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Evaluation of The Orthopedic Hospital Website's Performance Using User Acceptance Testing

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***Abstract*—User Acceptance Testing (UAT) is essential for ensuring a system meets the real-world needs of its users. Unlike traditional testing that prioritizes technical accuracy, UAT focuses on usability and overall user satisfaction. For the Orthopedic Hospital's website, UAT served as the primary evaluation method, targeting its core user groups—patients, staff, and stakeholders. The testing process followed the ISO 9126 software quality standards, evaluating the website across key dimensions such as functionality, reliability, usability, efficiency, maintainability, and portability. A Likert scale was used to capture structured user feedback, providing quantifiable insights into user perceptions. This combined approach allowed for a well-rounded assessment, balancing technical quality with user experience. Results indicated a high satisfaction rate of 92.7%, reflecting strong approval of the website's design and functionality. However, the evaluation also pointed to areas for enhancement. The online registration process, for example, could be simplified to improve ease of use and task completion. While the results are promising, continued improvement is vital—especially in healthcare, where user experience directly affects patient outcomes and service efficiency. To maintain alignment with evolving user needs and technologies, ongoing UAT cycles should be integrated into the hospital's digital strategy. Leveraging ISO 9126 standards and user-centered tools like the Likert scale will ensure the website remains effective, accessible, and responsive to its users.**

***Index Terms*—Website, hospital, UAT, service.**

I. Introduction

Information technology has become an essential need for every individual, business, educational world, and government institutions [1]. This rapid advancement in information and communication technology has significantly transformed how data and services are accessed and delivered [2], [3]. Information is no longer limited by time, location, or offline constraints, as everything is now connected through the internet [4].

Websites play a vital role in this digital ecosystem by providing information in various forms—such as text, audio, and multimedia—stored on servers and presented as hypertext [5], [6]. For organizations, websites are more than just communication tools; they are integral platforms for delivering online services and engaging with users [7].

Rehabilitation hospitals, including Orthopedic Hospitals (OH), are among the healthcare institutions that utilize websites to enhance service delivery. Service quality in this context is increasingly being measured by user experience and satisfaction, which reflect how effectively digital services meet patient expectations and foster long-term relationships [8].

The Orthopedic Hospital (OH), which began as a clinic in 2006 and transitioned into an Integrated Services Hospital in 2012, represents a prime example of healthcare digitalization through website use [9]. However, despite this digital presence, the OH website has never been formally evaluated for its effectiveness, usability, or alignment with user needs—including patients and hospital staff. This presents a significant research gap, particularly in understanding how orthopedic patients and employees perceive and interact with the site.

Given the specific challenges in healthcare service delivery—such as accessibility, clear communication of medical information, and support for patient decision-making—it is critical to evaluate hospital websites through comprehensive frameworks. The User Acceptance Test (UAT) offers a practical method to assess how well the OH website supports these goals and meets stakeholder expectations [10]. Moreover, this research aligns with broader trends in e-health and website usability studies, which emphasize the growing role of digital platforms in improving healthcare access, patient empowerment, and service efficiency. Evaluating the OH website using UAT not only addresses a local need but also contributes to the global discourse on how healthcare institutions can better design and maintain digital interfaces to serve patients effectively. Evaluating the OH website using User Acceptance Testing (UAT) not only addresses a local need but also contributes to the global

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discourse on improving digital healthcare services. This effort aligns with Sustainable Development Goal 3, which emphasizes ensuring healthy lives and promoting well-being for all. By optimizing the usability and accessibility of the website, this evaluation supports more efficient, patient-centered healthcare delivery, ultimately enhancing access to reliable health information and services.

II. Related Work

In the current digital era, hospital websites have become one of the main channels for patients to obtain information, access services, and interact with healthcare providers [11].These platforms not only enhance communication but also play a vital role in promoting health education and awareness. By improving digital access to healthcare information and services, hospital websites contribute directly to Sustainable Development Goal 3: Good Health and Well-being, ensuring inclusive and equitable health access for all [12], [13]. UAT evaluates the performance and usability of websites, especially in the context of hospitals. However, recent research still highlights a GAP or discrepancy in the understanding related to evaluating hospital website performance through UAT. There are three primary reasons why the presence of a "GAP" in research on website performance using User Acceptance Testing (UAT) is significant:

1) *Enhancement of research methodology*
   By critically comparing the methodologies used in prior website performance studies—many of which rely on static content analysis or generalized usability metrics—this study identifies limitations in capturing nuanced aspects like real-time user interaction and dynamic content responsiveness. Addressing these gaps, the current study introduces a more holistic and user-centered approach, integrating real-time interaction tracking and adaptive performance testing to enhance the methodological rigor and relevance of website performance assessments.
2) *Expanded Contribution to Scholarly Literature*
   While previous research has often emphasized technical parameters (e.g., load speed, uptime), fewer studies have systematically evaluated the interplay between performance metrics and user engagement quality. This study fills that void by bridging technical performance with user experience dynamics, offering novel insights into how performance affects user satisfaction and behavioral outcomes. As a result, it significantly enriches the literature by shifting the analytical lens toward more user-relevant performance indicators.
3) *Strengthened Practical and Industry Relevance*
   Earlier studies tend to overlook the operational context of websites in real-world, user-driven environments. By addressing this oversight—particularly the lack of focus on dynamic content and actual user interaction—the current study produces findings that are not only academically valuable but also directly applicable to practitioners. This alignment with real-world usage patterns ensures that the study's recommendations are practical, actionable, and tailored to the evolving demands of industry stakeholders.

Some previous studies have highlighted a gap in this area of research; Table 1 shows three gaps from four studies. Based on Table 1, this table shows gap between this research and previous research. The following below are identified gaps:

1) *Lack of comparative research*
   Some previous studies tend to lack comparison of different UAT methods in the context of evaluating hospital website performance [16]. This creates a need for more in-depth research focused on analyzing the effectiveness of communication on websites.
2) *Focus on user services*
   Although some studies have evaluated user satisfaction related to hospital websites through UAT, there is still a need to better understand how user services, specifically communication through the website, can be improved based on UAT results.
3) *Integration of accessibility standards*
   Many studies fail to thoroughly address how hospital websites align with accessibility standards for users with disabilities [17]. This gap highlights the need for research focused on evaluating the accessibility and inclusivity of hospital websites through UAT.

Table 1.
Research Gaps

Gap	Research			
Title	In-patient medication delivery in mobile app and outpatient online lab results for hospitals [14].	User acceptance factors of hospital information systems and related technologies: Systematic review [10].	Accessibility evaluation of university hospital websites in Turkey [15].	Evaluation of the Orthopedic Hospital Website's Performance Using User Acceptance Testing
Focus	Investigating the impact of User Acceptance Testing (UAT) on patient satisfaction in the use of hospital websites	Conducting usability evaluations of several hospital websites through User Acceptance Testing (UAT)	Metric analysing to assess hospital website performance	Exploring the role of UAT in enhancing communication effectiveness through hospital websites
Purpose	Identifying the relationship between User Acceptance Testing (UAT) and patient satisfaction.	Analyzing the website's usability level based on UAT.	Developing specific metrics for evaluating website performance.	Investigating the role of UAT in improving communication effectiveness.
Variable	Patient satisfaction, relationship with the UAT process.	Website usability quality, UAT results.	Developed metrics, website performance.	The role of UAT in communication, its effectiveness.

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4) Dynamic content evaluation

Existing research often overlooks the assessment of dynamic and interactive content on hospital websites, such as chatbots, appointment scheduling systems, and real-time notifications. There is a need for studies that investigate how these features influence user experience and satisfaction through UAT.

This study aims to assess the extent to which service usability quality, information quality, and interaction quality impact user acceptance of the hospital website. User acceptance is explored as a variable, given that website service quality is believed to influence the level of user acceptance. Thus, this study will analyze several website quality dimensions related to usability and user acceptance levels, taking into account the quality of website services that influence the relationship between these variables.

This research will employ quantitative methods approach. A quantitative data ensuring a comprehensive understanding of the factors influencing user acceptance. The usability quality will be evaluated through user-centered testing, focusing on ease of navigation and accessibility. Information quality will be assessed based on the accuracy, relevance, and comprehensiveness of the content provided on the Hospital website. Interaction quality will examine user engagement and satisfaction with interactive features such as appointment booking or chat support. By integrating these dimensions, the study aims to provide actionable insights for improving the OHP website and enhancing user experience.

III. Research Method

To effectively assess the strengths and weaknesses of a hospital website, a structured approach combining both qualitative and quantitative methods was adopted. This ensured a well-rounded understanding of user interactions and the website's overall functionality [18].For the quantitative component, 49 respondents were selected using purposive sampling to target individuals who had prior experience using hospital websites, ensuring relevance and insight. Participants were recruited through online platforms and community outreach to ensure demographic diversity in age, gender, and digital literacy.

The questionnaire used in the study was carefully developed based on existing literature and expert consultation. To ensure clarity and validity, the instrument underwent a pilot test with a small group of users whose feedback helped refine the wording and structure of the questions. Likert scale items, ranging from "Strongly Disagree" to "Strongly Agree," were derived from common usability metrics and tailored to the healthcare context.

Fig. 1. Research flow.

ISO 9126 was chosen as the evaluation framework due to its comprehensive quality characteristics—such as functionality, usability, efficiency, and maintainability—which align closely with the goals of hospital website assessments. Compared to alternative models, ISO 9126 offers a structured and internationally recognized standard that facilitates objective evaluation and comparability. Figure 1 shows the research flow of this study. The research is described as follows:

1) Research planning

Objective: Analyze the acceptance of the Hospital website services.

Identify key variables: Determine and define key variables to be observed and measured, such as user satisfaction, service effectiveness, and user response to website features.

2) Research design

Sample selection: Select a sample from the population of website users, website administrators, and IT managers of hospital.

Measurement instrument development: Develop a quantitative evaluation questionnaire to measure the identified variables.

3) Data Collection

Conducting user acceptance testing (UAT): Implement UAT by asking the sample to complete the questionnaire.

Questionnaire completion: Measure variables through questionnaires, surveys, or direct observation of users during UAT.

4) Data analysis

Data processing: Process and organize the collected data using UAT.

Statistical analysis: Use statistical tools to analyze the collected data, such as descriptive analysis.

5) Interpretation of results

Data interpretation: Draw conclusions from the data analysis results.

Report preparation: Prepare a report summarizing the findings and conclusions from the data analysis.

A. Evaluation Instrument

The International Organization for Standardization (ISO) 9126 specifies several characteristics for software quality testing [19]. ISO 9126 testing is designed to evaluate software quality in terms of functionality, reliability, usability, efficiency, maintainability, and portability. These metrics provide a standardized framework for assessing software from multiple quality dimensions. Each characteristic is further broken down into sub-characteristics, enabling more granular analysis. This systematic approach helps organizations identify areas for improvement and align their products with international quality benchmarks. The measurement formulas in ISO 9126 are shown in (1).

$$\%Actual\ Score\ = \frac{Actual\ Score}{Ideal\ Score} \times 100\% \quad (1)$$

Actual score denotes the preference of all respondents in the questionnaire. While, ideal score is all respondents who selected the highest option in all categories.

The range of questionnaire scores for respondents uses a Likert scale assessment method. The scale criteria used in the analysis are shown in Table 2.

Table 2.
UAT Scoring Criteria

% Total Score	Range
0 % ≤ x < 36 %	Bad
36 % < x < 52 %	Little bad
52 % < x < 68 %	medium
68 % < x < 84 %	Good
84 % < x < 100 %	Very good

The population of respondents came from website managers, IT staff and several users of the Hospital website. The selected sample was 49 to answer 10 questionnaire questions. The weight of the UAT questionnaire score is as in Table 3.

Table 3
Likert Scale Criteria

Score	Note
5	Very Agree
4	Agree
3	Neutral
2	Disagree
1	Very Disagree

The UAT questionnaire is the main and important material for evaluating website acceptance. Table 4 is a questionnaire statement that is the basis for the evaluation.

Table 4
Hospital Website Evaluation Questionnaire

No	Statement	Answer				
		1	2	3	4	5
1	The Hospital Website is comfortable to use.					
2	The Hospital Website is easy to use.					
3	The Hospital Website display is attractive.					
4	The Hospital Website features are according to the needs of patients or Hospital staff.					
5	There are not obstacles to use the Hospital Website in authentication and authorization					
6	The features of Hospital Website provides an informative error message					
7	The Hospital Website has user guide to helps users understand how the system works and very useful for patients or Hospital staff.					
8	The Hospital Website increases the efficiency of the work of patients or Hospital staff.					
9	The Hospital Website is effective for patients or Hospital staff.					
10	The Hospital Website meets the expectations of patients or Hospital staff.					

IV. RESULT

The analysis step is the next step to get the interpretation of the questionnaire data. The results and discussion of the UAT analysis of the Hospital website involve several key points related to the evaluation of website performance. Key points for evaluating website performance are based on three indicators including; user satisfaction, website functionality and services, and responsiveness to devices.

Table 5
Hospital Website Evaluation Questionnaire Result

Statement	Answer					Total	AVG	%
	1	2	3	4	5			
1	0	0	1	15	34	233	4,66	93.2
2	0	0	3	10	37	234	4,68	93.6
3	0	0	0	11	39	239	4,78	95.6
4	0	0	0	29	21	223	4,55	91
5	3	2	3	30	12	196	3,92	78.4
6	0	0	0	17	33	233	4,66	93.2
7	0	0	0	15	35	235	4,7	94
8	0	0	0	7	43	243	4,86	97.2
9.	0	0	0	12	38	238	4,76	95.2
10.	0	0	0	5	45	245	4,9	98
Average Percentage								92.7

Based on Table 5, 92.7% of responses to the 10 questionnaire items from a sample of 50 participants rated the hospital website positively. According to the scoring criteria in Table 2, this places overall user satisfaction in the "very good" category. However, while these findings are encouraging, the relatively small sample size limits the generalization of the results. The participants may not fully represent the diversity of the hospital's broader user base in terms of age, digital literacy, or healthcare needs.

An analysis also reveals important nuances that inform

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areas for improvement. For instance, while most users agreed that the website enhances communication and facilitates access to services, individual item scores varied. Question 5, for example, received a lower score of 78.4%, indicating that some users faced challenges with the authentication process—highlighting the need to simplify login procedures.

User acceptance testing (UAT) assessed usability, functionality, and content clarity, and informed several targeted recommendations. Although the interface scored well overall, responses to Question 4 identified issues with navigation intuitiveness, while a lower score for Question 7 indicated confusion about appointment booking. These insights, while valuable, should be interpreted with caution due to the limited scope of the sample. Broader testing with a more diverse user group would help validate these findings and ensure the recommendations are widely applicable.

Furthermore, longitudinal assessment could provide deeper insights into how user satisfaction evolves over time, particularly following any website enhancements based on the current findings. Tracking user feedback post-implementation would help determine whether changes effectively address the highlighted issues, such as navigation and authentication. It would also allow the hospital to measure the sustained impact of the website on user engagement and service accessibility. Incorporating analytic tools to monitor usage patterns, bounce rates, and time spent on key pages could complement survey-based evaluations and offer a more comprehensive view of user interaction with the site.

Table 6
Finding UAT Result

		Finding	Recommendation
1.	Basic System Functions	Users register an account, log in, or complete a transaction	Offer a "Remember Me" feature for returning users to reduce the need for repeated logins.
2.	User Interface	Navigation is easy to understand, button layout is in accordance with user habits.	ensure a consistent and user-friendly experience while accommodating potential growth and changes.
3.	System Performance	Application pages load in less than 3 seconds.	Prioritize loading visible content first (Critical Rendering Path).
4.	Compatibility	Web applications must run well on Google Chrome, Firefox, and Safari.	Build the core features first with baseline functionality, then enhance with additional features compatible with modern browsers.
5.	Security	There need focus on protected data for authentication and authorization processes in work properly, and safe.	Limit access to protected data based on user roles, ensuring only authorized personnel can access specific resources.
6.	Error Recovery	If a transaction fails, the system provides an informative error message and guidance on how to fix it.	Provide actionable steps to resolve the issue. For example, "Please ensure the payment method has sufficient funds and try again. Alternatively, use a different payment method.".
7.	Documentation and User Guides	The user guide is complete and available in digital format to helps users understand how the system work.	Ensure that the guide is optimized for mobile devices to improve accessibility for users on various platforms.
8.	Stability (effective)	The application does not hang and effective in system access even though it is used continuously.	Ensuring the system does not crash or experience technical problems often
9.	Integration (efficient)	Payment systems are successfully and efficient connected to third-party services such as payment gateways.	Regularly test the interface with real users to identify pain points or areas of unnecessary complexity and adjust accordingly.
10.	User Experience (Satisfaction)	Users feel comfortable and easy to complete their tasks in the application.	Ensure the current user interface remains clean and simple, avoiding unnecessary complexity

Table 6 presents the results gathered from interviews and observations conducted during the research, highlighting the relationship between the performance of the hospital website and its ability to meet user needs. The user acceptance test (UAT) for the website includes ten key indicators. These ten UAT indicators serve as the basis for evaluating the hospital website's performance and provide a foundation for generating ten recommendations.

The discussion of this criterion is important to ensure that the system not only meets technical specifications but is also relevant and useful. This testing is conducted by involving real users in simulations of actual work environments. The focus is on ensuring that the system can be effectively used in daily operational. UAT results can be used to provide feedback to the development team before the system is released. If a system fails to meet any UAT criteria, improvements need to be made before it is widely implemented to avoid major issues in the future. The graph of the results of the hospital website evaluation is shown in Fig. 2.

V. CONCLUSION

This study offers several practical insights for hospital IT teams and web developers by evaluating user acceptance of the hospital website. The findings reveal that users generally find the site easy to navigate, functional, and compatible across mobile platforms. In particular, the online registration system was positively received, with users confirming its smooth operation and reliability. An overall UAT score of 92.7% reflects a high level of user satisfaction and acceptance. This study underscores key considerations for designing future hospital websites. Particularly, enhancing core features such as

search accuracy and streamlining the online registration process can significantly improve user experience. Moreover, implementing a system for ongoing usability testing can ensure the website continues to meet evolving patient expectations and technological standards.

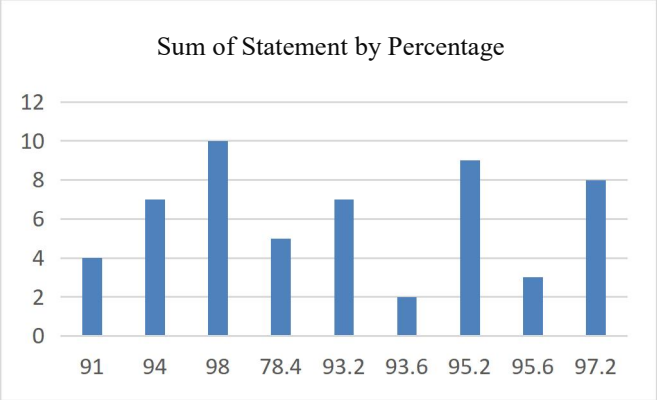

Fig. 2. Sum of statement by percentage.

However, this analysis was confined to a single hospital website, which may limit the generalization of the findings. Future research should expand the scope to include diverse hospital types—such as private clinics, regional hospitals, or specialty centers—to better understand variations in user needs. Additionally, integrating accessibility evaluations would provide a more comprehensive assessment of the website's inclusive, especially for users with disabilities. Continued research and iterative design improvements will be essential in creating hospital websites that meet technical requirements and provide a seamless, patient-centered digital experience.

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