

# Hospital Acceptance Toward Management Information Systems in Indonesia

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**Submission date:** 22-Nov-2021 07:59AM (UTC+0800)

**Submission ID:** 1709446465

**File name:** Hospital\_Staff\_Acceptance\_Toward\_Management\_HAT.pdf (354.84K)

**Word count:** 2393

**Character count:** 13126



Contents lists available at ScienceDirect

## Health Policy and Technology

journal homepage: [www.elsevier.com/locate/hlpt](http://www.elsevier.com/locate/hlpt)



Research Letter

# Hospital staff acceptance toward management information systems in Indonesia



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### ARTICLE INFO

#### Article history:

Available online 1 August 2020

#### Keywords:

Hospital administration management  
Information system  
Public health  
Technology acceptance model  
Information and Communication Technology

### ABSTRACT

**Background:** The use of hospital information systems in Indonesian hospitals have not met the proper level of acceptance. This study aims to assess the intention to use information systems among hospital staff.

**Methods:** This study used an online survey that was disseminated for 2 weeks in July 2019. The questions were developed based on the Technology Acceptance Model with the addition of Perceived Risk. The survey yielded 449 total responses, with only 400 determined to be valid. A total of three factors, namely: Perceived Usefulness, Perceived Ease of Use, and Perceived Risk were measured and then analyzed for its influence on Intention to Use, and to each other.

**Results:** The finding shows that only Perceived Usefulness has a significant influence on Intention to Use ( $\beta = 0,57$ ). Furthermore, higher Perceived Ease of Use was associated with higher Perceived Usefulness ( $\beta = 0,68$ ). Accordingly, higher Perceived Ease of Use also associated with significantly lower Perceived Risk ( $\beta = -0,49$ ). The finding indicates that hospital employees do not yet have a strong perception of risk toward using hospital information systems.

**Conclusions:** employees' perception of the benefits of using hospital information systems greatly determines their intention to use hospital information systems.

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### Introduction

Information systems play important role in many organizations as well as in healthcare and hospitals. In Indonesia, every hospital must use computer-based information systems as regulated by Indonesian government to assure hospital management efficiency. In 2017, the Ministry of Health of the Republic of Indonesia introduced strategy of e-kesehatan to further embrace the importance of information systems for healthcare organizations. This strategy also includes aset of guideline to enhance the accessibility and continuity of healthcare services [1,2].

Previous studies have shown many benefits of well-integrated hospital information systems (HIS) in healthcare services which include service quality improvement, cutting cost, and increasing patients' engagement and well-being [3]. These advantages can only be achieved through healthcare personnel acceptance

and continuous systems implementation [4]. Staff rejection and poorly perceived of HIS implementation due to large adjustment on current workflow are affecting technology acceptance in the hospital [4,5]. Staff refusal to adapt and use HIS as new technology can bring down its positive values. As a result, technology acceptance is essential to gain HIS benefits to healthcare organization.

Technology Acceptance Model (TAM) has been used and extended to find additional factors that might contribute to the acceptance. Research on TAM, by nature, are highly contextual and case-specific, thus it can be used to find contributing factors in hospital information systems acceptance [6,7]. Recent studies on healthcare technology acceptance have found contribution of perceived usefulness, perceived ease of use, subjective norm, trust, and perceived risk towards HIS [8,9].

This research strives to seek contributing factors healthcare personnel in accepting HIS in Indonesia by adopt TAM which considered as a reliable model that use human factors (i.e. Perceived Usefulness and Perceived Ease of Use) to predict technology adoption within an organization [10]. Further findings might bring more

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**Table 1**  
Respondent demographics.

Employee role	Percentage
Medical	32.7%
Nursing	21.9%
Pharmacy	8.1%
Others	3.6%

benefits to promote healthcare staff and managers intention to use of HIS. Therefore, this study aims to identify the contributing factors of HIS acceptance in Indonesia using Technology Acceptance Model.

## Methods

This study used an online survey with Google Forms as a questionnaire tool. The survey was disseminated for 2 weeks in July 2019. A purposive sampling was used as a sampling method in order to limit the respondent to a hospital staff only, but not one specific hospital was deliberately targeted. The survey was broadcasted via personal messages and emails with a link to the online survey.

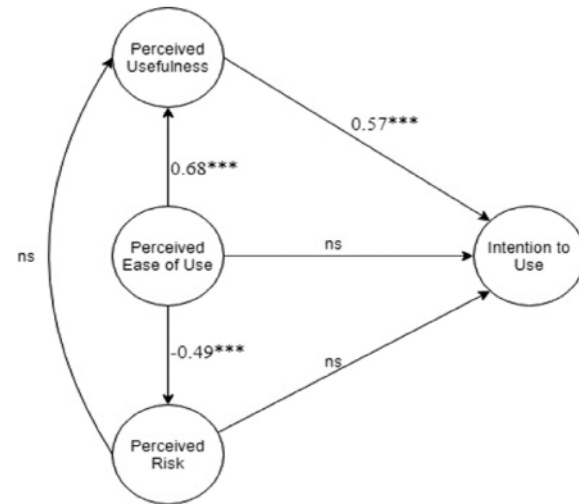
In this study, perceived of usefulness is defined as the degree to which a person believes that an innovation or a technology can be beneficial or helpful to complete his/her daily tasks. Next, perceived ease of use is the degree to which a person think that an innovation or a technology is easy to use with minimal to no effort of learning how to use it [10]. Furthermore, perceived of risk is the degree to which a person think that using a new technology or innovation will increase the possibility of making mistakes while using it therefore will bring more negative consequence than benefit [6,7].

An informed consent is presented to the respondent initially followed with a set of basic demographic questions including a question about the hospital that the respondent affiliated with, and their job at the hospital, were presented. The demographic questions were asked to identify the hospital working environment and the hospital involvement with information systems.

The measurement questions were developed based on the factors in Technology Acceptance Model with the addition of Perceived Risk. All variables in the model were operationalized with 5-point Likert scales, which then each construct was measured by five measurement items, except Intention to Use (which was measured by two items). The measurement items were deemed reliable for analysis with Cronbach's Alpha for each composite item valued more than 0.7, specifically: Perceived Usefulness ( $\beta = 0.89$ ), Perceived Ease of Use ( $\beta = 0.89$ ), Perceived Risk ( $\beta = 0.82$ ), and Intention to Use ( $\beta = 0.90$ ) [11]. A total of three factors, namely: Perceived Usefulness, Perceived Ease of Use, and Perceived Risk were measured and then analyzed for its influence on Intention to Use, as well as their relationship to each other. To analyze the conceptual model, a structural equation model was created using SPSS AMOS. The data source was then linked to the model and then the model was analyzed for its fit to the data.

## Results

The survey was concluded with 449 total responses, in which only 400 were determined to be valid for analysis. Most of the respondents reported themselves to be a Doctor (32%) which is important to note. The demographic for the respondents is depicted on Table 1. To analyze the model, a global test was first performed to determine the model fit to the data. The model fit indices indicate that the model is fit with SRMR = 0.05, RMSEA = 0.06, and



**Fig. 1.** Model test result.

CFI = 0.95 [12]. Since the model fit is confirmed, the relationship between variables can then be tested for its significance.

According to the test results, only Perceived Usefulness has significant positive influence on Intention to Use. While Perceived Ease of Use and Perceived Risk did not have a significant influence. Interestingly, Perceived Ease of Use has a significant influence on Perceived Usefulness, consistent to the original TAM model. Furthermore, Perceived Ease of Use has a significant indirect effect to Intention to Use which was mediated by Perceived Usefulness. The details of the model test results are depicted on Fig. 1.

The findings from this study contributes to existing TAM model by adding Perceived Risk as a variable that is theoretically exists in every aspects of a technology-related task, especially in Hospital Information Systems, which possess a different level of risk, since it includes a matter of life and death. However, Perceived Risk did not have a significant influence on Intention to Use and Perceived Usefulness in this study, although it has been confirmed in previous studies that Perceived Risk is an important variable in Technology Acceptance, although in a different work environment [6,7].

Nonetheless, it is confirmed in the finding that Perceived Ease of Use has a significant negative influence on Perceived Risk, which is consistent to previous studies [6,7].

## Discussions

Looking back to the respondent demographics, most of the respondents are doctors (32%) which may have a different purpose in using the information system. Most of the administrative tasks were done by the staff who do not have a direct contact with medical task, therefore the doctors may have less exposure to the hospital information systems compared to the administration staff. The doctor's perception of risk may also differ due to their daily job which deals with life-and-death level of risk. It is important to note that although information systems' risk include patient safety, it has a different level of risk compared to medical risk.

It is important to note that the respondents of this study are medical professionals who might have a different perception of risk towards the use of information system, which is assumed it may be the case that related to the insignificance of Perceived Risk toward Intention to Use.

Finally, it is recommended that the hospital should provide more insights about the benefit of using hospital information sys-

tem by conducting a regular briefing on how information systems work in a hospital environment so that the level of acceptance in using hospital information system can increase.

#### Future research and limitations

This study has some limitations. The sample size and sampling technique are not considered a good method to apply the finding to the general public. Perceived Risk also needs to be investigated deeper since it depends heavily on the respondent's line of work.

The purposive sampling used in this study may be suitable for an exploratory study, which can be upscaled in future research.

Future research may also add experimental design and variable in the study such as Usability study, which can be associated with Perceived Ease of Use, and in-depth interview, which can yield potential unseen problem of technology acceptance among the staff. Perceived Risk needs to be addressed in future research by confirming the real risk associated to the use of Hospital Information System, the question related to Perceived Risk in the questionnaire needs to be revamped and adjusted according to the field of work, because risk are highly depends on the respondent's demographic.

#### Conclusions

Employees' perception of the benefits of using hospital information systems greatly determines their intention to use hospital information systems. Such perceived benefits are found to be influenced by their perceived ease of using the information systems. Although there may be other factors that can influence perceived usefulness as well.

The finding of this study supported the hypothesis for the original TAM model by Davis [10]. It is shown that Perceived Usefulness is the most significant factor in the hospital information system acceptance, and Perceived Usefulness acts as a mediating variable for Perceived Ease of Use.

However, Perceived Risk as a unique addition from this study was not found to be statistically significant, although the theoretical background for the presence of risk in technology-related task were studied [6,7].

#### Research data

The research data is available upon request. The data will be stripped for its identifier to maintain the respondent's confidentiality.

#### Acknowledgement

Airlangga, Document Number 630-KEPK of the year 2018.

#### 17 Author Statements

#### Funding

None.

#### Competing interests

None declared.

#### Ethical approval

4 Approved by Health Research Ethics Committee of Faculty of Public Health Universitas.

#### References

- [1] Kuperman GJ, Gardner RM, Pryor TA. HELP: a dynamic hospital information system. Computers and medicine. Orthner HF, editor, New York, NY: Springer New York; 1991. Available from: <http://link.springer.com/10.1007/978-1-4612-3070-0>.
- [2] Handayani PW, Hidayanto AN, Pinem AA, Hapsari IC, Sandhyaduhita PI, Budi I. Acceptance model of a Hospital Information System. Int J Med Inform 2017;99(Mar):11–28. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S1386505616302726>.
- [3] Goldzweig CL, Towfigh A, Maglione M, Shekelle PG. Costs and benefits of health information technology: new trends from the literature. Health Aff Mar 2009;28(2):w282–93. Available from: <http://www.healthaffairs.org/doi/10.1377/hlthaff.28.2.w282>.
- [4] Buntin MB, Burke MF, Hoaglin MC, Blumenthal D. The benefits of health information technology: a review of the recent literature shows predominantly positive results. Health Aff Mar 2011;30(3):464–71. Available from: <http://www.healthaffairs.org/doi/10.1377/hlthaff.2011.0178>.
- [5] Ajami S. Training and its impact on hospital information system (HIS) success. J Inf Technol Softw Eng 2012;02(05). Available from: <https://www.omicsonline.org/open-access/training-and-its-impact-on-hospital-information-system-his-success-2165-7866.1000112.php?aid=9688>.
- [6] Lee MC. Factors influencing the adoption of internet banking: an integration of TAM and TPB with perceived risk and perceived benefit. Electron Commer Res Appl 2009;8(3):130–41.
- [7] Featherman MS, Pavlou PA. Predicting e-services adoption: a perceived risk facets perspective. Int J Hum Comput Stud 2003;59(4):451–74.
- [8] Strudwick G. Predicting nurses' use of healthcare technology using the technology acceptance model: an integrative review. CIN: Comput, Inform, Nurs May 2015;33(5):189–98. Available from: <https://insights.ovid.com/crossref?an=00024665-201505000-00004>.
- [9] Wu JH, Shen WS, Lin LM, Greenes RA, Bates DW. Testing the technology acceptance model for evaluating healthcare professionals' intention to use an adverse event reporting system. Int J Qual Health Care Dec 2007;20(2):123–9. Available from: <https://academic.oup.com/intqhc/article-lookup/doi/10.1093/intqhc/mzm074>.
- [10] Davis FD. Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Q 1989;13(3):319–40.
- [11] Nunnally JC. Psychometric theory. New York: McGraw; 1978.
- [12] Kline RB. Principles and practice of structural equation modeling. Guilford publications; 2015.

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