Imparting Gestalt Essence in Identifying User Preferences towards Interior Design

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ABSTRACT

The purpose of this study is to design and develop multimedia application that can identify human behavior and preferences in interior design. Alessi and Trollip Instructional Design Model has been utilized as a methodology in this study which consist of planning, design and development. Heuristic Evaluation and User Acceptance Test has been applied in completing this experiment. Three multimedia experts have been selected to identify usability problems that occur in the user interface (UI) design. After the refinement was made to the application, the User Acceptance Test was conducted to the user. A total of 60 participants at random selected as a target user to participate in this study. The results demonstrate this multimedia application is effective in satisfying the user needs and demand of the decoration of their dream house. Thus, the researcher was able to identify user behavior and preferences in interior design. With three dimensional (3D) features that were applied in this multimedia application, it helps the user to feel more self-assured with their interior design. At the end of this research, the developments of this application bring numerous benefits for both parties either the users or the developer in many aspects. Thus, the society will be disclosing to the use of technology in the interior design in this sophisticated era.

Keywords: Interior Design, Multimedia Application, User Behavior, User Preferences, 3D.

INTRODUCTION

In this modern era, technology is becoming more popular and synonymous to society from day to day. Interior design is the art and science or process of designing the interior decoration of a room or a building. A household is any group of people who lives together under one roof. Most of the studies also shown that the interior design is relates to the human behavior and requires a deep knowledge about it. According to the knowledge of human behavior, the designers will have their own persona intuition, sensitivity, and experience. In this case, the user is able to design their dream home with own preferences in a convenient situation with the help of the multimedia application.

Three dimensional (3D) is one of the medium that can be used to create an illusion of model to emerge in real life. It is an image or object that provides the perception or view of length, breadth and depth. 3D model shows the designated structure for a picture or items that are able to make the user feel involved in the scene like a real life and satisfied with their dream home. Developing this 3D model is very helpful to the people who are having difficulties in understanding and satisfying the design of two dimensional (2D) sketching that does not consist of the necessary detailed information.

By using a traditional method, it is hard to visualize the actual decoration of interior design to be more functional and appealing without a sample. These may lead people to become inefficient and inconvenient since they need to measure the dimension of existing space by using a measurement tools in order to buy new furniture for their house. User can place the print adhesive tapes from a Length Printer which is an actual length with one-dimensional printer of furniture to help them acknowledge the available space for particular furniture. It will take time to satisfy the user need and

demand if they want to find the best spot for the furniture that perfectly fits to the dimensions of available space. It is because they need to tear off and put on the Length Printer repeatedly (Tang, Lau, Chan, & To, 2014). Therefore, an effective way to help the user to visualize an actual dimension with best furniture that can maximize their satisfaction is by developing 3D model for them.

Besides that, an interior designer requires a deep knowledge of human behavior. A house is not just a functional shelter but a machine to live in and has everyday knowledge to its resident (Gram-Hanssen & Bech-Danielsen, 2004). Most of the studies show the reason why different people buy different things is much related to the social classes. Higher social classes have a "good taste" in consumption rather than the lower classes and shows that the symbolic power structure of society can be seen from the residential neighborhoods. Individuals have their own identity that will prompt to the utilization of everything from the houses to the central of furniture and clothes. The different sense of taste and choice was determined by the different forms of power and capital with differ in time and space. The residential neighborhoods with various representative esteems will lead to the decisions of a home. Thus, it shows that monetary capital may affect what an individual can afford and where is the social space you fit in (Gram-Hanssen & Bech-Danielsen, 2004). So, this multimedia application is seek to help these groups of people to décor the house according to their preferences and dreams without having to worry about their social classes.

The objectives of this project are:
i. To design and develop a multimedia application with 3D features that can satisfy user needs and demand of decoration in a shorter time.
ii. To identify user behavior and preferences in interior design.
iii. To evaluate the user satisfaction towards interior design by using multimedia application with self-pace control.

Several scopes have been identified in this project. Firstly, is about the design and development of a 3D element in multimedia application that can satisfy user needs and demand of decoration in a shorter time. The main target users are the households who are willing to participate and using this multimedia application with 3D features and multimedia experts. Nevertheless, this project is also suitable for all the households. Besides, the time taken to accomplish their interior design by using the application has been captured. User satisfaction towards interior design was evaluated through the survey after they use the application. Based on the time taken used by the user to complete the interior design, the researcher will identify user behavior and preferences towards it.

The significance of this project is that the user themselves can decorate the house according to their needs and expectation in the fastest and easiest way. For the households who are in the category of lower and middle income households, they will have a chance to decorate and build their dream house according to their own preferences at the lower cost and still in their budget since there is no need to hire interior design consultant.

Other than that, problem solving about consumer needs and requirements of their home decoration will be more effective and efficient since they are able to view the design in 3D by themselves before they proceed to the next step in decorating their homes in real life. Therefore, they can determine the design that can maximize their satisfaction. If the user does not satisfy with the design, they can edit the design until it meets their expectation.

This project will also bring numerous benefits to the developer. The developer is able to identify user behavior and preferences in interior design. The researcher was able get to know which part of the house that the user most preferred. The time that is consumed by the user in completing the design will be evaluated to determine their interest of interior design. The longer the time that user consumed to decorate shows the deeper their interest in it. It is because they were giving a deep thought of it.

GESTALT PRINCIPLES OF DESIGN

This principle is one of the most significant hidden thoughts behind the gestalt standards of visual discernment. The most powerful early proposition expounded on the hypothesis was distributed by Max Wertheimer in his 1923 Gestalt laws of perceptual association; however Wolfgang Köhler's 1920 conversation of Physical Gestalten likewise contains numerous persuasive thoughts regarding the matter.

Notwithstanding who originally proposed the thoughts, gestalt standards are a significant arrangement of thoughts for any creator to learn, and their usage can extraordinarily improve the style of a plan, yet in addition its usefulness and ease of use.

In the least difficult terms, gestalt hypothesis depends on the possibility that the human cerebrum will endeavor to disentangle and sort out complex pictures or plans that comprise of numerous components, by subliminally orchestrating the parts into a composed framework that makes an entire, instead of only a progression of divergent components. Our cerebrums are worked to see structure and examples with the goal for us to more readily comprehend the condition that we're living in.

There are six individual principles commonly associated with gestalt theory: similarity, continuation, closure, proximity, figure/ground, and symmetry & order (also called prägnanz). There are also some additional, newer principles sometimes associated with gestalt, such as common fate.

RESEARCH METHODOLOGY

The methodology that has been used in this study is Alessi and Trollip Instructional Design Model. It consists of three phases of the methodology: Planning, Design and Development.

a) Planning phase:
The first phase in developing this multimedia application is planning. Planning phase acts as a basis in ensuring all of the aspects needed in this multimedia application run smoothly (Por & Fong, 2011). There are four steps that is involve during the planning phase of the multimedia application namely: (i) Defining the Scope, (ii) Identifying User Characteristics, (iii) Establishing the Constraints, and (iv) Collecting the Resources.

b) Design Phase

The second phase of this Multimedia Application is the design phase. There are four steps have been conducted which are: (i) Develop Initial Content Ideas, (ii) Create Storyboards, (iii) Prepare Scripts, and (iv) Preparing a Prototype.

It is important for the researcher to develop the initial content ideas regarding this project. A brainstorming session has been conducted and is followed up with a card sorting techniques for getting the initial content ideas about this Multimedia Application.

Storyboard is a portrayal of a specific interaction sequence that the end user would be endeavoring to accomplish through the specific arrangement delineated (Newman & Landay, 2000). The storyboards are essentially utilized by the designer to communicate the ideas regarding the site structure navigation of the application (Newman & Landay, 2000). With the advance technologies that are being used nowadays, the multimedia storyboard is becoming more attractive and engaging for the novices (Antoniou-kritikou, Carayannis, & Katsouros, 1991). Thus, the storyboards will help the researcher to sketch the suitable flow of this multimedia application.

Anything from a piece of paper that can be converted into advance software is called a prototype (Lundberg, 2010). The researcher was using a prototype in the progress of the project before developing the real project. It is because a prototype can give the end user the look and feel of the application at an early stage of the project (Por & Fong, 2011). In preparing the prototype, the researcher was trying to find the collections of images and objects that is suitable to use in Natural Style Outcome Interior Design (NSO Interior Design) application. After that, the images and objects have been edited in Adobe Photoshop and imported to the library in the Adobe Flash.

c) Development Phases

The last phase in Alessi and Trollip Instructional Design Model is the development phase. This phase includes all of the computer programming aptitudes to make the entire application work that incorporates the composition of the programming code, production of graphics, audio and video materials, and the advancement of help materials (Por & Fong, 2011). The development phase consists of five stages which are (i) Preparing the Text, (ii) Create the Graphics, (iii) Develop 3D Model, (iv) Assemble the Pieces, and (v) Conduct a Testing.

Assemble the pieces in this context means that all of the multimedia elements that is used in this project will be combined together to generate an entire Multimedia Application namely NSO Interior Design application. The first objective has been meets during upon completion this prototype.
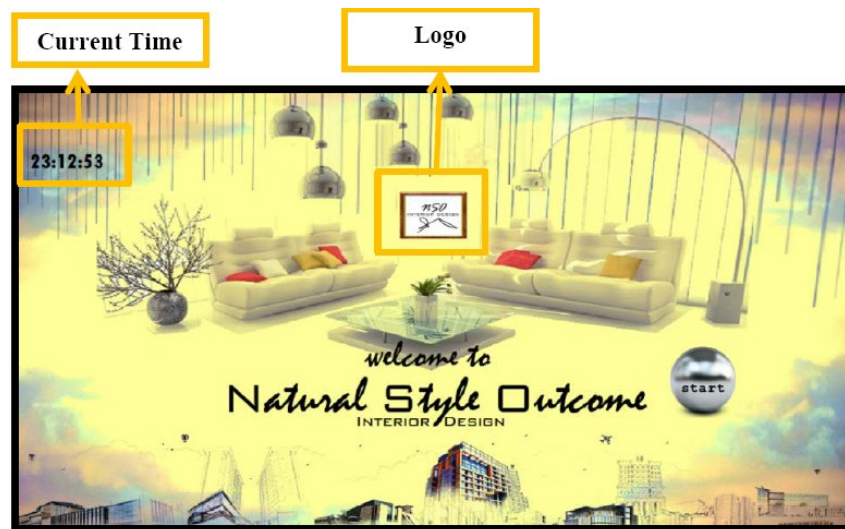

Figure 1: Welcome screen

According to Alessi and Trollip Instructional design model, a testing must be carried out to test NSO Interior Design application that was developed. Heuristic Evaluation and User Acceptance Test was being conducted in order to complete the final project development requirement. Heuristic evaluation and usability testing is carried out since each method discovers different usability problems (Manzari & Trinidad-christensen, 2006).

DATA COLLECTION AND FINDINGS

Heuristic evaluation has been conducted with three multimedia experts from Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA (UiTM) Perlis,. The reason of why heuristic evaluation was conducted is to identify usability problems that occur in the user interface design. It is because more flaws will be captured when using multiple experts rather than using a single expert.

User Acceptance Test is one of the techniques that measure of how easily the application can be used by the representative users. In order to achieve other objectives, the researcher chooses user acceptance test as method of testing. It will help the researcher to drive in getting the result and conclusion of the user satisfaction based on the feedback from the user about the multimedia application (NSO Interior Design).

The user acceptance test for this study was conducted to a total of 60 participants at random households from certain district of Langkawi and Perlis. The researcher was giving an instruction to the respondents before they were asked to work with NSO Interior Design Application. The respondents are required to answer all the questions provided by the researcher via Google Forms link upon completion of the application test. Small token of appreciation are also given to the respondents as a mark of recognition as they are willing to spend their time doing the experiment.
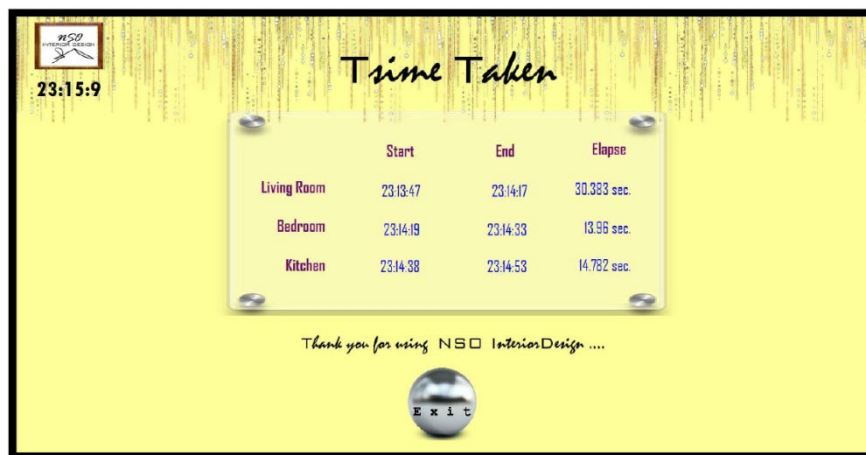

Figure 2: Time captured

This application can capture time taken by user for each main segment. Action Script 2.0 in Flash CS6 has been used by passing several parameters using PHP script interpreted by XAMPP services. XAMPP is a free and open-source cross-platform web server solution stack package developed by Apache Friends. Data has been stored in rich text file.

RESULTS AND ANALYSIS

The researcher analyze collected data using SPSS (Statistical Package for Social Science) based on all response that a respondent answers in the questionnaires. Toward the end, conclusion can be made. The interesting part was the growing one's age, they show less interest in the use of technology and interior design. There can have many factors that made the people showed less interest. The younger generations are the people who showed more interest to the use of technology is because they were growing with the technology environment and was always considered in the mind of the designer

when designing today's technology compared to the older generation. So, the majority of the older generation is having a hard time to use the technology. At the same time, a person who is aged 19 and below was not showing their interest to test this application is not because they do not love the technology, but they stated that they were too young to think about the interior design. It is because many of them are still in school or have just finished high school.

People who ages of 20-29 years old are those who shows their interest in interior design and the technology. This is because many of them are fresh graduates or the newly married people or people who are planning to get married or gologant-minded who think of the future. They think that interior design also plays an important role to make sure that their house has a great and convenience atmosphere. Thus, NSO Interior Design application is an application that is helpful in giving them ideas to decorate their dream house and they does not need to spent a large amount of money to hire interior design consultant.

The words interior design has becoming more popular among netizens nowadays. However, there is no denying that there are a few who do not know about interior design. So, the researcher has taken this opportunity to get certainty about this from the households. The screenshots of the pie chart show the result of the people who have ever heard about interior design. There is a yes and no answer for this question. The pie chart represents 49 people who give a yes answer with the percentage of 83.1% while there is only 16.9% or 10 people who does not know about interior design.
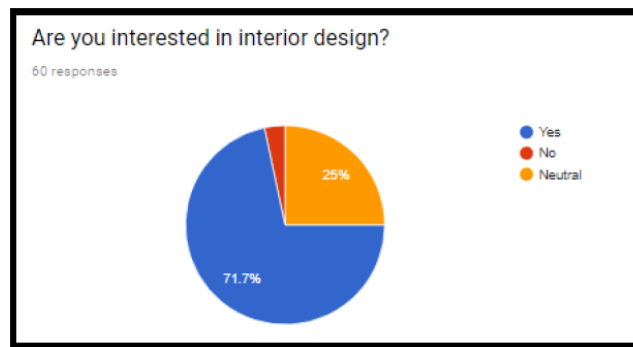

Figure 3: People interest in Interior Design

The pie chart represents two people who did not have any interest in interior design with 3.3% of the percentage. Another slice with 25% of the percentage belongs to 15 people who think that interior design is something that comes naturally to the individuals who are inside a house. The rest represents 43 people who claim that they are interested in interior design with a majority of 71.7% of the percentage.

Figure 4: Randomize button for three main proposed area

The questionnaires were asked the households if they are given a chance to choose, which part of home they would like to decorate first based on their need. The households can choose to décor either living room, bedroom, or kitchen first. Based on the pie chart above, total of 29 households with the percentage of 48.3%, majority of them think that they need to décor their living room first. It is because living room is considered as the main part of the home. They will spend lots of their time at the living room with the family members. Besides, if there is a visitor at the house, the living room will be a place where they will sit to have a conversation. So, it is important to make sure to have a good interior design at the living room.
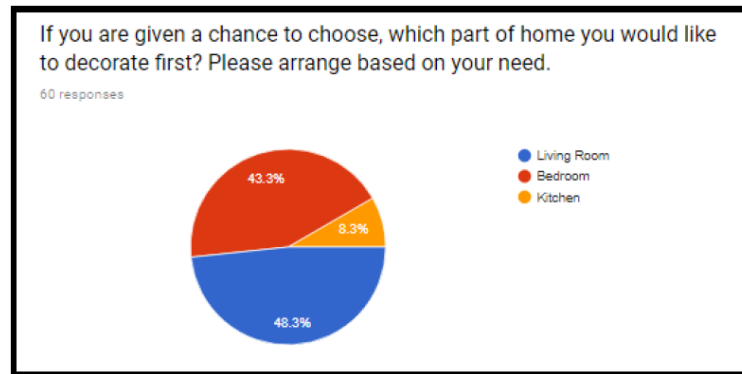

Figure 5: Most preferred area

The button that has been used in NSO Interior Design are also clear and understandable with 56.7% of the respondents are agree and 21.7% of the respondent is strongly agree. There are 18.3% think that it is natural while 1.7% of the rest of the respondent is agree and strongly disagree about it.

This application is also found to be helpful and give an ideas to the user to decorate their home with 58.3% of them is agree and 23.3% is strongly agree. NSO Interior Design is also found to be interesting and enjoyable with majority of the percentage with 60% of the respondent is agree and 20% is strongly agree about this.

With 55% of the respondent agreed that this application was able to satisfy their preferences of interior design. There is 20% of the respondent is strongly agree, 21.7% feel neutral and 3.3% is strongly disagree about this application was able to satisfying their preferences.

Out of total of 60 respondents, 26.7% strongly agreed and 50% agreed that they would like to use NSO Interior Design in the future. There is 18.3% feel neutral about it. However, there are also people who think that they would not use NSO Interior Design application in the future with 1.7% is strongly disagree and 3.3% is disagree about this. In a nutshell, NSO Interior Design application brings a positive feedback from the respondents.

CONCLUSION

It can be concluded that this application can bring several benefits to the potential respondents. The development of this multimedia application was useful and contribute the benefits for both parties either the respondents or developer. NSO Interior Design application also gives the respondents a new and fastest way to perform interior design without having to hire interior design consultant that is costly. The respondents were able to decorate their dream home by themselves in a shorter time. It also able to capture the total time spent for each component in identifying respondent behavior and preferences in interior design. The features used in NSO Interior Design application also can satisfy respondent needs and demand of decoration by providing intuitive interfaces which easily understandable by the respondents.

All in all, this multimedia applications (NSO Interior Design) application has been completed in a given period of time. NSO Interior Design is able to help the people who would like to decorate their

dream home according to their needs and expectation in the fastest and easiest way. To summarize this project, all of the objectives for this project had been accomplished as wishes and brings the benefits to both the respondent and the developer. Last but not least, the researcher hope that NSO Interior Design application will becomes renowned in the future.

RECOMMENDATIONS AND FUTURE WORKS

Most of the respondents suggest by providing are plenty of choice for furniture and accessories can offer great range of option. If possible, allow the respondents to add their own 3D model or collection which can be used during decoration process. Other than that, it will be more meaningful if this app can allow or directly link with furniture supplier where they can ask for advice or place an order in decorating their house.

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