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Quality Function Deployment (QFD) Analysis for Mobile Signal Application Improvement at Indonesian Cement Manufacturing

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ABSTRACT

The Mobile Signal application is a news and information portal from the company online especially for employees to make it faster and practical access to information and news compared to e-magazines issued at the end of each month. However, over the past 6 months, only 15% of number of employees who have used this application. Monitoring results showsseveral problemssuch as: not being able to log in, could not download and install the application, not-compatible with mobile phones, the content problems and attractiveness. Therefore, this research was conducted to find solutions of these problems. Using the Quality Function Deployment method, it is aimed to get recommendations for improving application attributes according to consumers requirements. The variables studied include the usability goals of a digital product, namely efficiency, effectiveness, memorability, safety, utility and learnability. Method data collection using questionnaires to 345 people, interviews and documentation. Data were analyzed using quantitative and qualitative methods QFD stages. The research results showed that 25 of the 30 attributes were not fulfilled Signal user satisfaction level, the house of quality matrix produces 5 technical characteristics as well as 15 recommended repair parts.

Keywords*:* Consumer's Requirement, House of Quality, Quality Function Deployment, Mobile Application.

1. INTRODUCTION

Indonesian Cement Manufacturing has 4 factory locations, namely in Narogong, Cilacap, Tuban and Lhoknga with a total of 2,230 employees. Indonesian Cement Manufacturing employees are grouped into 3 working conditions, namely: 1) Field operations, namely employees who work ± 8 hours in the field/factory and operate machines/tools such as technicians, mechanics, patrollers, etc. Computer use less than 5 hours a day. 2) Office operations, namely employees who work ± 8 hours indoors or do not work in the field, such as employees of human resources, finance, etc. Computer use more than 5 hours a day and minimum mobility. 3) Mobile operations, namely employees who work ± 8 hours at work locations that frequently move/mobile such as batchers, sales, etc. Computer use more than 5 hours a day. In this condition, there is a gap between employees in receiving information or news about the company. Employees with low computer use intensity rarely know about updated information or news about the company delivered via email. This raises special attention from management so that employees receive information or news more easily without having to use a computer.

Every 27th, the Corporate Communications Department sends an electronic magazine in pdf form to all employees via email which summarizes information and news about the company. In this condition, the news delivered experiences a time lag so that the news is no longer current. This prompted the launch of a news portal mobile application called Signal which aims to simplify and speed up the transfer of company information or news to employees. Through this application, employees can access actual news and information without being limited by time and place. According to the information available in the Signal application, the main function of this application is to make it easier for users with features such as: a) being able to read the latest news about the company; b) users

can write articles/news/content containing photos and videos independently; c) obtain information on services/products of MSMEs assisted by SBI; d) can take part in various quizzes with prizes; e) users can create and fill out surveys f) get information on ongoing activities or competitions; g) can access the library of official announcement documents, policies, forms, company profiles, annual & sustainability reports, bank photos & videos and brand guidelines.

The Signal application is a solution to make it easier and faster for employees to receive company information/news. However, since Signal can officially be used as of April 21th, 2023, until November 1st, 2023 there are only 341 users of this application. The comparison diagram can be seen in the following image

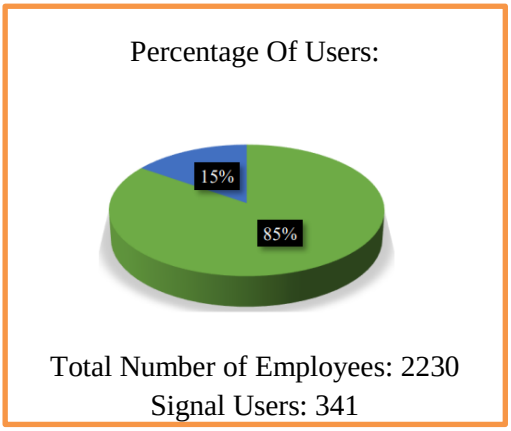

Figure 1. 3 Signal initial survey diagram

Based on the diagram above, it can be concluded the number of Signal users. Currently it is still very small compared to the total number of employees.

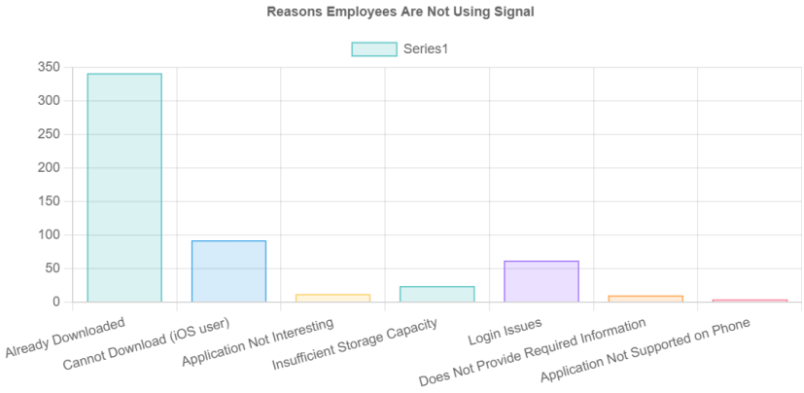

Figure 2 Reasons of employees not using Signal

Researchers conducted an initial survey of employees as respondents from several work locations, to find out the conditions and problems that occur. Survey data was obtained for 1 week, as many as 341 respondents said have downloaded and become users, 204 respondents have not used Signal due to several reasons, namely 92 people could not download the application for iPhone users, 12 people think the application is not interesting, 24 people said the capacity on the cellphone was insufficient, 62 people answered experienced problems when logging in so they couldn't become users, 10 people felt like he didn't get the information he needed so he deleted it again application, and 4 people stated that the Signal application was not supported on their cellphone.

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The problems voiced by some of these employees are quite varied, ranging from: technical issues, application quality to employee views regarding content this application, so it is necessary to find a solution so that the application objectives can be achieved.

According to (Joseph P. Ficalora, 2010) when there are differences in voices from customers, so development needs to be carried out to map needs specifically and must focus on customer satisfaction..

Therefore, this research aims to measure the level of satisfaction with the Signal application, identify the technical characteristics of the Signal application based on consumer requirements and provide recommendations for improvements to the quality of the Signal application. This research was conducted using the Quality Function Deployment (QFD) method which is considered to provide a standard method for systematically representing customer/user needs which functions as a product improvement method in developing and improving quality (Joseph P. Ficalora, 2010). It is hoped that this research will be able to provide positive benefits for companies in developing the Signal application optimally.

2. METHOD

This research employs the DMAIC (Define, Measure, Analyze, Improve, Control) method integrated with Quality Function Deployment (QFD) to systematically identify and address the issues within the Mobile Signal application. The study involved collecting data through questionnaires, interviews, and document analysis from 345 employees.

a. Define

The problem was defined as low adoption and usability issues with the Mobile Signal application. Specific issues identified included login problems, download failures, compatibility issues, lack of required information, and general uninterest in the application.

b. Measure

Data was collected to measure the extent and nature of the issues. The primary sources of data were employee surveys and usage logs. The survey covered various aspects of usability, including efficiency, effectiveness, memorability, safety, utility, and learnability.

c. Analyze

The collected data was analyzed using both quantitative and qualitative methods. The Voice of Customer (VOC) analysis revealed 30 attributes related to application usability, out of which 25 were found to be unsatisfactory.

d. Improve

Using the House of Quality (HOQ) matrix, technical characteristics and improvement parts were identified. Recommendations were made for enhancing the application's performance based on user requirements.

e. Control

A plan was developed to monitor the implemented improvements and ensure sustained application performance.

3. RESULTS AND DISCUSSION

a. Results

The analysis identified 30 key usability attributes, with 25 failing to meet user satisfaction levels. The HOQ matrix highlighted 5 critical technical characteristics and 15 specific areas for improvement.

b. Discussion

Implementing the recommended improvements is expected to address the primary issues identified in the analysis. Continuous monitoring and iterative enhancements will be essential to maintain and further improve the application's usability.

c. Key Findings and Issues Identified

The primary issues identified included difficulties in logging in, challenges in downloading and installing the application, incompatibility with various mobile devices, and concerns about the content's attractiveness and

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relevance. These issues have collectively contributed to a low adoption rate, with only 15% of employees actively using the application over the past six months.

The analysis revealed that 25 of the 30 assessed attributes did not meet the expected levels of user satisfaction. These attributes spanned critical areas such as efficiency, effectiveness, memorability, safety, utility, and learnability—key components that determine the usability of any digital product.

d. Recommendations for Improvement

Through the House of Quality matrix, a detailed set of recommendations was developed, focusing on five core technical characteristics that need enhancement:

1. Simplifying the login process to improve accessibility and reduce user frustration.
2. Streamlining the installation steps to make the app more accessible and user-friendly, particularly for users with varying levels of technical expertise.
3. Ensuring the application supports a wider range of mobile devices, addressing compatibility issues that prevent potential users from accessing the app.
4. Enhancing the quality, relevance, and attractiveness of the content to better engage users and maintain their interest.
5. Refining the app's interface and navigation to make it more intuitive, thus improving efficiency, learnability, and overall user experience.

Additionally, the study emphasized the importance of incorporating user feedback into the app's development cycle. Establishing a robust feedback mechanism would not only help in continuously improving the app but also foster a sense of ownership among users, thereby enhancing user satisfaction and loyalty.

e. Expected Outcomes

If the proposed improvements are implemented effectively, the Mobile Signal application is expected to experience a significant boost in user satisfaction and overall performance. The enhancements would address the current pain points, making the application more accessible, functional, and engaging for employees. This, in turn, would likely lead to higher adoption rates, increased user engagement, and a more integrated communication experience within the company.

4. CONCLUSION

The study successfully identified the primary issues affecting the adoption and usability of the Mobile Signal application. By applying the DMAIC method and QFD, targeted improvements were proposed, which, if implemented, are expected to significantly enhance user satisfaction and application performance. The research underscores the critical role of user-centric design and continuous improvement in the success of digital applications. By aligning the app's features and functionalities with user expectations and needs, the company can transform the Mobile Signal into a valuable tool that not only disseminates information efficiently but also strengthens internal communications and employee engagement. The comprehensive insights and targeted recommendations provided by this study serve as a strategic roadmap for the development team, guiding them toward creating a more effective, user-friendly, and widely adopted application. Moving forward, a consistent evaluation and adaptation process should be maintained to ensure the application continues to meet the evolving needs of its users.

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