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Development of Service Satisfaction Instrument Application Based on 5 Stars Rating Using PHP, SQL, and Javascript on FT UNNES Website

Sarwi Asri[1)]✉, Riska Dami Ristanto[2)], Hanif Hidayat[3)], Gandhi Satria Mukti[4)], Irzhafran Ridho Pradana[5)], and Tian You-he[6)]

[1,3]Department of Machine Engineering, Faculty of Engineering, Universitas Negeri Semarang, Indonesia

[2,4,5]Department of Electrical Engineering, Faculty of Engineering, Universitas Negeri Semarang, Indonesia

[1,3,6] Graduate School of Technological and Vocational Education, National Yunlin University of Science and Technology

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Abstract

Service satisfaction instruments are tools used to measure the level of user satisfaction with services provided by an institution, company, or organization. Service satisfaction instruments can be in the form of forms, applications, interviews, and many more. Service satisfaction instruments in the form of website applications have more advantages than others. Applications can be designed to suit various user needs. The service satisfaction instrument application at the Faculty of Engineering, UNNES, was designed as a form of renewal of the instrument that previously used a form. The instrument application has many advantages over the previously used form. The service satisfaction instrument application can present data in real-time after the user inputs an assessment. The application design is designed to be as attractive as possible so that users can use and receive information from the application easily. The application was developed using the agile software development method. This method is used because it has many advantages such as good flexibility and adaptability.In addition, the program is designed with a good structure to facilitate the development and maintenance process. With an organized structure, the code becomes more modular, clearly separated between components, and follows the principles of clean code.

✉ Correspondence Address:
E5 Building, Department of Mechanical Engineering, Universitas Negeri Semarang, Semarang, Indonesia, 50229
E-mail: sarwiasri@mail.unnes.ac.id

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INTRODUCTION

Website applications have become an important means of disseminating comprehensive and easily accessible information, especially in the education sector (Xue et al., 2000). Its wide and limitless use makes websites an essential element in various fields, including organizations and government agencies. In the world of education, website development is increasingly significant to provide better access to information to students, lecturers, and the general public.

One example of the application of website applications in the field of education is Universitas Negeri Semarang, which has provided an information platform through the website of the Faculty of Engineering Unnes Service Satisfaction Level. This website is designed to support various information services, including the FT Human Resource Development Management Service Satisfaction Instrument, the FT Financial Management Service Satisfaction Instrument for Lecturers and Education Staff, and the FT Facility Management Service Satisfaction Instrument. Through the various features offered, this website facilitates more efficient interactions between students, lecturers, and service managers at the Faculty of Engineering (Mustikasari, 2007).

The Faculty of Engineering Service Satisfaction Survey Website of Universitas Negeri Semarang is an innovation of the previous survey platform that used Google Form. With this website, students of the Faculty of Engineering have a more effective platform to convey input and assessments related to services available at the faculty. This update not only improves ease of access but also strengthens the faculty's commitment to listening to and responding to the needs and aspirations of its users (Hanaysha et al., 2011).

RESEARCH METHODS

In designing a web-based application, a method is needed, one of which is using the Agile software development method (Al-Saqqa et al., 2020). Agile software development is a software development method that focuses on speed in handling every change that exists according to the needs of its users (Altameem, 2015). With Agile, developers can accelerate the process of designing and developing applications, ensuring that the result meets user needs.

For a study using a faculty service satisfaction survey website application, the subjects studied included students, lecturers, and education staff at the Faculty of Engineering, Universitas Negeri Semarang, who used the service. The materials studied were satisfaction with FT HR development management services, satisfaction with FT financial management services, and satisfaction with FT facility management services. The tools used in this study included a service satisfaction survey web application specifically designed to collect data (Asri et al., 2023; Banerjee et al., 2020).

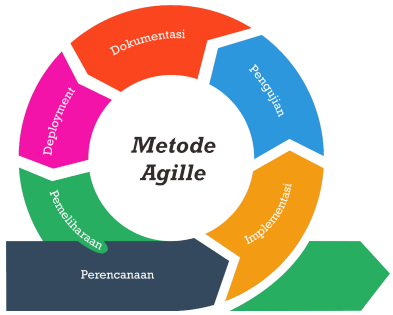

Figure 1. Agile method

The experimental design used in this study was a quantitative descriptive design (Price & Lovell, 2019), which involves data collection through surveys and statistical analysis to measure user satisfaction with faculty services. The sampling technique used is purposive sampling, where samples are taken from relevant service user groups, such as students, lecturers, and education personnel who directly use faculty services (Etikan, 2016).

The data collection technique was carried out through an online survey using a questionnaire distributed via the survey website, with a Likert scale used to measure the level of satisfaction (Papua & Papua, 2022). Data analysis was conducted using descriptive methods to present data in the form of percentages and averages (Pimentel, 2018).

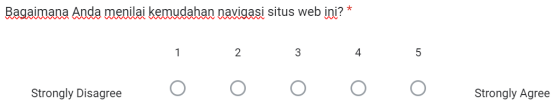

Figure 2. Likert scale

Validity tests were used to ensure the quality of the survey instruments. This data analysis used statistical software such as SPSS or R to ensure accurate and reliable results (Hossain, 2022). The following is data from the questionnaire filled out by FT UNNES respondents.

With this approach, the web application for the Faculty of Engineering service survey at Universitas Negeri Semarang is expected to provide a comprehensive picture of the level of user satisfaction with the services provided by the faculty, as well as enable the development of

applications that are more responsive and adaptive to user needs in the future.

Additionally, the Agile methodology not only aids in addressing dynamic user requirements but also emphasizes continuous feedback and iteration, ensuring that the application evolves based on real-time user input (Boyle et al., 2006). This iterative approach enhances the likelihood of producing a product that closely aligns with user expectations, which is particularly crucial for web applications aimed at assessing service satisfaction. By integrating user feedback at every stage, the development team can identify and rectify issues promptly, resulting in a more robust and user-friendly application. Furthermore, the ability to rapidly implement changes allows for more efficient development cycles, ultimately leading to improved user satisfaction and a more effective tool for gathering and analyzing service-related data.

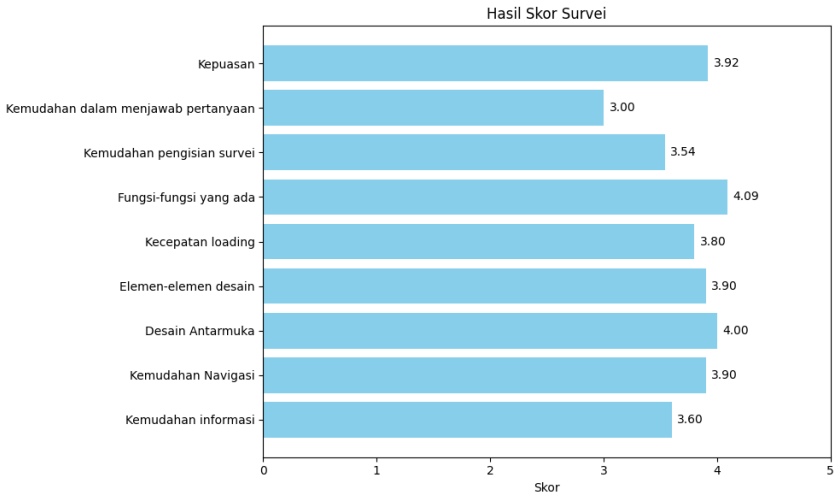

Figure 3. Survey data

RESULTS AND DISCUSSION

A. Analysis

1. Plan

The application design begins with conducting an analysis of the required needs. In the case of the Faculty of Engineering UNNES service satisfaction rating application, the application was created to facilitate the FT academic community to provide assessments of HR management services, financial management, and facility management within the Faculty of Engineering UNNES (Garett et al., 2017). Details of the required needs are listed in Table 1.

Table 1. Application Needs Analysis Results

No	The problem	Solution
1	The assessment form is outdated and inefficient	Create an application that makes it easy for users to provide assessments
2	Cannot see data results in real time	Added live update feature to update rating every time someone gives a rating
3	The data analysis process is less efficient and time consuming	Designing an application that can perform data calculation analysis directly.

B. Application Design

1. Design

The design of the application is made by considering various aspects of user experience (UX). Website design is very influential in attracting user attention (Flavián, Guinalíu, & Gurrea, 2006; Lee & Kozar, 2012; Petre, Minocha, & Roberts, 2006). The design is similar to the main application of FT UNNES, so that users can adapt more quickly to the application of the service satisfaction instrument created. Ensuring that the information to be conveyed can be easily understood by application users.

At the design stage, it starts with making a program prototype, which is submitted to the management for evaluation. Prototyping was carried out using Figma. Prototyping helps in providing an initial overview of the application that will be created before proceeding to the development process.

2. Development

At this stage, the application design is carried out according to the needs that have been analyzed in the previous stage. Various components are needed. The main component that needs to be designed is the application description. The application description can be seen in Table 2.

Table 2. Application Description

No	Element	Information
1	Application Title	FT UNNES Service Satisfaction Instrument
2	Link	https://ft-unnes.ac.id/ratingpage
3	Target Users	Academic Community of FT UNNES

In the second component, the design tool used to design this application is determined. Several programming languages are adjusted to the scale of needs and the server to be used. The design tools required are divided into two main types, namely, for Frontend and Backend purposes. In the Frontend section, the programming languages used are HTML, CSS, and JavaScript. Then, in the backend section, using PHP as the algorithm manager and connection to the database.

There are three instruments in the application: satisfaction with human resource management services, satisfaction with financial services, and satisfaction with FT UNNES facility services. Each question on each instrument is specifically designed to collect data needed for service development in the FT UNNES environment.

This application is also designed to be able to display ratings in real-time. The rating will continue to be updated when someone fills in the instrument. This application displays the average rating of each instrument group and the average rating of each question. Apart from that, this application also displays the rating of each respondent on the instrument. This is adjusted to the analytical needs required in the FT UNNES environment. Each user can see or evaluate directly the data that has been displayed. The display of the average can be seen in Figures 4, 5, and 6.

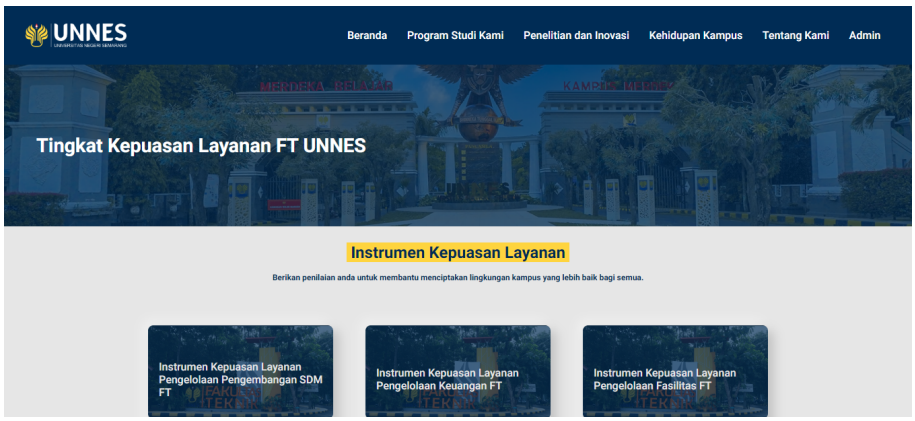

Figure 4. Application view

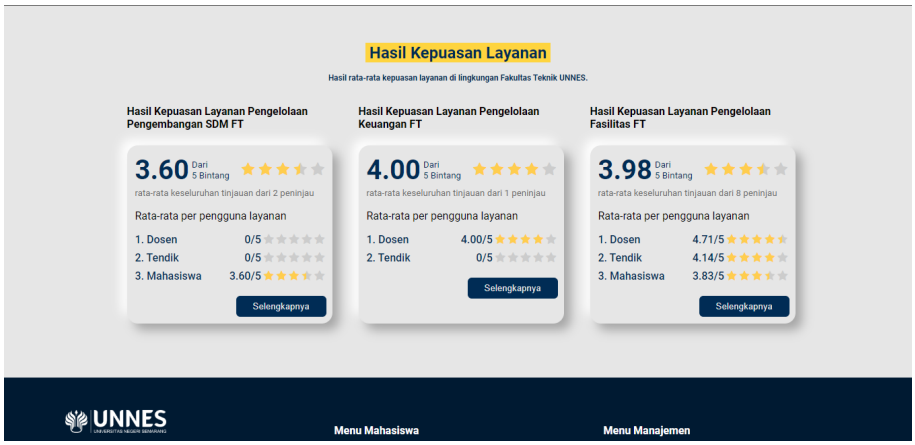

Figure 5. Service satisfaction results

Figure 6. Results details page

3. Test

At this stage, the application is tested using the Usability Testing method to ensure that the application is suitable for use. In this testing method, the application is broken down into several parts that will be tested specifically. The next step is to match the program results with the prototype that has been created. This aims to ensure that the designed application is in accordance with the predetermined design. After that, testing is carried out using several specified parameters. The specified parameters are in Table 3.

Table 3. Test Parameters and Results

No	Parameter	Results
1	Effectiveness	The website can be easily accessed on both computer and mobile platforms.
2	Efficiency	With the live update feature, users can immediately see the average results of FT UNNES service satisfaction.
3	Satisfaction	The entire academic community of FT UNNES is helped, and can provide an assessment of satisfaction with FT UNNES services more easily.

C. Implementation

1. Application Launch

The application launch is done by preparing infrastructure, such as a Server and Hosting. This application is hosted on the Faculty of Engineering server and uses an NGINX-based server. In addition, database migration and configuring database connections according to the server are also required. The launch process is were carried out with Phased Launch and Full Launch.

Phased rollouts are done to avoid excessive bugs during the initial launch. With phased rollouts, developers can identify issues that arise when the application is launched.

After the gradual launch and bug fixes, a full launch is carried out. The full launch is carried out when the application is ready to be used and ready for use by the public. Notifications and promotions are carried out to target users, namely the academic community of FT UNNES, so that they can try using the satisfaction instrument application.

2. Application Performance Monitoring

This stage is needed so that the application performance continues to run efficiently and stably after being launched (Nuraminudin et al., 2023). Monitoring is done by monitoring various activities such as response speed and server availability. In addition to technical monitoring, feedback from users is also needed to identify problems or bugs that appear in the application.

Application performance tests are carried out using a third-party application, namely PageSpeed Insight. From the results of the tests carried out, performance on mobile devices got a score of 59, which is considered quite bad for a website application. Meanwhile, the scores for accessibility, best practices, and SEO get quite good numbers. The test results on mobile devices are shown in Figure 7.

Meanwhile, in tests carried out on desktops, this application received a good performance score of 95. The test results on desktop devices can be seen in Figure 8.

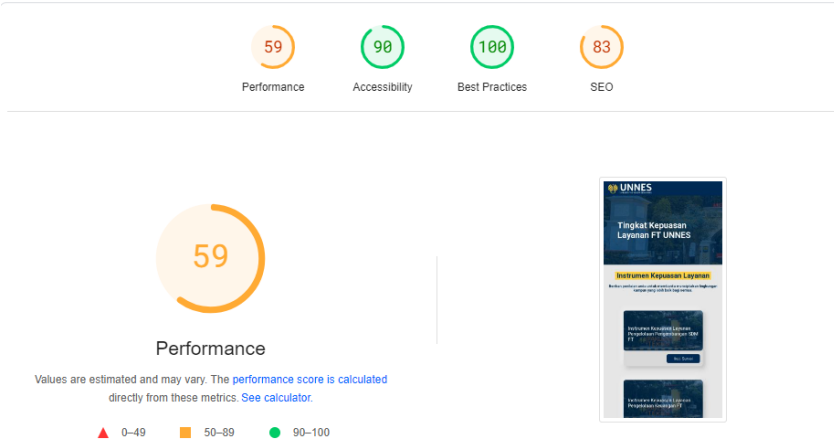

Figure 7. Performance test results on a smartphone

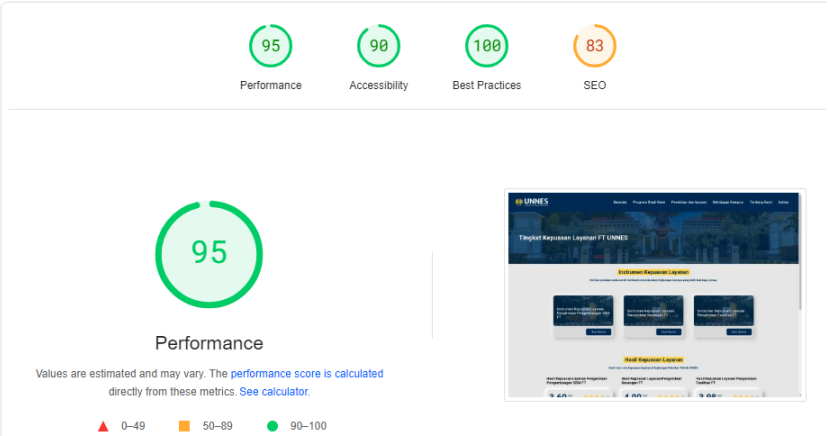

Figure 8. Performance test results on the desktop

D. Evaluation

This stage is very necessary to assess how the application is used and identify areas that need improvement. This evaluation is seen in terms of speed, responsiveness, and user satisfaction. The results of the evaluation can be a benchmark for updates to the application. With the evaluation, the application can develop more flexibly to user needs.

CONCLUSION

The UNNES Faculty of Engineering Service Satisfaction Instrument Application is designed as a form of renewal on conventional forms that are considered less effective. The application functions as a means for the FT UNNES academic community to convey assessments, aspirations, or feedback on the services provided in the FT UNNES environment. In its development, the application was designed by considering various needs. The appearance and navigation of the application are made more attractive than the previous form, which can make users more comfortable in using the application. The real-time result calculation system makes it easy for users to see the average results of the latest satisfaction services. Based on user evaluations, this application obtained a high average score of 3.9. This can be an indicator that this application has succeeded in becoming an answer to existing problems. It is hoped that this application can continue to be developed in order to solve various problems according to existing developments.

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