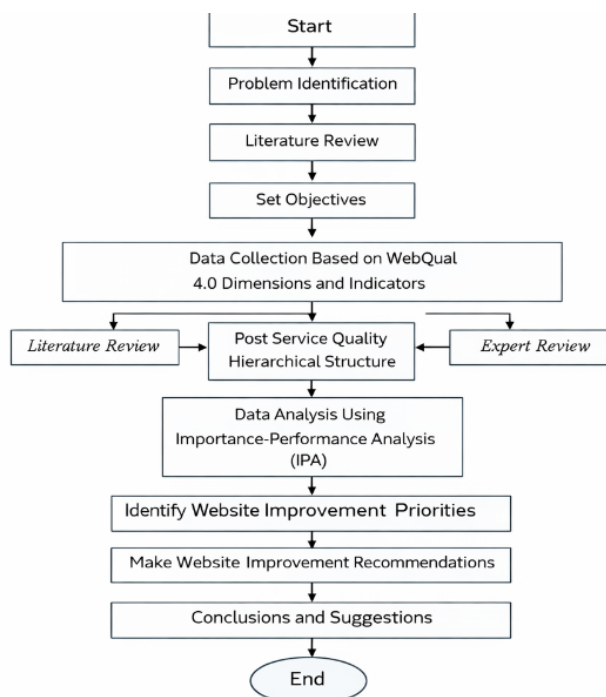


Figure 1. Research Procedure

This research was carried out systematically through structured methodological stages to produce a comprehensive evaluation of the website quality of LKP Bisma Informatika, starting from problem identification and formulation through initial observation and gap analysis between user expectations and website performance, which were then formulated into research questions, objectives, and limitations. The next stage was a literature review to build a theoretical foundation by examining the concepts of web-based service quality, the WebQual 4.0 model, Fuzzy Analytic Hierarchy Process (F-AHP), and Importance-Performance Analysis (IPA), as well as previous research, to develop a conceptual framework and integrated analysis model.

The research used a quantitative descriptive-evaluative approach with the population being all website users, an instrument based on the three dimensions of WebQual 4.0 (usability, information quality, and service interaction quality) consisting of 22 indicators with a five-point Likert scale for importance and performance aspects, and tested for validity and reliability. The weight determination process used expert analysis through the application of F-AHP for pairwise comparisons that generate triangular fuzzy numbers, followed by fuzzy synthesis, defuzzification, and consistency testing.

The analysis of the collected data was carried out through the calculation of the WebQual Index (WQI), gap analysis, mapping into four quadrants with the aid of IPA, and processing through Microsoft Excel and IBM SPSS. Combining WQI results, F-AHP weights, and IPA led to the identification of attributes with high weight, high importance, and low performance with a negative gap as strategic improvement priorities. The results yielded conclusions and academic recommendations regarding website optimization in areas such as loading speed, content security and quality, visual design and interface, and service interaction features, which serve as the basis for sustainable website development.

Population and Sample

This study's population comprised only LKP Bisma Informatika website users, limited to employees and course participants, as the total number of general public users and industry partners cannot be ascertained. The population refers to objects or subjects with specific characteristics that have been defined by the researcher, while sampling is a way of delineating

research objects to make generalizations. To determine the sample, two disproportionate strata were used — employees (8 people) and participants (77 people) — with all employees included through total sampling and participants selected through probability sampling using Slovin's formula.

The research instrument consisted of a two-part questionnaire, which included respondent profiles and 20 question items spanning the WebQual 4.0 dimensions (usability, information quality, and service interaction), the EUCS model, and user satisfaction, rated on a five-point Likert scale (1–5). Tested for validity and reliability using IBM SPSS. Data collection was carried out by distributing online questionnaires over two weeks.

Data processing was carried out through WebQual Index (WQI) calculation, which included the mean of importance, maximum score, and weighted score, to obtain an overall website quality index value. Furthermore, gap analysis was conducted to identify the difference between performance and importance levels, and Importance-Performance Analysis (IPA) was applied to map results into four priority quadrants for improvement. Data analysis began with demographic analysis using Microsoft Excel, followed by validity, reliability, and inferential statistical analyses using IBM SPSS 24. The interpretation of results was done by comparing empirical findings with field conditions and previous literature, thus yielding conclusions and improvement recommendations that are quantitatively objective and relevant to the website development needs of LKP Bisma Informatika.

RESULTS AND DISCUSSION

Result

Research Instrument Test

Before further analysis, instrument validity and reliability tests were conducted using SPSS 24. The validity test results are presented in the SPSS output in Table 1 below.

Table 1. Instrument Item Validity Test Results Data.

Question Item	Correlation Coefficient	Description
Item 1	0.560	Valid
Item 2	0.442	Valid
Item 3	0.596	Valid
Item 4	0.594	Valid
Item 5	0.589	Valid
Item 6	0.460	Valid
Item 7	0.564	Valid
Item 8	0.704	Valid
Item 9	0.426	Valid
Item 10	0.538	Valid
Item 11	0.548	Valid
Item 12	0.694	Valid
Item 13	0.540	Valid
Item 14	0.513	Valid
Item 15	0.598	Valid
Item 16	0.672	Valid
Item 17	0.707	Valid
Item 18	0.674	Valid
Item 19	0.742	Valid
Item 20	0.570	Valid

Based on Table 1, all question items have a correlation value greater than 0.3, so all question items are valid and can be used for the study. Next, a reliability test was conducted to determine the internal consistency of the instrument. The reliability test results are presented in the SPSS output in Table 2 below.

Table 2. Instrument Reliability Test Results Data

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.922	0.923	20

Based on Table 2 above, the reliability test using the Cronbach's alpha technique yielded a value of 0.923, greater than the minimum threshold of 0.70. This indicates that the research instrument has very high reliability, so the questionnaire instrument can be declared reliable and dependable for measuring research variables.

Fuzzification Results

At this stage, fuzzification calculations are performed to convert linguistic data into numerical data, where fuzzification in this study is used to obtain the lower bound (a), middle bound (b), and upper bound (c) values, which are the values of the Triangular Fuzzy Number (TFN). The fuzzification value can be calculated using the following formula:

$$a = \frac{(aj1 \times nj1) + (aj2 \times nj2) + \dots + (aji \times nji)}{(aj1 + aj2 + \dots + aji)}$$

$$b = \frac{(bj1 \times nj1) + (bj2 \times nj2) + \dots + (bji \times nji)}{(bj1 + bj2 + \dots + bji)}$$

$$c = \frac{(cj1 \times nj1) + (cj2 \times nj2) + \dots + (cji \times nji)}{(cj1 + cj2 + \dots + cji)}$$

Description:

a: lower bound fuzzification value

b: middle bound fuzzification value

c: upper bound fuzzification value n: number of respondents

i: criteria (1, 2, 3, ...)

j: variable

The following are the results of fuzzification of perception assessments and fuzzification of expectation assessments using Ms. Excel software, which can be seen in Table 3 for perception assessments.

Table 3. Fuzzification of Employee and Course Participant Categories at LKP Bisma Informatika

Variable	Code	TFN		
		a	b	c
Usability	A1	2.2	3.05	3.9
	A2	2.25	3.2	4.05
	A3	2.275	3.125	4.05
	A4	2.375	3.25	4.1
	A5	2.025	2.975	3.875
	A6	2.275	3.175	4
	A7	2.225	3.15	3.975
	A8	2.6	3.55	4.275
Information Quality	B1	2.375	3.3	4.1
	B2	2.3	3.225	4.05
	B3	2.275	3.15	3.95
	B4	2.4	3.325	4.175
	B5	2.3	3.25	4.15
	B6	2.35	3.3	4.125
	B7	2.65	3.525	4.275
Service Interaction	C1	2.375	3.275	4.05

Quality	C2	2.475	3.375	4.225
	C3	2.375	3.325	4.15
	C4	2.15	3.075	3.9
	C5	2.2	3.05	3.9

Defuzzification Results

The next stage is calculating the Defuzzification value of the performance/perception and importance/expectation assessments. This defuzzification is done to obtain a single representative value. The following is the formula to obtain the defuzzification result:

$$Defuzzyfication = \frac{a + b + c}{3}$$

The defuzzification results of the performance/perception and importance/expectation assessments can be seen in Table 4 for the performance/perception assessment.

Table 4. Defuzzification of Employee and Course Participant Categories at LKP Bisma Informatika

Variable	Code	TFN			Defuzzification
		a	b	c	
Usability	A1	2.2	3.05	3.9	3.05
	A2	2.25	3.2	4.05	3.166667
	A3	2.275	3.125	4.05	3.15
	A4	2.375	3.25	4.1	3.241667
	A5	2.025	2.975	3.875	2.958333
	A6	2.275	3.175	4	3.15
	A7	2.225	3.15	3.975	3.116667
	A8	2.6	3.55	4.275	3.475
Information Quality	B1	2.375	3.3	4.1	3.258333
	B2	2.3	3.225	4.05	3.191667
	B3	2.275	3.15	3.95	3.125
	B4	2.4	3.325	4.175	3.3
	B5	2.3	3.25	4.15	3.233333
	B6	2.35	3.3	4.125	3.258333
	B7	2.65	3.525	4.275	3.483333
Service Interaction Quality	C1	2.375	3.275	4.05	3.233333
	C2	2.475	3.375	4.225	3.358333
	C3	2.375	3.325	4.15	3.283333
	C4	2.15	3.075	3.9	3.041667
	C5	2.2	3.05	3.9	3.05

WebQual Index (WQI) Analysis

WebQual Index analysis is carried out by calculating the mean importance, mean performance, and Weighted Score for each indicator. The results of the WebQual Index calculation for each dimension are presented in Table 5 below.

Table 5. WQI Calculation Results per Dimension

Dimension	Mean Importance	Mean Performance	Weighted Score	WQI (%)
Usability (8 item)	4,30	3,75	16,12	87,2
Information Quality (7)	4,45	3,60	16,02	80,9
Service Interaction (5)	4,20	3,50	12,08	83,6

Total	4,32	3,62	44,22	83,9
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Based on the table above, the overall WQI value of the LKP Bisma Informatika website is 83.9%. This figure indicates that the website quality is in the good category, but there is still room for improvement, especially in the Information Quality dimension which has the lowest WQI (80.9%).

Gap Analysis

Gap analysis is performed by calculating the difference between the performance value and the importance value. The results of the Gap analysis data for each dimension are presented in Table 6 below.

Table 6. Gap Analysis Results per Dimension

Dimension	Mean Importance	Mean Performance	Gap
Usability	4,30	3,75	-0,55
Information Quality	4,45	3,60	-0,85
Service Interaction	4,20	3,50	-0,70

The results show that all dimensions have a negative gap, meaning the website's performance still does not meet user expectations. The largest gap is in Information Quality (-0.85), which indicates the need for significant improvement in aspects of completeness, accuracy, and timeliness of information.

Importance-Performance Analysis (IPA)

IPA analysis is used to map indicators into four matrix quadrants (Martilla & James, 1977). The results of the IPA analysis for each quadrant are presented in Table 7 below.

Table 7. Mapping of Indicators into IPA Quadrants

Quadrant I (Top Priority)	Quadrant II (Maintain)
B2: Trustworthy information	A4: Website easy to use
B3: Up-to-date information	A5: Attractive appearance
B6: Detailed information	C1: Website reputation
A3: Easy navigation	C2: Information security
	C5: Ease of communication
Quadrant III (Low Priority)	Quadrant IV (Overkill)
B7: Appropriate information format	A6: Design matches website type
C3: Personalization	A8: Positive experience
C4: Community space	A7: Website competency

The IPA results show that there are four indicators in Quadrant I (Top Priority), namely information accuracy and timeliness (B2, B3), information detail (B6), and ease of navigation (A3). These indicators are considered important by users, but their performance is still low, so they need immediate improvement. Meanwhile, indicators in Quadrant II (Maintain) such as information security, ease of communication, and visual appearance show that users consider these aspects important and their performance is already good, so they need to be maintained.

Recommendations for Website Quality Improvement

The results of the gap analysis method and Importance Performance Analysis (IPA) show that the quality level of the LKP Bisma Informatika website does not fully meet participant expectations. In the subsequent analysis, namely Importance-Performance Analysis, service attributes located in Quadrant I of the Cartesian diagram were identified. The attributes in this quadrant are highly recommended for quality improvement because these factors are considered important, while their performance in implementation remains below expectations.

Table 8. Recommendations for website quality improvement

Area	Recommendations
Hero / Header	Use a single strong headline + subheadline + main CTA ("Explore Courses" / "Register Now") --- avoid too many split CTAs.
Main Navigation	Reduce category items in the main nav, combine similar categories in dropdowns; provide breadcrumbs on course pages.
Filter / Sort in course list	Add filters (price, duration, popularity, category) so users can filter courses more easily.
Course Layout (grid)	Ensure each course card includes: image, name, price, duration, CTA button (e.g., "View Details") --- with consistent margin and padding.
"New / Popular / Top" Section	Consolidate into one "Featured Courses" with tabs or filters: "Popular / Newest / Recommendations".
Testimonials & Social Proof	Place testimonials in strategic positions (e.g., below featured courses), with visual display (photo + quote).
Footer / Contact	Create a clear & concise footer: contact, address, operating hours, quick links, social media.
Mobile / Responsive	Ensure "hamburger" navigation, responsive course cards (one column on small screens), buttons large enough for fingers.
Visual Consistency	Use a consistent color scheme + typography (heading size, body, CTA color) for a cohesive look.

1. Header / Navbar

The header is the primary user orientation area: the logo on the left (identity anchor), a clear main menu in the center/right, and a register/login CTA—most visible—at the far right. The nav should highlight the top 4–6 key items (Home, Courses, Certification, About, Blog, and Contact), while additional categories are organized into a "Courses" dropdown with subcategories. Implement small utility components: a search icon and a user account/cart indicator (if applicable). Keep the header sticky on scroll for quick access, switch to a hamburger menu on mobile, and pay attention to touch target size (≥ 44 px) and hover/focus states for accessibility.

2. Hero Section

The hero area is your chance to sell your value proposition in 3–4 words and a clear singular action. You can use a strong headline complemented with a short subheadline that communicates main benefits (official certification, lifetime access), followed by one primary CTA like "Explore Courses" and a softer secondary CTA such as "Get Your Certification." Background visuals need to be on-topic (instructor/class photos or illustrations), with an overlay to keep text readable; also think about including a course search bar or popular tags beneath the CTA so users can dive right in. Use color strategically—e.g., high contrast for CTAs, subtle micro-animations when hovering over elements to suggest interactivity—and never distract from the content by using slide-in/out or similar techniques.

3. Featured Courses

This section displays course cards, each of which must include a thumbnail, title, level/duration, price (or free label), status badge (Popular/New/Discount), and two CTAs—View Details and Quick Enroll—within the same grid. Filter and sort controls (category, price, duration, rating) should be placed above the grid so that users can refine results without leaving the page. Card design should maintain an adequate whitespace ratio, easily scannable text (title limited to 1–2 lines), and a hover state that reveals a brief summary or key course benefits. Lazy loading should be applied to images, along with clear pagination or infinite scroll, to improve performance.

4. Advantages / Benefit / Why Us

To reinforce trust (Why Us) after users view the courses, present 3–4 strong benefits using

icons with short headings and 1–2 line explanatory sentences (Practitioner Instructors; Updated Materials; Official Certification; Lifetime Access). Add metric numbers—e.g., "10,000+ students" and "95% passed certification"—that are easy to comprehend to increase credibility. Keep the visuals simple: vector icons and white space, and add a small CTA below the section linking users to the "About Us" or "Learning Method" page for those with epistemic concerns (i.e., a need for more comprehensive evidence).

5. Testimonials / Social Proof

Testimonials should have a few-word quotes, a photo (or initials if the person does not want to upload a photo), position/institution of origin, and — as far as possible — the logo of the company where they work. It can be a carousel so that it takes up less space, but make sure to add functionality for pausing or navigating through the carousel manually for accessibility purposes, or a 2–3-column grid view for desktop screens. Experiment with video testimonials or short case studies for added social proof. Add testimonials just after some featured courses so that those who are skeptical get some social proof before taking the next step.

6. Latest News / Articles

The blog/news section displays the 2–4 latest articles with images, title, date, category/tags, and a 1–2 line excerpt. The purpose is primarily to demonstrate activity, authority, and the benefits of SEO—so titles need to be interesting and excerpts informative. Links to category pages and archives, and a "View All Articles" button should be included for those who want to find more articles. The layout should also be easy to scan so that people can quickly find articles of interest—for example, those related to course topics or career tips.

7. Certificates / Partners / Logos

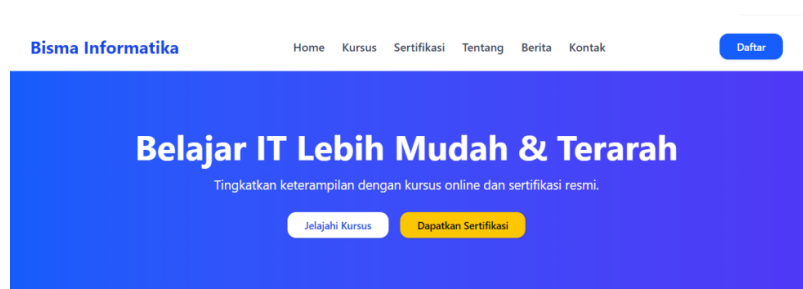
Add images of certificates and partner institutions to build credibility; include versions of logos in grayscale that reverse color on hover so they don't interfere with the main palette. Add a short identifier (e.g., "Verified: BNSP" or "Corporate Partner") and display a modal/tooltip describing the form of cooperation on click. If your offering is in the form of certificates — use certificate thumbnails (ideally ones that can be expanded for a closer look) or sample downloads so your content consumers will have a taste of what they'll get at course completion.

8. Footer

The footer is a catch-all of important information, split into several columns (About; Courses; Help & FAQ; Contact & Address) and a newsletter signup area. Add links to policies (Terms & Conditions, Privacy Policy), hours of operation, and social media icons. The footer is also a good place for security badges or license/accreditation numbers. Make sure text contrast is high enough to be readable, and that information stays in a simple-to-display format on mobile (if you have columns, collapse them into vertical lists).

9. Timely notes on responsive & accessible

Everything must be designed mobile-first: a hamburger navigation bar, course grids that shift into a single column on small screens, CTAs large enough to tap with a finger, and body text with a minimum font size of 16px. Ensure color contrast complies with WCAG AA standards, add alt text to every image, and include tabindex and ARIA labels on all focusable elements (dropdowns, carousels, and forms) so that it is fully accessible to all users.



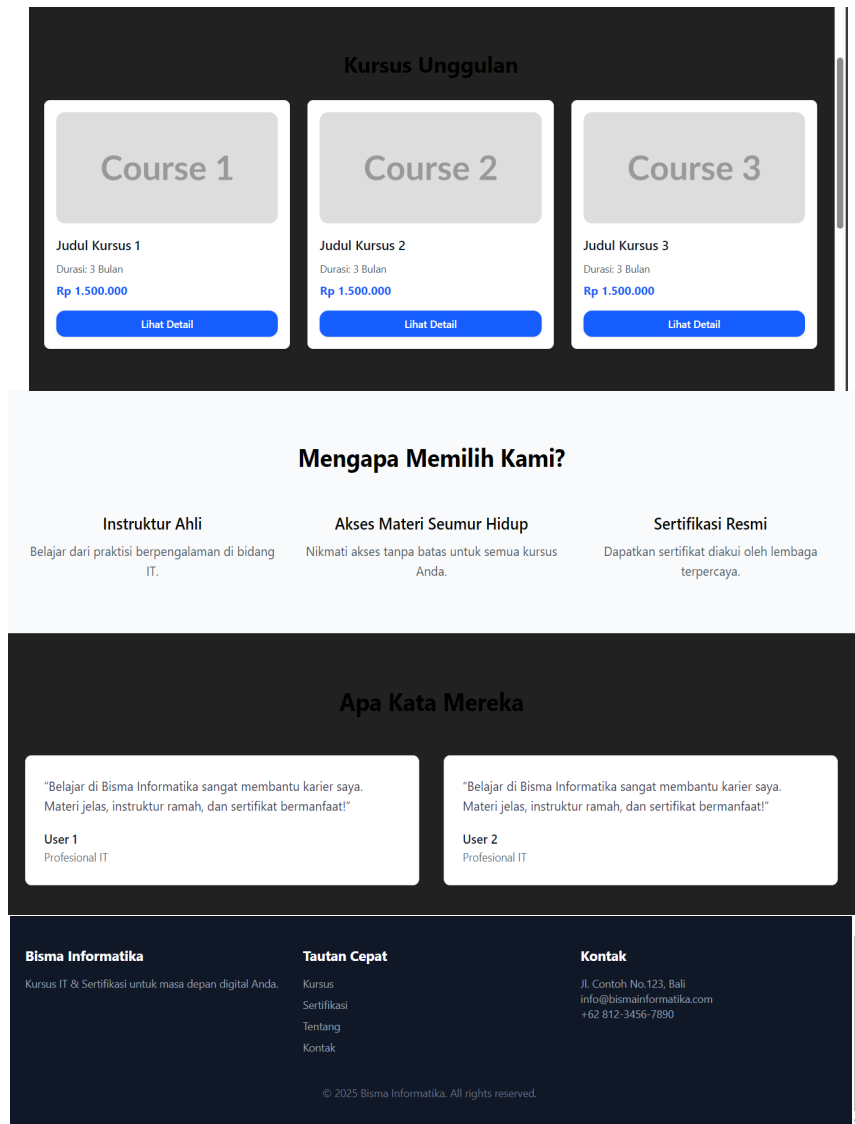


Figure 2. Website display recommendations

CODE

```
import { Card, CardContent } from "@/components/ui/card";
import { Button } from "@/components/ui/button";

export default function BismaInformatikaMockup() {
  return (
    <div className="flex flex-col items-center w-full">
      { /* Header */ }
      <header className="w-full flex justify-between items-center px-8 py-4 shadow-md bg-white">
        <div className="text-2xl font-bold text-blue-700">Bisma Informatika</div>
        <nav className="hidden md:flex gap-6 text-gray-700 font-medium">
          <a href="#">Home</a>
          <a href="#">Kursus</a>
          <a href="#">Sertifikasi</a>
          <a href="#">Tentang</a>
          <a href="#">Berita</a>
          <a href="#">Kontak</a>
        </nav>
        <Button className="bg-blue-600 text-white rounded-xl px-6">Daftar</Button>
    </div>
  );
}
```

```
</header>

{/* Hero */}
<section className="w-full text-center py-20 bg-gradient-to-r from-blue-600 to-indigo-600
text-white">
  <h1 className="text-4xl md:text-5xl font-bold mb-4">Belajar IT Lebih Mudah &
Terarah</h1>
  <p className="mb-6 text-lg max-w-2xl mx-auto">
    Tingkatkan keterampilan dengan kursus online dan sertifikasi resmi.
  </p>
  <div className="flex gap-4 justify-center">
    <Button className="bg-white text-blue-700 px-6 rounded-xl font-semibold">
      Jelajahi Kursus
    </Button>
    <Button className="bg-yellow-400 text-black px-6 rounded-xl font-semibold">
      Dapatkan Sertifikasi
    </Button>
  </div>
</section>

{/* Kursus Unggulan */}
<section className="w-full max-w-6xl px-6 py-16">
  <h2 className="text-3xl font-bold mb-8 text-center">Kursus Unggulan</h2>
  <div className="grid md:grid-cols-3 gap-6">
    {[1, 2, 3].map((course) => {
      <Card key={course} className="shadow-md">
        <CardContent className="p-4">
          <img
            src={`https://placeholder.co/400x200?text=Course+${course}`}
            alt={`Course ${course}`}
            className="rounded-xl mb-4"
          />
          <h3 className="font-semibold text-lg mb-2">Judul Kursus {course}</h3>
          <p className="text-sm text-gray-600 mb-2">Durasi: 3 Bulan</p>
          <p className="text-blue-600 font-bold mb-4">Rp 1.500.000</p>
          <Button className="w-full bg-blue-600 text-white rounded-xl">Lihat Detail</Button>
        </CardContent>
      </Card>
    })}
  </div>
</section>

{/* Keunggulan */}
<section className="w-full bg-gray-50 py-16 px-6">
  <h2 className="text-3xl font-bold text-center mb-12">Mengapa Memilih Kami?</h2>
  <div className="grid md:grid-cols-3 gap-8 max-w-6xl mx-auto">
    <div className="text-center">
      <h3 className="text-xl font-semibold mb-2">Instruktur Ahli</h3>
      <p className="text-gray-600">Belajar dari praktisi berpengalaman di bidang IT.</p>
    </div>
    <div className="text-center">
      <h3 className="text-xl font-semibold mb-2">Akses Materi Seumur Hidup</h3>
      <p className="text-gray-600">Nikmati akses tanpa batas untuk semua kursus Anda.</p>
    </div>
    <div className="text-center">
```

```
<h3 className="text-xl font-semibold mb-2">Sertifikasi Resmi</h3>
<p className="text-gray-600">Dapatkan sertifikat diakui oleh lembaga terpercaya.</p>
</div>
</div>
</section>
```

```
{/* Testimoni */}
<section className="w-full py-16 px-6">
<h2 className="text-3xl font-bold text-center mb-12">Apa Kata Mereka</h2>
<div className="grid md:grid-cols-2 gap-8 max-w-6xl mx-auto">
  {[1, 2].map((t) => {
    <Card key={t} className="shadow-sm">
      <CardContent className="p-6">
        <p className="text-gray-700 mb-4">
          "Belajar di Bisma Informatika sangat membantu karier saya. Materi
          jelas, instruktur ramah, dan sertifikat bermanfaat!"
        </p>
        <div className="font-semibold">User {t}</div>
        <div className="text-sm text-gray-500">Profesional IT</div>
      </CardContent>
    </Card>
  })}
</div>
</section>
```

```
{/* Footer */}
<footer className="w-full bg-gray-900 text-white py-10 px-6">
<div className="grid md:grid-cols-3 gap-8 max-w-6xl mx-auto">
  <div>
    <h3 className="font-bold text-lg mb-3">Bisma Informatika</h3>
    <p className="text-gray-400 text-sm">
      Kursus IT & Sertifikasi untuk masa depan digital Anda.
    </p>
  </div>
  <div>
    <h3 className="font-bold text-lg mb-3">Tautan Cepat</h3>
    <ul className="text-gray-400 text-sm space-y-2">
      <li><a href="#">Kursus</a></li>
      <li><a href="#">Sertifikasi</a></li>
      <li><a href="#">Tentang</a></li>
      <li><a href="#">Kontak</a></li>
    </ul>
  </div>
  <div>
    <h3 className="font-bold text-lg mb-3">Kontak</h3>
    <p className="text-gray-400 text-sm">Jl. Contoh No.123, Bali</p>
    <p className="text-gray-400 text-sm">info@bismainformatika.com</p>
    <p className="text-gray-400 text-sm">+62 812-3456-7890</p>
  </div>
</div>
<div className="text-center text-gray-500 text-sm mt-10">
  © 2025 Bisma Informatika. All rights reserved.
</div>
</footer>
</div>
```

);
}

Discussion

The results of this study indicate that the overall quality of the LKP Bisma Informatika website is in the good category, with a WebQual Index (WQI) value of 83.9%. This score indicates that the website satisfied most users; however, there are gaps across all dimensions measured. The Usability dimension scored the highest (WQI = 87.2%), indicating that the website is significantly easy to use. On the other hand, one usability indicator—web navigation—has not yet left the top priority quadrant, indicating that this aspect is not yet performing well enough to help users find information.

The Information Quality dimension scored the lowest, with a WQI of 80.9% and a gap of -0.85 , which suggests issues relating to the accuracy, timeliness, and completeness of information presented. This is also confirmed by the results of the Importance-Performance Analysis (IPA), where indicators related to trustworthy information, current information, and detailed information fall into Quadrant I (top priority), meaning that this data is regarded as very critical by users but the quality of its presentation does not live up to expectations. This condition may decrease users' trust in using the website as an official source of information about the institution.

A WQI of 83.6% (gap = -0.70) was observed in the Service Interaction dimension. Some indicators, such as data security and ease of communication, fall into Quadrant II (maintain), meaning that they are already performing well and need to remain consistent. In contrast, personalization and community indicators fall into Quadrant III, as they are not viewed as particularly important by users. This means that social interaction features such as community forums or service personalization are currently not a priority; therefore, resources should be allocated to improving information quality and navigability.

This condition affects the user experience of the website. Most of the respondents are young adults (21–30 age group) with high usage intensity, and thus have a very high need for complete and up-to-date information. In the absence of such support from the website, users often turn to alternative sources or employees for information, adding to the burden on administrative personnel. Moreover, potential future members may question the institution's credibility if the information available is incorrect or out of date.

CONCLUSION

The study used an integrated WebQual 4.0–Fuzzy AHP–IPA framework to evaluate the quality of the LKP Bisma Informatika website. Findings show an overall WQI of 83.9%, which means that the website is positioned in the good category, despite a negative performance gap across all three dimensions. The Information Quality dimension showed the lowest WQI (80.9%) and highest gap (-0.85), indicating that users do not yet feel that content accuracy, timeliness, and completeness meet their expectations. Targeted improvements are necessary in the Usability dimension (WQI 87.2%, gap -0.55) and Service Interaction dimension (WQI 83.6%, gap -0.70), which received lower scores than the overall WQI, mainly in ease of navigation (A3), indicating that it falls under Quadrant I (Top Priority) of the IPA matrix.

The analysis identifies four high-priority attributes that require immediate attention: trustworthy information (B2), up-to-date information (B3), detailed information (B6), and ease of navigation (A3); each is highly valued by users but currently underperforming. Quadrant II (Maintain) attributes A4, A5, C1 (reputation), C2 (information security), and C5 (ease of communication), which have excellent performance, should be maintained consistently. The implications of these findings give LKP Bisma Informatika a measurable framework to focus resource investment on improving information quality, interface navigation, and functionality, thereby increasing user trust and the credibility of its institution.

The overall quality level (WQI) is "good," but the Information Quality dimension falls behind. The WQI total value of the LKP Bisma Informatika website is 83.9% (good). Per dimension: Usability 87.2%, Service Interaction 83.6%, and Information Quality 80.9% — the lowest among the three, and thus the primary candidate for improvement. Gaps are negative

across all dimensions; Information Quality has the largest gap. All dimensions show a negative average gap between importance and performance: Information Quality -0.85 (highest), Service Interaction -0.70 , Usability -0.55 .

This leads to the conclusion that perceived performance does not align with users' expectations — particularly in terms of completeness, accuracy, and timeliness of content. Content and navigation are highlighted as focus areas for improvement from the IPA mapping. Quadrant I (Top Priority): B2 (trustworthy information), B3 (up-to-date information), B6 (detailed information), and A3 (ease of navigation) are the key attributes that need immediate improvement, with relatively low performance. Quadrant II (Maintain) — A4 (ease of use), A5 (attractive appearance), C1 (reputation), C2 (information security), C5 (ease of communication) — are important attributes that perform well and need to be maintained. Quadrant III (Low Priority) — B7 (information format), C3 (personalization), and C4 (community space); Quadrant IV (Overkill) — A6 (design suitability), A8 (positive experience), A7 (website competency) — suggests that resource allocation in these areas may potentially be optimized.

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AUTHOR CONTRIBUTION STATEMENT

Anop Sudiatmika: Conceptualization, methodology, data curation, analysis, writing — original draft preparation and final manuscript approval. Gede Angga Pradipta: Instrument development, data validation, statistical analysis, writing— review and editing. Roy Rudolf Huizen: Literature review, visualization, result interpretation and revision of the manuscript.

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