

**UNIMAS STUDENTS' ATTITUDES TOWARD ACCEPTANCE OF ONLINE
CUSTOMIZING HOUSE INTERIOR DESIGN IN 3D**

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ABSTRACT

Technology Acceptance Model (TAM) is a model that is widely used by researchers to study on how the user's attitude toward acceptance on certain technology or system.

This research is conducted with goal to research on how the UNIMAS students' attitudes toward acceptance of online customizing house interior in 3D by using the TAM. Besides that, this research also modified the TAM by adding 'perceived security' into the provided variables. As well as study the association UNIMAS students' experience with internet toward perceived usefulness, ease of use, and security.

Keywords: TAM, online customizing, 3D house interior, perceived usefulness, perceived ease of use, perceived security, acceptance attitudes

ABSTRAK

'Technology Acceptance Model (TAM)' adalah satu model untuk mengkaji penerimaan technology dalam kalangan pengguna. Model telah digunakan oleh ramai pengkaji dengan membuat pengubahsuaian dari model asalnya.

Antara tujuan kajian ini dijalankan adalah semestinya mengkaji penerima satu sistem laman sesawang yang menawarkan pengguna untuk mengubahsuai design dalaman rumah dalam maya 3D. selain daripada itu, TAM ini telah diubahsuai dengan menambahkan satu jenis pengubah iaitu 'tanggapan dari segi sekuriti'. Tambahan lagi, kajian ini juga mengkaji tentang kaitan kerjasama antara 'pengalaman mahasiswa dalam penggunaan jalur lebar/laman sesawang' dengan pengubah-pengubah yang telah ditetapkan ('tanggapan keberkesanan penggunaan', 'tanggapan keselesaan dalam penggunaan', dan 'tanggapan sekuriti').

Kata kunci: TAM, pengubahsuaian dalam talian, dalaman rumah 3D, tanggapan keberkesanan penggunaan, tanggapan keselesaan dalam penggunaan, dan tanggapan sekuriti

CHAPTER 1

INTRODUCTION

Introduction

This chapter will discuss about the research background, problem statements, objectives, hypothesis, conceptual and operation definition of terms, the research significance and the research scope.

Research Background

Fulfil the customers' demand is one of the objective to produce a product which is fulfil their need. Highly competition between companies to come out a good product which is fulfilling the customers' need had increasing. Thus, product customization is emerging in the purchasing processes (Dai, Li, Zhang & Xu, 2003). Purchasing via online become today's trend, therefore the customization via online is needed to emerge. By providing this application, customers are able to customize their product via online before confirm to buy it as well as preview it in real-time. As for this research focus on the home interior design, there are few examples of such customization in the internet – www.bluhomes.com, www.eplans.com, etc. In traditional way, people only able to customize their want-to-buy house's interior if they direct interact with the developer, and today's the buyers able to customize their dream home's interior via online customization and also able to preview the result of customization in real-time. Study the customers' acceptance toward the online customization is important in order to obtain the feedback from the customers. Thus, Technology Acceptance Model (TAM) is applied in this research. This model was first proposed by Fred Davis (Davis, 1985) and has been widely used by many researchers who want to explain consumer acceptance of information technologies (Cho & Yun, n.d),

including online customization of home interior design. He proposed that system use is a response that can be explained or predicted by user motivation, which in turn, is directly influenced by an external stimulus consisting of the actual system’s features and capabilities (Davis, 1985). Later, with the help from Fishbein and Ajzen in 1975, the conceptual model was refined as in Figure 1.

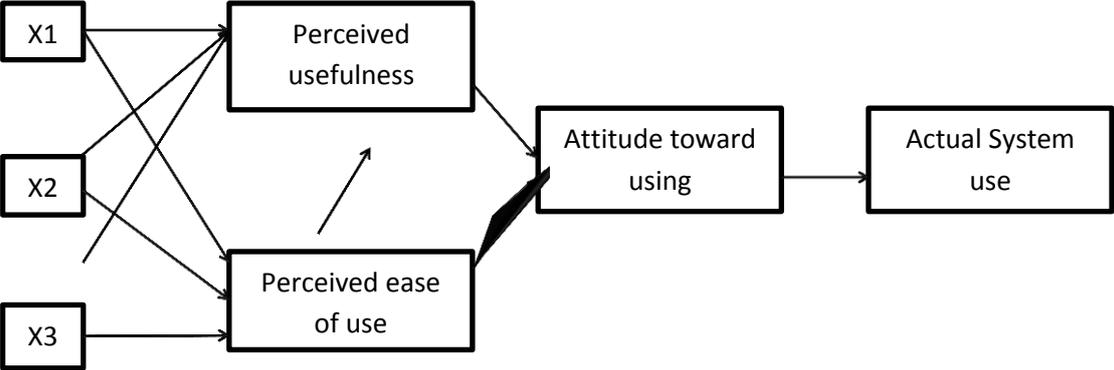


Figure 1: Original TAM proposed by Fred Davis (Davis, 1986).

In this model, users’ motivation can be explained by three factors: Perceived Ease of Use, Perceived Usefulness, and Attitude Toward Using the system (Davis, 1985). Attitude of user toward a system was a major determinant of whether the user will actually use or reject the system. The attitude of the user, in turn, was considered to be influenced by two major beliefs: perceived usefulness and perceived ease of use, with perceived ease of use having a direct influence on perceived usefulness (Chuttur, 2009). Then, both beliefs were hypothesized to be directly influenced by the system design characteristics: X1, X2 and X3 in Figure 1. As for this research, the beliefs will be influenced by the users’ experience with the Internet as the antecedent of the model which is further discussed in chapter 3.

Research Problem Statements

Online security is much concern in using the internet. Security issue should be implemented in future study for customizing online product (Dai, Li, Zhang & Xu, 2003). In the following years, (Chen-Yin & Yun, 2009) a study has been done, at which implemented the security issue in that study (perceived security). However, it is done focusing on customizing jeans in developed websites. Thus, in this research, perceived security will be implemented in Technology Acceptance Model (TAM) to study the UNIMAS students' attitudes toward acceptance of online customizing house interior in 3D in developed website, for example 'www.bluhomes.com'.

Research Objectives

Main objective:

Using Technology Acceptance Model (TAM) to study on UNIMAS students' attitudes toward acceptance of online customizing house interior design in 3D by adding perceived security variable in the modified TAM, as well as study on how UNIMAS students' experience with the internet play a role toward the perceived usefulness, perceived ease of use and perceived security in online customizing house interior design in 3D.

Specific Objectives:

- a. To study the significant association of UNIMAS students' perceived usefulness toward their attitudes on acceptance of online customizing house interior design in 3D.

- b. To study the significant association of UNIMAS students' perceived ease of use toward their attitudes on acceptance of online customizing house interior design in 3D.
- c. To study the significant association of UNIMAS students' perceived security toward their attitudes on acceptance of online customizing house interior design in 3D.
- d. To study the significant association of UNIMAS students' experience with the internet toward their perceived usefulness of online customizing house interior design in 3D.
- e. To study the significant association of UNIMAS students' experience with the internet toward their perceived ease of use of online customizing house interior design in 3D.
- f. To study the significant association of UNIMAS students' experience with the internet toward their perceived security of online customizing house interior design in 3D.

Conceptual Framework

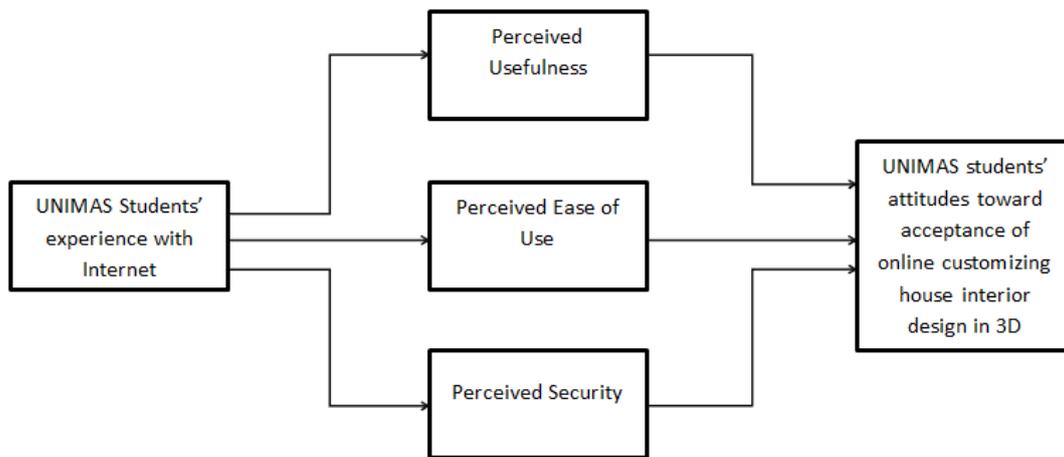


Figure 2: Research conceptual model (modified TAM).

Research Hypothesis

H1: UNIMAS students' perceived usefulness of online customizing house interior design in 3D has a significant association with UNIMAS students' attitudes toward acceptance of online customizing house interior design in 3D.

H2: UNIMAS students' perceived ease of use of online customizing house interior design in 3D has a significant association with UNIMAS students' attitudes toward acceptance of online customizing house interior design in 3D.

H3: UNIMAS students' perceived security of online customizing house interior design in 3D has a significant association with UNIMAS students' attitudes toward acceptance of online customizing house interior design in 3D.

H4: UNIMAS students' experience with the internet has a significant association with UNIMAS students' perceived usefulness of online customizing house interior design in 3D.

H5: UNIMAS students' experience with the internet has a significant association with UNIMAS students' perceived ease of use of online customizing house interior design in 3D.

H6: UNIMAS students' experience with the internet has a significant association with UNIMAS students' perceived security of online customizing house interior design in 3D.

Research conceptual and operational definition of terms

Customize

Conceptual: To modify or build according to individual or personal specification or preference.

Operational: Modifying product design desire by the users.

Internet

Conceptual: The international system of computers that makes it possible for user to see information from all around the world on their computer and to send information to other computer.

Operational: International system of computers that enable the users to gather the product's information and submit their purchasing.

Online

Conceptual: Controlled by or connected to a computer or the Internet.

Operational: Medium for users to connect into the Internet to retrieve data and submit data.

Experience

Conceptual: The observing, encountering, or undergoing of things generally as they occur in the course of time.

Operational: Refer to the user's experience with the use of internet to purchase item online.

Usefulness

Conceptual: Being of use or service; serving some purpose; advantageous, helpful, or of good effect.

Operational: The use of the online customization system among the UNIMAS students.

Ease

Conceptual: Freedom from stiffness, constraint, or formality; unaffectedness.

Operational: Refer to the use of the system on how easy the target user when using it.

Attitude

Conceptual: Manner, disposition, feeling, position, etc, with regard to a person or thing; tendency or orientation, especially of the mind.

Operational: Refer to the user's behave and think about the application of online customization of 3D home interior design.

Acceptance

Conceptual: The act of assenting or believing.

Operational: Refer to the user's act on how much the user will accept the system provided.

Research Significance

The focus of this research is to study on how the UNIMAS students' attitude toward the acceptance of online customizing house interior design in 3D. This application enables the user to modify the interior of the house according to their desire design and creativity. However, the design that design by the user of course have its own limitation which is the modified item will be refer to the safety of the location and also the house itself limitation area.

Research Scope

Research scope will cover on the acceptance level from the UNIMAS students on online customizing house interior design in 3D.

Summary

In conclusion, this chapter has discussed on the research background, research problem statements, objectives, hypothesis, conceptual and operation definition of terms, the research significance and the research scope.

CHAPTER 2

LITERATURE REVIEW

Introduction

This chapter is about to review the previous researches that has been done by researchers on online customization, user's trust toward online purchasing and also the conceptual model that this research will use to study the users' attitude toward acceptance of 3D Home Interior Design as well as review on the important variables in Technology Acceptance Model (TAM) that is used.

Online 3D customizing application

Today houses and others building are built in a fixed exterior design due to the limitation of house or building lot. Thus, changing the exterior design might difficult to carry out. Due to such difficulties, the interior design still can be customized by the developer. However, the developer might not know the customer need because different person has different demand design. For developer, to design the interior is easy if the developer himself is the customer which means they knew their own interest. However, to commerce the product – house interior design, the developer should aware with what are the customers really need (Dix, Finlay, Abowd and Beale, 2004). Therefore in this house interior design industrial, they must focus on what the customers' requirement to design the house interior. Using 3D software is the way how the industrial know the customers' requirement locally for example Google Sketchup Pro , AutoDesk Revit Arquitexture etc. However, the processes will be conducted locally around the industrial area or their branches. Therefore, the idea to design the interior design using 3D software through online is come out. Via online, the

customers able to design their favourite interior house design from their home or their workplace. The processes of course need an Internet connection at the customers' area. With the enhanced interaction functions, customers can customize the house interior design as they like and view the results in real time through a web browser (Dai, Li, Zhang and Xu, 2003) for example Safari, Opera etc. Able to view the real time result of designed house interior is the important key in this process. Customers really want to see the outcome of their result before they confirm the design to the developer for example the changing of the tile size and colour; the colour of the wall painting and etc. In this process also, it is including the user to rotate, pan and zoom-in/zoom-out the house interior design using input control for example mouse or keyboard. To ensure that the customers really want to confirm the design, the customers need to purchasing the interior design to the related industrial company, because different design have different prices regarding with the type of tile is used; the colour of wall painting; the material of the internal wall etc. This process is needed because when the customers satisfied with their own design, thus they maybe want to order it on the spot via online.

Trust toward purchasing online product via online transaction

The use of Internet technology (online) is implementing into this design process to increase the amount of customers worldwide and also to ease the customers to purchase the house interior design. However, this technology has causing trust issue among the customer as well because of the high price they need to pay for the design via online transaction. Therefore, a high usability website design should be developed to overcome this issue. Here the high usability website means the interactivity of the website with the customers. Thus, customers can participate in modifying the form and content of a mediated environment in real time (Steuer, 1992). Provide a good interactivity of website design enabled the customers

to interact with the certain function efficiently for example when the customers are customizing the house interior design and preview the result in real time. The website should show a real time result after the customer alter the design of the interior which mean the website did not giving a fake result for example showing a template of the design instead of customers customized interior design before. Therefore customers experienced high level of risk in online purchasing than traditional face-to-face transactions (Tan, 1999). By increasing website interactivity, customers would communicate with sellers and other buyers on the website more easily, get information about the commodity, reduce perceived of uncertainty and gain more control of their actions (Hampton-Sosa and Koufaris, 2005). As a result, the trust between the customer and the website can be built as well as increase the average of online purchasing in that particular website.

The Technology Acceptance Model (TAM)

In many previous researches, most of the researchers were using Technology Acceptance Model (TAM) to study the user acceptance toward technology that we have today. Thus, it is essential to use this model as this research are going to study the users' attitude toward acceptance of 3D online customization of Home Interior Design. This model was earlier proposed by Fred Davis in 1985 by explained that the system use is a response that can be explained or predicted by user motivation, which is then directly influenced by an external stimulus consisting of the actual system's features and capabilities (Chuttur, 2009).

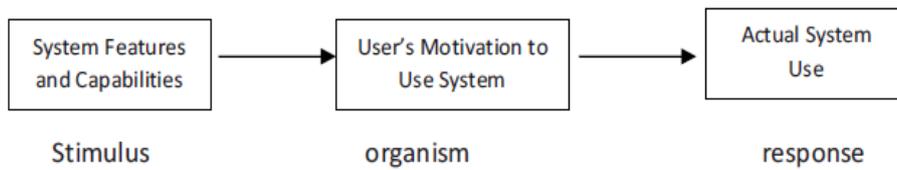


Figure 3: Conceptual model for technology acceptance (Davis, 1985).

‘User’s motivation to use system’ is the main important element in this model in order to determine the acceptance of the system which is using an organism, for example human, to determine it. Thus, suggested that the users’ motivation can be explained by three factors: Perceived Ease of Use, Perceived Usefulness, and Attitude Toward Using the system (Davis, 1985) as shown in Figure 3.

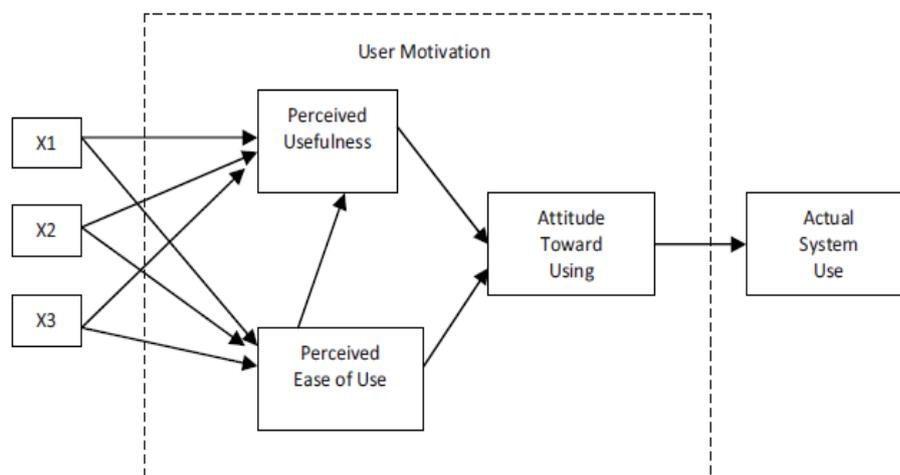


Figure 4: TAM proposed by Fred Davis (Davis, 1986).

The variables X1, X2 and X3 as shown in Figure 4 are the system design characteristics. The characteristics here mean that what is major characteristic that drive the

system to be use-able. For example the online customization of product, the major element to be used will be the Internet. Thus, in this research, the variable that will be used is the user's experience with the Internet which is to determine acceptance level from the user toward the technology. In previous research has stated that many researchers have adopted this model to study the users' acceptance of different technologies. For example microcomputers (Igarria, 1995), word processing systems (Adam, 1992; Davis & Venkatesh, 1996), spreadsheet systems (Adam, 1992; Davis & Venkatesh, 1996; Hendrickson, 1993; Mathieson, 1991) and database system (Hendrickson, 1993).

Perceived Usefulness and Perceived Ease of Use

These 'perceived usefulness' and 'perceived ease of use' are important beliefs (Swanson, 1982) as behavioural determinants that influence on the users' attitude toward using system. Davis defined them as:

Perceived Usefulness: The degree to which an individual believes that using a particular system would enhance his or her job performance (Davis, 1989).

Perceived Ease of Use: The degree to which an individual believes that a particular system would be free of physical and mental effort (Davis, 1989).

These two beliefs are needed to predict a person's behaviour toward the use of technology (Chuttur, 2009) as well as the fundamental variables in the prediction of information technology acceptance (Davis, 1989). Researchers stated that perceived usefulness provide a reliable prediction for self-predicted use of a decision model (Schultz & Slevin, 1975). Concluded that people tend to use a system to the extent that they believe it will help them perform their job better (perceived usefulness), and also that beliefs of the

efforts required to use a system can directly affect system usage behaviour (perceived ease of use) (Davis, 1985).

Perceived security

Security is a factor that will affect the user's attitude whether to trust the website or not as well as the website security itself to prevent the website from being hacked by some individual. Customer will take more concern on it as the transaction will involve a high amount of money for the transaction to the developer. Customizing house is not like customizing jean (though the price is lower, still concern with the security), because as mentioned before, it is involving high amount of money and also the information on the customizing. Customer will customize the house interior according to their preferable, thus the information of the material, the furniture etc, must be secured to avoid any unwanted information just right before the construction later on. If it is not secure, then it will not give any profit for both sides either the developer or the customer. There are three types of information that can be collected from the internet user during their online activities (Chellappa & Sin, 2005), that are, first is the anonymous information such as the information about their computer IP address, secondly is personally non-identifying information such as the user's gender, age etc, the third is the personally identifying information such as their email address, phone number etc. These will drive a factor that contributes in customer's trust toward the use of electronic commerce (Mekovec & Hutinski, 2012).

Summary

As a conclusion, this chapter reviewed previous research that have been done which is in online customization, user's perception in trust toward the technology as well as the technology acceptance model (TAM) that proposed by Davis (1985) which is widely used by other researchers to study the user's acceptance toward various technologies.

CHAPTER 3

METHODOLOGY

Introduction

This chapter will discuss on the methodology that is used to accomplish this research's objective. Quantitative methodology is used in this research and questionnaire is prepared for the purpose of collecting the data from the respondents. There are four variables that to be measured which are 'experience with Internet', 'perceived usefulness', 'perceived ease of use' and 'attitude toward acceptance of online customization of 3D Home Interior Design'. The respondents for this research are the undergraduate students of University of Malaysia Sarawak (UNIMAS). Also included in this chapter is research design, research population and sampling, pilot test, research instrumentation, data measurement, data collection procedure, and data analysis procedure.

Research Design

This research is to predict the student's perceived usefulness, perceived ease of use and perceived security from their experience with the internet of given website (www.bluhomes.com), as well as predict the student's attitude toward acceptance of the online customization of house interior which is in 3D.

Population and Sampling

Focus population will be the undergraduate UNIMAS students. The number of the respondents which is involved in this research is around 98 students with the mean age is 22.35 and standard deviation of 1.32 (Male = 22.4%, Female = 77.6%). This research uses Simple Random Sampling to collect the data.