

# 13th International Seminar on Industrial Engineering and Management

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Bandung, Indonesia • 28 July 2021

**Editors** • Winnie Septiani, Wahyukaton Wahyukaton,  
Rahmi Maulidya and Desinta Rahayu Ningtyas

## PRELIMINARY

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## DECISION ANALYSIS AND INFORMATION SYSTEM

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Determination of performance ranking of MSMEs using simple additive weighting approach 

Isnaeni Yuli Arini; Tiara Verita Yastica


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A conceptual framework for an adaptive sustainability assessment for industry and further research potential 

Muhammad Asrol; Haris Purna Widyatama; AAN Perwira Redi

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Decision support system for business location selection and economic feasibility 

Yudha Aprilianto; Muhammad Asrol

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Design of sales information system based on website at Amonyu Shop 

Elfira Febriani; Sucipto Adisuwiryo; Dhita Savitri


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Decision-making for conducting seismic-surveying activities on oil and gas exploration using decision tree and utility functions 

Heni Hindayanti; Winnie Septiani

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Evaluation of e-learning implementation using student readiness instrument 

M. M. W. Inderawati; P. T. Huang; R. Sukwadi; A. Sugioko; T. Liana; Y. T. Jou

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## Structural equation modelling for IoT and big data implementation in business performance 📄

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## YBM University tourism building location selection with a combination of cut off point and AHP Topsis method 📄

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## Design of website and web-based information system user interface of PT XYZ with human centered design method 📄

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## Implementation of artificial intelligence in improving the quality of service system in telecommunications industry 📄

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## Decision support system for raw material supplier selection by using fuzzy AHP-TOPSIS method in PT Mulia glass 📄

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Exploration of data science expertise in Indonesia: Study case of industry in Jakarta metropolitan area 🗑

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Resilient and sustainable supplier selection: Trends in criteria and methods 🗑

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E-C ommerce application of oil palm fresh fruit bunches supply chain 🗑

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Clustering the micro, small and medium enterprises (MSMEs) in Yogyakarta City based on technology readiness index 2.0 using K-Means method 🗑

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Deep walk and PCA based conceptual model of sustainable packaging design 🗑

[Arrahmah Aprilia](#); [Taufik Djatna](#); [Nastiti Siswi Indrasti](#); [Sugiarto](#)

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Agglomerative hierarchical clustering in determining the location of bio-briquette plant in Majalengka Regency 🗑

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### Hospitality food and beverage production with ERP system using odoo and rapid application development (RAD) method

Salma Jumaizar Hanif; Avon Budiyono; R. Wahjoe Witjaksono

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### Clustering on small and medium scale manufacturing industry in Jakarta using fuzzy cluster means

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### The effect of problem based learning method to student online learning performance during Covid-19

D. Pratami; W. Tripiawan; I. A. Puspita

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## ERGONOMICS & PRODUCT DESIGN

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### Analysis of quality preferences for cassava chips products

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### Design of handgrip for commuter line electric train using house of quality (HOQ)

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### A crusher machine design at PT XYZ using rational product design method

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### Usability testing and heuristic evaluation for improving usability registration of website hospital

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## Ergonomic design improvement of plastic-waste processing machine based on posture analysis

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### Mapping of noise contours due to the production process of bolts and nuts in the production department and residences environment of Pasir Angin Village, Cileungsi, Bogor Regency

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### New area of food packaging design research: A systematic review

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### Eye-tracking approach for analyzing the advertisement criteria of the most attractive sports drinks

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### Designing persuasive technology applications to solve human behavior problems: Enhancing better lifestyle on millennials

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Utility of reaction time in measuring fatigue associated with short-period, high-cognitive load task 📄

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Ergonomic risk analysis of tofu cutting process at Raimin's small and medium enterprise 📄

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Risk analysis and safety improvement of plastic waste processing machine 📄

Azizah Andra Risa Tassha Chairiyah; Niken Parwati; Aprilia Tri Purwandari; Widya Nurcahayanty Tanjung

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Analysis of work system to productivity with work stress as moderating variable 📄

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Redesign plastic waste processing machine by using the lean product development method 📄

Nadiya Hasna Fakhirah Hartanto; Widya Nurcahaanty Tanjung; Niken Parwati; Aprilia Tri Purwandari

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Comparative analysis of mental workloads for disruption technicians and new installation technicians using the NASA-TLX method (Case study: PT Telkom Akses Kandatel Sleman) 📄

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Usability evaluation and improvement design of hospital mobile website 📄

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Finding a research gap on service quality and safety improvement in public transportation 📄

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Proposed development process to improve customer quality of service with fuzzy-servqual and data mining methods in insurance agency 🗑

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Simulation based facility location modelling in a sustainable closed-loop supply chain network 🗑

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[D. Rahmayanti](#); [R. A. Hadiguna](#); [S. Santosa](#); [N. Nazir](#); [B. Yuliandra](#)

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**Sustainable product design engineering in industry 4.0: Civilian and military drones vis-à-vis digital transformation** 📄

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**Three-dimensional object measurement model image processing system based to calculate logistics cargo rates** 📄

[Y. Yogaswara](#); [H. W. Hardel](#)

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**Basic model simulation for disaster evacuation routes evaluation using agent based modeling (ABM)** 📄

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Waste reduction strategy design based on risk assessment and cost benefit approach 🗑

[Winda Nur Cahyo](#); [Bayu A. Swasono](#); [Riza S. I. Raben](#); [Riyan T. Sutartono](#); [Haryo Prawahandaru](#); [Taufiq Immawan](#)

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Strategy designed toward performance improvement of asset management system 🗑

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Design of conceptual models for comparison analysis between conventional methods and MCP methods based on productivity and logistic performance in cooperative X 🗑

[Leni Nuraeni](#); [Endang Chumaidiyah](#)

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The utilization of information technology: Live stream shopping as an innovation strategy to increase online store sales in the pandemic period 🗑

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A maturity model of I4.0 in developing country: Challenges and enablers in Indonesia for using INDI 4.0 as a measuring instrument of I4.0 readiness 🗑

[Hasbullah Hasbullah](#); [Salleh Ahmad Bareduan](#); [Sawarni Hasibuan](#)

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Evaluation performance of online learning in Indonesian higher education institution during pandemic Covid-19 🗑

[B. H. Nugroho](#); [S. Hasibuan](#)

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Increasing consumer satisfaction and loyalty with product innovation, e-commerce and reward factors 🗑

[Sarah Isniah](#); [Zulfa Fitri Ikatrinasari](#); [Torik Husein](#)

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## Opportunity and challenge for small wind power project in Indonesia 🇮🇩

Marsellinus Bachtiar Wahju; Tajuddin Nur

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## Effect of exposure time and elevated temperature on plain concrete 🇮🇩

S. Alsadey; A. Omran; Z. Jamal

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## Strengthening of cylinders concrete confined with glass-reinforced polymer 🇮🇩

S. Alsadey; A. Omran; Albakosuh A.

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## Glass fiber as reinforcement in cement mortar for the repair of plain concrete members 🇮🇩

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## Construction waste quantification and benchmarking in Libya 🇮🇩

S. Alsadey; S. Hamid; A. Omran

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## Comparing the effect of electronic word of mouth (eWOM) in Facebook and Instagram on donation intention during earthquakes in Indonesia 🇮🇩

D. S. Utomo; N. Paopraser; R. Yousuk

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## Analysis of optimistic bias and pessimistic bias in preparation for the new normal 🇮🇩

Atyanti Dyah Prabaswari; Bagus Wahyu Utomo

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## Investigating student anxiety factors among international student (Case study: Indonesian private university) 🇮🇩

D. Pratami

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Designing risk response from qualitative analysis, a strategy to avoid the project failure (Case study: Coffee plant construction project) 📄

D. Pratami; I. G. N. Aditya.; I. Haryono

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Waste identification using value stream mapping in the Pig Launcher production process 📄

Novia Rahmawati; Rahmi Maulidya; Nabila Hapsari

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Strategy analysis of fire victims evacuation queues on building areas in compliance with SMK3 regulations in order to Green Campus (Case study of the Faculty of Engineering, Pancasila University (FTUP)) 📄

M. Y. M. Sholihin; R. Prasetyani; Grief Kiki

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## PREFACE

*Bismillahirrahmanirrahim,  
Assalamu'alaikum Warrahmatullah Wabarrakatuh,*



First of all, we apologize for the inconvenience in the 13th ISIEM 2021 event, due to current condition and situation of COVID 19. The situation made us have to make some critical modification in the event, including: online presentation of keynote speaker, online presentation for all candidates that cannot attend the seminar. But we hope we all remain excited to continue to contribute to research publications. Nonetheless, we are trying to prepare this seminar as best we can.

This issue is published in line with the Thirteen International Seminar on Industrial Engineering and Management (13<sup>th</sup> ISIEM) 2021. The articles cover a broad spectrum of topics in Industrial Engineering and Management, which are Quality Engineering Management, Decision Support System and Artificial Intelligent, Ergonomics, Supply Chain Management, Production System, Operation Research, and Industrial Management. These articles provide an overview of critical research issues reflecting on past achievements and future challenges. Those papers were selected from 137 abstracts, and we send these papers to AIP to be published there as an Open Access Proceeding Scopus. This statistic shows the high competition to get published on this proceeding. This issue and seminar become special as more delegates come and join from various country as well as universities. We host 90 delegates both from abroad and local.

The 13<sup>th</sup> ISIEM is hosted by eight universities, which are Universitas Pasundan, Universitas Esa Unggul, Universitas Trisakti, Universitas Tarumanagara, Universitas Al-Azhar Indonesia, Atma Jaya Catholic University of Indonesia, Universitas Pancasila and Universitas Mercu Buana. This is the thirteenth years of the collaboration of those universities, and the first time we had MOU with AIP in America to publishing the papers that is indexed by Scopus. This is also the second years of our international partnership join committee with Chung Yuan Christian University – Taiwan, Yuan Ze University – Taiwan, Kasetsart University – Thailand and Bright Star University – Libya.

In this occasion, let us give special thanks to Prof. Yung-Tsan Jou, PhD (Professor and Chair Department of Industrial and Systems Engineering, Chung Yuan Christian University – Taiwan), Prof. Yun-Chia Liang, PhD (Professor and Chair, Department of Industrial Engineering and Management, Yuan Ze University – Taiwan), Elisa Lumbantoruan (President Director & CEO at ISS Indonesia, Independent Commissioner at PT Indosat Tbk, and Independent Commissioner at Garuda Indonesia) and Naphorn Paoprasert, Ph.D (Researcher, Department of Industrial Engineering, Faculty of Engineering, Kasetsart University – Thailand), for their contribution as keynote speakers, to Prof. Abdelnaser Omran from Brightstar University, and supported by Indonesian Association of Industrial Engineering Higher Education (BKSTI) and the Institution of Engineer Indonesia – Industrial Engineering Chapter (BKTI-PII). We are also grateful to all reviewers and editors, for their commitment, effort and dedication in undertaking the task of reviewing all of the abstracts and full papers. Without their help and dedication, it would not be possible to produce this proceeding in such a short time frame. I highly appreciate all members of committees (advisory, steering, and organizing committees) for mutual efforts and invaluable contribution for the success of seminar.

*Wassalamu'alaikum Warrahmatullah Wabarrakatuh.*

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*by Anonim Anonim*

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# Usability Testing and Heuristic Evaluation for Improving Usability Registration of Website Hospital

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**Abstract.** The hospital website is one of the facilities provided by the hospital to make it easier for prospective patients to find information about the hospital. The preliminary research results indicated that the display of the hospital website made users hard to find a doctor's practice schedule. Therefore, this study aimed to measure the usability of the registration of website hospital and provide suggestions for improvements of the website. The analysis and evaluation methods used in this study were usability testing and heuristic evaluation. The results showed that the aspects of usefulness, ease of use and satisfaction were still low. In addition, errors made by users were still high. The results of the heuristic evaluation showed that many aspects had a significant error rate. Suggestions for improvements are to change the website's display, shorten the stages of finding a doctor's practice schedule, and provide a help feature to users. After conducting improvements, the results for the usability testing indicated that users did not make errors at all in looking for a doctor's practice schedule and task-processing time became shorter than before. Meanwhile, the results for heuristic evaluation indicated that the major error from website after conducting improvements turned into a minor error.

**Keywords:** Usability Testing, Heuristic Evaluation, Registration of Hospital, Website

## INTRODUCTION

Human-computer interaction (HCI) is essentially a reciprocal interaction between humans and computers. This reciprocal relationship occurs because the users or humans give the command (input), and then the computer provides feedback in the form of a result (output). The study of the HCI system relates to the design, implementation, and evaluation of computer systems. All of those studies have the purpose of helping users in their daily activities [1]. Usability is one aspect of the HCI study that can determine the success rate of a system. With the rapid development of technology, the need for software or websites in daily needs is increasing [2].

The hospital has a website used as a platform for prospective patients to find information regarding the hospital facilities and the doctor's practice schedule at the hospital. A preliminary interview was conducted with five hospital patients. As a result, it was found that these five patients had difficulty operating the hospital website.

Therefore, usability testing and heuristic evaluation are needed to assess the website. Usability testing is a method that is carried out by directly taking information from the website user. This usability testing can be applied to assess how easy to understand and operate the display of a website [3]. Meanwhile, heuristic evaluation is a method of asking for expert opinion to improve the website to become a user-friendly website. This heuristic evaluation is also one way that is widely used to measure the level of website usability [4]. Both methods were used to find the usability problems from the user and the expert's point of view. However, these methods have never been conducted by the hospital management previously. People using the hospital website are likely those who are feeling

unwell and need medical treatment. Therefore, the heuristic evaluation is used with the factor of user-friendliness as the primary consideration.

This study was conducted at a private hospital in Bogor, West Java, Indonesia. In carrying out this study, the researchers used the previous studies as references in taking action. This study aims to determine the hospital website's usability level, explore the usability problems on the website, and provide measurable improvement suggestions for the website to make it easier for users to use the website.

Usability is a measure to determine the user experience, whether in good or bad quality, in which it reflects the interaction between the user and the product or system used [1]. Usability is a factor that affects an application or website to be good or not. There are three usability measurements: effectiveness, efficiency, and satisfaction (ISO, 1998) [5]. One of the methods of evaluating a product is usability testing. The product evaluation process involves direct testing on users as samples. The benefit of carrying out usability testing is that the website owner can objectively find out the website's problems [6].

In this method, a set of heuristic data is identified. After that, the design is carried out by fixing the violated criteria. This method has ten principles in its implementation, including visibility of system status, compatibility between the system and the reality, user control & freedom, standards & consistency, help service for the users to identify, diagnose, & solve problems, error prevention, recognition, flexibility & efficiency, aesthetics & minimalistic design, and documentation features [7].

Usability measurement is crucial because most community activities are carried out online in a pandemic situation. Telemedicine services and appointments with doctors are examples. Therefore, the user interface of a hospital's website must have a good usability value, meeting the usability criteria set by [14], namely learnability, the efficiency of use, memorability, few errors, and satisfaction. Usability measurement for hospital websites is one of the most widely conducted studies [8]. Among the many methods for usability evaluation, it is critical to know what essential criteria should be considered [9].

## METHODS

This study was preceded by conducting a preliminary study in open interviews with five patients at the hospital. The results were in the form of patient responses and complaints to the website of the hospital. Furthermore, identification was carried out to find the suspected causes of patients' complaints against the hospital's website. The process of problem identification was conducted using two usability measurement methods: usability testing and heuristic evaluation. The number of samples in this study was 20 users who were prospective patients and former hospital patients, in which they were randomly selected. Besides, the number of experts in this study was four people who had frequently used the website.

The measurements using these two methods were carried out twice, namely before the improvements were carried out and after the improvements were carried out in the form of a prototype. In the usability testing, users were given a task whose processing time was documented using a stopwatch to measure the website's effectiveness. After that, users were asked to complete the USE questionnaire to measure user satisfaction with the website. In the heuristic evaluation, users (in this case, they were experts) were asked to rate the website based on the ten heuristic aspects proposed by Nielsen. The measurement results before and after conducting improvements were then compared and analyzed. After that, the conclusions were drawn.

## RESULTS AND DISCUSSION

### Analysis of The Conditions

Based on the preliminary study, the use of hospital websites was tough to operate for prospective patients. The user interface in this application uses the Indonesian language. Its display is considered not user-friendly and confusing. Figures 1 and 2 show the mobile display of the hospital website.



**FIGURE 1.** Number of Pages for the Doctor's Practice Schedule



**FIGURE 2.** Inefficient Grouping of

In Figure 1, it can be seen that the doctor's practice schedule is grouped on too many pages (26 pages). It was difficult for prospective patients to find the doctor's or specialist's schedule that suits their needs. Figure 2 also shows that when a doctor has a practice schedule for more than one day, it is not placed in the same column, causing prospective patients to assume that the columns are filled with different doctors.

### Measuring Website Usability with Usability Testing

In the usability testing, this study focused on the users (in this case, they were the respondents). Respondents were given tasks to operate – the tasks can be seen in Table 1. The time in completing the tasks was documented using the stopwatch. In addition, the respondents' failure in carrying out the tasks was also recorded.

**TABLE 1.** Tasks Given to Respondents

Tasks	
#	Users are asked to find the doctor's practice schedule that they need.
1	Users open the Karya Bhakti Prawiti Hospital website at <a href="http://www.karyabhakti.co.id">www.karyabhakti.co.id</a> .
2	Users press the "menu" button at the top right of the website.
3	Users select the "news and information" menu.
4	Users select the "doctor's practice schedule" sub-menu.
5	Users search for the doctor's practice schedule that they need.
6	If it is not found on the first page, the user must search for it on the next page.

Data regarding the number of errors made by respondents were used to measure the effectiveness of the website. If the number of errors is low, the website already has a good level of effectiveness, and vice versa. Table 2 shows the number of respondents' errors.

**TABLE 2.** The Average of Errors for Each Task

Repetition	Average Number of Errors Made					
	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6
1	0	0.15	2.2	1.50	0	7.15
2	0	0	0.65	0.20	0	0.65
3	0	0	0	0.00	0	0.25
4	0	0	0	0.05	0	0.25

After measuring the effectiveness, the efficiency of the website was measured. Efficiency measurement was conducted by comparing the time needed by the respondents in the first and second repetitions. The results can be seen in Table 3.

**TABLE 3.** Recapitulation of Time for Completing the Task

Efficiency	Average (in Minutes)	Efficiency	Average (in Minutes)
Repetition 1	2.65	Repetition 3	0.23
Repetition 2	0.56	Repetition 4	0.20

Table 3 showed that respondents completed the tasks with a long average time in the first repetition due to many errors. In the next step, respondents were asked to answer the questionnaire given to measure user satisfaction.

The measurement of user satisfaction is conducted to find out the satisfaction factor of the hospital website using the USE questionnaire. Table 4 shows a recapitulation of each aspect.

**TABLE 4.** Recapitulation of the Aspects from the USE Questionnaire

Aspects	Average	Aspects	Average
Usefulness	3.48	Easy of Learning	4.79
Ease of Use	3.23	Satisfaction	3.35

Table 4 shows that the score of each aspect is not high. Therefore, it can be concluded that users are not satisfied with the current hospital website. Furthermore, the display of the website needs to be improved to increase user satisfaction.

### Measuring The Level of Usability with The Heuristic Evaluation

The heuristic evaluation questionnaire was distributed to 4 respondents. Those respondents also described each aspect according to their experience using the website. Respondents gave scores concerning an error or deficiency level in every aspect related to the hospital website. Table 5 shows the average score from the assessment conducted by four respondents.

**TABLE 5.** Recapitulation of the Assessment Conducted by Experts

No.	Heuristic Aspects	Recapitulation	Category
1	Visibility of system status	2.75	Major
2	Compatibility between the system & the reality	2.5	Major
3	User control & freedom	1.25	Cosmetic
4	Standards & consistency	2	Minor
5	Error prevention	2	Minor
6	Recognition, not memory	3.5	Catastrophe
7	Flexibility & efficiency of use	3.5	Catastrophe
8	Aesthetic & minimalist design	3.25	Catastrophe
9	User assistance to identify, diagnose and recover errors	3.5	Catastrophe
10	Help service and documentation feature	4	Catastrophe

The recapitulation of expert assessments on ten aspects of the hospital website shows that many aspects have a significant error rate, including aspects 1, 2, 6, 7, 8, 9, and 10. The results of two methods that had been carried out indicated that the website had many problems that made users difficult. Those problems are summarized in Table 6.

TABLE 6. Usability Problems based on 2 Methods

Problems	Description	Improvement
1	The stages of searching for a doctor's practice schedule are inefficient.	The doctor's practice schedule is made the main menu.
2	The stages of searching for a doctor's practice schedule are confusing.	The doctor's practice schedule is grouped based on their specialty.
3	There is no help service provided when the user makes an error or is confused with the website.	The website is added with help features for the users.

### The Design of Improvements

Website improvement suggestions were made in the form of a prototype for the hospital website. Figures 3 – 6 are suggestions for improvements made in a prototype to solve the problem.

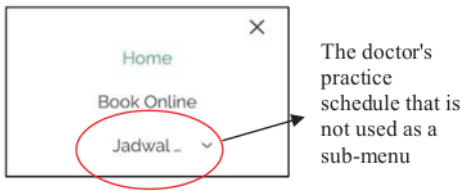


FIGURE 3. The display of the website menu

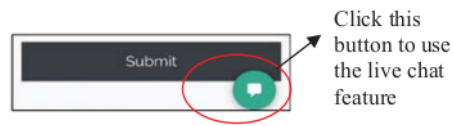


FIGURE 4. The help feature of the website



FIGURE 5. The group of the doctor's practice schedule

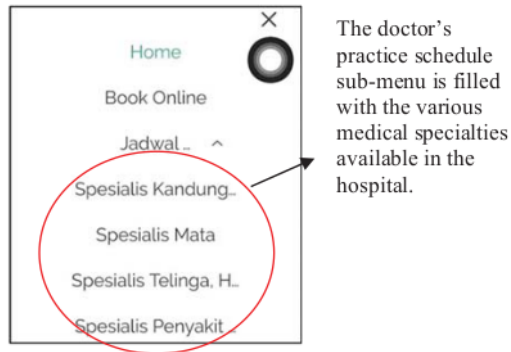


FIGURE 6. The display of the website sub-menu

### Measuring Website Usability with Usability Testing After Improvements

The stages in the implementation were similar before the improvements were conducted. However, it was different in terms of the tasks given. The tasks were different because of the adjustment with the new website format. The new tasks can be seen in Table 7.

**TABLE 7.** Tasks Given to Respondents After Improvements

Tasks	
#	Users are asked to find the doctor's practice schedule that they need.
1	Users open the Karya Bhakti Prawiti Hospital website at www.karyabhakti.co.id.
2	Users press the "menu" button at the top right of the website.
3	Users select the "doctor's practice schedule" menu.
4	Users select the "specialty of the doctor" sub-menu.
5	Users search for the doctor's practice schedule that they need.

If the number of mistakes made by respondents is low, it means that the website has a good level of effectiveness. However, if the number of mistakes is high, it indicates a low level of website effectiveness. Table 8 indicates that the respondents conducted no errors while doing the tasks given.

**TABLE 8.** The Average of Errors for Each Task After Improvements

Repetition	Average Number of Errors Made					
	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0

The average of errors for each task indicates that all respondents did not even make a mistake. After that, efficiency measurement was conducted by comparing the time needed by the respondents in completing the given tasks. The results can be seen in Table 9.

**TABLE 9.** Recapitulation of Time for Completing the Tasks After Improvements

Efficiency	Average (in Minutes)	Efficiency	Average (in Minutes)
Repetition 1	0.15	Repetition 3	0.11
Repetition 2	0.14	Repetition 4	0.11

Time for completing the tasks after conducting improvements indicates a significant decrease in time needed if compared with completing the tasks before conducting the improvements seen in Table 9. Furthermore, the measurement of user satisfaction from the hospital website was conducted by employing the USE questionnaire. The recapitulation of each aspect can be seen in Table 10.

**TABLE 10.** Recapitulation of the Aspects from the USE Questionnaire After Improvements

Aspects	Average	Aspects	Average
Usefulness	5.99	Easy of Learning	6.31
Ease of Use	6.03	Satisfaction	5.84

Table 10 above shows that all the average scores for each aspect exceed the predetermined median value of 4. It indicates that the website has experienced significant improvements compared to before conducting the improvements on the website.

### Measuring Website Usability with The Heuristic Evaluation After Improvements

The heuristic evaluation was also repeated to find out the respondents' opinions. In this case, the respondent was an expert who often uses the website. Table 11 shows the average score from the assessment conducted by four respondents.

**TABLE 11.** Recapitulation of the Assessment conducted by Experts After Improvements

No.	Heuristic Aspects	Recapitulation	Category
1	Visibility of system status	1	Minor
2	Compatibility between the system & the reality	1	Minor
3	User control & freedom	1	Minor
4	Standards & consistency	1	Minor
5	Error prevention	1.75	Minor
6	Recognition, not memory	1	Minor
7	Flexibility & efficiency of use	1	Minor
8	Aesthetic & minimalist design	1	Minor
9	User assistance to identify, diagnose and recover errors	1	Minor
10	Help service and documentation feature	1	Minor

The recapitulation of expert assessments on ten aspects related to the hospital website indicates an excellent improvement. All aspects that have a major error rate were down to a minor error rate.

The results of the usability testing show that all aspects have an increase in results. Similarly, the heuristic evaluation results also indicate that all aspects with a major error rate have been down to a minor error rate.

Improvements were carried out on the display of the website, the stages of searching the doctor's practice schedule, and the addition of a help feature that users highly need. These improvements were based on users' and experts' points of view so that the results can be as expected.

## CONCLUSION

1. The results of the usability measurement using usability testing before conducting improvements were 3.48 for the aspect of usefulness, 3.23 for the aspect of ease of use, 4.79 for the aspect of ease of learning, and 3.35 for the aspect of satisfaction. Improvements resulted in 5.99 for usefulness, 6.03 for ease of use, 6.31 for ease of learning, and 5.84 for the aspect of satisfaction. Meanwhile, the results using the heuristic evaluation before conducting improvements indicated that, from the ten existing aspects, only aspects 3, 4, and 5 had a minor error rate, while the others had a major error rate. After carrying out improvements, all aspects had a minor error rate.
2. The first problem is that the stages for searching a doctor's practice schedule took a long time. The suggestion for improvement is that searching the doctor's practice schedule is made into a separate menu. The second problem is that the stages for searching for a doctor's practice schedule were confusing. The suggestion for improvement is that the doctor's practice schedules were grouped based on each specialist. It made it easy to find a doctor's practice schedule according to the doctor's specialization they need. The last problem is that no help feature was provided to users when users experienced confusion or errors in operating the website. The suggestion for improvement is to add a live chat feature with operators that can help users when experiencing errors or confusion while using the website. Besides that, the other suggestion is to provide a column for commenting, providing suggestions, and asking questions regarding the service at the hospital.

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