Journal of Theoretical and Applied Information Technology
15th October 2022. Vol.100. No 19

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

FACTORS ANALYSIS AFFECTING SMART HOME ACCEPTANCE IN JAVA ISLAND, INDONESIA

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ABSTRACT

This research aims to determine the factors that influence the acceptance of IoT smart homes in Indonesia, including the desire to use and perceived benefits. Therefore, this research was conducted using Technology Acceptance Model (TAM) Theory and conducted a survey method and resulted in 100 respondents indicated. In this study, it was found that the Perceived compatibility variable for the Perceived Ease of Use and Perceived Usefulness variables and the Perceived enjoyment variable for Perceived Usefulness did not affect - the use of IoT Smart Home. At the same time, other external variables show that external variables affect the use of IoT Smart homes. The results of this study can be used as a research reference on the acceptance of IoT Smart homes in Indonesia. They can enrich theories about the acceptance of IoT Smart homes in Indonesia.

Keywords: *Technology Acceptance Model, Acceptance, Smart Home, Internet of Things*

1. INTRODUCTION

Information technology is a common thing in the current era. Not infrequently, information technology can be used in life to facilitate daily activities in education, communication, offices, and others. Using information technology is arguably the best thing based on an information system survey [1].

As for Indonesia itself, internet penetration is growing every year. It can be proven based on a survey obtained from the Association of Indonesian Internet Service Providers (APJII), amounting to 73.7% of the total population of Indonesia, amounting to 266.91 million people, of which 196.71 million people can use the internet.

Table 1 Internet user penetration and user penetration percentage in Indonesia (Source: APJIII)

Internet user penetration 2018		% Penetration
Total population of Indonesia	264.16 million	64.8%
Total internet users in Indonesia	171.17 million	
Internet user penetration 2019 - 2020 (Q2)		**% Penetration**
Total population of Indonesia	266.91 million	73.7%
Total internet users in Indonesia	196.71 million	

And according to the results of the survey Table 1.2 from APJIII, internet users grew 8.7% in the 2019-2020 period in Q2, the result of which exceeds the total population growth itself.

Table 2 Total population growth compared to the growth of internet users (Source: APJIII)

Internet user penetration 2019 - 2020 (Q2)		Penetration
Internet users	196.714.070,30	73.7% from total population
Total population	266.911.900	
Internet user growth	25.537.353,50	+8.9% comparing with 2018

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

Meanwhile, according to the survey in Table 1.3 conducted by APJIII as many as 95.4% of internet users almost use the internet every day. This can be proven by the results of a survey that has been released by APJIII.

Table 3 How often do respondents connect to the internet via smartphones or mobile phones (Source: APJIII)

Q. 11. How often do you connect to the internet via Smartphone/Mobile?	
Answer	**Result**
Daily	95.4%
Once a week	2.4%
Once a month	0.9%
Never	0.9%
No answer	0.1%
Don't know	0.2%

With the results of the survey Table 1.1, Table 1.2 and Table 1.3 conducted by APJII, it can be concluded that internet penetration in Indonesia is already very large, and with the large penetration it can be concluded that almost 95.4% of internet users use smartphones as a tool to connect to internet. Internet.

Internet of Things (IoT) is a technology that can connect objects such as computers, smartphones, electronic tablets (tablets), smart televisions, home devices with sensors, actuators, and software. This connectivity allows these devices to connect, communicate and exchange data through network infrastructure such as the Internet. Each device with a unique identity will be interconnected with other devices to build a new form of communication and network between people and people, between people and objects, and between objects and objects [2].

IoT is a technology consisting of techniques for receiving data from anywhere (sensors), communication technology (sensor networks, communication between devices to devices, communication between machines to machines), fog computing (IoT gates) and cloud computing (cloud) [3].

In [4], Mathilda Gian Ayu in her article entitled "The Development and Use of IoT in Indonesia", said that the development of the Internet of Things (IoT) in 2021 will be more numerous and widespread. Regarding the development of IoT, in 2014 it is estimated that 16 billion devices are connected, and it is estimated that in 2021 it will be 28 billion. However, based on the information when this article was written in September 2020, it has reached 31 billion devices.

Teguh Prasetya, General Chairperson of the Indonesian IoT Association (ASIOTI) [5], said that IoT devices will grow 5-6 million devices every year, which means that in 1 house there will be 5 smart devices.

However, there are very few users of smart home appliance devices in Indonesia, according to the Ministry of Industry [6] in its article entitled "IoT Technologies for Future Industrial Development Solutions" saying that there are around 400 million IoT sensor devices installed, 16% of which are in the industry. Manufacturing, 15% in the health sector, 11% in insurance, 10% in banking and securities, as well as in the retail, wholesale, computer repair sectors 8% and about 7% in government, 6% in transportation, 5% in utilities, and real estate and business services and agriculture with 4% each, and the remaining 3% for housing and so on, which can be concluded that 5% utilities and 3% housing with a total of 8% are tools for supporting IoT Smart homes which are indeed very few.

Furthermore, Gultom & Asvial [7] also argue that the level of adoption of smart home systems in Indonesia is still very low. Meanwhile, in Indonesia, there are several smart home service providers from Telkom Indonesia and MNC but in 2019, Telkom Indonesia itself can only reach 719 users.

The main reason why this research needs to be done is that there is still a low level of adoption of smart home systems in Indonesia. There are several research same as this research but they focus on the big city only, meanwhile, most Indonesian city is still far from modern city. Then according to [8] in his article entitled "6 shortcomings of smart home technology that you need to understand. It's not always easy, you know!" said that there is a large cost in installing a smart home system which is included in the (Perceived Cost), the required electrical power is quite large (Perceived Cost), different brands of different operating systems (Perceived Compatibility, Perceived Connectedness, Perceived Ease of Use), device dependence smart home to the internet (Perceived Control and Perceived Connectedness), the device has a risk of failure (bug) or technical failure caused by many things (Attitude, Perceived Enjoyment, Perceived Usefulness, Intention of Use, and Actual Use). From the problems above, several variables were taken that were used in this study.

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

This research also does a literature review of related works to help the author develop the model and hypothesis. However, these factors are still hypothetical and need to be studied further. Later, this research is expected to insight and become a reference for the IoT smart home company and smart home providers to improve their product, also the author expected this research can become a research reference about IoT smart home acceptance in Indonesia and can enrich theory about technology acceptance, especially about smart home IoT technology.

This research purposes an approach to evaluating which factor of IoT smart home adoption encourages IoT users to use IoT systems in their homes. The rest of this paper is organized as follows, in section II, we will discuss and review the literature related to the topic from previous research. Section III is explained the method used to do this research. Section IV consists of the results of the research. In Section V, we implicate the result with theoretical and practical implication aspects with previous research. Section VI is the conclusion of this research.

2. LITERATURE REVIEW

2.1 Internet Of Things

Internet of Things (IoT) is the latest communication model, where objects and equipment from everyday life will be equipped with technology to communicate, and appropriate protocols that will enable them to communicate with each other as well as with users, which is an integral part of the Internet of Things (IoT). Internet. IoT can provide a unified communications infrastructure, and simple, and economic access to a number of public services, thereby unleashing potential synergies and increasing transparency for use [9].

The working concept of IoT itself is the use of physical goods that are given a wireless module so that these physical goods can be connected to the internet, which will store all data in the cloud system to be collected as big data [10].

IoT will drive the development of several potentially large applications and the various data generated by these objects to facilitate the use of old services as well as provide new services to citizens, companies, and public administrations, by enabling easy access and interaction with a wide variety of devices. IoT also describes a system architecture that integrates sensors, software, networks and appropriate interfaces that will provide real-time awareness and integrate people, processes and knowledge to gather intelligence that can make good decisions [11].

Internet of Things (IoT) is a development of network communication of interrelated objects, connected to each other through internet communication and can exchange data which then turns it into information[12]. Internet of things is a technology that allows us to connect machines, equipment, and other physical objects with network sensors and actuators to obtain data and process and be able to manage their own performance, making it possible for machines to collaborate with each other [11].

The following are consumer-based IoT tools that smart home users can use, according to [13] Smartphones, Smartwatch, Smart band, Smart lock, Smart TV, Smart appliances (Coffee maker, refrigerator, Air conditioner, Bulb, Speaker, etc), Smart Sensor (IR blaster, Motion detector).

2.2 Smart Home

Smart home is a concept where a house can be integrated with IoT devices and technologies that are connected to each other through a connection that can be controlled by other hardware connected to a network. In addition, Smart Home can also carry out an activity without the need for physical interaction between hardware that can be set through software that can be adjusted according to the preferences of each user. According to [14] IoT devices are part of a larger home automation concept, which can include lighting, heating, air conditioning, media and security systems.

On the other hand, [15] said that Smart Home is the definition of a home that uses tools that can be connected to the internet which in its use can be automatically controlled from anywhere with an internet connection. Here's how Smart Home, works according to [14], Smart Home devices can be connected to one another into a device, where a system is installed into a device so that these devices can be connected to each other, with the connection between them. device making it easier for users to control Smart Home devices through these devices.

2.3 Related Work And Previous Research

In Jordanian, [16] conduct a qualitative research to understanding users acceptance of smart home using TAM and SEM-PLS approach with result that trust, awareness, enjoyment, and perceived risks, with perceived usefulness and perceived ease of use significantly influence attitude towards smart homes which, in turn, impact the intention to use smart homes.

In another recent work at Finnish, a research conducted by [17] based on technology acceptance model, diffusion of innovation theory and consumer perceived innovativeness, pro- poses an integrated model and using SEM to validate the result come with result that compatibility, perceived usefulness and perceived ease of use are important determinants affecting the adoption of smart home technology, meanwhile perceived cost negatively impacts the intention to use.

Another work conducted by [7] using UTAUT2 and SEM to do analysis of Affecting Technology Adoption Factors for Smart Home Services in Jabodetabek, Indonesia with result that performance expectancy, effort expectancy, hedonic motivation, risk, trust, the attractiveness of alternatives, and behavioural intention.

And another recent work conducted by [18] using TAM to do research about adoption and acceptance of Smart Home Technology Products in bandung and jabodetabek, Indonesia with result that indicated the perceived system reliability, compatibility, connectedness, and enjoyment of smart home products were positively linked to the user's intention to use the products, although there was a negative correlation between the perceived cost and the intention to use.

2.4 Hypothesis Development

2.4.1 Technology Acceptance

Checking user acceptance of a new product or service is an important activity to do in order to achieve the success of a product or service in the market [19].

Likewise, [20] uses acceptance technology as a research model which indicates that Actual Usage was influenced by various reasons related to Behavioural Intention to Use, Attitude, Perceived Cost, Perceived Ease of Use, Perceived Usefulness.

[21] also argues that technology acceptance can have an effect and can explain the acceptance of use in using a technology or product. [22] also used technology acceptance on the influence of perceived ease of use, perceived usefulness, attitudes towards use, behavioural intentions to use, and actual system use.

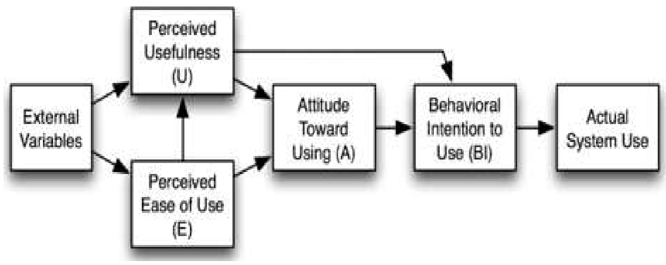

Figure 1. The Original TAM [23]

Based on several journal studies conducted by [19], then several hypotheses are taken that:

• H1. The attitude towards IoT technology in the smart home environment significantly influences the intention to use the technology.

• H2. The perceived usefulness of IoT technology in a smart home environment significantly influences the intention to use the technology.

• H3. The perceived usefulness of IoT technology in a smart home environment significantly influences attitudes towards technology.

• H4. Perceived ease of use of IoT technology in smart home environments significantly influences attitudes towards technology.

• H5. Perceived ease of use of IoT technology in smart home environments significantly affects perceptions of technology usability.

2.4.2 Perceived Enjoyment

The concept of TAM has been examined through many studies. And one of the considerations in motivating users to accept technology is the perceived enjoyment in using a technology [19].

Based on several journal studies conducted [19] it was found to be insignificant, but according to [24] Perceived enjoyment through Perceived Usefulness was found to have a positive influence on motivation to desire to use, so several hypotheses were taken that:

• H6. The perceived enjoyment of IoT technology in the smart home significantly affects the perception of the usefulness of the technology.

2.4.3 Perceived Connectedness

What is considered by smart home IoT users is the connection between smart devices and mobile

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

phones, with a connected connection between devices, users can feel comfort and convenience in life which is one of the goals of smart devices [19].

Based on several study journals conducted [19], several hypotheses were taken that:

• H7. The perceived connectedness of IoT technology in a smart home environment significantly affects the perceived usefulness of the technology.

• H8. The perceived connectedness of IoT technology in a smart home environment significantly affects the perceived ease of use of the technology.

2.4.4 Perceived Compatibility

The concept of compatibility is one of the core players in increasing the perceived usefulness of a particular application or system, especially in implementation it requires the cost of switching and additional efforts from the old system to the new system must be minimized, compatibility is one of the main characteristics of IoT technology in the home smart [19]. In his research [19] found the results that Perceived Compatibility had an effect on Perceived Usefulness and Perceived Ease of Use. Likewise with [25] who found the results that Perceived Compatibility had an effect on Perceived Usefulness and Perceived Ease of Use. So, the author decided to include this variable.

• H9. The perceived compatibility of IoT technology in a smart home environment significantly affects the perceived usefulness of the technology.

• H10. Perceived compatibility of IoT technology in a smart home environment significantly affects perceived ease of use of the technology.

2.4.5 Perceived Control

Perceived control is a user's perception of skills, abilities, resources, to easily understand and naturally use a particular system or service [19]. In his research [19], [26] found that Perceived Control had a positive effect on Perceived Ease of Use, so the author used this hypothesis.

According to [19] to develop successful services, manufacturers should do their best to provide their services with a useful user interface that allows users to maximize their control skills. Based on the definitions developed in previous research, the current study defines perceived control as “users' sense of how skilled they are “performing certain activities using IoT technology in a smart home environment”

• H11. The perception of IoT technology control in the smart home environment significantly affects the perception of the ease of use of the technology

2.4.6 Perceived Cost

Price is one of the most significant barriers for those who will use IoT technology. This shows that users are likely to consider carefully about the benefits of a particular service or service that are greater than the previous costs, many are worried about the costs spent buying, using, and repairing components of a particular system or service or the costs spent buying, install, maintain, and operate IoT technology in a smart home environment [19]. From the results of research conducted [17], [19], [18] it was found that there was a significant influence between Perceived Cost and Perceived Intention of Use so the authors used this variable in the study.

• H12. The perception of the cost of IoT technology in the smart home environment significantly influences the intention to use the technology.

2.4.7 Actual Use

The actual use (Actual Use) is a real condition of a system user using the system [23].

Users will be satisfied using the system or device if the user believes in the benefits and usability that the user will get when the user uses the system. The form of measurement of Actual Use is based on the frequency and duration of time in using the system or device, the measurement can also be based on the total time used by the user in using the system or smart device [27].

With the thought of the convenience obtained and the benefits obtained will be an encouragement to users to use existing devices or systems [21].

The form of measurement of Actual Use is based on the frequency and duration of time in using the system or device, the measurement can also be based on the total time used by the user in using the system or smart device [22].

• H13. Perceptions of how long and how often user interactions use IoT devices and IoT systems

3. RESEARCH MODEL

3.1 Proposed Model

Based on the problem, literature review, preliminary survey review of previous similar research, and the developed research model, the researcher conducted a Research Model based on Research conducted by [19]. The following research model used in this study as shown in Figure 2 below.

It can be seen in Figure 2 which is the result of the framework obtained from the Technology Acceptance Model (TAM) theory which was inspired by research conducted by [19].

Research conducted by [19] uses the TAM model as a reference where the results of research conducted by Attitude greatly affect ease of use, while Perceived Cost makes users have to think again when there is a desire to use Intention of Use.

In the framework created in Figure 2, Actual Use is added as an indicator of whether from the results obtained, whether the Intention of Use can make people use IoT devices or not.

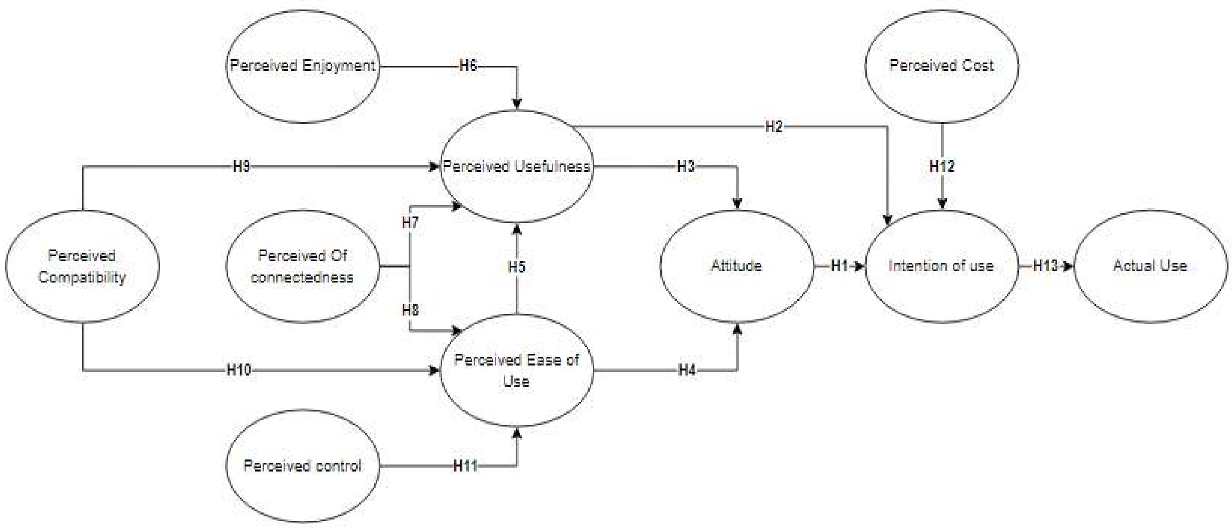

Figure 2. Proposed model modified TAM

3.2 Data Gathering

In this study, respondent data was obtained using the distribution method through online questionnaires using Google Forms media. The distribution of the questionnaire was carried out by distributing it through the Facebook, Telegram, and WhatsApp Group applications. The number of respondents obtained is 107 respondents, with 7 people not using IoT Smart Home devices. So that the total number of respondents obtained is reduced by the number of valid data of 100 people.

In this study there are 7 age classifications, namely under 17 years, 17-24 years, 25-32 years, 33-39 years, 40-47 years, 48-55 years, and above 56 years. it was found that respondents aged 25 - 32 years dominated the survey results with a total of 44 respondents or 41.1%. And in the 2nd position it was found that there were 24 respondents aged 17 – 24 years or 22.4%, while in the 3rd position it was dominated by users aged 33 – 39 years as many as 15 respondents or 14%. In this survey it was also found that there were 10 users over 56 years old, 8 people aged 40-47 years old and 6 people aged 48-55 years old. From the results obtained, it can be concluded that users aged 17 – 32 years or gen Z and millennials dominate the use of IoT Smart home due to their productive age and at that age the majority already have income.

3.3 Validity And Reliability Testing

In this study, data processing was carried out using Smart PLS software version 3.3.9. The data is obtained from the results of a questionnaire with a Likert scale and has been adjusted to the data in the form of a CSV file so that the data can be processed by the Smart PLS software.

According to [28] said that in the convergent validity test the Loading Factor value must be 0.7 or it can be seen from the Average Variance Extracted (AVE) value. [29] also said that in the Average variance extracted (AVE) test, variables that have a value above 0.7 can be declared valid, but a correlation value between 0.5 and 0.6 is still acceptable. Meanwhile according to [29] and [19] said that in the Average variance extracted (AVE) test variables that have values above 0.7 can be declared valid, but the correlation value is between 0.5 and 0. ,6 is still acceptable. In the validity test, discriminant validity is also carried out using the Fornell-Larcker Criterion and Cross-Loading. In the Fornell-Larcker Criterion, the correlation value between variables and the correlation value between variables cannot be less than the correlation between these variables and other variables. Meanwhile, in the Cross-loading test, it displays data on the relationship between indicators and variables, the correlation value of the indicators of each variable must be the largest compared to the correlation of these indicators to other variables.

The reliability test was carried out in 2 ways, namely analysis with Cronbach's Alpha and Composite Reliability. [29] said that the measurement and assessment of Cronbach's alpha was divided into 4, namely below 0.60 in the not accepted category, 0.60 - 0.70 minimum, 0.70 - 0.80 in the good category, and 0.80-0.90 in the very good category. In the analysis of the data above, the results of the variables used are said to be good. In the analysis of composite reliability, all variables are called reliable, also according to [29] The generally accepted CR value must be 0.7 and above.

4. RESULT AND ANALYISIS

After all data is declared valid and reliable (based on validity and reliability tests), then the data is processed to the next stage, namely hypothesis analysis. Hypothesis analysis in this study was carried out using the bootstrapping method using smart pls with a significance level of 5% or p-value <0.05 so that the data was considered significant [30].

In hypothesis testing, the first indicator is the Path Coefficient. The path coefficient can be between -1 to 1, where 0.1 to 1 indicates a perfect positive correlation, a value of 0 indicates no effect on the variable, a value between higher than -0.1 to lower than 0.1 is not a value. significant, and values between -0.1 and above -1 indicate the opposite correlation [26].

In the bootstrap process, a subsample of 5000 will be taken, and the subsamples are observations taken at random from the original data set (with replacement). Each of these processed subsamples will then be used to estimate the PLS path model. This process will be repeated until many random subsamples have been generated (for example, 5,000) [29].

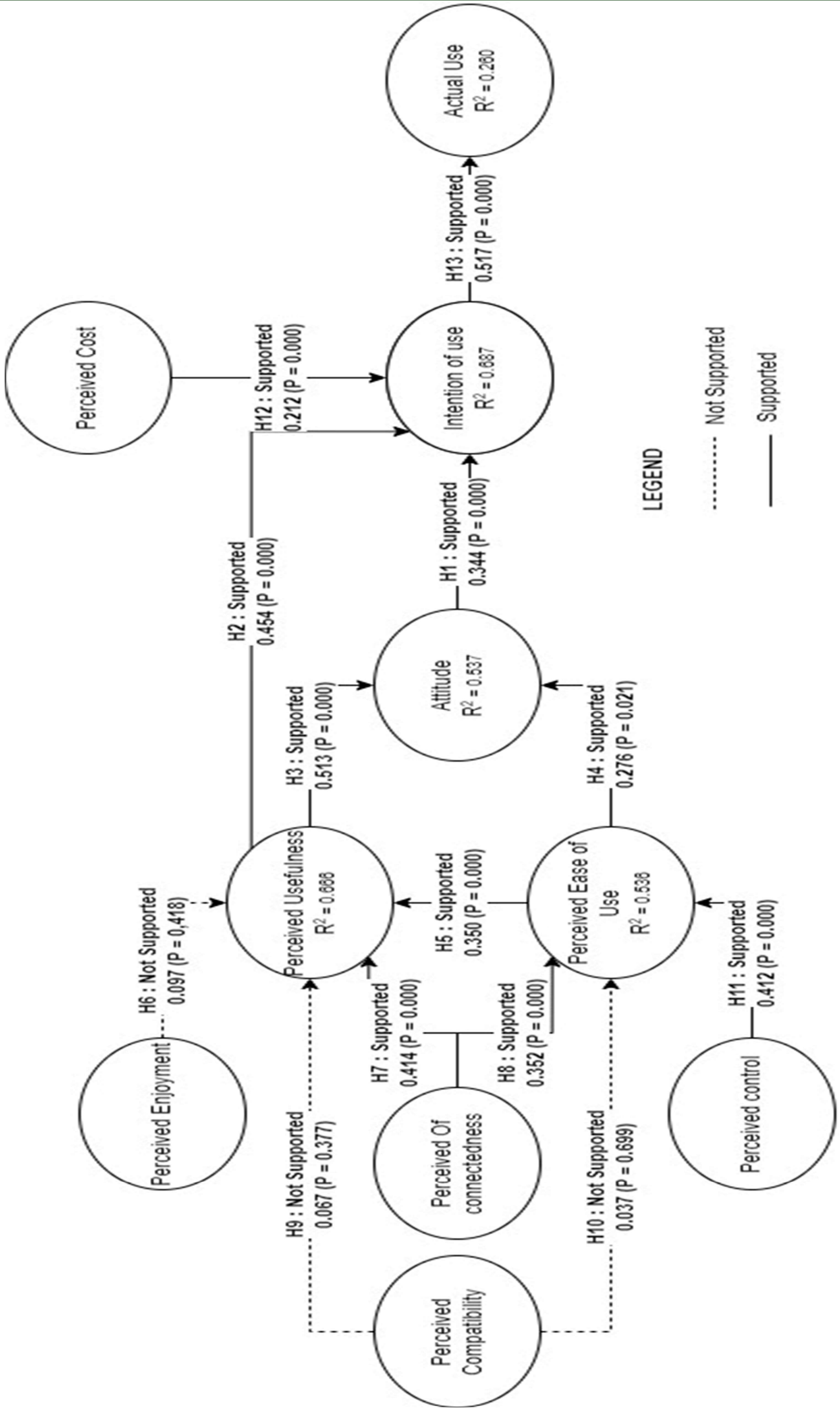

Figure 3. Structural Model

Table 4 Validity and Reliability Test Result

Variable	Item	Loadings	Cronbach's Alpha	CR	AVE
AU	AU1	0.860	0.734	0.881	0.788
	AU2	0.914			
AT	AT1	0.867	0.839	0.903	0.757
	AT2	0.913			
	AT3	0.828			
IU	IU1	0.868	0.892	0.925	0.755
	IU2	0.870			
	IU3	0.885			
	IU4	0.852			
COM	COM1	0.805	0.817	0.877	0.642
	COM2	0.806			
	COM3	0.752			
	COM4	0.838			
CON	CON1	0.875	0.854	0.911	0.774
	CON2	0.885			
	CON3	0.879			
PCT	PCT1	0.817	0.740	0.852	0.659
	PCT2	0.873			
	PCT3	0.739			
COS	COS1	0.733	0.825	0.880	0.648
	COS2	0.791			
	COS3	0.898			
	COS4	0.790			
PEU	PEU1	0.853	0.808	0.873	0.633
	PEU2	0.769			
	PEU3	0.836			
	PEU4	0.718			
ENJ	ENJ1	0.905	0.889	0.922	0.748
	ENJ2	0.872			
	ENJ3	0.845			
	ENJ4	0.836			
PU	PU1	0.800	0.899	0.929	0.767
	PU2	0.903			
	PU3	0.897			
	PU4	0.901			

Table 5 Fornell-Larcker Criterion Data result

Variable	AU	AT	IU	COM	CON	PCT	COS	PEU	ENJ	PU
AU	**0.887**									
AT	0.431	**0.870**								
IU	0.517	0.727	**0.869**							
COM	0.462	0.469	0.549	**0.801**						
CON	0.563	0.763	0.731	0.654	**0.880**					
PCT	0.522	0.642	0.580	0.628	0.757	**0.812**				
COS	0.349	0.274	0.454	0.231	0.301	0.334	**0.805**			
PEU	0.628	0.651	0.691	0.526	0.688	0.702	0.483	**0.796**		
ENJ	0.492	0.718	0.657	0.536	0.758	0.655	0.233	0.633	**0.865**	
PU	0.603	0.715	0.770	0.574	0.772	0.733	0.326	0.732	0.669	**0.876**

Table 6 Hypothesis Test Result

Hypothesis	**Path**	**path coefficient**	**P Values**	**Result**
H1	AT -> IU	0.344	0.000	**Significant**
H2	PU -> IU	0.454	0.000	**Significant**
H3	PU -> AT	0.513	0.000	**Significant**
H4	PEU -> AT	0.276	0.024	**Significant**
H5	PEU -> PU	0.350	0.000	**Significant**
H6	ENJ -> PU	0.097	0.420	**Not Significant**
H7	CON -> PU	0.414	0.000	**Significant**
H8	CON -> PEU	0.352	0.000	**Significant**
H9	COM -> PU	0.067	0.383	**Not Significant**
H10	COM -> PEU	0.037	0.703	**Not Significant**
H11	PCT-> PEU	0.412	0.000	**Significant**
H12	COS -> IU	0.212	0.000	**Significant**
H13	IU -> AU	0.517	0.000	**Significant**

5. DISCUSSION AND IMPLICATION

5.1 Theoretical Implication

This research is supported by the concept of TAM theory in what factors affect the acceptance of IoT Smart Homes. Based on the results of the analysis obtained from the data, it can be concluded that this study supports mainly the findings in previous studies related.

There are only 3 hypotheses that do not support, namely enjoyment has no significant effect on perceived usefulness, compatibility has no significant effect on perceived usefulness, and compatibility has no significant effect on perceived ease of use.

These results show that some variables are not the same as the research conducted by Park [19] and Ferdhany [18].

Attitude (AT) influences Intention of Use (IU). Based on the results of hypothesis testing using the bootstrapping method, the relationship between attitude (AT) and intention of use (IU) has a P-value of 0.000 and a beta value of 0.344. This shows that attitude (AT) affects the intention of use (IU), so it can be said that the H1 hypothesis is accepted.

This shows that IoT Smart Home users in wanting to use IoT Smart home devices are strongly influenced by attitude (AT). This is in accordance with the TAM theory by Davis [23], and the same as the results of several studies including [26], [22], [19], [18], [16], [31] and [32] who found that attitude (AT) results had an effect on intention of use (IU).

Perceived Usefulness (PU) influences Intention of Use (IU). Based on the results of hypothesis testing using the bootstrapping method, the relationship between Perceived Usefulness (PU) and intention of use (IU) has a P-value of 0.000 and a beta value of 0.454. This shows that Perceived Usefulness (PU) influences the intention of use (IU), so it can be said that the H2 hypothesis is accepted.

This shows that IoT Smart Home users in the Intention of Use (IU) of IoT Smart home devices are influenced by Perceived Usefulness (PU). This is in accordance with the TAM theory by Davis [23] and the same as the results of several studies including [19], [18], [16], [33], [17] who get the results that the Intention of Use (IU) of IoT Smart home devices is influenced by Perceived Usefulness (PU), but in research conducted by [32] and [21] found that IoT Smart Home users in the Intention of Use (IU) of IoT Smart home devices were not affected by Perceived Usefulness (PU).

Perceived Usefulness (PU) influences Attitude (AT). Based on the results of hypothesis testing using the bootstrapping method, the relationship between Perceived Usefulness (PU) and Attitude (AT) has a P-value of 0.000 and a beta value of 0.513. This shows that Perceived Usefulness (PU) influences Attitude (AT), so it can be said that the H3 hypothesis is accepted.

This shows that IoT Smart Home users in Attitude (AT) using IoT Smart home devices are strongly influenced by Perceived Usefulness (PU). This is in accordance with the TAM theory by Davis [23] and the same as the results of several studies including [26], [22], [19], [18], [16], [31] and [32] who found that Perceived Usefulness (PU) influenced Attitude (AT).

Perceived Ease of Use (PEU) influences Attitude (AT). Based on the results of hypothesis testing using the bootstrapping method, the relationship between Perceived Ease of Use (PEU) and Attitude (AT) has a P-value of 0.024 and a beta value of 0.276. This shows that the Perceived Ease of Use (PEU) influences Attitude (AT), so it can be said that the H4 hypothesis is accepted.

This shows that IoT Smart Home users in Attitude (AT) using IoT Smart home devices are strongly influenced by Perceived Ease of Use (PEU). This is in accordance with the TAM theory by Davis [23] and the same as the results of several studies including [26], [22], [19], [18], [16], [31] who found the results of Perceived Ease of Use (PEU) to have an effect on Attitude (AT), but in research conducted by [32] found that IoT Smart Home users in Attitude (AT) IoT Smart home devices are not affected by Perceived Ease of Use (PEU).

Perceived Ease of Use (PEU) influences Perceived Usefulness (PU). Based on the results of hypothesis testing using the bootstrapping method, the relationship between Perceived Ease of Use (PEU) and Perceived Usefulness (PU) has a P-value of 0.000 and a beta value of 0.350. This shows that the Perceived Ease of Use (PEU) influences the Perceived Usefulness (PU), so it can be said that the H5 hypothesis is accepted.

This shows that IoT Smart Home users in Perceived Usefulness (PU) use of IoT Smart home devices are influenced by Perceived Ease of Use (PEU). This is in accordance with the TAM theory by Davis [23], and is the same as the results of several studies including [19], [18], [16], [17], [31] and [32] who found the results of Perceived Ease of Use (PEU) influenced Perceived Usefulness (PU).

Perceived Enjoyment (ENJ) influences Perceived Usefulness (PU). Based on the results of hypothesis testing using the bootstrapping method, the relationship between Perceived Enjoyment (ENJ) and Perceived Usefulness (PU) has a P-value of 0.097 and a beta value of 0.420. This shows that Perceived Enjoyment (ENJ) has no effect on Perceived Usefulness (PU), so it can be said that hypothesis H6 is not accepted.

This shows that IoT Smart Home users in Perceived Usefulness (PU) use of IoT Smart home devices are not influenced by Perceived Enjoyment (ENJ). This is in accordance with the results of research from [19] which says that Perceived Enjoyment (ENJ) has no effect on Perceived Usefulness (PU), but the research conducted by [18] states that Perceived Enjoyment affect the Perceived Usefulness (PU).

Perceived Connectedness (CON) influences Perceived Usefulness (PU). Based on the results of hypothesis testing using the bootstrapping method, the relationship between Perceived Connectedness (CON) and Perceived Usefulness (PU) has a P-value of 0.000 and a beta value of 0.414. This shows that Perceived Connectedness (CON) influences Perceived Usefulness (PU), so it can be said that the H7 hypothesis is accepted.

This shows that IoT Smart Home users in Perceived Usefulness (PU) use of IoT Smart home devices are influenced by Perceived Connectedness (CON). This is in accordance with the results of research from [19] and [18] which say that Perceived Connectedness (CON) influences Perceived Usefulness (PU).

Perceived Connectedness (CON) influences Perceived Ease of Use (PEU). Based on the results of hypothesis testing using the bootstrapping method, the relationship between Perceived Connectedness (CON) and Perceived Ease of Use (PEU) has a P-value of 0.000 and a beta value of 0.352. This shows that Perceived Connectedness (CON) influences Perceived Ease of Use (PEU), so it can be said that the H8 hypothesis is accepted.

This shows that IoT Smart Home users in their Perceived Ease of Use (PEU) use of IoT Smart home devices are influenced by Perceived Connectedness (CON). This is in accordance with the results of research from [19] which says that Perceived Connectedness (CON) influences Perceived Ease of Use (PEU), but in research conducted by [18] it is stated that Perceived Connectedness (CON) has no effect on Perceived Ease of Use (PEU).

Perceived Compatibility (COM) influences Perceived Usefulness (PU). Based on the results of hypothesis testing using the bootstrapping method, the relationship between Perceived Compatibility (COM) and Perceived Usefulness (PU) has a P-value of 0.383 and a beta value of 0.067. This shows that Perceived Compatibility (COM) has no effect on Perceived Usefulness (PU), so it can be said that the H9 hypothesis is not accepted.

This shows that IoT Smart Home users in Perceived Usefulness (PU) use of IoT Smart home devices are not affected by Perceived Compatibility (COM). This is not in accordance with the results of research from [19], [26], [18], and [17] which say that Perceived Compatibility affects Perceived Usefulness.

Perceived Compatibility (COM) influences Perceived Ease of Use (PEU). Based on the results of hypothesis testing using the bootstrapping method, the relationship between Perceived Compatibility (COM) and Perceived Ease of Use (PEU) has a P-value of 0.703 and a beta value of 0.037. This shows that Perceived Compatibility (COM) has no effect on Perceived Ease of Use (PEU), so it can be said that the H10 hypothesis is not accepted.

This shows that IoT Smart Home users in their Perceived Ease of Use (PEU) use of IoT Smart home devices are not affected by Perceived Compatibility (COM). This is not in accordance with the results of research from [19], [26], and [17] which say that Perceived Compatibility affects Perceived Usefulness, but in research conducted by [18] states that Perceived Compatibility has no effect on Perceived Ease of Use.

Perceived Control (PCT) influences Perceived Ease of Use (PEU). Based on the results of hypothesis testing using the bootstrapping method, the relationship between Perceived Control (PCT) and Perceived Ease of Use (PEU) has a P-value of 0.000 and a beta value of 0.412. This shows that Perceived Control (PCT) influences Perceived Ease of Use (PEU), so it can be said that the H11 hypothesis is accepted.

This shows that IoT Smart Home users in their Perceived Ease of Use (PEU) use of IoT Smart home devices are influenced by Perceived Control (PCT). This is in accordance with the results of research from

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

[19] and [18] which say that Perceived Control (PCT) influences Perceived Ease of Use (PEU).

Perceived Cost (COS) influences Intention of Use (IU). Based on the results of hypothesis testing using the bootstrapping method, the relationship between Perceived Cost (COS) and Intention of Use (IU) has a P-value of 0.000 and a beta value of 0.212. This shows that the Perceived Cost (COS) influences the Intention of Use (IU), so it can be said that the H12 hypothesis is accepted.

This shows that IoT Smart Home users in their Intention of Use (IU) use of IoT Smart home devices are affected by Perceived Cost (COS). This is in accordance with the results of research from [19], [26], [18], [17] which said that Perceived Cost (COS) had an effect on Intention of Use (IU).), but in research conducted by [7] and [32] it is stated that Perceived Cost (COS) has no effect on Intention of Use (IU).

Intention of Use (IU) influences Actual Use (AU). Based on the results of hypothesis testing using the bootstrapping method, the relationship between Intention of Use (IU) and Actual Use (AU) has a P-value of 0.000 and a beta value of 0.517. This shows that the Intention of Use (IU) influences Actual Use (AU), so it can be said that the H13 hypothesis is accepted.

This shows that IoT Smart Home users in Actual Use (AU) using IoT Smart home devices are affected by Intention of Use (IU). This is in accordance with the TAM theory by Davis [23]. This is in accordance with the results of research from [26], [22], and [21] which say that Intention of Use affects Actual Use.

5.2 Practical Implication

This study aims to determine the acceptance of technology based on the factors that influence the acceptance of IoT smart home in Indonesia between the desire to use, perceived benefits and knowing the impact of acceptance of IoT smart home that is felt by users.

Which includes perceived cost, perceived compatibility, perceived usefulness, perceived ease of use, perceived enjoyment, perceived control, perceived connectedness, attitude, intention of use, and actual use in the use of IoT Smart Home.

So, hopefully this research will help users to see what benefits other users feel in using IoT smart homes and help users in making decisions about using IoT Smart Homes.

It can also help IoT Smart home device providers to innovate to pay more attention to what factors are perceived by IoT Smart Home software and hardware users, create software and hardware innovations to be more accepted by IoT Smart Home users, and if allows to create a universal system where all IoT Smart Home devices can be connected and can be controlled in 1 application.

This paper can be useful for smart home service providers so that this research can provide knowledge about smart home acceptance in the community and smart home service providers can adjust the devices, systems and needs of smart home users.

And finally for researchers, hopefully this research can be a reference for research on the acceptance of IoT Smart Homes and can enrich theories about technology acceptance, especially regarding the acceptance of IoT smart home technology in Indonesia.

5.3 Limitation And Further Research

In this study, research was conducted to find out what factors influence the acceptance of IoT Smart home, which include Perceived cost, perceived compatibility, perceived usefulness, perceived ease of use, perceived enjoyment, perceived control, perceived connectedness, attitude, intention of use, and actual use in the use of IoT Smart Home.

Following are some of the limitations given below; First, there are limitations of users and answers because this type of research is a quantitative research based on a questionnaire. Second, the research focuses only on perceived cost, perceived appropriateness, perceived usefulness, perceived ease of use, perceived enjoyment, perceived control, perceived connectedness, attitudes, use intentions, and actual use, excluding other possibilities about behaviour. and Attitudes towards systems such as cognitive styles, subjective norms and more in the proposed model.

Therefore, this research can be continued in the future by conducting qualitative research with IoT Smart Home users and strengthening the model by incorporating possible behaviours and attitudes towards the system such as subjective norms of other relevant variables based on the latest literature and research models.

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

6. CONCLUSION

This study aims to determine what factors influence users in using IoT Smart home because the number of IoT Smart home users is not many in Indonesia. Therefore, this research was conducted using TAM theory with the addition of external variables. The model and data obtained were tested by partial least squares - structural equation modelling (PLS-SEM), which also tested the inner and outer models using SmartPLS software.

This research was conducted using a survey method and 100 respondents who showed that the actual use of IoT Smart Homes was influenced by various reasons related to Perceived cost, perceived compatibility, perceived usefulness, perceived ease of use, perceived enjoyment, perceived control, perceived connectedness, attitude, intention of use, and actual use in the use.

The conclusion that can be drawn from this research is that the perceived cost, perceived usefulness, perceived ease of use, perceived control, perceived connectedness, attitude, intention of use, and actual use in the use mostly have a significant influence on the actual use of IoT Smart home. on the Indonesian island of Java.

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