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Investigation of E-Health Acceptance Factor
Case Study in Rural Area of Central Kalimantan

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Abstract - The E-Health is used to support information technology to maximize the tasks and medical services in the hospital. However, the hospital's management still have some issues due to E-Health implementation, particularly in the interaction with the system. This study identifies significant factors affecting the implementation of E-Health. Testing a model has been done, to identify factors affecting E-Health acceptance. Quantitative Research methods has been done is implemented in this research, by conducting a survey of 150 respondents on health practitioners in the District Hospital of Gunung Mas Province of Central Kalimantan. Random Sampling Method has been-done is performed by doctors, nurses, medical record officers, and midwives. Meanwhile, model testing has been-done with Structural Equation Model (SEM) analysis technique. The results of this study show that computer self-efficacy factor is the most powerful factor influencing user's opinion about perceived ease of use and perceived the usefulness of E-Health (significant $p < 0.05$), followed by compatibility, top management support, information quality, system quality, facilitating condition, service quality, complexity, and adaptability. Hospital management needs to work together as a team effort to medical practitioners to apply E-Health in hospitals. Supports and awareness from various parties, such as government, IT support, and resources are expected to help implement E-Health in rural areas. The result of this study could be a decision in taking steps to implement E-Health in the future, in order to improve services of people in rural areas.

Keywords – E-Health, Technology Acceptance Model, Hospital, Rural.

I. INTRODUCTION

The E-Health technology is defined as medical services based on information technology and health communication. The E-Health support health assistance on communities, particularly in rural areas. Implementation of E-Health is an effort to improve the flow of information with electronic media to support the management of systems and health services [1]. The development of E-Health is also done in the process of disease observation through a scan in a rapid process [2]. Implementation of E-Health can improve service, efficiency, quality, and can reduce health costs [3].

The development of E-Health technology can overcome the lack of specialist doctors in local hospitals by using telemedicine [4]. Implementation of E-Health allows patients not to travel long distances to get health services [5]. The use of E-Health technology more emphasis on empowerment of individuals with the chronic disease to actively engaged in managing their health [6]. The E-Health has been adopted in some countries [7]–[9], but are still lacking in Indonesia to adopt E-Health technologies.

In research conducted by [11], [12], shows that user factors play an important role in realizing the quality of service performance of a health organization.

The purpose of this study is to identify the affecting factors of E-Health acceptance for medical practitioners at Gunung Mas Hospital in Central Kalimantan. It is expected to improve the understanding of individuals and management about the use of E-Health in performing services in hospitals. Hospital management can make evaluations and recommendations in

implementing E-Health based on these factors. To achieve this, Technology Acceptance Model (TAM) will be implemented in this research.

Technology Acceptance Model (TAM) is a model built to determine the factors that affect user acceptance of a computer-based technology. This model was proposed by Davis, Fred D. in 1989 [13]. The TAM model is built upon the development of Theory of Reaction Action (TRA) to explain the relationship between attitude and volitional behavior [14]. This relates to a person's motivation to display a reaction based on intent. The construction of the TAM model has been proven to understand and explain the perceived usefulness (PU) and perceived ease of use (PEOU) of users, on the implementation of information technology. The use of TAM has been tested in empirical research and can rely on as it can provide a basis for external variables, perceived usefulness and perceived ease of use [11], [15]–[17].

In research conducted by [11], research was conducted on medical staff in private and government-owned hospitals. Handayani et al, adopted TAM model from [18] with its constructs consisting of external variables, perceived usefulness, perceived ease of use, and acceptance of the Hospital Information System (HIS). The results of these studies prove that non-technological factors influence PU, PEOU and HIS acceptance.

Empirical research is done by [18], the study was conducted to investigate the factors that affect the reception of nurse anesthesia on Pain Management Decision Support Systems (PM-DSS). The results of the study prove that the perception of the nurse anesthesia affects the acceptance of Pain Management Decision Support Systems.

Chung-Fei Liu, et al (2013) [19], conducted a study with TAM to find out factors affecting patient acceptance of a personal health record system (PHR). The results of the study prove that the Patient-Physician Relationship (PPR) affects patient and PEOU, PU toward PHR.

Further research was conducted by R.Gajayanake, et al, (2016) [20], this study uses Technology Acceptance to identify factors that affect the acceptance of Health Professionals to Accountable-eHealth (AcH) System. Moderation in the study proved to affect perceptions of intentions of health professionals against AcH System.

This study also adopted from previous research related to the theory of technology acceptance [14], [21]–[23]. Previous research [24], using TAM to assess PU and PEOU on health professionals for online counseling. The results of the study indicate that the intent of use and perceived usefulness (PU), significantly predict the intentions of use and correlate influence with perceived users.

There are 4 main constructs of TAM theory: external variables, perceived usefulness, perceived ease of use, and system acceptance. The TAM approach provides the flexibility to add external factors that affect technology acceptance. This study will adopt the conceptual model of user acceptance from Handayani et al, (2016) [11].

The conceptual model in this study will be modified as shown in Fig.1, external factors are categorized into 4 sections: Human Characteristic, Organizational Characteristic, Technology Characteristic, and Innovation Characteristic.

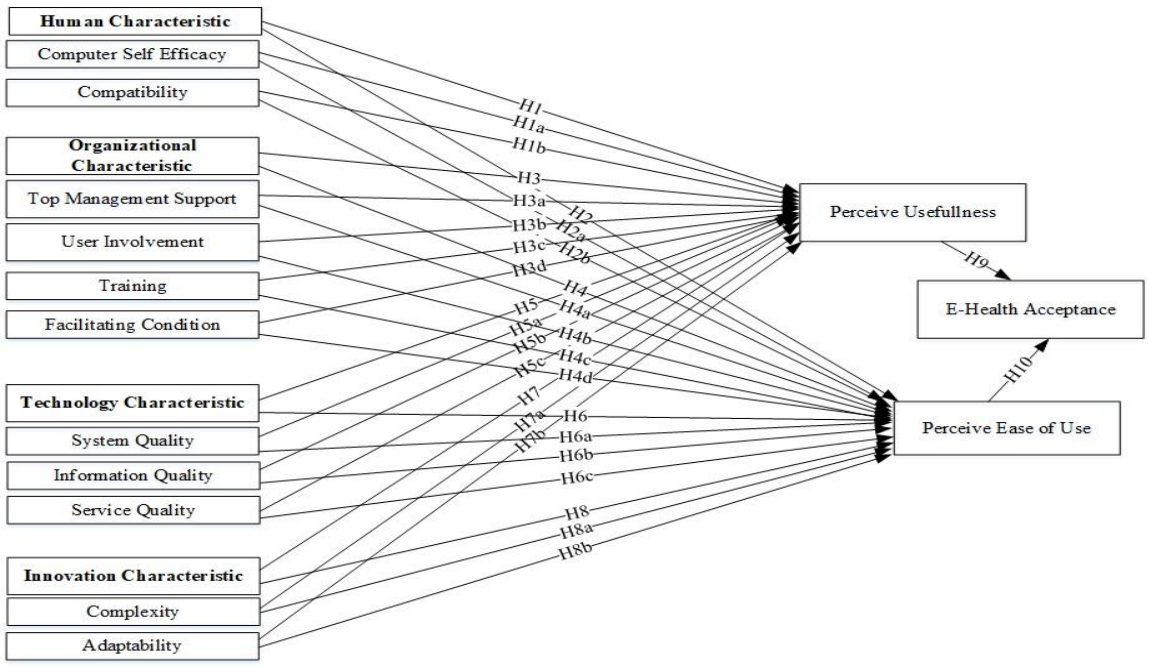

Figure 1. Conceptual Model of E-Health User Acceptance

Human characteristic reflects computer self-efficacy (CSE), and Compatibility (COMP). Organizational characteristic consists of Top Management Support (TMS), User Involvement (UIV), Training (TR), and Facilitating Condition (FC). Technology Characteristic will reflect Information Quality (IQ), System Quality (SQ), and Service Quality (SEQ), the latest Innovation Characteristic there are 2 i.e. Complexity (CP) and Adaptability (AD). In total, there are 11 external factors, which are part of TAM in this study.

Computer self-efficacy is defined as the self-assessment of health workers over its ability to use E-Health systems to complete clinical work or task. CSE becomes an important factor because it becomes an influence on the TAM model. Compatibility is defined the consistent level of innovation based on the necessities, values, and experience of the adopters [11], [18], [25]. The compatibility factor refers to the level of system application consistent with the previous user, needs, and experience. Previous research has found that compatibility is a significant factor affecting the individual's desire to adopt technological innovation [25]–[27].

Top management support related to professional stakeholders, which consists of organizational structure, leadership, and medical personnel [18]. User involvement is defined as greater user engagement in the design, implementation, and evaluation of IT health [18]. In research conducted by [11], user involvement is defined as the user's active participation in design, communication, and training processes.

Training is defined as a way, to introduce ICT in an effort to improve user performance. In previous research, training became an important factor that can affect the level of computer skills, care, and build ICT infrastructure as an effort to improve health services [28]–[30].

In research conducted by [31], Facilitating condition is defined as one of the supporting resources of objective factors that can make certain behavior to be easy to adopt the technology. Previous research understands that facilitating condition is a supporting factor of E-Health implementation [15], [32]–[34].

Another factor, System quality is defined as the level of software excellence and focuses on the consistency of the user interface, the level of system response, archiving, and bug-free system [11]. Other studies understand, that the quality of the system also includes reliability and system security [18].

Quality of information is defined as the level of excellence an information generated by the software. The quality of information focuses on the difficulties associated with accuracy, timeliness, information format, and relevance generated by the system [11]. Previous research has proven that the quality of information is important in the application of E-Health [35], [36].

Service quality refers to all support provided by the department, or resource provider [37]. The quality level is defined as Measuring the quality of system services from the user's view, for example, managing online registration skills and the breadth of service information provided by the hospital [38].

Furthermore, complexity is a complicated factor such as slow system performance that is difficult to use, the work involved in transferring records between two systems, the inability to provide real-time access, slow speed, unplanned downtime and connectivity issues will affect system implementation [26]. Other studies also assess that complexity is an important factor that affects user acceptance in adopting technology [15], [39].

The last factor is adaptability where the technology is updated, to be able to customize the design with local context [26]. Adaptability is also defined as Adaptability, i.e. willingness to try new things and take risks [40].

In an effort to improve health services in rural areas, this research will focus on the perceived human, organizational, technology, and innovation at Gunung Mas District Hospital, Central Kalimantan.

II. RESEARCH METHOD

This research will be conducted at Gunung Mas District Hospital, Central Kalimantan. Locations are chosen because Hospitals will gradually implement E-Health to support information technology in hospitals. Paper-based surveys have been done conducted on medical practitioners such as physicians, clinical stakeholders and units, nurses, midwives, and medical record staff, questionnaire data collection was done, as many as 150 respondents medical staff based on the random sampling approach. Questionnaires in previous studies [11], [18] related to the acceptance of health technology systems will be used in this study.

Measurement by Likert scale will be used in this study, each parameter has a value based on 5 Positive Point. The tool used in this TAM research consists of 41 instruments (as shown in table 1): 6 Items for Human Characteristic, 12 Items for Organizational Characteristic, 9 items for technology characteristic, 6 items for innovation characteristic, 3 items for PEOU, 3 items for PU and 2 items for E-Health Acceptance (EA).

Table 1. Questionnaire

Variable	Item	Question
Perceived usefulness	PU1	E-Health can improve the effectiveness of my work.
	PU2	E-Health will be fully useful for my work.
	PU3	E-Health can improve my productivity.

Variable	Item	Question
Perceived ease of use	PEOU1	I would be easy using E-Health
	PEOU2	I would find it easy to use E-Health to do my work.
	PEOU3	It would be easier for me to be an expert, in using E-Health .
Computer self-efficacy	CSE1	I can do work with E-Health if I have never used the system before
	CSE2	I can do the job using E-Health if I already use the same system before someone does the same job with E-Health
	CSE3	I have the ability to operate E-Health
Compatibility	COMP1	Use E-Health according to the way I work
	COMP2	Use E-Health according to my practice preference
	COMP3	Using E-Health suits my service needs
Top Management Support	TMS1	Top managers provide support for the adoption of new technology
	TMS2	Top managers have an active participation in the E-Health decision-making process
	TMS3	Top managers provide an adequate resource for E-Health development
User involvement	UIV1	I was involved in the corresponding process of E-Health socialization.
	UIV2	I am involved in designing E-Health needs.
	UIV3	I was involved in the implementation of E-Health .
Training	TR1	I got the training related to E-Health .
	TR2	I can actualize the results of training related to E-Health, so I can use E-Health.
	TR3	I can easily follow the practices taught training.
Facilitating condition	FC1	The device needed for E-Health are readily available.
	FC2	I have some knowledge of E-Health , so I can use the E-Health .
	FC3	There are a few people or a certain group will help me when I have difficulties in using E-Health.
System quality	SQ1	E-Health provides timely information.
	SQ2	The system is reliable, despite system failures.
	SQ3	The E-Health security to prevent unauthorized access to patient data is already effective.
Information quality	IQ1	E-Health is powerful in integrating data from multiple sources.
	IQ2	I feel information that is processed with E-Health, will be more accurate.
	IQ3	I feel the information conveyed by E-Health, will be well formatted.
Service quality	SEQ1	The data I entered, easy to upload to the central processing system.
	SEQ2	Data from E-Health pain can be trusted.
Complexity	CP1	E-Health is too difficult to learn.
	CP2	E-Health is difficult because it has many features.
	CP3	It is too difficult to remember the steps.
Adaptability	AD1	I can follow what is discussed during training.
	AD2	I can follow any changes to the system.
	AD3	I can receive and learn well any changes in the system.
E-Health Acceptance	EHA1	I easily adjust each stage change from the organization.
	EHA2	I easily adjust any development of the system.

III. RESULT

A. Demographic Data

The population in this study, are medical staff working in District Hospitals in Gunung Mas district, Central Kalimantan. Respondents in this study namely medical record employees, nurses, doctors, and midwives. The sample of 150 respondents has been done by using probability sampling technique. The number of samples used here is the smallest number of samples by using random sampling.

Table 2. Respondent Profile

Profile	Amount	Percentage
Sex		
Male	70	47%
Female	80	53%
Age		
<20	2	1%
20-30	46	31%
31-40	41	27%
41-50	18	12%
>50	43	29%
Position		
Doctor	30	20%
Nurse	58	39%
Administration	28	19%
Midwife	9	6%

Profile	Amount	Percentage
Pharmacist	25	17%
The ability to use a computer		
Never	25	17%
Below Average	41	27%
Average	68	45%
Upper Average	16	11%

The data presented in Table 2 is the result of the distribution of paper-based questionnaires at the Gunung Mas District Hospital, Central Kalimantan. Based on 150 questionnaire data, 53% are women where the highest medical staff are women. Productive age range in 20-30 years old. Therefore, we assume that there will be no difficulty in the implementation of E-Health because of productive and young workers.

B. The Measurement Model

In this study to test the model theory using structural equation modeling (SEM) and WarpPLS 5.0. SEM techniques are more popular in Information Systems research. SEM technique is based on Partial Least Square (PLS) which can provide a visual relation between hypothesis and variable [39]. By using PLS approach in this research consists of 2 stages. The first stage evaluates the value of the instrument by investigating the reliability and determining the validity of the construct. As for the second stage will display the level of significance in the phase of the coefficient model to test the relevant hypothesis. Previous research has also used Wrap PLS version 5.0 to analyze and measure user acceptance of technology [41]–[43].

After the data for sample measurement has been filled, then do the model structure measurement with validity and reliability test. The WarpPLS 5.0 tool provides validity testing using Cronbach Alfa (CA), composite reliability (CR) and average extracted variance (AVE). While reliability test can be seen on AVE matrix.

In WarpPLS 5.0 Testing CR, CA and AVE can be shown as in Table 3. The value on Cronbach alpha will increase with the number of indicators used, and often slightly lower than Composite Reliability (CR). The acceptable value at which CR> CA, the results of this study is in accordance with the standards. As for the variable reliability measure, the acceptable CR is ≥ 0.7. Based on Table 3, CR has a distance of 0.777 to 0.917 and is in accordance with the recommended value. For the validity assessment of AVE, it is used in conjunction with the matrix correlation in Appendix 1, this shows that each variable has a square root higher than the average value of variance extracted rather than the correlation with other variables [44]. AVE has a recommended standard of> 0.5. Based on Table 3 AVE has a distance of 0.538 to 0.786 and the relationship with the matrix (Appendix 1) also shows acceptable values.

Table 3. Reliability and Validity Test.

	CA	CR	AVE
PU	0,822	0,894	0,738
PEOU	0,751	0,859	0,671
CSE	0,730	0,849	0,657
COMP	0,787	0,878	0,708
TMS	0,726	0,846	0,647
UIV	0,777	0,872	0,694
TR	0,646	0,812	0,604
FC	0,580	0,781	0,544
SQ	0,839	0,903	0,757
IQ	0,700	0,833	0,625
SEQ	0,864	0,917	0,786
CP	0,569	0,777	0,538
AD	0,788	0,878	0,707
EHA	0,530	0,810	0,680

Furthermore, that is to test the model and quality indices. A total of 4 models of fit and quality indices have been provided: Average path coefficient (APC), Average R-Square (ARS), Average adjusted R-squared (AARS) and Tanenhaus GoF (GoF) as seen in Table 4.

Table 4. Model Fit and Quality Indices

Statistic	p-value	Value	Conclusion
APC	= 0,007	0,175	Acceptable
ARS	< 0,001	0,760	Acceptable
AARS	< 0,001	0,757	Acceptable
GoF	-	0,713	Large

Based on the results of these tests, the data collected is already normal. Table 4 shows the p-value on APC, APS, and AARS showing <0.05, which means significant and normal.

Test data normality has been done. The next step is to test the explanatory model with GoF testing. GoF is defined as the strength of the model structure [45]. Wetzels et al, [46], proposes a threshold against GoF: small if ≥ 0.1, medium if ≥ 0.25 and large if ≥ 0.36. In this study can be seen in table 4, GoF > 0,36 (value 0,713) which is categorized as large. The last one is testing the hypothesis by comparing the path coefficient and p-value based on the indicator.

C. Hypotheses Testing

At this stage, is to test the hypothesis by looking at the value of Path coefficient and P value, with a significant standard value <0.05. If the level is significant <0.05 then the hypothesis is accepted whereas if> 0,05 then the hypothesis is rejected.

Table 5. Path Coefficient and p-value

	Path coefficient			p-value		
	PU	**PEOU**	**EHA**	**PU**	**PEOU**	**EHA**
PU			0,232			0,002
PEOU			0,318			<0,001
CSE	0,480	0,421		<0,001	<0,001	
COMP	0,213	-0,018		0,004	0,411	
TMS	0,103	0,124		0,099	0,061	
UIV	0,052	0,034		0,261	0,340	
TR	0,057	0,050		0,242	0,268	
FC	0,258	0,040		<0,001	0,310	
SQ	-0,045	0,285		0,291	<0,001	
IQ	0,158	0,196		0,024	0,007	
SEQ	0,079	0,348		0,164	<0,001	
CP	0,250	0,104		<0,001	0,097	
AD	0,286	0,050		<0,001	0,267	

WarpPLS 5.0 provides the output path coefficient and p-value as in Table 5. Computer self-efficacy, compatibility, top management support, facilitating condition, information quality, complexity and adaptability (H1a, H1b, H3a, H3d, H5b, H7a, H7b) significantly affect the perceived usefulness of E-Health. Furthermore, computer self-efficacy, system quality, information quality, and service quality (H2a, H6a, H6b, H6c) significantly affect perceived ease of use on E-Health. Inconsistency is also found in this study, where User involvement and Training (H3b, H4b, H3c, H4c) has a value that is not significant effect on perceived usefulness and perceived ease of use. Finally, this study supports TAM because Perception benefit and perceived ease of use (H9, H10) have a significant effect on E-Health acceptance.

IV. DISCUSSION

Based on the results in section 3, there is influence from human, organization, technology and innovation characteristic. Especially, there is a significant influence on Computer self-efficacy, compatibility, top management support, facilitating condition, information quality, complexity and adaptability towards the perceived usefulness of E-Health. Likewise, on the factors of computer self-efficacy, system quality, information quality, and service quality to perceived ease of use E-Health.

Hypothesis results in Appendix 2, shows that out of a total of 32 hypotheses, 16 hypotheses are accepted, 13 hypotheses are rejected, and 3 hypotheses are accepted in part.

Although several factors affecting E-Health acceptance have been identified, user involvement and training have no significant effect on both perceived usefulness and perceived ease of use. The underlying cause of this inconsistency is that the majority of respondents aged 20-30 years as many as 31%, who are active in working in health services either in the clinic or in other health units. Meanwhile, at the Hospital of this Gunung Mas district, which is involved in the planning and design of system requirements are stakeholders with experience of 5 years more work in hospitals. The average stakeholders are around> 50 years old with little knowledge of IT / ICT requirements related to local needs. These problems make the results of this study not significant to perceived usefulness and perceived ease of use. This result is supported by previous research by [12]. As for training, users do not feel usefulness and ease of use, because due to training and socialization either from the provincial health department or central government is still gradual in building E-Health program. In addition, limited training in rural areas is also more difficult because of the great distances, time and costs required. In this case only a few stakeholder representatives and not a direct-use-system medical practitioner, who participated in E-Health training and socialization at provincial or central level.

Furthermore, an explanation of the significant factors affecting PU and PEOU:

A. *Computer self-efficacy, compatibility, top management support, facilitating conditions, information quality, complexity, and adaptability significantly affect perceived usefulness in E-Health.*

Based on Table 5, Computer self-efficacy has the p-value <0.05 to PU. It means the CSE Relationship with PU is higher towards E-Health information systems as a supporter. Users feel they are using a very useful system, so users can either self-evaluate or group in case of changes, or system updates, especially in rural areas. These results support the research of Hsiao et al, (2013) [18], and Handayani et al, (2016) [11].

The COMP factor to PU has p-value <0,05. This means that the COMP factor is stronger and positively valued for the benefits of technology. Users feel the need to match E-Health needs based on user value, needs, and experience [11]. Users feel the benefits gained can improve health services.

Furthermore, relation of TMS to PU has p-value <0,05. This means that TMS stakeholders in the clinic and the unit in the hospital feel the benefits gained from E-Health technology in terms of providing health services, especially to rural communities. These results support the research of Hsiao et al. (2013) [18].

The relationship between FC and PU has a value of p-value <0.05 significantly affects the acceptance of E-Health implementation. Users feel the benefits, from facilitating conditions. In rural areas, in particular, facilities are the main factor supporting E-Health, but the inhibitor is the long distance and the many costs required to reach the hospital. These results support Ross et al research, (2016) [26] and Wang (2017) [31].

The IQ factor and PU begins with the p-value <0.05, which means, that the quality of information

significantly affects the perceived usefulness. Users feel the benefits of E-Health that provide quality information. Users feel E-Health can provide quality data based on timeliness, accuracy, format, integrity, and relevance [11]. These results support previous research [35], [36].

CP and PU relationship starts with the p-value <0,05. This means that complexity significantly affects users' perceived usefulness, users feel fewer E-Health benefits due to slow system performance in both hardware and software. Inability to provide real-time access, security, data entry problems, unplanned speed and downtime connectivity is a problem of receiving E-Health in rural areas. These results support the research of Ross et al, (2016) [26] and Andargoli et al, (2017) [39] on the implementation of E-Health technology.

Relation between AD and PU is seen from the result of p-value <0,05. Adaptability factors significantly influence the perception of user benefits in receiving E-Health technology. Users feel the benefits of adaptability to E-Health as supporting health information technology. The result certainly needs support from the users themselves for their willingness to try new things and take risks [26]. Compliance with technology needs as well important in implementing E-Health especially in rural areas [40].

B. Computer self-efficacy, system quality, information quality, and service quality significantly affect perceived ease of use in E-Health.

The relationship of self-efficacy computer with PEOU begins with the p-value <0,05. Computer self-efficacy has a significant impact on perceived ease of E-Health. Users feel the evaluation factor of E-Health technology is either done alone or in groups depending on the difficulty and ease of use of the technology itself. This is supported by the profile of respondents where as many as 11% of users completed their work using a computer. These results are supported by research from Cresswell et al, (2013) [12].

The SQ factor and PEOU is based on p-value <0.05, which means, System quality significantly affects the perception of ease of use for E-Health technology. Users feel the interface interaction between users and the system affects the ease of using E-Health. These factors have an impact on system response rates, consistent level of interface excellence, documentation included in system quality. This result is supported by previous research from Cresswell et al, (2013) [12].

Relation of IQ and SEQ with PEOU is also significant where p-value <0.05. Users feel that the quality of information related to time accuracy, data relevance, and format affects the E-Health ease of use. This result is supported by the profile of respondents where as many as 29% of employees in hospital aged> 50 years. These results are supported by previous research by Handayani et al, (2016) [11] and Hsiao et al, (2013) [18]. Meanwhile, for service quality, users feel the ease of using E-Health related to all health service activities, especially E-Health as supporting hospital information system. This, of course, supports long-distance health services conducted by district hospitals with provincial hospitals in Central Kalimantan. This result is supported by previous research [37], [38].

C. Perceived benefits and perceived ease of use significantly affect the implementation of E-Health.

Lastly, for PU factor and PEOU on the acceptance of E-Health can be seen from p-value <0,05. This means that PU and PEOU significantly influence the acceptance of E-Health. This result is supported by previous research [18], [47].

Although health services in rural areas are still in limited condition, medical practitioners support government programs in developing E-Health as supporting hospital information technology, especially in rural areas [48]. Medical practitioners accept the use of E-Health as a supporter of hospital information technology if beneficial, useful and easy to use in their work [18]. When they have a positive attitude their acceptance of E-Health will also be high.

The government should put more effort into implementing E-Health in rural areas. The most important thing especially for medical practitioners as E-Health users.

V. CONCLUSION

Based on the E-Health acceptance evaluation framework, it can be concluded that the characteristics of human, organization, technology, and innovation have a significant impact on the perceived usefulness and the perceived ease of use in the application of E-Health as supporting health information technology in the hospital. Training materials, the introduction, and education of E-Health socialization should also be routinely performed on each individual medical practitioner. Of course, supported by the condition of adequate facilities to be able to produce a good quality system, information, and service. Support for implementing E-Health in rural areas should also be carried out by the central government more broadly. In order not only socialization to medical practitioners but also socialization to the rural community, about the importance of applying E-Health to improve health service. This activity can be done by conducting social health services as well as an introduction to schools in rural areas.

In this evaluation, we hope that this research can p-value as a recommendation and consideration in applying E-Health, especially in rural areas.

APPENDIX

Appendix 1

	CSE	COMP	TMS	UIV	TR	FC	SQ	IQ	SEQ	CP	AD	PU	PEOU	EHA
CSE	0,859													
COMP	0,725	0,819												
TMS	0,649	0,732	0,810											
UIV	0,543	0,510	0,606	0,841										
TR	0,420	0,535	0,584	0,634	0,804									
FC	0,152	0,324	0,322	0,165	0,226	0,833								
SQ	0,529	0,590	0,563	0,582	0,455	0,333	0,777							
IQ	0,462	0,534	0,651	0,439	0,549	0,477	0,557	0,738						
SEQ	0,394	0,550	0,596	0,413	0,448	0,492	0,634	0,721	0,870					
CP	0,384	0,469	0,533	0,594	0,517	0,162	0,619	0,499	0,493	0,791				
AD	0,557	0,593	0,644	0,604	0,561	0,134	0,739	0,480	0,427	0,698	0,887			
PU	0,312	0,352	0,498	0,527	0,415	0,338	0,575	0,492	0,424	0,545	0,593	0,734		
PEOU	0,549	0,548	0,533	0,487	0,509	0,190	0,576	0,409	0,296	0,579	0,652	0,613	0,841	
EHA	0,453	0,451	0,393	0,470	0,455	0,137	0,573	0,431	0,277	0,517	0,588	0,698	0,817	0,825

Note: CSE, Computer self-efficacy; COMP, Compatibility; TMS, Top management support; UIV, User Involvement; TR, Training; FC, Facilitating Condition; SQ, System quality; IQ, Information quality; SEQ, Service quality; CP, Complexity; AD, Adaptability; PU, Perceived Usefulness; PEOU, Perceived Ease of use, EHA, E-Health Acceptance.

Appendix 2

Hypotheses	Parameter	Path Coefficient	p-value	Conclusion
H1: Human characteristic has a significant impact on users perceived E-Health usefulness.				Accepted
H1a: Computer self-efficacy affects users perceived of E-Health usefulness	PU ← CSE	0,480	<0.001	Accepted
H1b: Compatibility affects users perceived of E-Health usefulness	PU ← COMP	0,213	0.004	Accepted
H2: Human characteristic has a significant impact on users perceived E-Health ease of use.				Partial Accepted
H2a: Computer self-efficacy affects users perceived of E-Health ease of use.	PEOU ← CSE	0,421	<0.001	Accepted
H2b: Compatibility affects users perceived of E-Health ease of use.	PEOU ← COMP	-0,081	0.411	Rejected
H3: Organizational characteristic has a significant impact on users perceived E-Health usefulness.				Partial Accepted
H3a: Top Management support affects users perceived of E-Health usefulness.	PU ← TMS	0.103	0.099	Accepted
H3b: User Involvement affects users perceived of E-Health usefulness.	PU ← UIV	0.052	0.261	Rejected
H3c: Training significantly affects users perceived of E-Health usefulness.	PU ← TR	0.057	0.242	Rejected
H3d: Facilitating Condition affects users perceived of E-Health usefulness.	PU ← FC	0.258	<0.001	Accepted
H4: Organizational characteristic has a significant impact on users perceived E-Health ease of use.				Rejected
H4a: Top Management support affects users perceived of E-Health ease of use.	PEOU ← TMS	0.124	0.061	Rejected
H4b: User Involvement affects users perceived of E-Health ease of use.	PEOU ← UIV	0.034	0.340	Rejected
H4c: Training affects users perceived of E-Health ease of use.	PEOU ← TR	0.050	0.268	Rejected
H4d: Facilitating Condition affects users perceived of E-Health ease of use.	PEOU ← FC	0.040	0.310	Rejected

Hypotheses	Parameter	Path Coefficient	p-value	Conclusion
H5: Technology characteristic have a significant impact on users perceived E-Health usefulness				Partial Accepted
H5a: System Quality affects users perceived of E-Health usefulness.	PU ← SQ	-0.045	0.291	Rejected
H5b: Information Quality affects users perceived of E-Health usefulness.	PU ← IQ	0.158	0.024	Accepted
H5c: Service Quality affects users perceived of E-Health usefulness.	PU ← SEQ	0.079	0.164	Rejected
H6: Technology characteristic has a significant impact on users perceived E-Health ease of use.				Accepted
H6a: System Quality affects users perceived of E-Health ease of use.	PEOU ← SQ	0.285	<0.001	Accepted
H6b: Information Quality affects users perceived of E-Health ease of use.	PEOU ← IQ	0.196	0.007	Accepted
H6c: Service Quality affects users perceived of E-Health ease of use.	PEOU ← SEQ	0.348	<0.001	Accepted
H7: Innovation characteristic have a significant impact on users perceived E-Health usefulness				Accepted
H7a: Complexity affects users perceived of E-Health usefulness.	PU ← COMP	0.250	<0.001	Accepted
H7b: Adaptability affects users perceived of E-Health usefulness.	PU ← AD	0.286	<0.001	Accepted
H8: characteristic has a significant impact on users perceived E-Health ease of use.				Rejected
H8a: Complexity affects users perceived of E-Health ease of use.	PEOU ← COMP	0.104	0.097	Rejected
H8b: Adaptability significantly affects users perceived of E-Health ease of use.	PEOU ← AD	0.050	0.267	Rejected
H9: The perceived usefulness of users affects E-Health acceptance	EHA ← PU	0.232	0.002	Accepted
H10: The perceived ease of use of users affects E-Health acceptance	EHA ← PEOU	0.318	<0.001	Accepted

REFERENCES

[1] D. D. Soemitro Sp.BS, "Tantangan e-Kesehatan di Indonesia," *Pusat Data dan Informasi, Kementerian Kesehatan RI*, pp. 1–16, 2016.

[2] A. E. Amalia, G. Airlangga, and A. N. A. Thohari, "Breast Cancer Image Segmentation Using K-Means Clustering Based on GPU Cuda Parallel Computing," *J. INFOTEL*, vol. 10, no. 1, Feb. 2018.

[3] A. R. Ahlan and B. Isma, "User Acceptance of Health Information Technology (HIT) in Developing Countries : A Conceptual Model," *Procedia Technol.*, vol. 16, pp. 1287–1296, 2014.

[4] S. Saravanan and P. Sudhakar, "Telemedicine communication system in Mobile units," in *2017 International Conference on Computer Communication and Informatics (ICCCI)*, 2017, pp. 1–4.

[5] M. C. Paul, S. Sarkar, M. M. Rahman, S. M. Reza, and M. S. Kaiser, "Low cost and portable patient monitoring system for E-Health services in Bangladesh," in *2016 International Conference on Computer Communication and Informatics (ICCCI)*, 2016, pp. 1–4.

[6] P. Wicks, J. Stamford, M. A. Grootenhuis, L. Haverman, and S. Ahmed, "Innovations in E-Health ," *Quality of Life Research*. 2014.

[7] J. P. Weiner, S. Yeh, and D. Blumenthal, "The Impact Of Health Information Technology And E-Health On The Future Demand For Physician Services," *Health Aff.*, vol. 32, no. 11, pp. 1998–2004, Nov. 2013.

[8] C. Thuemmler and C. Bai, "E-Health in China," in *Health 4.0: How Virtualization and Big Data are Revolutionizing Healthcare*, Springer, Cham, 2017, pp. 155–185.

[9] P. Kierkegaard, "eHealth in Denmark: A Case Study," *J Med Syst*, vol. 37, no. 6, p. 9991, 2013.

[10] E. Hage, J. P. Roo, M. A. G. Van Offenbeek, and A. Boonstra, "Implementation factors and their effect on E-Health service adoption in rural communities: A systematic literature review," *BMC Health Serv. Res.*, vol. 13, no. 1, p. 19, 2013.

[11] P. W. Handayani, A. N. Hidayanto, A. A. Pinem, I. C. Hapsari, P. I. Sandhyaduhita, and I. Budi, "Acceptance Model of a Hospital Information System," *Int. J. Med. Inform.*, 2016.

[12] K. Cresswell and A. Sheikh, "Organizational issues in the implementation and adoption of health information technology innovations: An interpretative review," *Int. J. Med. Inform.*, vol. 82, no. 5, pp. e73–e86, 2013.

[13] F. Davis, "Perceived Usefulness, Perceived East of Use, and User Acceptance of Information Technology," *MIS Q.*, vol. 13, no. 3, pp. 319–340, 1989.

[14] M. Fishbein and I. Ajzen, *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. 1975.

[15] J.-L. Hsiao and R.-F. Chen, "Critical factors influencing physicians' intention to use computerized clinical practice guidelines: an integrative model of activity theory and the technology acceptance model," *BMC Med. Inform. Decis. Mak.*, vol. 16, no. 1, p. 3, Dec. 2015.

[16] C.-H. Hsiao and K.-Y. Tang, "Examining a Model of Mobile Healthcare Technology Acceptance by the Elderly in Taiwan," *J. Glob. Inf. Technol. Manag.*, vol. 18, no. 4, pp. 292–311, Oct. 2015.

[17] T. P. Borges Jr, Uirassu MSc; Kubiak, "Continuous Glucose Monitoring in Type 1 Diabetes: Human Factors and Usage," *J. Diabetes Sci. Technol.*, vol. 10, no. 3, pp. 633–639, 2016.

[18] J.-L. Hsiao, W.-C. Wu, and R.-F. Chen, "Factors of accepting pain management decision support systems by nurse anesthetists," *BMC Med. Inform. Decis. Mak.*, vol. 13, no. 1, p. 16, 2013.

[19] C.-F. Liu, Y.-C. Tsai, and F.-L. Jang, "Patients' Acceptance towards a Web-Based Personal Health Record System: An Empirical Study in Taiwan," *Int. J. Environ. Res. Public Health*, vol. 10, no. 12, pp. 5191–5208, Oct. 2013.

[20] R. Gajanayake, R. Iannella, and T. Sahama, "An Insight into the Adoption of Accountable-eHealth Systems – An Empirical Research Model Based on the Australian Context," *IRBM*, vol. 37, no. 4, pp. 219–231, Aug. 2016.

[21] F. D. . D. Viswanath Venkatesh , Michael G . Morris , Gordon B . Davis, V. Venkatesh, M. G. Morris, G. B. Davis, and F. D. Davis, "User acceptance of information technology: Toward a unified view," *MIS Q.*, vol. 27, no. 3, pp. 425–478, 2003.

[22] I. Ajzen, "The theory of planned behavior," *Organ. Behav. Hum. Decis. Process.*, vol. 50, no. 2, pp. 179–211, Dec. 1991.

[23] F. D. Davis, R. P. Bagozzi, and P. R. Warshaw, "Extrinsic and Intrinsic Motivation to Use Computers in the Workplace1," *J. Appl. Soc. Psychol.*, vol. 22, no. 14, pp. 1111–1132, Jul. 1992.

[24] L. Lazuras and A. Dokou, "Mental health professionals' acceptance of online counseling," *Technol. Soc.*, vol. 44, pp. 10–14, 2016.

[25] M.-P. Gagnon, É.-R. Nsangou, J. Payne-Gagnon, S. Grenier, and C. Sicotte, "Barriers and facilitators to implementing electronic prescription: a systematic review of user groups' perceptions," *J. Am. Med. Informatics Assoc.*, vol. 21, no. 3, pp. 535–541, May 2014.

[26] J. Ross, F. Stevenson, R. Lau, and E. Murray, "Factors that influence the implementation of E-Health : A systematic review of systematic reviews (an update)," *Implement. Sci.*, vol. 11, no. 1, pp. 1–12, 2016.

[27] S. Benavides-Vaello, A. Strode, and B. C. Sheeran, "Using Technology in the Delivery of Mental Health and Substance Abuse Treatment in Rural Communities: A Review," *J. Behav. Health Serv. Res.*, vol. 40, no. 1, pp. 111–120, Jan. 2013.

[28] M. Duplaga, "Searching for a Role of Nursing Personnel in Developing Landscape of Ehealth: Factors Determining Attitudes toward Key Patient Empowering Applications," *PLoS One*, vol. 11, no. 4, 2016.

[29] S. Jarosławski and G. Saberwal, "In eHealth in India today, the nature of work, the challenges and the finances: an interview-based study," *BMC Med. Inform. Decis. Mak.*, vol. 14, no. 1, 2014.

[30] G. T. Olok, W. O. Yagos, and E. Ovuga, "Knowledge and attitudes of doctors towards E-Health use in healthcare delivery in government and private hospitals in Northern Uganda: A cross-sectional study," *BMC Med. Inform. Decis. Mak.*, 2015.

[31] W. Wang *et al.*, "Renal transplant patient acceptance of a self-management support system," 2017.

[32] J. Li, A. Talaei-Khoei, H. Seale, P. Ray, and C. R. Macintyre, "Health Care Provider Adoption of eHealth: Systematic Literature Review.," *Interact. J. Med. Res.*, vol. 2, no. 1, p. e7, Apr. 2013.

[33] T. M. Waters *et al.*, "Effect of Medicare's Nonpayment for Hospital-Acquired Conditions," *JAMA Intern. Med.*, vol. 175, no. 3, p. 347, Mar. 2015.

[34] I. Cho, I. Park, E. Kim, E. Lee, and D. W. Bates, "Using EHR data to predict hospital-acquired pressure ulcers: A prospective study of a Bayesian Network model," *Int. J. Med. Inform.*, vol. 82, no. 11, pp. 1059–1067, Nov. 2013.

[35] A. Naghieh and M. Parvizi, "Exercising soft closure on lay health knowledge? Harnessing the declining power of the medical profession to improve online health information," *Soc. Theory Heal.*, vol. 14, no. 3, pp. 332–350, 2016.

[36] F. Cabitza and C. Batini, "Information Quality in Healthcare," in *Data and Information Quality*, Springer, Cham, 2016, pp. 403–419.

[37] L. Nguyen, E. Bellucci, and L. T. Nguyen, "Electronic health records implementation: An evaluation of information system impact and contingency factors," *Int. J. Med. Inform.*, vol. 83, no. 11, pp. 779–796, 2014.

[38] M. Y. Chang, C. Pang, J. Michael Tarn, T. S. Liu, and D. C. Yen, "Exploring user acceptance of an e-hospital service: An empirical study in Taiwan," *Comput. Stand. Interfaces*, vol. 38, pp. 35–43, 2015.

[39] A. Eslami Andargoli, H. Scheepers, D. Rajendran, and A. Sohal, "Health information systems evaluation frameworks: A systematic review," *Int. J. Med. Inform.*, vol. 97, pp. 195–209, 2017.

[40] S. A. O'Neill *et al.*, "Development of a technology adoption and usage prediction tool for assistive technology for people with dementia," *Interact. Comput.*, vol. 26, no. 2, pp. 169–176, 2014.

[41] T. L. M. Suryanto, D. B. Setyohadi, and A. Faroqi, "Analysis of the effect of information system quality to intention to reuse of employee management information system (Simpeg) based on information systems success model," vol. 58, 2016.

[42] S. Faber, M. van Geenhuizen, and M. de Reuver, "eHealth adoption factors in medical hospitals: A focus on the Netherlands," *Int. J. Med. Inform.*, vol. 100, pp. 77–89, Apr. 2017.

[43] P. Ifinedo, "Empirical Study of Nova Scotia Nurses' Adoption of Healthcare Information Systems: Implications for Management and Policy-Making," *Kerman Univ. Med. Sci.*, vol. 7, no. 74, pp. 317–327, 2018.

[44] C. Fornell and D. F. Larcker, "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *J. Mark. Res.*, vol. 18, no. 1, p. 39, 1981.

[45] M. Tenenhaus, V. E. Vinzi, Y.-M. Chatelin, and C. Lauro, "PLS path modeling," *Comput. Stat. Data Anal.*, vol. 48, pp. 159–205, 2005.

[46] Wetzels, Odekerken-Schröder, and van Oppen, "Using PLS Path Modeling for Assessing Hierarchical Construct Models: Guidelines and Empirical Illustration," *MIS Q.*, vol. 33, no. 1, p. 177, 2009.

[47] P. W. Handayani, A. N. Hidayanto, D. Ayuningtyas, and I. Budi, "Hospital information system institutionalization processes in indonesian public, government-owned and privately owned hospitals," *Int. J. Med. Inform.*, vol. 95, pp. 17–34, 2016.

[48] A. R. Ahlan and B. I. Ahmad, "User Acceptance of Health Information Technology (HIT) in Developing Countries: A Conceptual Model," *Procedia Technol.*, vol. 16, pp. 1287–1296, Jan. 2014.