



Technology Readiness Index in Adopting the COVID-19 Reporting System at Referral Hospitals in Semarang City, Indonesia

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background and Objective: As a referral health care facility, the hospital has prepared an Allrecord COVID-19 reporting system, which has been integrated with the Hospital Management Information System. To explain optimism and innovation perceptions. users' perceptions of comfort and security in the covid-19 reporting system application.

Methods: The Mix-Method method was used in this study, with research subjects being Covid-19 data reporting officers at the Semarang COVID-19 referral hospital types C and B. The instrument employed a questionnaire with four dimensions (optimism, innovation, discomfort, and insecurity).

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Results: The perceived optimism obtained with a score of more than 3 is 86%, and with a score of less than 3 is 14%, indicating that this is consistent with the user's perception of optimism when using the Covid-19 reporting system application. The perception of innovation obtained is greater than a score of three, indicating a balance between agreeing and disagreeing with the perception of innovation from users of the COVID-19 reporting system application. The value of the user's perception of discomfort is greater than 3, with a score of 30%, and less than 3, with a score of 70%, indicating that they disagree with the user's perception of discomfort when using the co-19 reporting system application. Meanwhile, a perceived insecurity score greater than 3 is 0%, and a score less than 3 is 100%, indicating that it disagrees with the user's perception of insecurity when using the covid-19 reporting system application.

Conclusion: The application for the COVID-19 reporting system is satisfactory, and users are eager to begin using it. Continuous socialization of the use of reporting systems is required in referral hospitals.

Keywords: COVID-19 reporting system; Technology Readiness Index (TRI); Hospital management information system; COVID-19 referral hospital.

1. INTRODUCTION

The disease that is currently popular is caused by a virus called COVID-19, creating a critical and worrying situation around the world. This virus belongs to the Coronaviridae family and the Nidovirales order [1]. COVID-19 was discovered in the Chinese city of Wuhan in December 2019, causing pneumonia with symptoms of fever, dry cough, and fatigue to the point where patients struggle to breathe. Patients will feel dizzy, nauseous, and vomit. This is spread from person to person via droplets or droplets coughing or sneezing [2].

The hospital, as a referral health service facility, has prepared a Covid-19 Allrecord reporting system, which has been integrated with the Hospital Management Information System (SIMRS) in the form of an Online Hospital information system version 2 based on the letter of the Directorate General of Health Services No. IR.03.01/I.1/9665/2020 dated 31 August 2020 concerning Covid-19 Version 2 Reporting. The data reported is a summary of data on covid patients admitted to the hospital, patients treated with comorbidities, patients treated without comorbidities, discharged patients, availability of rooms and beds, availability and needs of human resources, Personal Protective Equipment and Medical Devices needs [3].

Given the importance of this data, specifically as a source and reference in making decisions about Covid-19 management, this issue should not be overlooked. The readiness of Covid-19 case data management system users is critical for reporting Covid-19 data with the Technology Readiness Index. As a result, users must

understand the function of the data reporting system that is their job in order to be more innovative, optimistic, and comfortable at work, as well as the level of data security that they handle in the reporting system COVID-19 [4].

The growing interest and need for information technology in the field of health reporting systems is also based on the benefits that its users experience. The greater the user's belief in the benefits of information technology, the greater the interest of medical personnel in using the Covid-19 Reporting System information technology to carry out their duties [5]. Another study found that the use of information technology had a positive impact [6]. The perception of optimism and innovation is a positive trigger for medical personnel's readiness to use the information technology-based Covid-19 Reporting System, as it can encourage medical personnel to become acquainted with new technology. Optimism produces a more positive attitude, which fosters a more positive attitude toward new technologies. Meanwhile, medical personnel are hesitant to use information technology for the Covid-19 data reporting system because of feelings of discomfort and insecurity [7]. Medics (users) will be more confident in implementing new technology because they will feel more assisted in carrying out their duties, the work will become lighter and easier, and users will be more innovative as a result. Perceptions of data information system innovation in hospitals have a significant positive impact on the system's perceived ease of use. In contrast, perceived insecurity has a negative impact on perceived usefulness. Users (medical personnel) who are unfamiliar with technology will find it more difficult. This perception leads

users to believe that technology is difficult to use, causes a lot of inconvenience, prefers simpler standard models, and is useless [8]. Perceived security can be defined as the user's (medical personnel) perception of data security, which in this case is covid 19 data. Technically, the security perception will ensure data integrity, confidentiality, authentication, and concerns about data modification by third parties without permission [9].

Study of the Technology Readiness Index in the implementation of the Covid-19 Reporting System at Referral Hospitals in Semarang City).

2. METHODS

The Mix-Method method was used in this study, with the research subjects being Covid-19 data reporting officers at the Covid-19 referral hospital in Semarang. The hospitals are of the type C and B varieties. The instrument employs a questionnaire with four dimensions: optimism, innovation, discomfort, and insecurity) [10,11].

2.1 Design

This study is a cross-sectional, mixed-methods study that employs an online survey to generate quantitative and descriptive narrative data from open questions [12].

2.2 Participant

The research subjects/participants were in charge of collecting data on Covid-19 cases at two referral hospitals in Semarang: Telogorejo

Hospital and Panti Wiloso Dr. Cipto Hospital. A total of eight people were involved in the study.

2.3 Data collection

For study participants to contact the researcher if additional assistance was required during or after the survey, a personal email account was provided.

2.4 Validity, Reliability and Thoroughness

The survey tool assessed its content validity, reliability, and thoroughness. It has previously been used in numerous research studies in Indonesia that looked at healthcare workers and nurses treating patients during COVID-19. A statistician's job is to analyze and interpret quantitative data.

3. RESULTS AND DISCUSSION

3.1 Results

The following findings were obtained as a result of the research:

3.1.1 The findings of a study on user perceptions of optimism when using the Covid-19 reporting system application.

More than a score of 3 is 86% on the optimism perception parameter, and less than a score of 3 is 14%, indicating that the user agrees with the perceived optimism of the user when using the Covid-19 reporting system application. Users are optimistic about using the application and have no reservations about doing so.

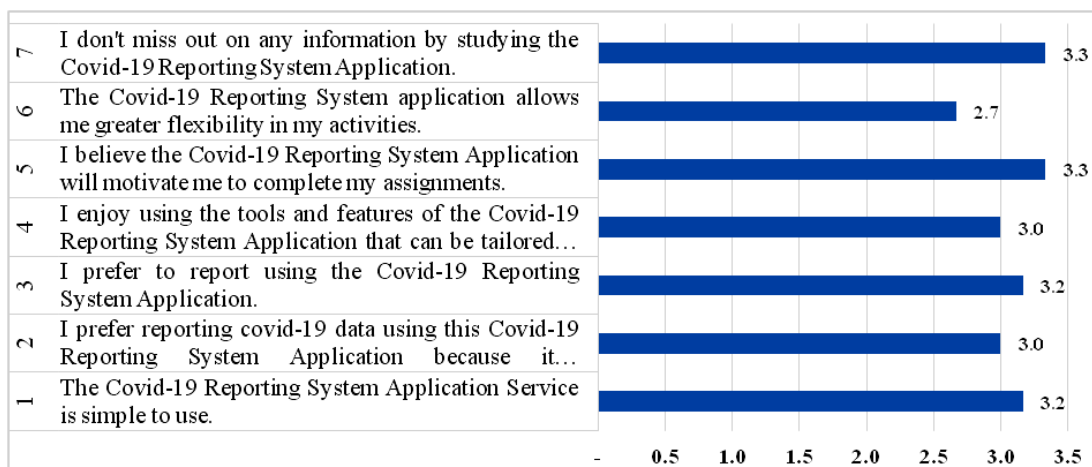


Fig. 1. Perception of user optimism in using the COVID-19 reporting system application

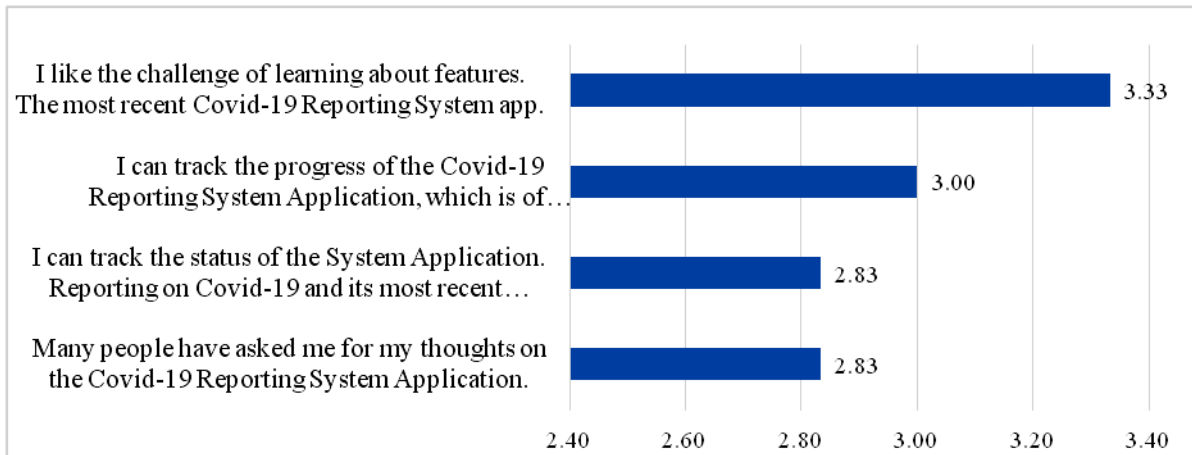


Fig. 2. Users' perceptions of innovation in using the COVID-19 reporting system application

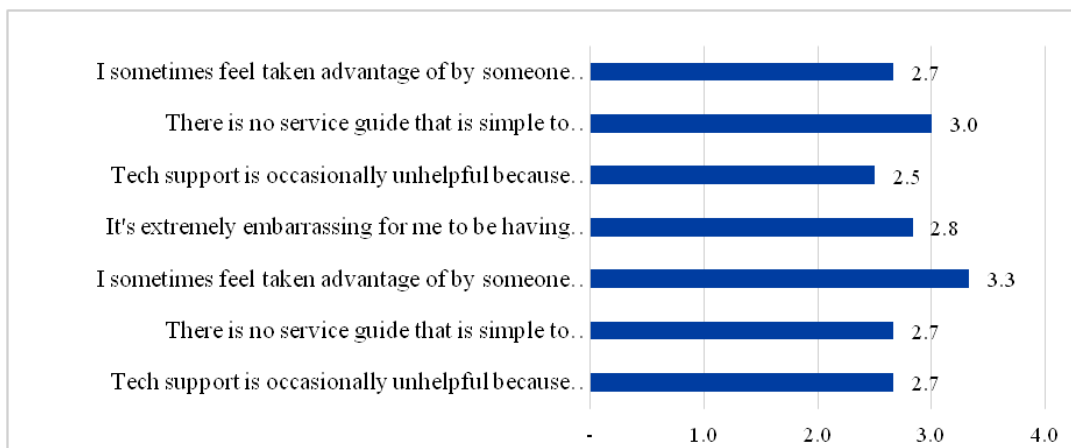


Fig. 3. Users' perceptions of discomfort with the COVID-19 reporting system application

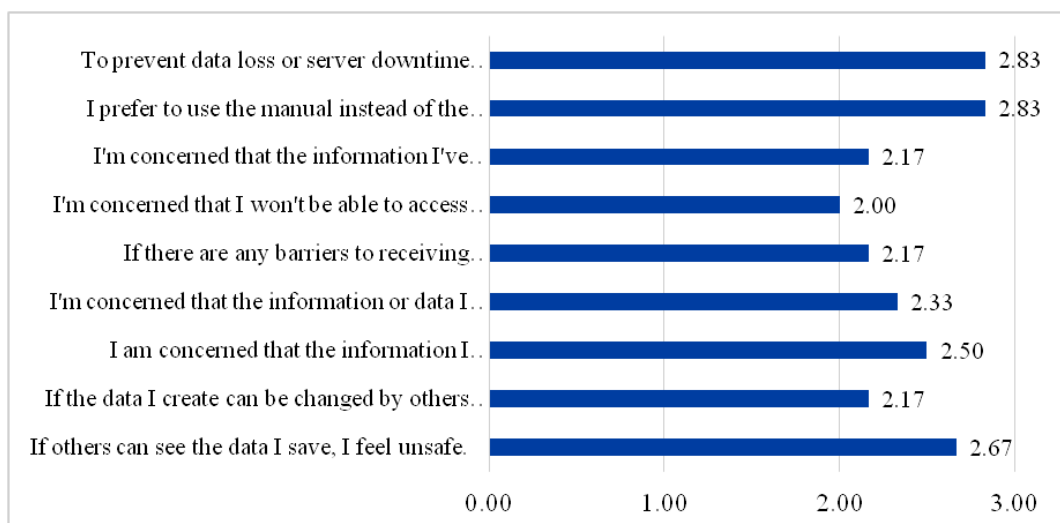


Fig. 4. Users' perceptions of Insecurity with the COVID-19 reporting system application

3.1.2 Users' perceptions of innovation when using the COVID-19 reporting system application

The results obtained with more than a score of 3 are 50%, and those obtained with less than a score of 3 are 50%, indicating that there is a balance between agreeing and disagreeing with the perception of innovation from users using the Covid-19 reporting system application, with the highest being in innovation, the part that enjoys challenges. This means that when there is new technology, users prefer challenges; they are more prepared and enjoy new experiences.

3.1.3 The user's perception of comfort in using the Covid-19 reporting system application

When using the higher Covid-19 reporting system application, the results obtained are greater than a score of 3, indicating 30%, and less than a score of 3, indicating 70%, indicating that you do not agree with the user's perception of discomfort. The average score is less than 3, and there is still a slightly uneasy attitude toward using the application that needs to be determined. Persepsi keamanan dari user dalam menggunakan aplikasi sistem pelaporan COVID-19.

The results obtained for the perception of insecurity are greater than a score of 3 (0%), and less than a score of 3 (100%), indicating that it does not agree with the user's perception of insecurity when using the Covid-19 reporting system application.

3.2 Discussion

There are various interpretations and perspectives on the role of information technology in the Covid-19 Reporting System. Technological readiness is a human character trait related to technology use. Technology Readiness is defined as the proclivity to use technology to complete and facilitate Covid 19 data reporting. [13] Technology readiness can also be measured using an index. Readiness to Use Technology is used to assess user readiness in using new technology by using four variables: (1) optimism (optimism), a positive attitude towards technology and the belief that technology will increase control, flexibility, and efficiency in life; (2) innovation, the tendency to be the first to use new technology products and services; and (3) discomfort, an attitude that is

difficult to control and a tendency to be the first to use new technology products and services [14].

Base on valued point whwn using the Covid-19 reporting system application. The results of the Perception study based on valued points (parameters) are as follows:

- 1) Users' perceptions of optimism have a positive value of 84% and a negative value of 16%
- 2) Users' perceptions of innovativeness have a positive value of 67% and a negative value of 33%
- 3) Users' perceptions of discomfort have a positive value of 0% and a negative value of 100%
- 4) Users' perceptions of security have a positive value of 84% and a negative value of 16%

3.2.1 Users' perceptions of optimism when using the Covid-19 reporting system application

Social support is one of the factors that influence optimism; with enough support, individuals can be more optimistic because they are confident that help will always be available when needed. Individuals who have high self-confidence in what they have and are confident in their abilities will be optimistic. c. People with high self-esteem are always motivated to maintain a positive view of themselves and look for personal assets that can offset failures, so they always try harder and better in subsequent attempts. d. accumulation of individual experiences in dealing with problems or challenges, particularly successful experiences that can foster an optimistic attitude [15]. Reporting procedures and levels include: 1) Input: patient data, patient status/condition data after obtaining laboratory results, actions taken. 2) Procedure: Central Java Corona website, Ministry of Health application, City Health Service application, and Covid Task Force. and 3) Output: returns a count of corona patients. Every day, after receiving the results of the patient's laboratory examination, the Central Java corona application is used (PCR test). Medical record officers, nurses, laboratory/laboratory analysts, secretariats, and doctors are among those involved in this level of reporting. Because the procedures and levels of reporting are quite complex, skilled, educated, and trained human resources as well as specific education are required. Medical personnel are educated and trained human resources with high confidence and work experience as practitioners, allowing for a positive attitude [15,16].

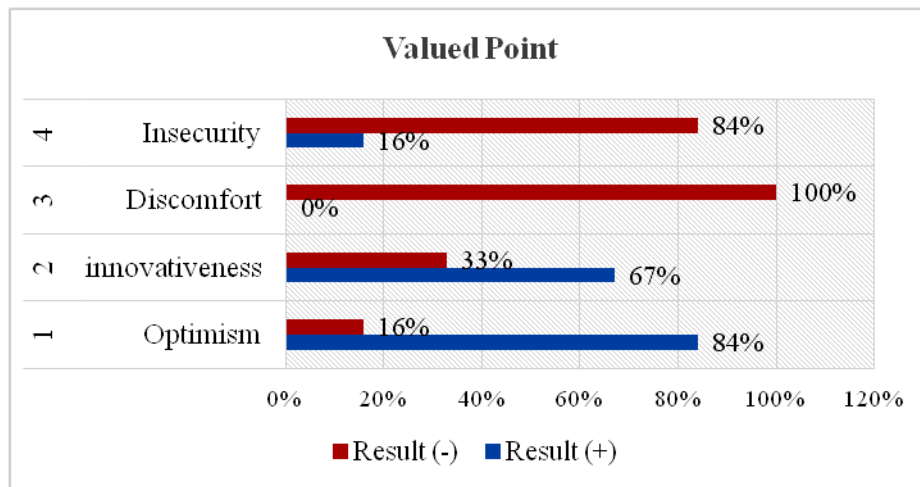


Fig. 5. valued point whwn using the COVID-19 reporting system application

The results obtained for the perception of optimism are greater than a score of 3 of 86% and less than a score of 3 of 14%, indicating that users have a sense of optimism when using the co-19 reporting system application. One of the factors that contributed to this sense of optimism was the officers' understanding of the application of the covid-19 reporting system. Based on the findings of FGD interviews with respondents, all officers were able to correctly identify the application used in reporting covid-19 data to the national covid-19 task force as the Corona Central Java system application.

However, there are several other applications that must be filled out as reports by health workers, including those from health facilities (Ministry of Health), Semarang City Health Office, Central Java Provincial Health Office, and the Covid-19 task force system. This is a burden for offi cers, and some of these applications cannot be implemented because they are not yet integrated [17].

3.2.2 Users' perceptions of innovation in using the Covid-19 reporting system application.

The ability to use creativity to solve problems and create opportunities to improve human welfare is referred to as innovation. The development of the COVID-19 data reporting system is an upgrade from the previous reporting system, with the goal of improving medical personnel performance and making work easier [18]. With the advancement of technology in the field of health and medicine, this is nothing new for medical personnel; therefore, innovation must be accepted and developed for the advancement of science [19].

In other studies, researchers discovered that innovation has an indirect effect on behavioral intentions to use information technology. Innovation is regarded as a trait that is unaffected by external or internal factors [20]. Menurut Solberg E, Traavik LE, Wong SI. (2020) shows that the more innovative a person is, the less complex a set of beliefs he will have about new technologies. An innovative person will feel that technology is an easy thing [21]. This argument is supported by the findings from a study conducted by Kartikasari et al. (2017) which states that one's innovativeness significantly has a positive influence on perceived ease of use [22].

The findings of a study on perceptions of innovation show that those with a score of more than 3 are 50%, while those with a score less than 3 are 50%, indicating that there is a balance between agreeing and disagreeing with the perceptions of innovation users. when using the Covid-19 reporting system application. This is possible because technological innovations related to the reporting system have been implemented before, however, because there are several similar applications that must be run, the staff assumes that their workload has increased, and some of these applications have not been integrated with each other so they have to do the work repeatedly.

3.2.3 Users' perceptions of discomfort when using the Covid-19 reporting system application

Discomfort with information technology describes a person's lack of confidence in mastering technology. The dimension of discomfort also

reflects one's lack of technological mastery. Individual discomfort with technology is referred to as discomfort. People who are highly uncomfortable believe they have no control over technology and are overwhelmed by it [13]. The level of discomfort also reflects one's technological mastery. People who are highly anxious believe they have no control over technology and are overwhelmed by it, so they believe it is useless. Previous research has clearly demonstrated a link between variable discomfort and perceived usefulness [23].

On the perception of discomfort, the results obtained are greater than a score of 3 of 30% and less than a score of 3 of 70%, indicating that they do not agree with the user's perception of discomfort being higher when using the Covid-19 reporting system application.. According to the service features available in the reporting application, users like it because it is directly connected to the care for protection application (the Indonesian Ministry of Health's Covid 19 data reporting system program), while the service feature that is disliked is that filling out the application is a little complicated because there are multiple applications, User cannot edit data after 12 o'clock, and the system is slow. All informants who used this application stated that they were at ease with it and that it did not add to officers' workload. The following are the obstacles to using this application: 1) Input: differences in data calculation, patient data is incomplete. 2) Process: applications frequently encounter system errors and a slow network. However, the majority of the informants felt it was more useful to use the Central Java All Record Corona application, and 50% of the informants felt they had leadership support in using the Central Java All Record Corona application, which came in the form of infrastructure and training facilities, while the rest stated that they did not receive support from internal parties..

3.2.4 Users' perceptions of security when using the Covid-19 reporting system application

The embodiment with the existence of Law No. 11 2008, concerning Information and Transactions Electronic, particularly in Article 4, that use of information technology and electronic transactions carried out with other goals include providing a sense of security, justice, and legal certainty for organizers of information Technology [24], Thus, insecurity acts as a mental barrier to accepting new technology. The implementation of health information security is

to secure data and information according to the level of classification of information assets and information confidentiality, maintain document security, secure computer equipment used, manage passwords, use intranets, internet, electronic mail, and Wi-Fi, to practice information technology ethics, and use licensed software. As a result, it will be very important for every medical officer to be aware of and implement information security rules for the use of medical data in hospitals. This has a positive impact on the acceptance of information system data for health workers who handle clinical data [25].

The result obtained for the perception of insecurity is that more than a score of 3 is 0% and less than a score of 3 is 100%, indicating that you do not agree with the perception of insecurity from users when using the Covid-19 reporting system application. This is due to frequent application obstacles such as data processing management and reporting delays, but the informants overcame these obstacles by re-reading the technical guidelines, cross-referencing the Hospital Management Information System (SIMRS), and contacting IT experts. Informants believed that the difficulties they faced had an impact on their reporting.

4. CONCLUSION

The Covid 19 reporting system application is satisfying, and users are eager to start using it. Officers already understand the reporting of covid patients with the Covid-19 Reporting System, but managing data processing and delays in reporting Covid patients are often obstacles.

The need for socialization and assistance in the implementation of reporting all records covid-19 in hospitals; there must be coordination from every level related to reporting, beginning with national, regional, and area, so that there is no impression of a lack of coordination, particularly in technical data collection and reporting; and hospital management must provide support in the form of training/work.

5. DATA AVAILABILITY

All necessary information is contained in supporting information papers and files. With the Technology Readiness Index, this study will assist researchers in identifying critical areas of User Readiness of the Covid-19 Reporting System (Allrecord) in the Semarang City Referral Hospital.

CONSENT

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

Dian Nuswantoro University's research ethics committee approved the study in the form of an Ethical Clearance No. 21286/TU.710/KEPK/K/2021, which was explained on the first page of the survey and implied when the respondent chose to begin answering questions.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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