**Article Type:** Research Paper

# Antecedents of perceived usefulness on the use of electronic hospital management information systems

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**Abstract**

**Research aims:** This study aims to analyze the factors that influence SIMRS and examine the mediating effect of perceived ease of use on the factors that affect SIMRS.

**Design/Methodology/Approach:** This explanatory research used a quantitative approach through survey methods. The population in this study was doctors practicing in the outpatient polyclinic of XYZ Hospital, totaling 80 doctors using the total sampling. Data collection techniques employed a scale and analyzed utilizing Smart Partial Least Square (PLS).

**Research findings:** According to the research findings, all examined indicators were found to be positively and substantially correlated with perceived ease of use by the following variables: computer self-efficacy, trustworthiness, technological risk, facilitating conditions, and degree of openness. Although all but the degree of openness exhibited a significant correlation with perceived usefulness, the remaining indicators did not. In relation to perceived usefulness, all factors exhibited a positive and statistically significant association with perceived ease of use as a mediator.

**Practical and Theoretical Contribution/Originality:** In terms of practical and theoretical contributions, these findings offer valuable insights for hospitals, emphasizing the importance of enhancing doctors' knowledge, openness, and confidence in adopting SIMRS technology. Recommendations offered include increasing computer literacy among doctors, mitigating risks associated with SIMRS, and improving access to healthcare services.

**Research limitation:** In this case, the research limitation stems from the need to explore further additional characteristics, such as computer self-efficacy, trustworthiness, technological risk, facilitating conditions, and perceived ease of use, as they may impact perceived usefulness across various variables. Future research should expand its scope and population, employing comprehensive data collection techniques to maximize research outcomes.

**Keywords:** SIMRS; Technology Acceptance Model (TAM); Unified Theory of Acceptance and Use of Technology (UTAUT)

**JAI Website:**

## Introduction

In recent years, the Indonesian government has significantly promoted the use of Information and Communication Technology (ICT) in various sectors. Information technology can be used to assist organizations in processing, storing, and transforming data into the information they need (Antoni et al., 2017). It becomes the main facilitator for organizational activities,

contributing greatly to fundamental changes in the organization's structure, conditions, policies, and management.

The availability and efficacy of information depend on the utilization of information technology through the development of several applications within the organization. Likewise, it plays a role in supporting the achievement of organizational goals (Pramono et al., 2022). Information system management using information technology is related to investing in information technology to adapt to organizational needs optimally.

Specifically, the hospital is one of the agencies that has implemented a management information system in business processes, as the government has required a Hospital Management Information System, abbreviated as SIMRS, for every hospital throughout Indonesia. This was emphasized by the government that SIMRS, owned by all hospitals in Indonesia, must be integrated with the Ministry of Health (Kemenkes) system. For policies that serve as guidelines for the implementation of health development carried out by the government and the private sector to improve the quality of health services in hospitals, the Ministry of Health of the Republic of Indonesia has issued the Regulation of the Minister of Health of the Republic of Indonesia Number 1171/MENKES/PER/VI/2011 (PMKRI, 2011). Article 1, section 1 states, "Every hospital is required to implement a hospital information system." The hospital information system is a vital component in realizing quality improvement efforts. Hospital information systems, in general, aim to integrate information systems from various sub-systems and collect, present, and process hospital data to produce information needed for hospital decision-making.

However, the implementation of SIMRS in Indonesia is remarkably diverse. Data from the Ministry of Health (2017) uncovered that at the end of 2016, only 48% of hospitals had used SIMRS, which increased by 4.05% to 52.05% in September 2017. The rest of the hospitals already had SIMRS but were not functioning properly (5%), did not have SIMRS (16%), and did not report SIMRS usage. Currently, many hospitals are unaware of how important it is to manage exceptionally large data in hospitals and have not been structured properly; as a result, hospital services do not run effectively. In addition, the hospital is still unaware of how much information has been obtained, processed, and distributed, either manually or computerized.

SIMRS is a system that supports decision-making for management in determining strategies to achieve hospital administration goals (Alhaq et al., 2022). A sub-system of the overall hospital information system is medical records, which have a crucial role in improving the quality and service of the hospital itself. Implementation of medical records starts when the patient registers and gets health services until he leaves the hospital. Organizing medical records is a form of activity conducted to achieve fast, accurate, and precise services so that the information produced is more effective and efficient, and good quality management is needed.

In this research, XYZ Hospital was examined for several reasons. It was due to problems at XYZ Hospital regarding perceptions of using SIMRS by doctors, where the level of understanding of information systems was not the same among doctors (Tuten, 2020).

Based on the observations made at the XYZ Hospital, it is also known to have used the Electronic SIMRS. There has been a change in the Electronic SIMRS from the old system in collaboration with a third party to a new system, an independent system developed by the XYZ Hospital Information Technology (IT) Team, requiring a transition process. The Electronic SIMRS used at the XYZ Hospital has also integrated services in all sections of Nurses, Dental Poly, Children's Poly, Gynecology, Ear, Nose and Throat (ENT) Poly, Ophthalmology, Maternal and Child Health (MCH), Internal Medicine Poly, Psychiatry, Urology, Orthopedics, Laboratory, Medical Records, Pharmacy, Clinic, Psychology, Rajal Registration, Emergency Registration, and Administration, SIMRS Installation, Care Support Treatment (CST), to the Financial system. In implementing the Electronic SIMRS, several elderly doctors complained about the process of having an Electronic SIMRS because it was difficult to adapt due to a lack of knowledge of its use. In contrast, young doctors who understood the technology for the first time felt no problem with implementing electronic SIMRS at XYZ Hospital.

The second problem is where data were often scattered, the data entry process was wrong, and the system used was still in the development stage, so data processing was still slow and not optimal, such as the data contained in the patient data input section with the existing database section having different IT management (Alshurideh et al., 2021). Apart from that, another reason is that outpatient polyclinics experienced a lack of authority regarding Electronic SIMRS, impacting the flow queue of patients. Hospitals are also required to have speed in reviewing previous patient histories, accuracy in inputting patient data, the ability to prescribe medication to patients, and the ability to provide consultations and examine patients.

Based on the above phenomenon, the personal technical capabilities of information system users play an essential role in developing information systems to produce information to create accurate planning reports (Dwivedi et al., 2020). Therefore, every doctor must be able to master the use of computer-based systems to process several transactions quickly and in an integrated manner, be able to store data and retrieve large amounts of data, be able to reduce mathematical errors, produce timely reports in various forms, and utilize it as a decision aid.

Therefore, the analysis in this study was carried out using the TAM method to measure health workers' acceptance levels. The constructs of the TAM used in this study were adapted to research objectives. The use of SIMRS was analyzed with the TAM method to determine the existing system in the hospital. Besides TAM, this study also used the UTAUT model. The UTAUT model is a technology acceptance model that affects individual acceptance of information technology. The UTAUT model was originally developed to explain the acceptance and use of technology but then be developed for other contexts, such as consumer technologies, where many industries have developed applications and services from technology that target consumers (Anwar & Rikumahu, 2020). The result of the development of the UTAUT model is called the UTAUT-2 model. The UTAUT-2 model aims to identify three important constructs from research into technology use and acceptance for both the general public and consumers, change some of the existing

relationships in the concept of the UTAUT model, and introduce new relationships (Tuten, 2020).

This research also offers practical recommendations for hospitals aiming to increase SIMRS acceptance among physicians while providing a valuable theoretical contribution to understanding technology adoption in healthcare environments. Further research could leverage these findings to continue improving the utilization of healthcare technology.

# Literature Review and Hypotheses Development

**SIMRS Concept**

A hospital information system (SIMRS) is an integrated information system that improves patient care by increasing user knowledge and reducing uncertainty, allowing rational decisions from the information provided (Kumalasari & Sulistiadi, 2022). SIMRS, with a computer base, is an important supporting facility and mandatory for hospital operations. The system is simply described as components or variables that are organized, interact with each other, depend on each other, and are integrated (Adi et al., 2022). The system is also a network of interconnected procedures that work together to carry out an activity or complete certain goals (Yusuf et al., 2023).

There are two fundamental theories: the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT). The Technology Acceptance Model, hereinafter abbreviated as TAM, is one of the theories regarding the use of information technology systems, which is considered very influential and is generally used to explain the individual acceptance of the use of information technology systems (Ramayani et al., 2021). In this study, the TAM theory used included perceived usefulness and perceived ease of use.

On the other hand, the Unified Theory of Acceptance and Use of Technology (UTAUT) model is the most comprehensive enhancement of the Technology Acceptance Model (AlQudah et al., 2021) and is described as a consolidation of previous research constructs (Al-Rahmi et al., 2019). Compared to the previous model, UTAUT presents a more complete picture of technology acceptance (Al-Nuaimi & Al-Emran, 2021). The UTAUT model is also an extension of the Theory of Planned Behavior. In this study, the UTAUT theory employed covered computer self-efficacy, degree of openness, trustworthiness, technological risk, and facilitating conditions.
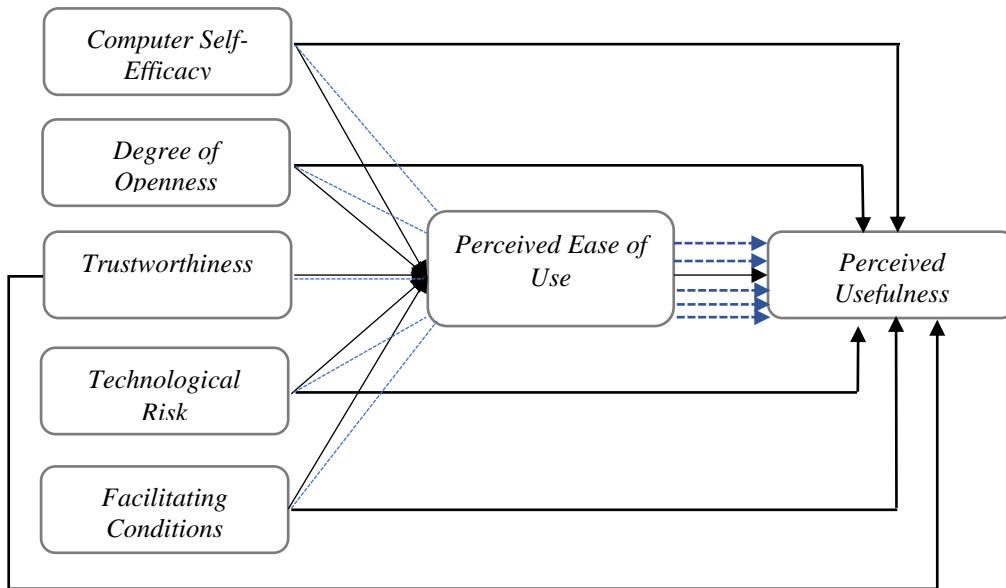
**Hypothesis**



**Figure 1** Research Framework Model

Drawing from the aforementioned research framework Figure 1, the present study posits the following hypothesis.

**The influence of computer self-efficiency on perceived ease of use**

If users have positive perceptions about computer self-efficacy, this will also affect their perception that SIMRS is easy to use and that users do not need to exert much effort when using the system. Furthermore, computer self-efficacy refers to individual confidence in using a computer or computer system. Individuals with elevated levels of computer self-efficacy also tend to have higher perceptions of the system's benefits. They may be more confident in utilizing the system's features and see positive value in using them. Based on the description above, the research hypothesis could be formulated as follows:

*H₁: Computer self-efficacy influences perceived ease of use.*

**The influence of degree of openness on perceived ease of use**

In the context of SIMRS, openness means the extent to which individuals are willing and psychologically ready to use SIMRS services. This level of openness includes the extent to which a person is open to adopting modern technology and innovation and the extent to which they see positive value in using these systems. People who are more open to innovation tend to have a more positive view of the benefits of using SIMRS and are more motivated to use it. An individual's level of openness can influence how they perceive the ease of use and benefits of using SIMRS. Openness can also influence an individual's

intention to actively use SIMRS in everyday life. It is important to point out that as more open individuals have a greater tendency to utilize SIMRS more actively, an individual's level of openness significantly impacts perceptions of system use. Given the information provided, the study hypothesis can be phrased as follows:

*$H_2$: Degree of openness influences perceived ease of use.*

### The influence of trustworthiness on perceived ease of use

Trustworthiness denotes the level of individual trust in a system or technology's reliability, security, and integrity. A high level of trustworthiness is associated with a higher actual system use. If individuals trust the system and positively perceive their trustworthiness, they will be more likely to use the system actively in their daily lives. Then, trustworthiness can affect the perception of using the system because the level of individual trust in its security, reliability, and integrity affects their perception of risk, reliability, and data integrity and builds confidence and user intention to use the system actively. The following formulation of the research hypothesis could be made in light of the previous description:

*$H_3$: Trustworthiness influences perceived ease of use.*

### The influence of technological risk on perceived ease of use

Technological risk as a construct has been used (Huang et al., 2020) as perceived risk. Technological risk signifies the potential risks or negative consequences associated with using a particular technology or system and affecting an individual's intention to use the system. If users feel that the technological risks related to the system are too high or unmanageable, they may have less intention to use the system. A high technological risk can hinder user intentions and affect system adoption.

It can be inferred that technological risk can affect the perception of system use because the level of risk perceived by users affects their perception of the system's security, reliability, and integrity. Negative perception of risk can reduce users' trust, motivation, and intention to use the system actively. Therefore, mitigation and management of technology risks are crucial in building a positive perception of the use of the system. Based on the given description, the research hypothesis might be written as follows:

*$H_4$: Technological risk influences perceived ease of use.*

### The influence of facilitating conditions on perceived ease of use

The degree to which users feel that resources or assistance are accessible for using the system is referred to as "facilitating conditions" (Bervell & Arkorful, 2020). Facilitating

conditions represent factors that support using a system or technology, such as accessibility, technical support, adequate resources, and adequate infrastructure. Good facilitating conditions tend to be associated with a higher perception of the system's ease of use. If users feel that they have good access to the system, adequate technical support, and adequate resources and infrastructure to use the system, the individual is more likely to view the system as easy to use.

Based on the results of research conducted (Natasia et al., 2022), facilitating conditions provide a relationship with perceived ease of use. Thus, the hypothesis tested in this study is shown as follows:

*$H_5$: Facilitating conditions influence perceived ease of use.*

**The influence of computer self-efficiency on perceived usefulness**

Computer self-efficacy is the individual confidence level in his ability to use a computer or computer system. This can affect individual perceptions of the effectiveness of using the system. Individuals with high confidence in their ability to use computers or systems tend to believe they can achieve their goals using these systems. This will increase their perception of the system's usefulness in achieving the desired results. Overall, computer self-efficacy can affect perceived usefulness because individuals' confidence in their abilities influences how they interpret ease of use, effectiveness of use, satisfaction, and intention to use the system. Self-confidence in the ability to use the system can increase positive perceptions of the system's usefulness as a whole.

The results of research carried out directly (Usman et al., 2020; Gultom, 2021) revealed that computer self-efficacy provides a relationship with perceived usefulness. Then, the hypothesis in this study is:

*$H_6$: Computer self-efficacy influences perceived usefulness.*

**The influence of degree of openness on perceived usefulness**

In the context of SIMRS, openness can be defined as how open and psychologically prepared individuals are toward using SIMRS services. The degree of openness level can also affect individual perceptions of the system's benefits. Individuals who are more open to innovation and innovative technologies tend to see positive values in using the system. They are more likely to see the potential benefits derived from the system and are more motivated to take advantage of it. Individual openness to new technologies can strengthen perceptions of perceived usefulness.

Research (Ortega-Toro et al., 2019; Öberg & Alexander, 2019) indicates that openness correlates with perceived usefulness. The hypothesis evaluated in this study is, therefore, as follows:

*H₇: Degree of openness influences perceived usefulness.*

**The influence of trustworthiness on perceived usefulness**

Trustworthiness is based on trust impacting the intention to use SIMRS services (Huang et al., 2020). Trustworthiness alludes to the user's trust in a technology or service's integrity, reliability, and security. Meanwhile, perceived usefulness refers to the users' perception of the extent to which the technology or service is useful in achieving their goals or meeting their needs. The relationship between trustworthiness and perceived usefulness is that when users feel that a technology or service can be trusted, they are more likely to accept and use the technology, believing it will provide the expected benefits. In this case, trustworthiness is a key factor influencing the user's perception of the usefulness of a technology or service.

The findings of two studies (Nyssa & Rahmidani, 2019; Sairaga & Maulana, 2023) suggest a direct correlation between perceived usefulness and trustworthiness. Presented below is the hypothesis that this study attempts to test:

*H₈: Trustworthiness influences perceived usefulness.*

**The influence of technological risk on perceived usefulness**

In general, perceived usefulness refers to the user's perception of the extent to which a technology can provide benefits or uses for them. On the other hand, technological risk indicates the possibility of a risk or negative consequence associated with using the technology. Technology risks can include system failures, security vulnerabilities, data loss, privacy issues, or other negative impacts. It is, therefore, important for technology providers to manage and mitigate the technology risks associated with their products or services and communicate clearly to users about the efforts being made to mitigate those risks. In this way, they can increase users' perceptions of the benefits and uses derived from the technology, thereby facilitating wider adoption and acceptance.

The research conducted by Ferdiansyah et al. (2022) and Maulani et al. (2022) demonstrated that technological risk influences perceived usefulness. The hypothesis examined in this study is presented as follows:

*H₉: Technological risk influences perceived usefulness.*

**The influence of facilitating conditions on perceived usefulness**

Facilitating conditions characterize factors around the user and can affect the ease of use of technology. These factors can include infrastructure, accessibility, availability of resources, technical support, and user expertise. The relationship between facilitating

conditions and perceived usefulness is positive and influences each other. When users are provided with conditions that facilitate good use of technology, they tend to have higher perceptions of the benefits and uses they can derive. For example, if users have easy and reliable access to the required infrastructure, such as stable internet connectivity or adequate hardware, they will be more able to utilize the technology effectively. This will increase their perception of the benefits that can be obtained.

According to the research findings (Natasia et al., 2022; Sukendro et al., 2020), facilitating conditions correlate with perceived usefulness. The hypothesis tested in this study is as follows:

$H_{10}$: *Facilitating conditions influence perceived usefulness.*

### The influence of perceived ease of use on perceived usefulness

The relationship between perceived ease of use and perceived usefulness is one of the important aspects in the study of technology acceptance, especially in the context of information systems and technology. There is a positive relationship between the two, meaning that if people perceive a technology as easy to use, they are also more likely to view it as useful.

The research results (Usman et al., 2020; Lutfi, 2022) showed that perceived ease of use provides a relationship with perceived usefulness. Hence, the hypothesis investigated in this study is:

$H_{11}$: *Perceived ease of use influences perceived usefulness.*

### The mediating role of perceived ease of use to increase perceived usefulness in electronic hospital management information systems

In the context of technology acceptance, several studies have exhibited that perceived ease of use can mediate the relationship between computer self-efficacy and perceived usefulness. It means that perceived ease of use functions as a mediator between computer self-efficacy and perceived usefulness. In this connection, mediation by perceived ease of use means that computer self-efficacy can influence perceived usefulness through perceived ease of use. In other words, an individual's computer self-efficacy can influence their perception of the ease of use of technology, which in turn affects their perceived usefulness of technology. For example, individuals with high levels of computer self-efficacy may find it easier to master and use new technologies. Their perception of high ease of use can then increase the perceived usefulness of the technology. They may feel that technology can help them in their jobs, increase efficiency, or provide other expected benefits. By understanding this relationship, technology organizations and designers can recognize the importance of facilitating high perceived ease of use. Building intuitive interfaces, providing clear guidance, and providing

adequate user training or support can help improve perceived ease of use, strengthening users' perceived usefulness and interest in adopting the technology.

According to studies (Usman et al., 2020; Gultom, 2021; Lutfi, 2022), perceived ease of use may act as a mediator in the association between perceived usefulness and computer self-efficacy. The following illustrates the hypothesis that this study tested:

***H$_{12}$**: Perceived ease of use mediates the effect of computer self-efficacy on perceived usefulness.*

Since the results of research conducted directly (Nyssa & Rahmidani, 2019; Sairaga & Maulana, 2023; Ortega-Toro et al., 2019; Öberg & Alexander, 2019) explained that perceived ease of use could mediate the relationship between the degree of openness and perceived usefulness, this study examines the below the hypothesis:

***H$_{13}$**: Perceived ease of use mediates the effect of degree of openness on perceived usefulness.*

In this context, technology providers need to build trust through transparency, reliability, security, and good performance. In addition, technology providers must also ensure that the interface and use of technology are well designed to be easy for users to use. Thus, individual trust can be increased through highly perceived ease of use, which in turn will strengthen the user's perceived usefulness and interest in adopting the technology. According to the studies conducted (Nyssa & Rahmidani, 2019; Usman et al., 2020; Lutfi, 2022; Sairaga & Maulana, 2023), perceived ease of use can mediate the trustworthiness relationship with perceived usefulness. Then, the hypothesis in this study is:

***H$_{14}$**: Perceived ease of use mediates the effect of trustworthiness on perceived usefulness.*

Here, in discussing mediation, technology providers need to mitigate and manage the technology risks associated with using their products or services. Transparency regarding security policies, privacy, and risk mitigation measures can help build trust and reduce the perception of substantial risk. In addition, technology providers must also ensure that their technology is properly designed and developed to be easy for users to use. By paying attention to the high perceived ease of use, individuals can experience greater usefulness of technology and are more inclined to adopt it. However, it is also vital to note that other factors, such as perceived usefulness, trust, and social factors, can influence the acceptance and use of technology.

Perceived ease of use can act as a mediator in the relationship between perceived usefulness and technical risk, according to the findings of direct research conducted by Budiantara et al. (2019), Nazirwan (2019), Ferdiansyah et al. (2022), and Fahazzahrullail (2022). Next, the following is the study's hypothesis:

*$H_{15}$: Perceived ease of use mediates the effect of technological risk on perceived usefulness.*

Furthermore, mediation by perceived ease of use means that facilitating conditions can affect perceived usefulness through perceived ease of use. In other words, the existing facilitating conditions can affect an individual's perception of the ease of use of technology, which in turn influences their perceived usefulness of technology. For example, if individuals perceive that they have easy access to technology, receive adequate training support, and have infrastructure that supports the use of technology, they are more likely to view technology as an easy-to-use and useful tool in achieving goals or meeting their needs. In optimizing this mediation, technology providers or organizations need to create and facilitate adequate supporting conditions for using technology. This can involve providing appropriate training, supporting technology infrastructure, providing user support, and ensuring adequate physical and technical accessibility. By creating adequate facilitating conditions, perceived ease of use can be enhanced, which in turn will strengthen the user's perceived usefulness and interest in adopting the technology.

The findings of studies (Natasia et al., 2022; Sukendro et al., 2020; Ferdiansyah et al., 2022; Fahazzahrullail, 2022) stated that perceived ease of use can mediate the relationship facilitating conditions with perceived usefulness. Hence, the hypothesis confirmed in this study is:

*$H_{16}$: Perceived ease of use mediates the effect of facilitating conditions on perceived usefulness.*

## Research Method

This research uses the Partial Least Square (PLS) model. There are several reasons why the PLS approach was used for this research. The type of research conducted is explanatory research, which aims to explain the cause-and-effect relationship between the variables studi (Ritonga & Gatot, 2023). For analyzing causal relationships like this, PLS is an appropriate statistical method. PLS has the advantage of handling complex models, especially when the relationships between variables are interrelated and several constructs are difficult to measure precisely. Therefore, PLS is a suitable choice to test the hypotheses in this research. Apart from that, this research used a quantitative approach with a survey method. The sampling technique employed in this research was total sampling, which involved collecting data from a representative sample of the population (80 doctors at XYZ Hospital) using a questionnaire. In situations where the population is less than 100 people, as in this study, total sampling techniques are often used to allow the entire population to be part of the sample (Ritonga & Gatot, 2023). Therefore, the use of total sampling techniques in this research is appropriate.

The data collection technique in this study used a scale. Data collection can use primary or secondary sources. The measurement scale used in this study was the Likert scale (Ritonga & Gatot, 2023). The Likert scale measures attitudes, opinions, and perceptions of a person or group regarding social phenomena. Data were then processed and analyzed through software based on raw data or primary data collected from respondents: 1) SPSS for Windows, producing information/data for descriptive statistical analysis of respondents' responses, and 2) Smart Partial Least Square (PLS), yielding information/data for inferential statistical analysis, such as research instrument testing (questionnaire), path analysis, and parametric statistical tests or hypothesis testing.

# Result and Discussion

## Characteristics of Respondents

The characteristics of respondents in this study were doctors who worked at XYZ Hospital, totaling 80 doctors. Female respondents constituted the majority, with 53 respondents (66%). The majority of respondents were in the age group of 46-55 years, including 26 respondents (33%). Also, most respondents, comprising 31 individuals (39%), had work experience of 6-10 years.

## Evaluation of the Measurement Model (Outer Model)

Convergent validity, discriminant validity, composite reliability, and Cronbach Alpha are the four outer model measurement criteria considered when evaluating the outer research model. The following Figure 2 illustrates the research model:
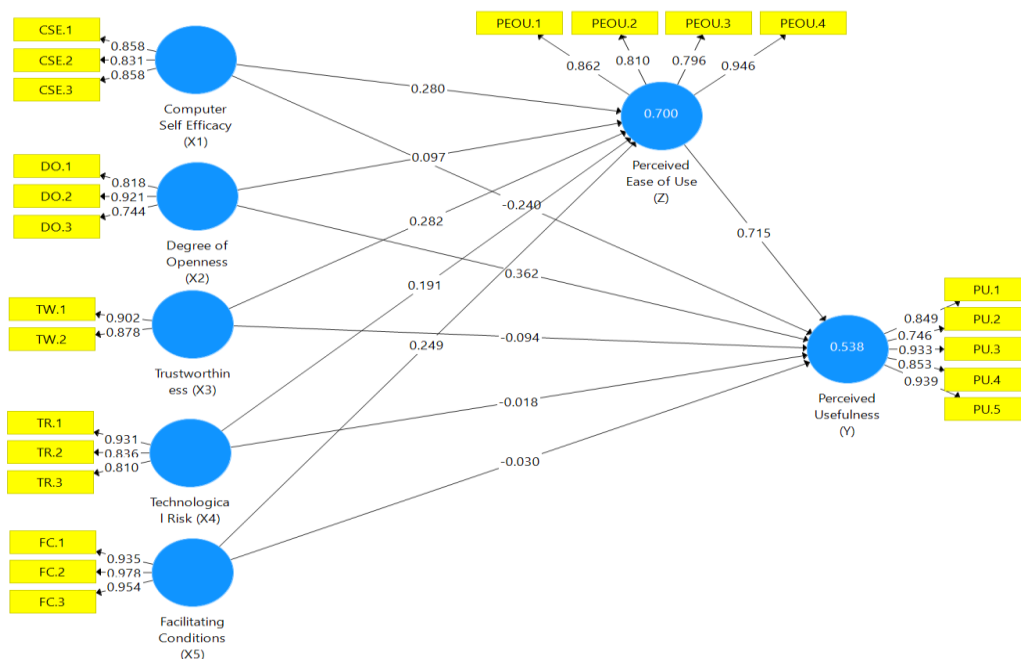


**Figure 2** Outer Model

Related to this, based on the convergent validity criteria, most research indicators could be used as material for measuring a variable because the outer loading value was greater than 0.7. Therefore, all the results in the study that were declared valid were also feasible to use.

Next, based on the results of the discriminant validity analysis in Figure 2, the Heretroit-Monotrait Ratio (HTMT) value was less than 0.9, which explains that all construct variables had very good discriminant values. Meanwhile, considering the value of the square root of average variance extracted (AVE) as an additional way of measuring discriminate validity, the AVE value was more than 0.5. Therefore, it can be said that each variable had the appropriate discriminant validity.

**Table 1** Reliability Test

| Variable | Cronbach Alpha | Composite Reliability |
|---|---|---|
| Computer Self-Efficacy | 0.808 | 0.886 |
| Degree of Openness | 0.771 | 0.869 |
| Trustworthiness | 0.738 | 0.884 |
| Technological Risk | 0.823 | 0.895 |
| Facilitating Conditions | 0.953 | 0.969 |
| Perceived Ease of Use | 0.876 | 0.916 |
| Perceived Usefulness | 0.916 | 0.937 |

Furthermore, Table 1 presents the results of the reliability test which can be presented through the results of Cronbach alpha and composite reliability. The results show that Cronbach alpha and composite reliability have met the criteria of more than 0.6, so it can be concluded that the sudech results are reliable.

**Evaluation of the Structural Model (Inner Model)**

The inner model is a structural model used to predict causal relationships between latent variables or variables that cannot be measured directly. Several tests were performed in this case, including the Path Coefficient Test, the Coefficient of Determination (R2), the Q-square test, the f-square Test, and the Hypothesis Test. In brief, based on these tests, almost all the test results were positive. This indicates that the causality relationship between variables could be measured, which could be confirmed through hypothesis testing at the end of the data testing process.

In Figure 3, there are five main constructs with various indicators. The "Computer Self Efficacy (X1)" construct is represented by three indicators with respective values as follows: CSE.1 with a value of 21,884, CSE.2 with a value of 16,788, and CSE.3 with a value of 17,753. This shows the loading size for each indicator on construct X1.

The "Degree of Openness (X2)" construct also has three indicators, DO.1 with a value of 16,092, DO.2 with a value of 47,729, and DO.3 with a value of 13,654. Meanwhile, the "Trustworthiness (X3)" construct has two indicators, TW.1 with a value of 31,576 and TW.2 with a value of 26,314. For the "Technological Risk (X4)" construct, there are three

indicators, TR.1 with a value of 85,091, TR.2 with a value of 17,259, and TR.3 with a value of 17,699.

The final construct, "Facilitating Conditions (X5)", is also represented by three indicators: FC.1 with a value of 60.126, FC.2 with a value of 159.462, and FC.3 with a value of 51.884.
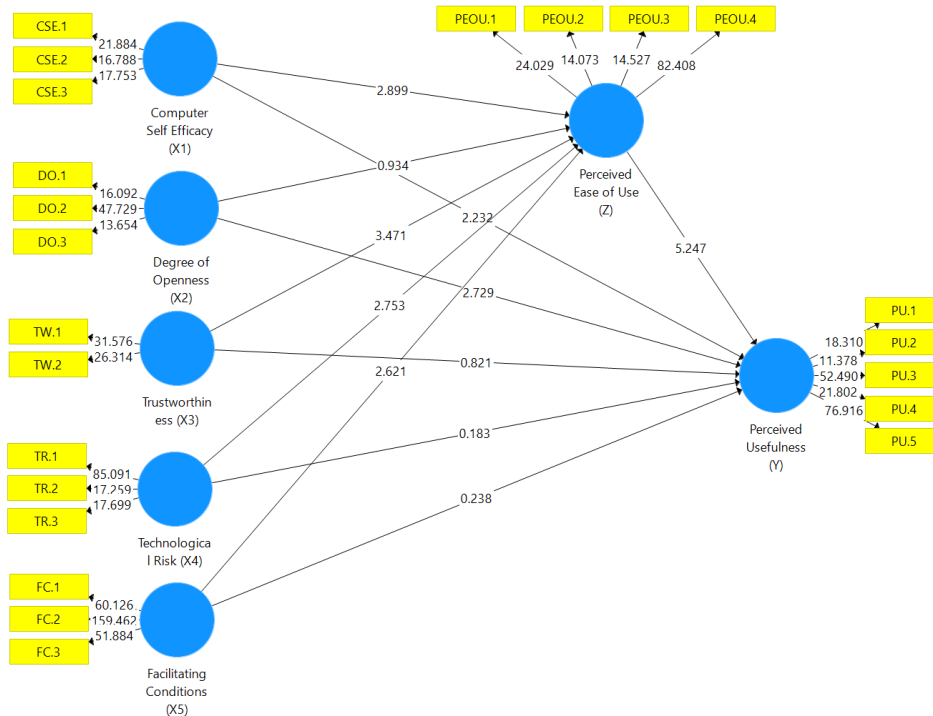


**Figure 3** Inner Model

The constructs "Perceived Ease of Use (Z)" and "Perceived Usefulness (Y)" are on the right side of the model. "Perceived Ease of Use (Z)" has four indicators, PEOU.1 with a value of 24.029, PEOU.2 with a value of 14.073, PEOU.3 with a value of 14.527, and PEOU.4 with a value of 82.408. This construct is related to "Perceived Usefulness (Y)", which has five indicators: PU.1 with a value of 18.310, PU.2 with a value of 11.378, PU.3 with a value of 52.490, PU.4 with a value of -21.802, and PU.5 with a value of 76,916.

The values listed on the arrows connecting these constructs represent path coefficients or weights in the SEM (Structural Equation Modeling) model, showing the influence of one construct on another. This model appears to be designed to assess how factors such as computer self-efficacy, openness, trust, technological risk, and facilitating conditions influence perceptions of ease of use and usefulness, which can be part of an evaluation of the acceptability of a technology or information system.

**Hypothesis Testing**

Based on the data processing, the results in Table 2 could be used to answer the hypotheses in this study. Hypothesis testing in this study was carried out by looking at the T-statistics values and P-values. The research hypothesis can be accepted if the P-values are <0.05. Based on Table 2 below, it can be concluded that Perceived Ease of Use (PEOU) acts as a mediator in several relationships between variables, but not in all cases. Specifically, PEOU acts as a significant and positive mediator in the relationship between Computer Self-Efficacy (CSE) and Perceived Usefulness (PU), between Trustworthiness (TW) and PU, and between Facilitating Conditions (FC) and PU. However, no mediation effect was detected in some other relationships, such as between Degree of Openness (DO) and PU.

**Table 2** Hypothesis Test

|     | Variable | Original Sample | P-Value | Result |
| --- | --- | --- | --- | --- |
| H1 | CSE -> PEOU | 0.280 | 0,005 | Supported |
| H2 | DO -> PEOU | 0.097 | 0,339 | Supported |
| H3 | TW -> PEOU | 0.282 | 0,000 | Supported |
| H4 | TR -> PEOU | 0.191 | 0,006 | Supported |
| H5 | FC -> PEOU | 0.249 | 0,010 | Supported |
| H6 | CSE -> PU | -0.240 | 0,746 | Not Supported |
| H7 | DO -> PU | 0.362 | 0,000 | Supported |
| H8 | TW -> PU | - 0.094 | 0,385 | Not Supported |
| H9 | TR -> PU | - 0.018 | 0,254 | Not Supported |
| H10 | FC -> PU | - 0.030 | 0,327 | Not Supported |
| H11 | PEOU -> PU | 0.715 | 0,000 | Supported |
| H12 | CSE -> PEOU -> PU | 0.200 | 0,012 | Supported |
| H13 | DO -> PEOU -> PU | 0.070 | 0,337 | Supported |
| H14 | TW -> PEOU -> PU | 0.201 | 0,001 | Supported |
| H15 | TR -> PEOU -> PU | 0.137 | 0,019 | Supported |
| H16 | FC -> PEOU -> PU | 0.178 | 0,024 | Supported |

**Notes:** CSE: Coputer self-efficency; PEOU: Perceived Ease of Use; DO: Degree of Openness; TW: Trustworthiness; TR: Technological Risk; FC: Facilitating Conditions; PU: Perceived Usefulness

**Discussion**

**The Influence of Computer Self-Efficacy on Perceived Ease of Use**

Accordingly, individuals with a positive view of computer self-efficacy will affect their ease of use of SIMRS and use of the system, which does not require excessive effort. Furthermore, computer self-efficacy describes individual confidence in using a computer or computer system. Individuals with high levels of computer self-efficacy also tend to have a more positive view of the system's benefits. Therefore, users feel more confident utilizing system features and see various advantages in SIMRS.

In line with that finding, research Usman et al. (2020) and Lutfi (2022) stated that computer self-efficacy has a relationship with perceived ease of use.

### The Influence of Degree of Openness on Perceived Ease of Use

The degree of openness is defined as the level of user openness or readiness to accept and adopt a new information system or technology. If the level of openness about the benefits of using the system is low, this is due to the tendency of users to see negative aspects or less positive values in using the system. They may tend to underestimate the benefits that can be obtained from the system and are less motivated to make optimal use of it. In addition, users may have low intentions to adopt the system and be less active in using it in daily life.

Based on the statement above, the results of this study are not supported by Ortega-Toro et al. (2019), Öberg and Alexander (2019), who uncovered that the degree of openness has a relationship with perceived ease of use.

### The Influence of Trustworthiness on Perceived Ease of Use

In this instance, trust will be one of the main factors in attracting someone's interest, so a high level of trust in SIMRS will affect the use of the system. This is due to a positive view of SIMRS. Trust refers to how much a person believes in a system or technology's reliability, security, and integrity. A high level of trust is strongly associated with a more engaged and active use of the system. If a person believes in a system and has a positive perception of their belief, they are more likely to incorporate the system into their daily routine actively. As a result, trust plays a key role in shaping the user's perception of using the system. An individual's degree of confidence in the system's security, reliability, and integrity influences how they perceive risk, reliability, and data integrity, ultimately affecting their confidence level and intention to use the system actively. Consistent with that, according to the research results carried out directly Nyssa and Rahmidani (2019), Sairaga and Maulana (2023), trustworthiness is related to perceived ease of use.

### The Influence of Technological Risk on Perceived Ease of Use

Technological risk portrays the potential for harm or adverse consequences associated with using a particular technology or system, as well as impacting an individual's willingness to use the system. If users perceive the technological risks associated with the system are too high or beyond their control, they may be less interested in using it. A high technological risk can hinder user intent and system deployment. As a result, technology risk can affect perceptions of system use because users' perceptions of system security, reliability, and integrity are affected by perceived risk. Negative perception of risk can reduce user trust, motivation, and intention to use the system actively. Therefore, it is very important to address and manage technology risks to foster positive perceptions about the use of the system. This study's findings reinforce the results of research Budiantara et al. (2019) and Nazirwan (2019), stating that technological risk is related to perceived ease of use.

### The Influence of Facilitating Conditions on Perceived Ease of Use

By having facilitating conditions such as technology accessibility, stakeholder support, comprehensive training, user guides, and other helpful resources, the user's perception of the ease of use of the system will increase. For example, when users receive proper training and access guidance resources that help them overcome usage challenges, they will find the system easier to use and feel more confident doing so. As such, companies or system developers must focus on and improve these facilitating factors to increase perceived ease of use. Providing appropriate support, adequate training, and access to relevant resources can contribute to a more positive user experience and promote better system implementation. Supporting that result, studies Natasia et al. (2022) demonstrated that facilitating conditions provide a relationship with perceived ease of use.

### The Influence of Computer Self-Efficacy on Perceived Usefulness

Related to that, computer self-efficacy refers to the level of individual confidence in their ability to use a computer or computer system, but this belief cannot influence how individuals perceive the effectiveness of using the system. Those who do not have high self-efficacy in using computers or systems tend to believe that they cannot run the system optimally. Consequently, these beliefs do not enhance their perception of the system's usefulness in achieving the desired results. In general, computer self-efficacy can affect the perceived usefulness of the system because the level of individual confidence influences how they interpret the ease of use, effectiveness of use, satisfaction, and intention to use the system. Confidence in using the system can lead to a more positive perception of the system's overall usefulness. Built on the statement above, the results of this study are not corroborated by the statements of Usman et al. (2020) and Gultom (2021) that computer self-efficacy is related to perceived usefulness.

### The Influence of Degree of Openness on Perceived Usefulness

Including in the SIMRS context, the degree of openness positively correlates with perceived usefulness in using systems or technology. Users with a high degree of openness or are more open to adopting innovations and technologies tend to have a more positive perception of the usefulness of the system or technology. They are more likely to see the benefits and positive values of using the system, as well as realize the potential benefits that can be obtained from using the system. To put simply, the higher a person's degree of openness to innovation and new technology, the more likely they will find the system or technology useful in meeting their needs or goals. Therefore, system or technology developers need to consider the degree of openness level of potential users in strengthening perceptions about the system's usefulness and increasing the adoption of the system. It agrees with the results of research Ortega-Toro et al. (2019), Öberg and Alexander (2019), stating that the degree of openness is correlated with perceived usefulness.

### The Influence of Trustworthiness on Perceived Usefulness

In this study, trustworthiness cannot be based on the fact that trust impacts the intention to use SIMRS services. Trustworthiness study does not pertain to users' trust in the honesty, dependability, and safety of a technology or service. Therefore, if the level of trustworthiness is low, users are less inclined to perceive the system as unreliable or question its security, diminishing their perception of its usefulness. Thus, system or technology developers must enhance and maintain the system's trustworthiness to strengthen user perceptions of its usefulness and encourage wider system adoption. Trust in the system will help create a positive environment and build users' confidence about the benefits of using the system or technology. The research results do not align with those Nyssa and Rahmidani (2019), Sairaga and Maulana (2023), which showed that trustworthiness is correlated with perceived usefulness.

### The Influence of Technological Risk on Perceived Usefulness

In research, technological risk does not refer to the possibility of risk or negative consequences of using the technology. Suppose users perceive that the technological risks associated with using a system or technology are high, such as the potential for system failure, vulnerability to security attacks, or the risk of data loss. In that case, they will likely perceive the system's usefulness negatively. When technology risk is considered high, users may feel hesitant or worried about using the system for fear of problems and negative impacts that may arise, then perceived usefulness may decrease because users may feel that the benefits obtained from using the system are not worth the risks involved they have to face. Based on the statement above, the research results are not the same as those of Ferdiansyah et al. (2022), and Fahazzahrullail (2022), stating that technological risk impacts perceived usefulness.

### The Influence of Facilitating Conditions on Perceived Usefulness

Facilitating conditions that refer to factors around the user cannot affect the ease of use of technology. Facilitating factors, such as technology accessibility, support from related parties, adequate training, user guides, or other supportive resources, cannot positively impact a system's perceived usefulness. This is because the user feels that facilitating factors do not exist or are not given enough attention, and perceived usefulness can decrease. Users may find it difficult and hindered in using the system if they do not have adequate guidance or support. The research findings presented above contradict the conclusions drawn by Natasia et al. (2022) and Sukendro et al. (2020), which posit that perceived usefulness is associated with facilitating conditions.

### The Influence of Perceived Ease of Use on Perceived Usefulness

In studying technology acceptance, especially in the context of information systems and technology, the relationship between perceived ease of use and perceived usefulness is crucial. There is a positive association between these two factors, meaning that if someone perceives a technology as easy to use, they are also more likely to see it as

useful. Perceived ease of use refers to the degree to which a person perceives a technology or system as easy to use in a particular context. Factors that influence perceived ease of use include friendly interfaces, level of complexity, clear usage guidelines, and ease of understanding and navigation of the system. The easier it is for users to operate the technology, the more likely they will find it easy to use.

On the other hand, perceived usefulness reflects a person's belief that technology will improve their performance and productivity or better meet their needs. Factors affecting perceived usefulness encompass perceived benefits, the relevance of technology to tasks or goals, and the contribution of technology to work efficiency or effectiveness. The higher the perceived usefulness, the more likely someone will find the technology useful and positively impact their work or life as a whole.

When someone perceives a technology as easy to use, it tends to increase their perception of its usefulness. If people find technology easy to operate and understand, they are more likely to see it as a useful tool for achieving their goals or meeting their needs. Conversely, if someone finds a technology difficult to use, they are likely to doubt its usefulness and may be reluctant to adopt it. In the context of technology acceptance, perceived ease of use and perceived usefulness influence each other and contribute to a person's interest in adopting technology. If someone finds technology easy to use and useful, they are likely to be more open to adopting and actively using it. In designing information systems and technology, designers and developers need to pay attention to perceived ease of use and usefulness. Ensuring an intuitive interface, clear guidelines, and functionality relevant to user needs can help increase positive perceived ease of use and perceived usefulness. Thus, users are more likely to feel comfortable and motivated to adopt and use the technology effectively. The research results carried out directly by Usman et al. (2020) and Lutfi (2022) support this study's finding that perceived ease of use is associated with perceived usefulness.

**Perceived Ease of Use in Mediating the Effect of Computer Self-Efficacy on Perceived Usefulness**

Perceived ease of use acts as a mediator between computer self-efficacy and perceived usefulness. Computer self-efficacy refers to an individual's belief in their ability to use computer technology. Individuals with high self-confidence tend to feel confident in using technology easily, can take advantage of technological features, and overcome obstacles that may arise. Perceived ease of use reflects a person's perception of the extent to which technology is considered easy to use. Factors such as interface appearance, complexity, and usage guidelines can affect perceived ease of use. If someone perceives technology as easy to use, they will likely feel confident operating it and more comfortable using it. Meanwhile, perceived usefulness represents a person's belief that technology will provide significant benefits and contributions in achieving goals or meeting their needs. If someone feels that technology is useful and adds value to their work or daily life, they are more likely to be interested in adopting and using that technology.

In the context of this relationship, perceived ease of use acts as a link between computer self-efficacy and perceived usefulness. It means that an individual's computer confidence can influence their perception of the ease of use of technology, which in turn affects their perceived usefulness of technology. For example, individuals with high computer confidence may find it easier to master and use new technologies. Their perception of high ease of use can then increase their perception of the usefulness of the technology. They may feel that technology can help them in their jobs, increase efficiency, or provide other expected benefits.

By understanding this relationship, technology organizations and designers can recognize the importance of facilitating high perceived ease of use. Building intuitive interfaces, providing clear guidance, and providing adequate user training or support can help improve perceived ease of use, strengthening users' perceived usefulness and interest in adopting the technology. According to a study by Usman et al. (2020), Gultom (2021), and Lutfi (2022), perceived ease of use can act as a mediator in the connection between computer self-efficacy and perceived usefulness.

### Perceived Ease of Use in Mediating the Effect of Degree of Openness on Perceived Usefulness

In this study, perceived ease of use did not mediate the relationship between the degree of openness and perceived usefulness in the context of technology acceptance. A degree of openness is defined as a person's openness or readiness to accept and use a new system or technology. On the other hand, perceived usefulness reflects a person's belief that technology will provide significant benefits and contributions in achieving goals or meeting user needs. Although the degree of openness can affect perceived usefulness, the relationship between the degree of openness and perceived usefulness does not involve perceived ease of use as a mediator. In other words, perceived ease of use does not explain the link between individual openness to technology and the perceived usefulness of the technology.

Therefore, in the relationship between the degree of openness and perceived usefulness, the role of perceived ease of use is irrelevant as a mediator, and individual openness to technology can directly affect their perception of the usefulness of technology without going through the influence of perceived ease of use. Based on the discussion above, the results of this study are not supported Nyssa and Rahmidani (2019), Sairaga and Maulana (2023), Ortega-Toro et al. (2019), and Öberg and Alexander (2019), explaining that perceived ease of use can mediate the degree of openness relationship with perceived usefulness.

### Perceived Ease of Use in Mediating the Effect of Trustworthiness on Perceived Usefulness

Therefore, trustworthiness impacted the intention to use SIMRS services. In the context of technology acceptance, perceived ease of use is thought to mediate between

trustworthiness and perceived usefulness. It denotes that perceived ease of use is an intermediary between trustworthiness and perceived usefulness.

Trustworthiness refers to the extent to which individuals trust a technology or system's reliability, honesty, and integrity. Factors such as the technology provider's reputation, data security, and system performance can affect an individual's perception of trust in the technology. People who view technology as trustworthy tend to feel more comfortable and motivated to use it. Then, perceived ease of use reflects one's perception of the extent to which technology is considered easy to use. If someone finds a technology easy to use, they will likely feel more comfortable and motivated to adopt and use it.

In this connection, mediation by perceived ease of use means that trustworthiness can influence perceived usefulness through perceived ease of use. In other words, an individual's belief in technology can affect their perception of the ease of use of technology, which in turn affects their perception of the usefulness of technology. For example, if someone feels the technology is trustworthy and secure, they will likely feel more comfortable using it. Their perception of high ease of use can then increase their perception of the usefulness of the technology. They may believe the technology will help them in their jobs, increase efficiency, or provide other expected benefits.

Hence, technology providers need to build trust through transparency, reliability, security, and good performance. In addition, technology providers must ensure that the interface and use of technology are well-designed to be easy for users to use. Thus, individual trust can be increased through highly perceived ease of use, which in turn will strengthen the user's perceived usefulness and interest in adopting the technology. Supporting that finding, research Nyssa and Rahmidani (2019), Usman et al. (2020), Lutfi (2022), and Sairaga and Maulana (2023) demonstrated that perceived ease of use can mediate the trustworthiness relationship with perceived usefulness.

**Perceived Ease of Use in Mediating the Effect of Technological Risk on Perceived Usefulness**

Technological risk alludes to the potential risks or negative consequences of using a particular technology or system. If users feel that the technology risks are too high or difficult to overcome, they may have less intention to use the system. A high technological risk can hinder user intentions and affect system adoption. On the other hand, perceived ease of use reflects a person's perception of the degree to which technology is perceived as easy to use. Factors such as interface appearance, complexity, and usage guidelines can affect perceived ease of use. If someone finds a technology easy to use, they will likely feel more comfortable and motivated to adopt and use it.

In this association, perceived ease of use acts as a mediator between technological risk and perceived usefulness. It denotes that perceived ease of use can affect the perceived usefulness of technology when technology risks are considered. If someone faces high technology risk but finds the technology easy to use, they may still be interested in using it. A highly perceived ease of use can help reduce feelings of uncertainty or fear regarding

technology risks and increase the perceived usefulness of technology. Hence, understanding and improving the perceived ease of use of technology can help overcome barriers that may arise due to technology risks and improve the perceived usefulness of technology. Factors that affect perceived ease of use, such as intuitive interface design, clear usage guidelines, and adequate training, can help create a more positive user experience and increase user interest in adopting and using the technology. This study finding is consistent with the results of research carried out directly Budiantara et al. (2019), Nazirwan (2019), Ferdiansyah et al. (2022), and Fahazzahrullail (2022), stating that perceived ease of use could mediate the relationship between technological risk and perceived usefulness.

**Perceived Ease of Use in Mediating the Effect of Facilitating Conditions on Perceived Usefulness**

In this case, facilitating conditions are factors that facilitate or support users using technology or systems. These factors can be the accessibility of technology, support from related parties, adequate training, user guides, or other resources that help users overcome obstacles in using the system. Perceived ease of use is an individual's perception of how user-friendly technology is. Factors including appearance, complexity, and usage instructions might impact the perceived ease of use. Individuals are more likely to accept and use technology if they find it easy to use, as it increases their comfort and motivation.

In this relationship, perceived ease of use mediated facilitating conditions and perceived usefulness. It indicates that perceived ease of use can affect the perceived usefulness of technology when facilitating factors are taken into account. If users are provided with good accessibility to technology, receive adequate training, and have clear user guides, they are more likely to become familiar with the technology and feel more comfortable using it. This high perception of ease of use can then increase the perception of the usefulness of technology because users feel that technology can help them in their work, increase efficiency, or provide other expected benefits. Therefore, understanding and improving technology's perceived ease of use can help increase facilitating factors' influence on perceived usefulness. Facilitating factors that promote ease of use, such as intuitive interface design, good training support, and accessibility of relevant resources, can help create a more positive user experience and increase the perception of technology's usefulness. Agreeing with that result, studies Natasia et al. (2022), Sukendro et al. (2020), Ferdiansyah et al. (2022), and Fahazzahrullail (2022) explained that perceived ease of use can mediate the relationship facilitating conditions with perceived usefulness.

# Conclusion

Based on the results of research conducted regarding the determining factors of SIMRS, this research succeeded in identifying the factors influencing the acceptance of SIMRS among doctors who practiced in the outpatient clinic of XYZ Hospital. First, these findings

revealed a positive and significant relationship between factors (computer self-efficacy, trustworthiness, technology risk facilitating conditions, and degree of openness) and perceived ease of use of SIMRS. In other words, doctors who feel more confident in operating computers, have high trust in SIMRS, feel that technological risks can be managed well, and are more open to innovation tend to find SIMRS easy to use. Second, these findings indicate that most factors studied did not significantly relate to perceived effectiveness. The only exception is the degree of openness factor, which positively and significantly influenced perceived effectiveness. This suggests that the extent to which a person is open to innovation may influence their views on the extent to which SIMRS is effective in its use.

The results of this research have important implications for XYZ Hospital and similar institutions. By understanding the factors influencing the perceived ease of use of SIMRS, hospitals can design more effective training programs to improve physicians' computer skills and confidence in using the system. This can contribute to increasing the effectiveness of SIMRS use in health services.

The results and conclusions drawn from the research led to several suggestions for improving future research, which are detailed as follows: First, for academics, it is suggested that later, they can utilize the findings of this study as a research description that can be explored further by measuring the ability of researchers to obtain data with their limitations to examine perceived usefulness in using SIMRS in other hospitals. Second, for further research, it is recommended to develop and expand additional characteristics, including computer self-efficacy, degree of openness, trustworthiness, technological risk, facilitating conditions, and perceived ease of use, which may provide a relationship with perceived usefulness with various variables, increasing the scope of research and expanding the population by completing data collection techniques so that research results are maximized.

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## Conflicts of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.