Ilkogretim Online - Elementary Education Online, 2021; Vol 20 (Issue 5): pp. 6072-6078
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2021.05.681

Technology Acceptance Model Analysis for Internet of Things-based Remote Monitoring at Bali Mandara General Hospital

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Abstract- This study aims to analyze the technology acceptance model for remote monitoring based on the internet of things at Bali Mandara General Hospital. The number of respondents used in this studynamely the Engineering Department. The research method used is qualitative in the form of direct interviews through interviews, the researchers extracted data, information, and information frameworks from the research subjects. The data analysis technique used in this study was the Miles and Huberman Model data analysis technique. Based on the results of the analysis in this study, it is found that from the results of the interview research conducted that Remote Monitoring has benefits for employees in the engineering department to improve their performance and effectiveness properly and also to use to improve their performance and effectiveness. Remote Monitoring makes employees in this Department of Engineering able to use Remote Monitoring well. From the results of the interview, research conducted that Remote Monitoring can be easily used by employees in the Department of Engineering because this tool is very easy to operate and also for ordinary people it is also easy to use it and also with intention to use this remote monitoring makes employees in this Department of Engineering able to use remote monitoring easily.

Keywords: TAM, Internet of Things, remote monitoring, perceived usefulness, intention to use, perceived ease of use.

I. INTRODUCTION

IoT (Internet of Things) is all activities that the perpetrators interact with and are carried out using the internet (Sulaiman&Widarma, 2017). This technology can be a solution to save human labor and time because it allows surveillance to be carried out remotely via a computer or smartphone. One type of IoT-based system that is currently being developed is a remote control system. This method is much more effective and efficient than the traditional way of security by patrolling around. The era where all objects around us will be connected to the Internet and can run automatically, as desired. This is also confirmed by (Ashton, 2009) who reveals that the Internet of Things has the potential to change the world as the Internet has done, maybe even better. One of the security tools used today is a camera. The camera is capable of capturing images and moving objects in video form.

Since the emergence and rapid growth of the Internet of Things, many global organizations have provided specifications and guidelines for building IoT applications. Hence, IoT applications are very diverse due to the heterogeneity of the platforms available. An identifier has a series of characters that are used to identify a physical or virtual entity. An IoT device or application needs to be recognized before being used in an IoT environment. Many platforms use different global Unique Identification Schemes (IS) or their proprietary methods. Problems arise when devices from different platforms need to exchange data or communicate with other applications. Due to the lack of identification standards, inter-working between IoT platforms remains challenging. In the development of IoT in the health sector, there are challenges for users of this technology, including the possibility of security failures from IoT providers, which allow leakage of consumer privacy data, limit movement, analysis to the commercialization of health data.

Remote monitoring is a standard specification that facilitates monitoring of network operations through the use of a remote device also known as a monitor or probe. This is very useful for monitoring your network devices that are in several locations. In other words, you can easily monitor your network devices anywhere and anytime. With remote monitoring, you can ensure devices such as servers, routers, and others continue to run properly. Remote monitoring, also known as RMON, can help network administrators with efficient control and management of network infrastructure.

Davis (1989) stated that the acceptance or rejection of technology and user behavior can be explained in the Technology Acceptance Model or better known as TAM. He further explained that the reason someone uses information technology includes user perceptions of the benefits or uses of technology (perceived usefulness), user perceptions of the ease of using technology (perceived ease of use), and user interest in using the technology itself (behavioral intention to use). TAM (Technology Acceptance Model) is a research model that is generally used to examine the acceptance of information technology. TAM focuses on user attitudes towards technology use based on perceptions of the benefits of using information technology (perceived usefulness) by considering the ease of use of information technology (perceived ease of use) (Zainuddin, 2014). The purpose of this model is to be able to explain the main factors of information technology user behavior towards the acceptance of the use of information technology itself. This TAM model is considered by researchers to be the most appropriate to identify the readiness of a community, in applying computer-based technology to its work activities (Alomary&Woollard 2015).

Therehas been an overflow of wastewater in the basement collection tubat the Bali Mandara Regional General Hospital. In this basement liquid waste collection basin, liquid waste overflows because there is no monitoring of the level of the wastewater. So that pump failure cannot be monitored and can only be known when the wastewater has overflowed. Itdisturbs the basement hospital services, because of the warm smell of the wastewater. Therefore, a tool was made, namely IoT-based remote monitoring to make it easier to monitor wastewater if it would overflow. Based on the background description above, the researcher is interested in research to determine the technology acceptance model analysis for the internet of things-based remote monitoring at the Bali Mandara General Hospital.

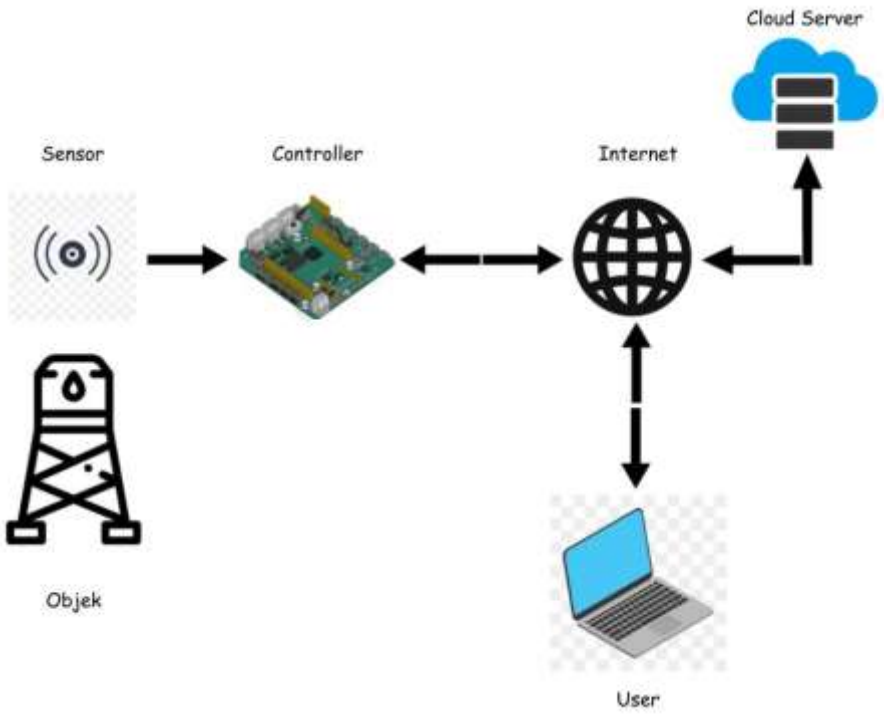

Figure 1. IoT-Based Remote Monitoring System

This research is important to do by looking at the things that have been described previously such as the acceptance or rejection of application-based digital payment technology and the influence of public trust in the use of these applications, the researchers formulated the following problems: (1) Whatperceived of usefulness affect intention to use on IoT-based remote monitoring system? (2) Whatperceived ease of use affects intention to use on IoT-based remote monitoring systems?

II. LITERATURE REVIEW

According to the Coordinator and support action for global RFID-related activities and standardization, the IoT is a global network connection infrastructure, which connects physical and virtual objects through

the exploitation of data capture and communication technology. The IoT infrastructure consists of an existing network and the internet and its development. It offers object identification, sensor identification, and connection capabilities that form the basis for the development of independent cooperative applications and services, as well as being characterized by a high degree of data capture autonomy, event transfer, network connectivity as well as interoperability. According to the IEEE (Institute of Electrical and Electronics Engineers) Internet of things (IoT) is defined as a network with each object embedded with sensors connected to the internet network (IEEE "Internet of things" 2014).

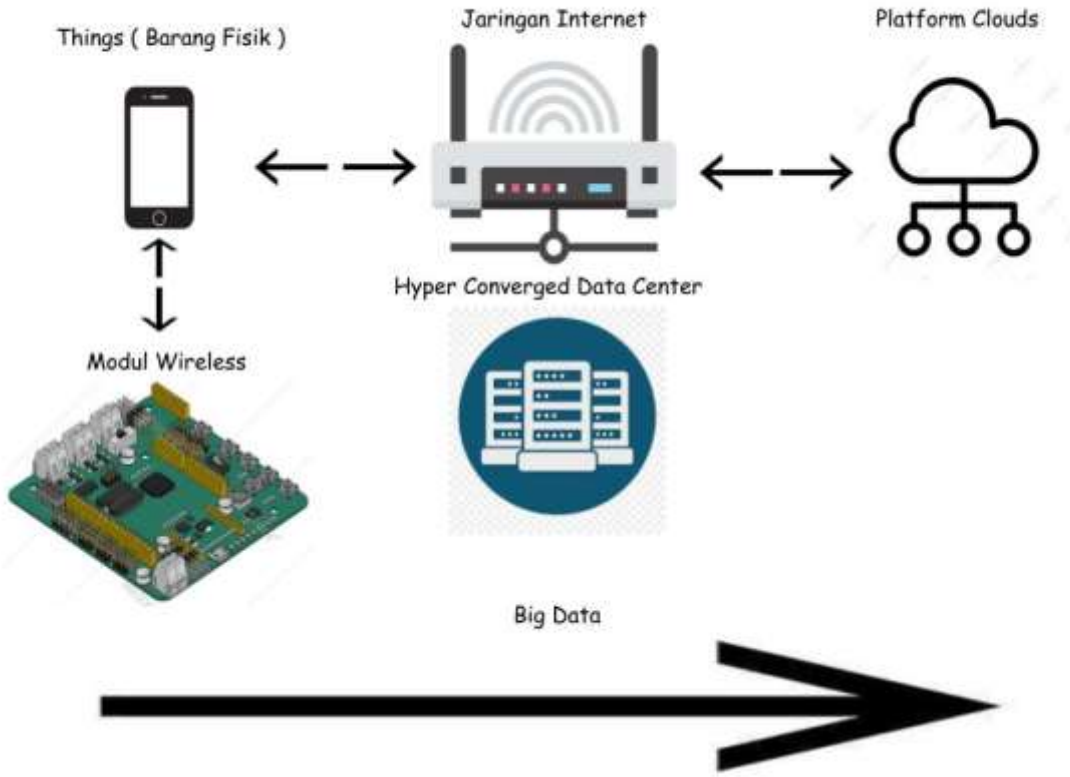

Figure 2. The concept of the internet of things

The concept of the internet of things includes three main elements, namely physical or real objects that have been integrated into sensor modules, internet connections, and data centers on servers to store data or information from applications. The use of objects connected to the internet will collect data which is then collected into 'big data' to be processed, analyzed either by government agencies, related companies, or other agencies, and then used for their respective interests.

The TAM was first proposed by Davis et al. (1986), TAM is a model developed to analyze and understand the factors that influence the acceptance of the use of technology. Initially, TAM was designed by Davis in 1986, there were three main variables, namely perceived ease of use, and perceived usefulness as independent variables, then attitude toward using as an independent variable. intervening variables, and actual system usage variables as the dependent variable.

TAM emphasizes that perceived usefulness and perceived ease of use are the most significant and important variables in influencing actual system usage of information technology (Davis, 1989). Of course, in this model, it is permissible to include external variables that affect the above independent variables into the dependent variable. The following is an outline of the TAM model that was first conceived by Davis in 1986.

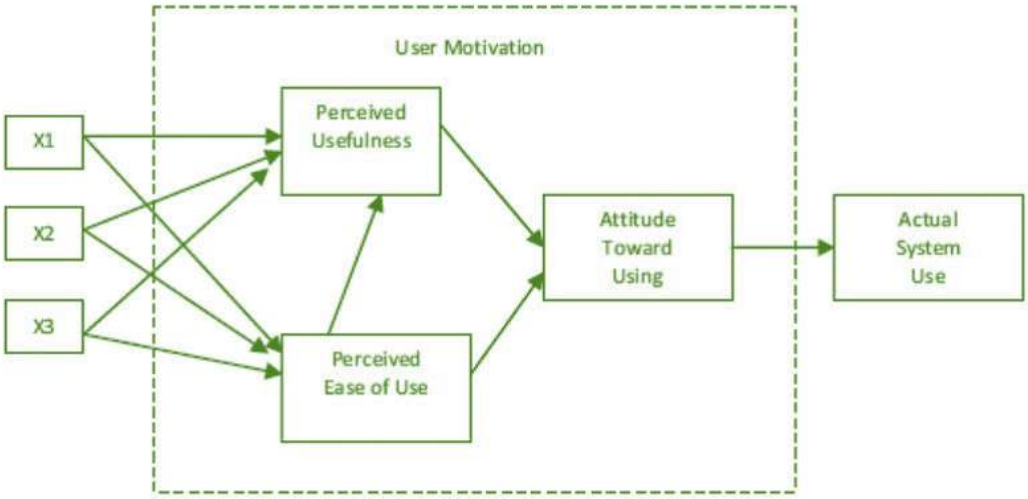

Figure 3. The initial model of TAM design by Davis (1986)

Then, in the same year, a modification was made by Davis, Bagozzi&Warshaw (1986) by adding a behavioral intention to use the variable as an intervening variable which is also directly influenced by the variable perceived usefulness.

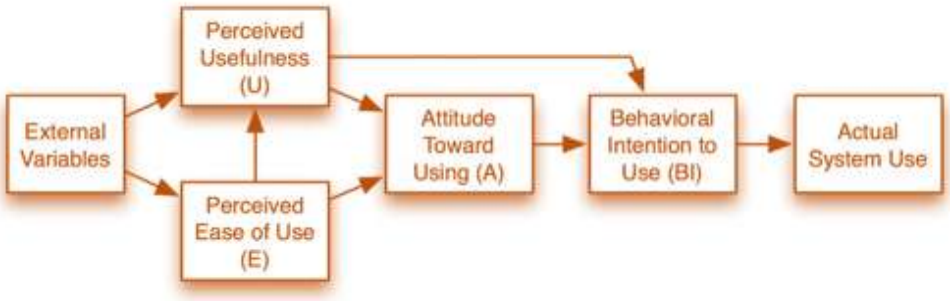

Figure 4. The TAM model by Davis et al. (1986)

Davis et al. (1986) explained that five variables can influence users in using technology, namely perceived usefulness, perceived ease of use, attitude toward using, intention to use behavior (behavioral intention to use), and actual use (actual system usage). TAM is also a model adopted from the theory of reasoned action (TRA), which is a theory of action that has the premise that a person's reaction and perception of something will determine the person's attitude and behavior(Adnyasuari, 2017). But in the TAM model, perceived usefulness and perceived ease of use are the basic determining factors for acceptance of technology use (Cania, 2018).

III. RESEARCH METHOD

The research design is a descriptive study with a qualitative approach. Hadari Nawawi (2005), stated the descriptive method describes the current state of the research object based on visible facts or as it is. This study uses a qualitative method that intends to understand the phenomena experienced by research subjects and obtain a complete picture of something according to the human perspective under study. Qualitative research deals with the ideas, perceptions, opinions, or beliefs of the people studied and all of which cannot be measured by numbers. Qualitative research is believed to be able to direct new concept searches through the interpretation of the process and meaning of a phenomenon which can then be used to build predictions and provide explanations for the phenomena under study. The location of this research was conducted at the Bali Mandara Regional Hospital, which is located at Jl. By Pass Ngurah Rai No.548, Sanur Kauh, South Denpasar, Denpasar City, Bali. The reason for choosing the location of this

research is because the Bali Mandara Regional Hospital is one of the large hospitals in Bali that uses an IoT-based remote monitoring system.

IV. DISCUSSION

Perceived Usefulness with Perception of Intention to Use Remote Monitoring

From the results of the interview research conducted that Remote Monitoring has benefits for employees in the engineering department to improve their performance and effectiveness well and also to use this remote monitoring makes employees in this engineering department can use with remote monitoring well. As research conducted by Rahmawati&Narsa (2019) perceived usefulness, hereinafter referred to as usability is defined as the extent to which a person believes that using technology will improve his job performance (Fred D Davis, 1985). This construct is influenced by the ease of use construct. Intention to use is the behavioral tendency of users to keep using a technology. The presence of PU directly influences the behavioral intention to use. PU has a direct impact on behavioral intention to use technology (Fadare, 2015). Perceived usefulness has been one of the dominant factors that shape the desire to use technology with the hope that better use of certain application systems will improve the quality (performance) of work and the quality of one's life (Chen et al., 2011). As research conducted by Rahmawati&Narsa (2019) the construct of perceived ease of use is the level at which a person believes that in using a system without the hard effort required (Fred D Davis, 1985).

Perceived Ease Of Use With Perception Of Intention To Use Remote Monitoring

From the results of the interview research conducted that Remote Monitoring can be easily used by employees in the engineering department because this tool is very easy to operate and also for ordinary people it is also easy to use it and also to use this remote monitoring makes employees in this engineering department can use it. use remote monitoring easily. The perception of ease of use affects the perception of the usefulness of the technology. When individual judges if the technology is easy to use, then he will know its use in work activities. Furthermore, the consideration of whether to apply the technology or not will depend on the level of ease in learning its use. The easier the technology is to use, the higher individual interest will be to use (Barhoumi, 2016; Khan et al., 2019). The more difficult the technology is to use, the lower the individual's interest in using it, and the slower individuals and community groups will adopt it (Venkatesh &Bala, 2008).

Theoretical Contribution
The results of this study contributed to the development of the Technology Acceptance Model (TAM) theory, especially the IoT-based remote monitoring system at the Bali Mandara Regional General Hospital.

Practical Contribution
The results of this study can be used as material for consideration and a morning reference for the hospital that has an IoT-based remote monitoring system in developing it. A study will certainly have benefits for researchers and other parties who will use it. For researchers, this research has the benefit of applying the field of management science obtained in lectures with realities in the field. This research is expected to be useful for solving practical problems. Besides being useful for companies, it can also be useful for all institutions that we can find in society, such as government agencies or private institutions that are aware of these benefits by placing research and development as an integral part of their organization. The results of this study are expected to provide input on company and company policies

V. CONCLUSIONS

From the results of research conducted by researchers at the Bali Mandara General Hospital with the title Technology Acceptance Model Analysis for Internet of Things-based Remote Monitoring at Bali Mandara General Hospital, it can be concluded that Bali Mandara Hospital, especially in the engineering department, is greatly helped by remote monitoring. Thistool can help employees, especially in the engineering department, in doing their work effectively, therefore this tool has great benefits for Bali Mandara Hospital in monitoring the level of their wastewater so they don’t experience wiping and also in terms of using this remote monitoring very easy to use for employees in the engineering department and do not experience difficulties in its operation.

VI. SUGGESTION

The suggestion in this research is the monitoring tool is no longer used because there is something that causes the remote monitoring to not operate again and there are still many employees who prefer manual systems. So my suggestion is that to be more educated with current developments that are shifting to the IoT system and also adequate hospital facilities in the development of this IoT system, it can maximize the performance of this system in the future.

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