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Improving a Two-Way Interaction Customer Service Platform in Company X using AHP

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ABSTRACT: The Covid-19 Pandemic has accelerated mass digitalization in most human activities, including in the construction industry. As a response to the social restriction policy during the pandemic, customers and companies have preferred doing business online. Company X has already launched an online customer service platform that could be maximally used during the social restriction policy. This platform uses SST (Self-Service Technology) to let customers perform their service independently. However, the platform was ineffectively utilized due to a lack of sense of two-way interaction. The stakeholders suggested adding a new feature based on the customer's aspirations and the company's considerations. During the development, understanding the relationship between the user and the system must be learned through HCI (Human-Computer Interaction). This research is primarily focused on the factors that affect layout design. The method to obtain a new feature in this customer service platform is using Analytical Hierarchy Process (AHP) to minimize inconsistencies while considering the new features.

KEYWORDS: Construction Industry, Self-Service Technology, Customer Service, Human-Computer Interaction, Analytical Hierarchy Process

INTRODUCTION

The impact of the Covid-19 Pandemic that started in March 2020 made the Global economic growth expected to downfall by ±2.2 in 2020, especially in Indonesia, which has plunged by 2.07% [1][2]. Many industries were forced to rush into digitalization to keep up their business activities due to the impact of social restriction enforcement by the government as a health reason. According to a survey conducted by McKinsey, the percentage of digitized customer interactions and products or services is rising to 20% from December 2019 to July 2020 across the globe [3].

To serve digital services, companies have invested in developing their technology. Company X, based in Indonesia, has worked in the construction industry and launched an online platform to boost customer service. It aims to eliminate the duration of bureaucracy and break the limit of time and space. Their platform uses self-service technology that allows customers to perform their own services without direct human involvement [4]. Some benefits included operational cost efficiency, establishing a sense of flexibility, and providing more privacy.

However, this customer service platform has flaws. One of the most highlighted by their users is the lack of two-way interaction between customers and the company, reflected by the inadequacy of customer involvement. It is reflected that customers have limited interaction with the company despite the platform itself already providing complete information on customers' orders. As a result, the customer service platform was ineffectively utilized since customers have boundaries to give feedback.

To resolve the problem in the platform, adding a new feature in the customer service platform was intended to minimize the burden of interaction. A method called AHP (Analytical Hierarchy Process) is used to decide on a new feature on this platform based on considerations from several alternatives and considering their factors themselves. AHP is chosen based on its advantages, including handling uncertainty between choices and giving objective solutions, and can be implemented in most cases, making it useful for decision-making [5][6].

LITERATURE REVIEW

SST (Self-Service Technology) has been implemented in multiple cases for many years. During the Covid-19 Pandemic, contactless services that included SST were favored since they could overcome social distancing restrictions where conventional services required physical contact [7]. Another sample positive impact of the implementation of SST can be seen in the banking industry.

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The implementation of SST in banking services has positively influenced customer satisfaction since customers could manage their service experiences [8].

Design interfaces also have an impact on the productivity of its user. There is a correlation between movement time from graphic design placement and the time of movement of multiple tasks. Task efficiency is measured by the completion time and error rates that the user performs. Reaction times are significantly influenced by display properties [9]. The interface must focus on human cognition, mental processes, and information processing from a human's cognitive perspective to achieve productivity from an interface [10].

Implementing AHP as the decision-making for problem-solving can be implemented in many industries and various cases. Research conducted by Ganguly and Kumar (2019) used a variant of AHP called Fuzzy Analytic Hierarchy Process (F-AHP) to set resiliency strategies for supply chains in the Indian pharmaceutical industry [11]. Another research in a case that discussed evaluating the stability of slope revegetation based on hydroseeding applications also uses AHP to analyze the data and establish priority weights for each criterion [12].

METHODOLOGY

This research has collected relevant data within the company that is not limited to primary and secondary data. The primary data was taken to collect customer's voice regarding the existing customer service platform and their opinion about the company in general. Spreading questionnaires and interviewing selected customers were required to obtain the data. Secondary data were collected from existing questionnaires, internal company studies, and relevant articles. In this case, The conceptual framework has used data already collected previously. Self-Service Technologies as the central concept were implemented in the current Customer Service Platform that uses Design Principle from Human-Computer Interaction as a guideline for designing the new feature. In the AHP processing, the decision has been influenced by VRIO and SWOT analysis based on the previous data. As the processing AHP is finished, the result can be used to decide on a new feature in this customer service platform to improve twoway interaction between customers and the company.

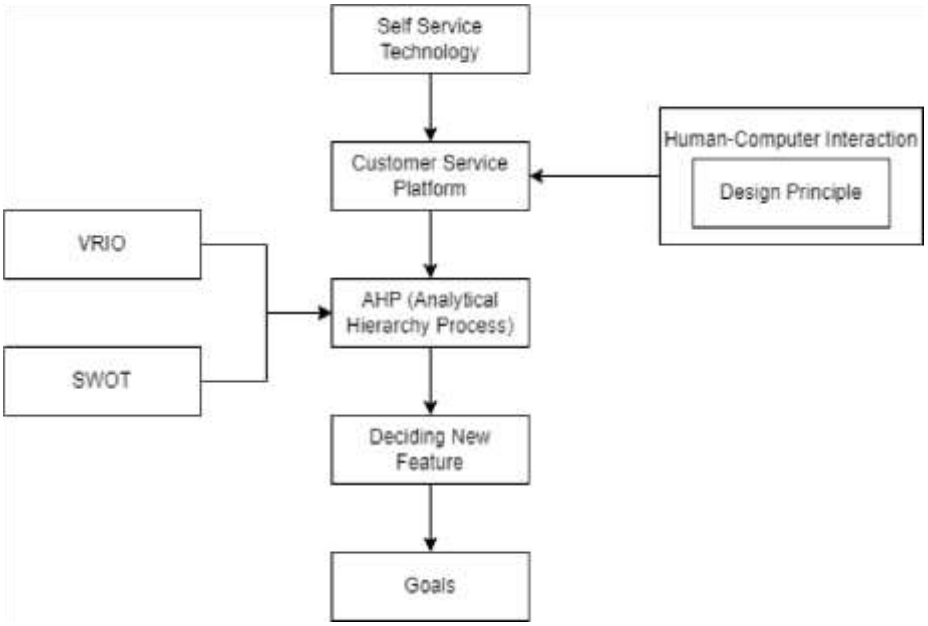

Figure I. Conceptual Framework

ANALYSIS

A. Human-Computer Interaction

The Human-Computer Interaction gave more understanding of the interaction between humans and computers and that both parties have different approaches to processing information. A friendly interface design for the customer is required to bridge the

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communication between the user and the system. This research focused on the Design Principles as a guideline for designing the interface of the new feature to be added to the company's customer service platform. According to Dix et al. (2004), there are three categories of designing principles comprising fifteen. Before this research, some principles were eliminated due to the customer service platform's needs and usage considerations. These definitions and the principles that have been selected for this research are shown in Table 1 below.

Table I. Explanation of Design Principles

Category	Principle	Definition
Learnability	Predictability	Determinism and operation visibility
	Familiarity	Matching users' expectations from their previous knowledge
	Generalizability	Extending specific interaction knowledge to new situations
	Consistency	Equivalent values of input and output can be substituted for each other
Flexibility	Dialog initiative	Controlling the user freedom from artificial constraints on the input dialog
	Multi-threading	Support multiple tasks simultaneously
	Substitutivity	Equivalent values of input and output can be substituted for each other
	Customizability	Modify user interface for different needs
Robustness	Observability	User impression of system state
	Recoverability	Support for undoing errors
	Responsiveness	Feedback should be commensurate with action

B. VRIO

VRIO Analysis can analyze internal and external environments and assess their advantages through an effective strategy [11]. The analysis was based on the customer's perspective about the company's performance and internal analysis from the company itself. In general, Company X has advantages in their concrete as the primary commodity; the customer tends to become loyal to the brand and effectively and efficiently uses information technology (IT) resources.

Table II. VRIO Analysis

Resource/Capability	Valuable	Rare	Imitate	Organization	Competitive Consequences
Concrete Quality	Yes	Yes	Yes	Yes	Sustain Competitive Advantage
Transportation Heavy Equipment	Yes	No	Yes	Yes	Competitive Parity
Plant Site Location	Yes	No	Yes	Yes	Competitive Parity
Customer Loyalty	Yes	Yes	Yes	Yes	Sustain Competitive Advantage
IT Utilization	Yes	Yes	Yes	Yes	Sustain Competitive Advantage

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C. SWOT

The SWOT analysis describes the strategy formulation from its resources and capabilities based on the organization's internal and external factors [12]. It can be a helpful tool to examine the strengths and weaknesses of internal factors and the opportunities and threats from external factors.

Table III. SWOT Analysis

Strength	Weakness
- A new fresh innovation on the construction sector companies - Capability in Information Technology utilization - Offering information disclosure	- Lack of utilization by customers - Some features have not fully operated - Third-party communication still preferred by customers
Opportunity	Threat
- Product is relatively new in the industry - Invest in technology due to its rapid growth - Flexible to put additional features	- Other firms could imitate the concept - Cybercrime and data breach potential - Reaching comfortability for customers

BUSINESS SOLUTION

This research is primarily using AHP to find the solution of selecting a new feature for the customer service platform in Company X. AHP is a method that uses a hierarchically structured approach consisting of goals, criteria, and alternatives that use prioritization in making decisions. In the AHP processing, some information, including respondents, was required to decide on the new feature to be added to Company X's customer service platform. VRIO and SWOT analysis are also used as considerations in the alternatives and the criteria within AHP itself alongside the company's considerations.

The first step of AHP processing is considering its primary goals, each desired criterion, and the alternative. The goal was clearly to select a new feature from several candidates already considered by stakeholders. Each criterion is based on categories of design principles already described in Table I, as well as sub-criteria borrowed from the principles. The alternative for the new feature in the customer service program is described in the table below.

Table IV. Alternative of The New Feature

Alternative	Explanation
Monitoring Project	Customer have access to observe all of their projects that have deal with company. This feature is primarly focused on administrative purpose and payment
In-app Chat	Build-in chat feature that also equipped with automation reply for several tasks. Customers could proceed to contact the realperson staff
Estimation Schedule and Tracker	Provide information about project progress that shown in Gantt chart timeline and tracking the information status of the truck mixer using GPS, including its latest update location

After describing all the goals, criteria, and alternatives, hierarchy of AHP can be arranged that shown as in Figure II below.

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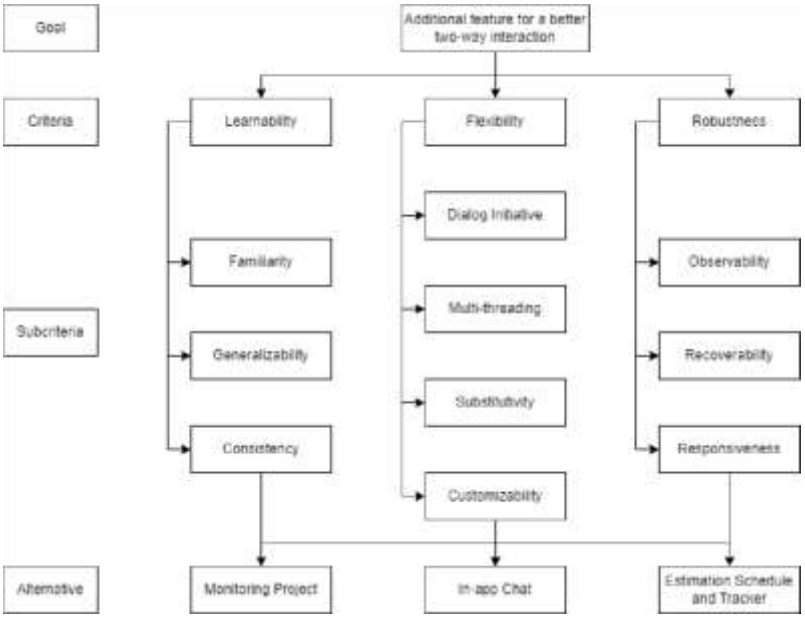

Figure II. AHP Hierarchy

The AHP process uses data collected from twelve respondents through fulfilling questionnaires regarding their preferences upon types of design criteria and the desired alternatives based on the previous criteria they chose. Table V below that resulted from combined instances of all respondents.

Table V. Calculation Weighting

Criteria	Result	Sub Criteria	Result	Alternatives	Result
Learnability	.152	Familiarity	.152	Monitoring Project	.003
				In App Chat	.006
				Est. Schedule	.012
		Generalizability	.282	Monitoring Project	.006
				In App Chat	.011
				Est. Schedule	.023
		Consistency	.566	Monitoring Project	.016
				In App Chat	.032
				Est. Schedule	.047
Flexibility	.250	Dialog initiative	.140	Monitoring Project	.004
				In App Chat	.008
				Est. Schedule	.019
		Multi-threading	.218	Monitoring Project	.008
				In App Chat	.012
				Est. Schedule	.029
		Substitutivity	.235	Monitoring Project	.010
				In App Chat	.024
				Est. Schedule	.032
		Customizability	.407	Monitoring Project	.015
				In App Chat	.029
				Est. Schedule	.055

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Robustness	.598	Observability	.127	Monitoring Project	.018
				In App Chat	.029
				Est. Schedule	.041
		Recoverability	.199	Monitoring Project	.015
				In App Chat	.031
				Est. Schedule	.064
		Responsiveness	.674	Monitoring Project	.066
				In App Chat	.115
				Est. Schedule	.218

Based on the results of Weighting, Robustness is the most desired category of design principles with a score of 0.598 (59.8%), followed by Flexibility with a score of 0.250 (25%) and Learnability with a score of 0.152 (15.2%). The most desired principles are Responsiveness that have a score of 0.674 (67.4%).

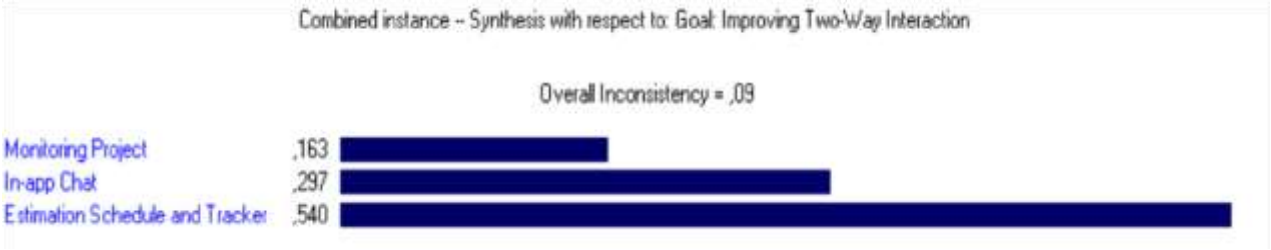

Figure III. Result of Alternatives

Figure III shows that the most favourable new feature candidate is Estimation Schedule and Tracker, with a score of 0.540. These scores were obtained from the total of each alternative based on Table V.

CONCLUSION

The result of the Business Analysis on this research is that Company X should be added Estimation Schedule and Tracker as the most preferred new feature based on the AHP calculation in the alternatives with a score of 0.540. They also should focus on Responsiveness while designing this new feature. This new feature should function effectively and reliably in various conditions or scenarios reflecting Robustness. AHP usage as a problem-solving in decision-making is proven to be versatile in most scenarios, including this research. Some advantages of AHP, in this case, can be reflected in the prioritization of numerous factors, considering multiple factors criteria, reproducibility, and transparency.

REFERENCES

1. Siri, N., Acker, O., Mengue, C., Richardson, A. (2020). COVID-19 – A digital technology agenda driving an accelerated transition to the new normal. PricewaterhouseCoopers GmbH Wirtschaftsprüfungsgesellschaft.
2. https://www.bps.go.id/pressrelease/2021/02/05/1811/ekonomi-indonesia-2020-turun-sebesar-2-07-persen--c-to-c-.html
3. LaBerge, L., O'Toole, C., Schneider, J., Smaje, K. (2020). How COVID-19 has pushed companies over the technology tipping point—and transformed business forever. McKinsey & Company.
4. Wang, X., Wong, Y. D., Sun, S., Yuen, K. F. (2022). An investigation of self-service technology usage during the COVID19 pandemic: The changing perceptions of 'self' and technologies. Technology in Society 70 (2022) 102032.
5. Goodwin, P., Wright, G. (2004). Decision Analysis for Management Judgement, Third Edition. John Wiley & Sons Ltd.
6. Saaty, T. L. (2008). Decision making with the analytic hierarchy process. International Journal Services Sciences, Vol. 1, No. 1, pp 83-98.
7. Opportunities and challenges for contactless healthcare services in the post-COVID-19 Era Sang M. Lee a, DonHee Lee b,* Technological Forecasting & Social Change 167 (2021) 120712

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8. IOSR Journal of Business and Management (IOSR-JBM) e-ISSN: 2278-487X, p-ISSN: 2319-7668. Volume 16, Issue 1. Ver. VI (Feb. 2014), PP 39-50 www.iosrjournals.org www.iosrjournals.org 39 | Page The Effect of Self Service Technology, Service Quality, and Relationship Marketing on Customer Satisfaction and Loyalty Ludfi Djajanto1, Umar Nimran2, Srikandi Kumadji3, Kertahadi4
9. Michalski, R., Grobelny, J., Karwowski, W. (2006). The effects of graphical interface design characteristics on human–computer interaction task efficiency. International Journal of Industrial Ergonomics Vol. 36 (2006) pp 959–977.
10. Dix, A., Finlay, J. Abowd, G. D., Beale, R. (2004). Human–Computer Interaction – Third Edition. Pearson Education Limited.
11. Pakkanen, T. M. (2012). Internal and external analysis. Arcada - Nylands svenska yrkeshögskola.
12. Tsourela, M., Paschaloudis, D., Fragidis, G. (2007). SWOT Analysis of Service e-business Models. Department of Business Administration, Technological Education Institute of Serres.

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