# Analysis of User Satisfaction with the SatuSehat Mobile Health Application

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**Abstract.** SatuSehat is a follow-up application from PeduliLindungi with a focus on exchanging health data that connects applications or information systems throughout Indonesia. Many people complained about the SatuSehat application because they could not access the app and check vaccine data. This study analyzed user satisfaction with SatuSehat, a mobile health application launched in Indonesia during the COVID-19 pandemic. A survey was conducted with 400 SatuSehat users in Jakarta aged 17 and above. The results showed service quality, information quality and system quality significantly influenced user satisfaction. However, perceived enjoyment did not impact satisfaction. The findings imply enhancing data accuracy, system integration, features and language support would improve user experience. This study provides insights for developers to refine SatuSehat and increase user retention.

**Keywords:** Application SatuSehat, User Satisfaction, Delone & McLean and TAM Modification, Pandemic Covid-19

# 1. Introduction

COVID-19 is an infectious disease that spreads quickly due to close contact resultingfrom talking, coughing, and sneezing. This virus is caused by SARS-CoV-2 and is a new variant that has never been found before. Once infected, people will experience symptoms such as fever, cough, loss of taste, and shortness of breath. There are morethan 90 million cases of infection and 1.94 million people have died as of 10 January2021(Tang et al., 2021). The first case of the Covid-19 virus was found on March 2, 2020 in Indonesia. The National Disaster Management Agency has declared a Specific Emergency Status for Disease Outbreaks Due to the Corona Virus in Indonesia. President Joko Widodo issued a Presidential Decree concerning the Establishment of a Covid-19 Public Health Emergency on 31 March 2020 and a Presidential Decree concerning the Designation of Non-Natural Disasters of the Spread of Covid-19 as a National Disaster on 13 April 2020 (Nurhidayati et al., 2021).

SatuSehat was launched by the government of Indonesia in March 2020. Previously, this application was called PeduliLindungi which was officially used for digital contact tracing in Indonesia. PeduliLindungi application is an effort to support Health Surveillance, through the Decree of the Minister of Communication and Information regarding efforts to handle Covid-19 (Wuragil Z, 2020). The Ministry of Health officially changed PeduliLindungi to the SatuSehat application on March 1, 2023. SatuSehat is an upgraded version of PeduliLindungi application after Covid-19 pandemic ended in Indonesia. SatuSehat focuses on a health data exchange ecosystem that connects applications or information systems throughout Indonesia. The change to SatuSehat was due to several reasons, there are more than hundreds of government-owned health applications that have not been integrated, some of the same data is collected by different applications, and there is no standard format for the health system in Indonesia so integration between one application and other applications is different. (Arlinta, 2022).

SatuSehat interface provides many features at the start, such as check-in, vaccines and immunizations, Covid-19 test results, health services, and searching for hospital rooms. SatuSehat will gradually add various other personal health support features, from child immunizations, queuing at the hospital, examination results, and drug purchase data integrated through SatuSehat (Purwanto, 2023).

The most used feature based on the Databoks survey, the Covid-19 vaccine certificate is the feature most used by SatuSehat application users with a percentage reaching 65.6%. Next, the most widely used feature is check-in/check-out public facilities with 42.1% of respondents using this feature. Then, 17.1% of respondents used the SatuSehat application to check COVID-19 test results. Then, 15.9% of respondents used the application to register for Covid-19 vaccination. The remaining 11.5% of respondents used the SatuSehat application to check COVID-19 statistical information. Followed by using eHAC to board a plane (8.4%), registering for health services (5.4%), checking information on domestic and international travel regulations (3.4%), checking information on hospital bed availability (1.5% ), and use of telemedicine. (0.8%) (Annur C, 2022).

There were several obstacles at the start of Satusehat's development. Problems with the SatuSehat application are taken from the ratings and reviews on the Play Store page. Many people are still dissatisfied with the SatuSehat application because of the poor quality of the application. Users gave a 1 star rating and commented that the application experienced many problems and could not provide services as desired or requested. A common problem that users often experience is not being able to check vaccine data on their device. Based on comments from Wave (2023) "there is no vaccine certificate in the application even though the medical officer has shown my certificate from his computer." Safitri (2023), said "after being updated, the vaccine status and certificate cannot be checked. The point is that my vaccine was not detected. Honestly, the previous application was better than the current application." Besides vaccine data problems, users also often have difficulty accessing and registering the application after downloading it on Playstore. Purnawan (2023) commented that "after updating the application it often keeps force closing, cannot register into the application, and cannot detect location if connected to Wi-Fi." This problem disrupts users' activities and works even though they have used PeduliLindungi before. Kanon (2023) complained about this condition, he said "I couldn't enter

the application even though I had previously registered for PeduliLindungi, I experienced problems/errors when I wanted to register."

Missing or incomplete vaccine data on the SatuSehat application is a problem that many users experience. The availability of vaccine data in SatuSehat is an issue that falls into the information quality factor. Information quality is one factor that can have a positive impact on satisfaction factors that help users complete their work quickly (Alotaibi & Alshahrani, 2022). The results of previous research show that information quality has a positive impact on user satisfaction so that the better the quality of information, the more user satisfaction will also increase. These results are in accordance with research conducted by Delone & McLean that information quality is a system that can influence user satisfaction (Salim et al., 2021).

Previous research on user satisfaction was tested with factors that influence information systems using the technology acceptance model (TAM) and the information system success model (ISSM) (Hassan & Abu-Shanab, 2020). The variables used are service quality, information quality, system quality, and satisfaction for ISSM, while TAM uses the variables perceived usefulness, perceivedease of use, and behavioral intentions. The results showed that user satisfaction is significantly influenced by service quality and information quality. And research to identify the factors that influence satisfaction and perceived impact uses the TAM, ECM, and Flow Theory models (Muñoz-Carril et al., 2021). The variables used are perceived usefulness, perceived ease of use, attitude, and perceived impact on learning for TAM, ECM uses confirmation and satisfaction variables, and perceived enjoyment variables are used in Flow Theory. The variables perceived usefulness and perceived enjoyment positively and significantly influence satisfaction. Perceived ease of use and perceived usefulness positively and significantly affect attitude, and attitude together with perceived enjoyment is a determining factor in the impact on learning.

## 2. Literature Review

### 2.1. Service Quality

Service quality is a construct added to ISSM to measure the success of IS. They foundthat service quality has a significant impact on user satisfaction (DeLone & McLean,2003). Previous research developed 4 indicators to measure this construct which include: assurance, infrastructure, responsiveness, and artificial service (Mtebe & Raphael, 2018; Chen et al., 2020). Based on research conducted in Bangladesh, one of the factors in the Delone and Mclean model that influences user satisfaction is service quality. These results were obtained from research conducted on systems created by the government to serve the public, especially health facilities and services using modern digital and communication technology (Biswas & Roy, 2020).

### 2.2. Information Quality

The performance dimension of information quality is the desired function of the output of an information system. Information quality is the quality of production in the kind of information provided by the device used by the user (DeLone & McLean,1992). Information quality is one of the critical determinants that influence the satisfaction of users while using the COVID-19 applications (Al-Soni et al., 2021). Information quality has 4 indicators, namely : completeness, precision, reliability, and currency (Iivari, 2005). Previous research examined the health system used by nurses to determine the influencing factors based on user satisfaction and technology acceptance in the 3Q model (service quality, information quality, and system quality). The results of the research show that information quality influences nurses to determine whether they are satisfied or not with the system used (Ho et al., 2019).

### 2.3. System Quality

System quality usually focuses on system performance characteristics. System qualityis a characteristic of the preferred quality of the system and the quality of the desiredinformation product characteristics

(DeLone & McLean, 2003). System quality has 4 indicators, namely: easy of understanding, user-friendly, response time, and language (Davis, 1989; Mtebe & Raphael, 2018; Livari, 2005; DeLone & McLean, 2003). Previous research investigated Ehteraz as a health application to determine the predictive factors that influence user satisfaction. This research confirms that service quality is a significant predictor of user satisfaction. The research results show that users will be satisfied with system functionality when users feel that the operation or SQ is easy to use, produces accurate information, and is useful overall (Al-Soni et al., 2021).

## 2.4. User Satisfaction

User satisfaction is used as a measure of the effectiveness of information systems. Effective system is a system that has a positive influence in supporting daily activities (Gatian, 1994). Customer satisfaction or dissatisfaction with a product lies in the relationship between customer expectations and the perceived performance of the product (Bian et al., 2019). Satisfaction has 4 indicators, namely: recommendation, repeat visit, information satisfaction, and healthcare needs (Hassan & Abu-Shanab, 2020; DeLone & McLean, 2003; Chen et al., 2020; Gable & Poore, 2008). Nurmansyah M et al. (2022) concluded that user satisfaction for Covid-19 Application is influenced by system quality and information quality. User satisfaction with information systems is influenced by information security and privacy. Overall user satisfaction among respondents ranged between neutral and satisfied. Respondents agreed that in terms of system quality, the application was useful, easy to use and learn. Information such as vaccine certificates, COVID 19 diagnosis and so on can be accessed.

## 2.5. Perceived Usefulness

Leclercq (2007) examined the relationship between perceived usefulness and user satisfaction of an information system using a qualitative approach. The research found a strong positive correlation between perceived usefulness and user satisfaction. Previous research developed 4 indicators to measure this construct which include: saving time, increase efficiency, increase effectiviness, and service convenience (Davis, 1989; Venkatesh et al., 2003). Alfarrel & Noerlina (2023) confirmed the role of perceived usefulness in user satisfaction of the PeduliLindungi health application by analyzing data from 242 respondents in his research. The test results show that perceived usefulness has a positive effect on user satisfaction.

## 2.6. Perceived Ease of Use

Perceived ease of use is defined as the extent to which a person believes that using aparticular system or technology to perform a task will be easier or requires less effort(Lu et al., 2003). With more ease and less effort when using certain systems or technologies, perceived ease of use is found to have a positive influence on user satisfaction in the context of using information technology (Hong et al., 2006). This is in line with previous research (Dalcher & Shine, 2003) that the higher the perceivedease of use, the higher the user satisfaction. Perceived ease of use has 4 indicators, namely: easy to regist, clear and understandable, easy to learn, and easy to use (Davis, 1989; Venkatesh et al., 2003). Previous study aims to explore system usage for healthcare during Covid-19, specifically the impact of perceived ease of use on user satisfaction in Bangladesh. If an application is considered easier to use than other applications, it is more likely to be accepted by users. Perceived ease of use is a precursor to satisfaction. The findings confirmed that perceived ease of use is significant with user satisfaction (Uzir et al., 2021).

## 2.7. Attitude

Attitude is the result of certain actions towards objects that are used or found, but a person's behavior does not necessarily represent his attitude (Alkhowaiter, 2020). In addition to perceived usefulness and perceived ease of use as the 2 main variables inTAM, the Technology Acceptance Model (TAM) is a model for utilizing informationtechnology introduced by Davis and developing it with the intention to use technologythat focuses on a person's attitude by measuring perceptions of use and ease of use (Davis,

1989). Previous research developed 4 indicators to measure this construct which include: good idea, right decision, like, and convenient (Chen et al., 2022; Venkatesh et al., 2003). Muñoz-Carril et al. (2021) explains that a positive attitude toward technology use increases perceptions of enjoyment. Attitude and perceived enjoyment imply intrinsic motivation and increase the relative likelihood of users having positive perceptions of satisfaction. The results of the research show that attitudes and perceptions of enjoyment have a direct positive and significant effect on user satisfaction.

## 2.8. Perceived Enjoyment

Perceived enjoyment refers to the extent to which the activity of using a particular system is perceived as pleasurable in itself, apart from the performance consequences resulting from using the system (Dillenbourg & Hong, 2008). Perceived pleasure is a significant variable within the Flow Theory framework and research has shown a positive effect on satisfaction, particularly with the use of technology (Ifinedo, 2017). Perceived enjoyment has 4 indicators, namely: comfort, attractive, emotion, and enjyoment (Kim & Ammeter, 2018; Koufaris & Hampton-Sosa, 2002; Venkatesh & Bala, 2008; Venkatesh & Davis, 2000). Some previous studies have shown that perceived enjoyment has proven to have a significant positive effect on user satisfaction during Covid-19 (Binowo et al., 2023; Muñoz-Carril et al., 2021; Rouibah et al., 2021).

## 3. Research Methodology

This research model was built from a combination of 2 models. First, the research model (Hassan & Abu-Shanab, 2020) uses Delone and McLean. Second, a modified model (Muñoz-Carril et al., 2021) which is taken only in part, namely the TAM modeland Flow Theory of the entire model. The variables used from each model are as follows; the variables used from the Delone and McLean research model are Service Quality, Information Quality, System Quality, and Satisfaction. Then from the partially modified Muñoz-Carril model, the variables used are Perceived Usefulness,Perceived Ease of Use, and Attitude taken from the TAM model, while one more variable is Perceived Enjoyment taken from the Flow Theory model.
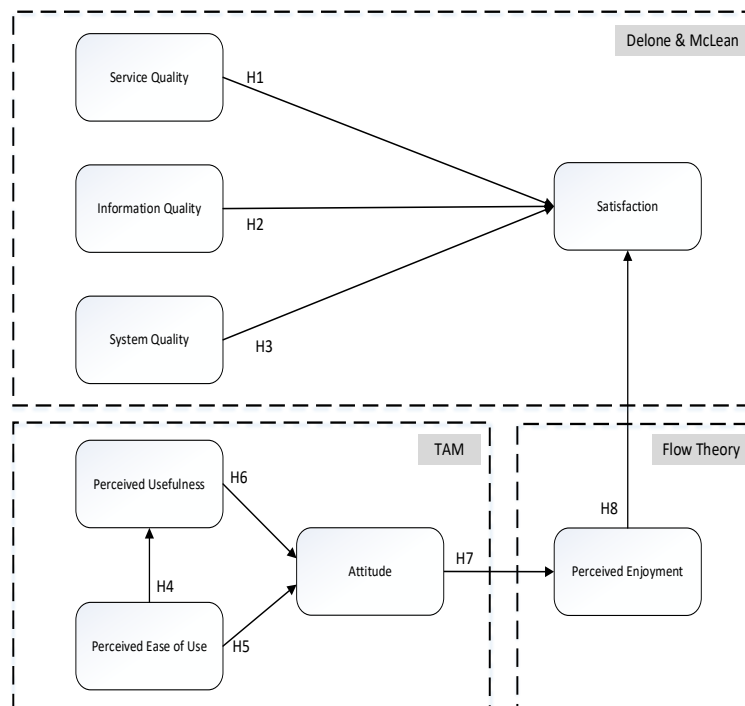


Fig. 1: Research Model

There is several hypotheses in research using the model according to Figure 1, is presented below:

1. H1: Service Quality in using SatuSehat influence Satisfaction
2. H2: Information Quality in using SatuSehat influences Satisfaction
3. H3: System Quality in using SatuSehat influences Satisfaction
4. H4: Perceived Ease of Use in using SatuSehat influences Perceived Usefulness
5. H5: Perceived Usefulness in using SatuSehat influence Attitude
6. H6: Perceived Ease of Use in using SatuSehat influences Attitude
7. H7: Attitude in using SatuSehat influences Perceived Enjoyment
8. H8: Perceived enjoyment in using SatuSehat influences satisfaction

Quantitative methods involve utilizing and analyzing numerical data using specific statistical techniques to answer questions. The type of quantitative method in this research is survey research. This study uses an online questionnaire that has 7 demographic questions, namely gender, age, education, domicile, and frequency of use, followed by 32 questions based on indicators of the variables tested using a Likert scale. Various variables in this study require appropriate indicators.Each indicator is a reflection of the questionnaire questions. The variables used are 4 from the DeLone McLean model, 3 from the TAM model, and 1 from the Flow Theory model.

The following are the research indicators used based on the proposed research model :

Table. 1: Indicators for questionnaire questions

| Variabel | Indikator | Source |
|---|---|---|
| Service Quality | Assurance (SEQ1) | (Chen et al., 2020; Mtebe & Raphael, 2018) |
| | Infrastructure (SEQ2) | |
| | Responsiveness (SEQ3) | |
| | Artificial Service (SEQ4) | |
| Information Quality | Completeness (IQ1) | (Iivari, 2005) |
| | Precision (IQ2) | |
| | Reliability (IQ3) | |
| | Currency (IQ4) | |
| System Quality | Ease of Understanding (SYQ1) | (Davis, 1989) |
| | User-friendly (SYQ2) | (DeLone & McLean, 2003; Mtebe & Raphael, 2018) |
| | Response Time (SYQ3) | (DeLone & McLean, 2003; Iivari, 2005) |
| | Language (SYQ4) | |
| Percieved Usefulness | Saving Time (PU1) | (Davis, 1989) |
| | Increase Efficiency (PU2) | (Venkatesh et al., 2003) |
| | Increase Effectiviness (PU3) | |
| | Service Convenience (PU4) | |
| Perceived Ease of Use | Easy to Regist (PEU1) | (Davis, 1989) |
| | Clear & Understandable (PEU2) | |
| | Easy to Learn (PEU3) | (Venkatesh et al., 2003) |
| | Easy to Use (PEU4) | |
| Attitude | Good Idea (A1) | (Venkatesh et al., 2003) |
| | Right Decision (A2) | |
| | Like (A3) | |
| | Convenient (A4) | (Chen et al., 2022) |
| Perceived Enjoyment | Comfort (PE1) | (Venkatesh & Davis, 2000) |
| | Attractive (PE2) | (Kim & Ammeter, 2018; Koufaris & Hampton-Sosa, 2002) |
| | Emotion (PE3) | (Venkatesh & Bala, 2008) |
| | Enjoyment (PE4) | (Venkatesh & Davis, 2000) |
| Satisfaction | Recommendation (S1) | (Hassan & Abu-Shanab, 2020) |
| | Repeat Visit (S2) | (DeLone & McLean, 2003) |
| | Information Satisfaction (S3) | (Gable & Poore, 2008) |
| | Healthcare Needs (S4) | (Chen et al., 2020) |

Questionnaires were distributed to SatuSehat application users using Google Form. This questionnaire contains questions related to the use of the SatuSehat application. WhatsApp and email were used as media for distributing questionnaires online. The main target respondents are students and office workers aged 17 years and over in the Jakarta area. Based on data from BPS (2022), in 2022 there will be a total of 10,748,230 million residents of DKI Jakarta and 7,814,201 million people aged 17 years and above. Thus, the population for research is 7,814,201 million users. The number of respondents required is 400 people based on Slovin's calculations. This study uses a 95% degree of confidence, so the error rate is 5%. The sample calculation is as follows:

sample = 7.814.201/ (1 + 7.814.201 (0,05) ²)

sample = 7.814.201 / 19.536,5025

sample = 400

## 4. Result and Discussion

Data were analyzed using the SEM-PLS approach assisted by SmartPLS software in processing data. The analysis is used in two stages, namely the first stage is testing using a measurement model (outer model), then the second stage is continued by usinga structural model (inner model). In the design ofthe measurement model (outer model) there are two stages of testing, namely validity and reliability testing. Meanwhile, the structural model or inner model is assessed by the significance of the path coefficients.

### 4.1. Validity Testing

Validity indicates how well the data collected covers the research area and can measure what is to be measured. The validity test can be calculated by loading factor. Calculation of loading factors to determine the value of each indicator for the latent variable. An indicator is declared valid if the loading factor value is greater than 0.7 (Sarstedt et al., 2014).
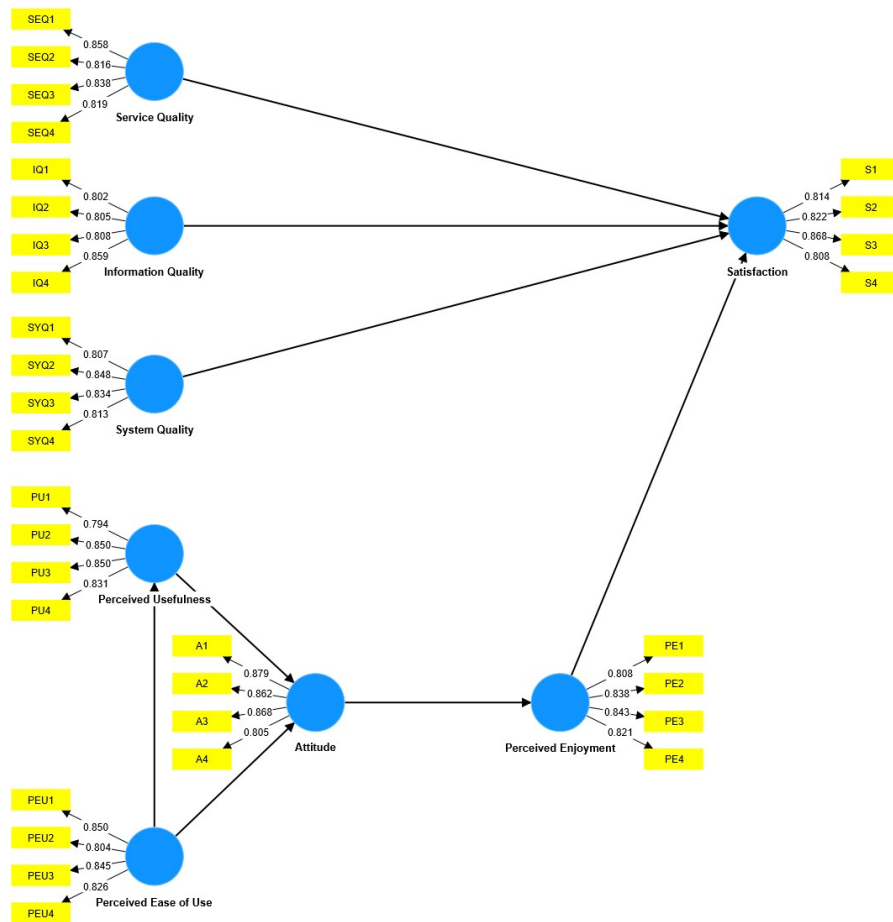
Fig. 2: Output Loading Factor Model

Calculations using SmartPLS show that all indicators have values above 0.7. It can be concluded that all indicators based on the model are declared valid, there is no need to delete any indicators.

## 4.2. Reliability Testing

The next step is to calculate the reliability test which is used to determine the Cronbach's alpha value for each indicator of the latent variable. Reliability testing tests the consistency or stability of each question prepared in a questionnaire. An indicator is said to be reliable if the Cronbach's alpha value is above 0.7 (Sarstedt et al., 2014).
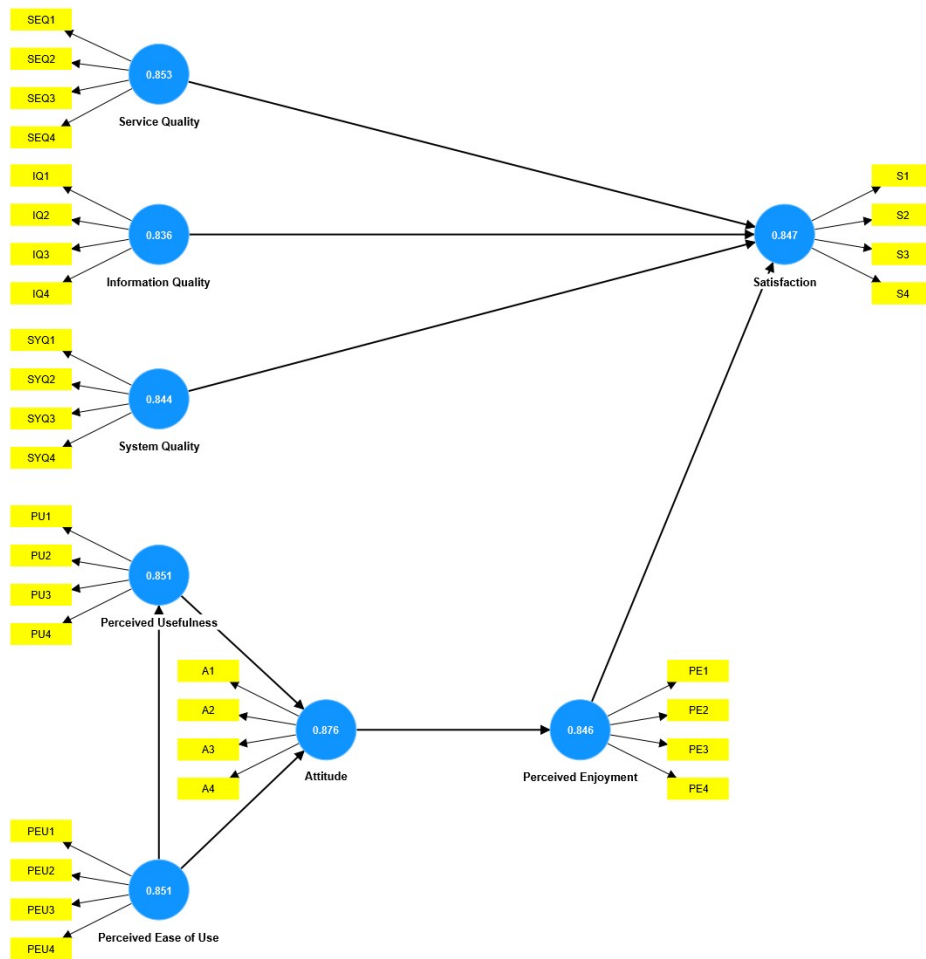
Fig. 3: Output Cronbach Alpha Model

Calculations using SmartPLS show that all indicators have cronbach alpha values greater than 0.7. It can be concluded that all indicators based on the model are declared realiable.

### 4.3. Hypothesis Testing

Analysis with the inner model is shown from the path coefficient value. Testing the path coefficient by carrying out bootstrapping calculations first. Bootstrapping is carried out using 500 sub-samples and the bootstrapping process in the SmartPLS application to obtain t-statistics values which will then be compared with the t-table value of 1.96.

Table. 2: Hypothesis result

| Hypothesis | Path | Original Sample | T Statistic |
|---|---|---|---|
| H1 | Service Quality ->Satisfaction | 0.277 | 3.930 |
| H2 | Information Quality -> Satisfaction | 0.340 | 4.625 |
| H3 | System Quality -> Satisfaction | 0.248 | 4.597 |
| H4 | Perceived Usefulness -> Attitude | 0.432 | 6.195 |

| H5 | Perceived Ease of Use -> Perceived Usefulness | 0.876 | 75.503 |
|----|----------------------------------------------|-------|--------|
| H6 | Perceived Ease of Use -> Attitude | 0.482 | 6.702 |
| H7 | Attitude ->Perceived Enjoyment | 0.846 | 79.533 |
| H8 | Perceived Enjoyment -> Satisfaction | 0.103 | 1.876 |

As shown in Table. 1, T-Statistics has a range of 1,876 to 79,533. It can be concluded that H1 to H7 have a t-statistic value above 1.96. Meanwhile, H8 has a t-statistic value below 1.96. We can confirm that service quality has a significant positive influence on satisfaction (t-statistic = 3.930). This confirms that service quality is an important factor in determining user satisfaction in using the application. This finding is consistent with previous research such as Hassan & Abu-Shanab (2020). We also confirm that information quality is a strong predictor, influencing user satisfaction positively and significantly (t-statistic = 4.625). This result is from previous research that examined the Delon and McLean model that improving information quality will increase user satisfaction (Salim et al., 2021). System quality is also proven to be a fundamental variable in Delone & McLean. Our results show that this construct has a significant positive influence on satisfaction (t-statistic = 4.597). Previous research on system quality factors, such as Al-Soni et al. (2021), has confirmed this. The research states that a good and easy-to-use system will satisfy users. In line with previous research, such as Nisa & Solekah (2022), we can also confirm that perceived usefulness and perceived ease of use have a significant positive influence on attitude (t-statistic = 6.195; t-statistic = 6.702). This confirms that user attitudes are influenced by factors that can provide usefulness and easiness when using the system. Our data has also shown that users' perceived ease of use has a significant positive influence on perceived usefulness (t-statistic = 75.503). Both factors have a high value and strong relationship in influencing such satisfaction with information systems. This result is in line with previous research on technology use such as Isaac (2020). These findings suggest that, to make users satisfied with the system, it is necessary to promote that using the system reduces effort and will improve activity performance. We also confirm that attitude affects users perceived enjoyment positively and significantly with a high value (t-statistic = 79.533). This result is in accordance with previous research examining factors on user satisfaction that an increase in attitude will increase perceived enjoyment (Muñoz-Carril et al., 2021). However, the relationship between perceived enjoyment and satisfaction is not in accordance with research of Muñoz-Carril et al. (2021) because it does not show a significant effect (t-statistic = 1.876). We can conclude that the SatuSehat app can give users a sense of pleasure and comfort when used, but does not significantly affect satisfaction.

## 5. Conclusion

This study examines the factors that influence user satisfaction with the SatuSehat application. The hypothesis results show that service quality significantly affects satisfaction with t-statistic of 3.930, information quality significantly affects satisfaction with t-statistic of 4.625, system quality significantly affects satisfaction with t-statistic of 4.597, perceived usefulness significantly affects attitude with t-statistic of 6.195, perceived ease of use significantly affects perceived usefulness with t-statistic of 75.503, perceived ease of use significantly affects attitude with t-statistic of 6.702, attitude significantly affects perceived enjoyment with t-statistic of 79.533, perceived enjoyment does not significantly affect satisfaction with t-statistic of 1.876. The findings of this study are summarised into 3 factors that are significant in the satisfaction of SatuSehat application users: service quality, information quality, and system quality. Service quality in the SatuSehat application can make users satisfied with the device used because almost all devices support and are compatible with SatuSehat.

Users do not need to be confused about the device to be used. In addition, users also feel safe storing their data in the PeduliLindungi application. Then Information quality in the SatuSehat application plays an important role in satisfaction. Users are satisfied that the personal and vaccine data stored in SatuSehat is accurate and valid data. Users feel that vaccine data can be relied on when needed to carry out activities/travel. Furthermore, System quality in the SatuSehat application provides user satisfaction to input their data in the SatuSehat application according to the application requirements. Good system response is the reason users continue to use the SatuSehat application. We hope that the government will continue to maintain the quality of the SatuSehat application in the future and improve several services such as customer service that must always be available 24 hours, reduce errors in user information or vaccine data by crosschecking before data is uploaded, improve system quality, and add health service features needed by the community such as integrated medical data, hospital queues, and drug purchases through the SatuSehat application.

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