



# RESEARCH METHODOLOGY IN COMPUTING & TECHNOLOGY

## - 3D E-Commerce Shopping - CT098-3-2-RMCT

**Name** : Sherif Magdy  
**TP Number** : TP051258  
**Intake Code** : UC2F1908SE  
**Submission date** : 4 May 2020  
**Lecturer's name** : Dr. Siti Sarah Binti Maidin  
**Assignment title** : Individual Assignment

## Contents

Table of figure.....	3
<i>Abstract</i> .....	4
1. Introduction.....	4
2. Literature Review.....	5
3. Problem Statement .....	7
4. Aims and objectives of the research .....	8
5. Research Questions .....	8
6. Significance of the research .....	8
7. Methodology .....	9
7.1 Questionnaire .....	9
7.2 Data Analysis.....	10
8. Overview of the proposed system.....	10
9. Conclusion .....	12
10. References.....	12

Table of figure

By: Author

Figure 1.0 .....10

Figure 2.0 .....10

Figure 3.0 .....11

Figure 4.0 .....11

Figure 5.0 .....11

## 3D E-Commerce Shopping

*Sherif Magdy Abdelhay Mohamed*

[Sherif\\_shanner@hotmail.com](mailto:Sherif_shanner@hotmail.com)

### Abstract

*This proposal aims to identify the current challenges of e-commerce systems. The first section discusses how e-commerce began and gives an introduction about 3D environments and its benefits. The second section explains the significance of 3D e-commerce. The third section states the issues of current e-commerce. A quantitative study will be conducted throughout this research and this research will point out how 3d e-commerce is a solution to the identified issues.*

*The development of e-commerce and online shopping using information technology and internet has rapidly emerged due to the benefits it gives to the consumers. In contrast, e-commerce and online shopping still cannot fully replace onsite shopping because online shopping websites does not provide full information or details about the products. Therefore, it will lead to an*

*informed decision by the customer before checkout. 3D e-commerce shopping will have a great potential for enhancing e-commerce systems and provide more detailed information about the product for the customer. Also, it will engage the customer in a high definition 3d shopping environment.*

***Index Terms*** – Virtual Environment, e-commerce.

### 1. Introduction

The tremendous development of technology thanks to Tim Berners-Lee [3,4,5], the inventor of the World Wide Web, gave the first browser to view the web which changed most of things. He wrote the first web client and server in 1990. Later, Netscape introduced the first protocol [6], The Secure Sockets Layer (SSL) [7,8], in 1994. The internet was emerging, and it required a way for transport security to secure transactions.

Later, money was involved in a lot of businesses over the internet. PayPal was then launched in 1998 which provided a facility for a secured online payment. Then a new development takes place 49 years ago when electronic data interchanges and teleshopping was emerging [1]. The internet became public 29 years ago, that's when Amazon, the first e-commerce site, started selling products and millions of businesses followed. Quickly, various benefits were discovered regarding the customers, therefore, it became very attractive for them. Benefits, such as, convenient price, easy process, fast shipping, price comparison, obtaining customer reviews, and social shopping [10]. Then, development starts to process, and online shopping sites have added more facilities, such as transforming those two-dimensional (2D) sites into three-dimensional (3D) through the additional use of 3d environment. Additionally, the 3d shopping environment multiple categories or sections under one roof where the customers can use their 3d characters to traverse from one category to another easily. Creating a 3d environment help increase customer satisfaction through transforming website into 3d where they can view product in 3d mode. Correspondingly, the computer usage grew to the next level of technology, where

it comes helpful and can create a more well-organized, less expensive, and higher-quality service-delivery environment for the users. Using a 3d environment and a controllable 3d character replicates the looks, touch, and feeling experience of shopping where it allows the user to have an in-store experience online. Shopping is more than just buying; it is excitement, the noise, the look, the gatherings and the colours. Simulate this experience by bringing customers experience in the real world to the comfort of their homes.

## 2. Literature Review

The internet has become the reason for a significant change in the aspects of our life. The internet is used daily and it became a channel for accessing information. The user can access information easily using various ways and various activities online such as watching educational videos, or reading E-book, or asking the collection databases, google. In Addition, the user can carry out multiple activities using internet services such as e-commerce, e-learning, online gaming and etc. Online services became an alternate for real life actions such as gathering, meeting, and shopping. 2D websites, that are integrated with most

online facilities help in increasing sales, market activities, and advertisement.

So, why not expand those business activities by using 2D web environments in 3D environments because it can revolutionize activities and create opportunities for co-creation and enhancing customer's point of view and value of brand.

Such systems could be used for multiple purposes such as entertainment, simulation, and education. 3D environments will help us experience the world by creating an environment to be explored. With high advanced graphics and real-time simulations, it will help the user engage with the 3d environment and it will be the next generation of 3D technology.

A computer generated 3d environment that is similar to the real world can connect to an online entertainment and social networking for users [10]. In chatting, people can communicate with each other from various places. Now if we integrate the chatting with the 3D environment it will offer a rich environment for customers that will help the user interface to be more attractive and it will increase interaction between customers. In Addition, there will be an increase in the user's motivations to walk around and see the realistic 3d environment. 3D

environments are usually developed for 3 main purposes: gaming, recreation, and entertainment [11]. In addition, 3d gaming has developed in an extraordinary way, it is one of the fastest growing technology nowadays. Games such as Fortnite where it has 250 million players in total, and Pubg where it has over 200 million users aside the mobile version [13]. So, 3d environment gaming will have a significant impact if there is high quality graphics, realistic environments, controllable 3d character, and easy controls.

Edutainment is the combination of education and entertainment. It is blending engaging, enjoyable experiences with a learning value [14]. Nowadays, we can find and learn information via various techniques such as researching online, watching instructional videos on YouTube, or any other distance learning powered by video technology. Therefore, establishing realistic environments provides a powerful set of learning-oriented tools, these platforms allow for the implementation of sophisticated instructional models within a framework with richer information and cooperation [12]. In general, 3d environments provide various possibilities to socially research and learn including opportunities for testing capabilities. 3d

world environments are used for teaching purposes. For instance, a pilot takes a simulation exam before he moves on to the real world. The simulation is a high definition 3d environment game where you are able to control the high definition 3d airplane as if you are experiencing it in real life. This simulation's role is to test and give him the experience that he will go through in the real flight. In conclusion, 3d technology gives the ability of modifying, controlling or manipulating physical object to use them in the favourable environment.

This paper presents a new type of e-commerce system that integrates 3d environments with an active 3d character. This system will be implemented by using 3d language to allow consumers to access into realistic 3d environment to improve shopping experience and user interaction.

### 3. Problem Statement

Design is the most attractive aspect for any user that is shopping online. In addition, 2d ecommerce websites is stuck in at the old-school way of approach to selling. Most of the e-commerce websites lack necessary insights of a customer's behaviour and buying patterns. So, if we combine entertainment within purchasing products it will increase sales in any business.

Inaccurate 2d product images and description is one of the main factors that make customers take an ill-informed decision. Therefore, several purchases happen online where the user does not receive the exact product as mentioned in the product image or description.

Another factor is clothing measurements size. Around 20% - 40% of clothing sold is often returned by the consumer [15]. The reason for this is because the consumer purchases garments and when he receives it, the clothes does not fit him at all. So, there is inaccuracy in clothing measurement and lack of visuality before purchase.

This research will present a new system that combines entertainment and e-commerce where the user can fully control his/her own character in a 3d environment to give him feeling or the taste of shopping while being at home. Also, he can chat and meet other customers while shopping (multiplayer). In addition, the user will have the ability to view the product in a fully high definition 3d model and a detailed description will be visually represented next to the model. In addition, there will be online 3d fitting where the user can try any garments on his/her 3d character. Therefore, the customer

can make an informed decision before purchasing the product.

#### 4. Aims and objectives of the research

This research discusses the current issues of e-commerce and why it exists, also it introduces a technology-wise solution. The aim of this research is to introduce a new type of e-commerce where it will help users in taking a formed decision before purchasing any item and help be certain of the garment's size before any garment purchase.

This proposed system has never been implemented before, and it will be a complicated system, therefore, we will face multiple difficulties. The objective of this research is to:

- Introduce a new format of e-commerce website other than the old-school format of any e-commerce website.
- State and study the issues that occurs in e-commerce and state how 3D e-commerce will solve those issues
- Discuss how the proposed system would satisfy customer needs.

- Evaluate the Statistical data analysis about how users are open to the 3d e-commerce.

#### 5. Research Questions

- I. What topics are evident in a 3D e-commerce research?
- II. Why 3D e-commerce has never been implemented before?
- III. What is the required data for statistical data analysis?
- IV. How will 3D-ecommerce affect the economy?

#### 6. Significance of the research

There are over 4 billion users on the internet in the world. 2 billion of them are global digital buyer. Each day the usage of technology increases, and technology get more advanced and innovative. The aim of this research is identifying the current e-commerce issues and stating the solution that creates a new type of ecommerce. On the other hand, the significance of this research is that it notifies the reader the issues of current ecommerce systems that there is the idea of a new system with easy process that can help, customers make better purchasing decisions, solve ecommerce issues, enhance the concept of ecommerce



with high level of security, increase the number of global digital buyers, and increase profit.

## 7. [Methodology](#)

Developing a 3d e-commerce website requires a study of e-commerce customers tastes and preferences, and requirements. In order to obtain this information, quantitative method have been chosen to obtain this information because it is important to establish facts about 3D e-commerce. A questionnaire will be conducted to gather data.

### 7.1 [Questionnaire](#)

The purpose of conducting a questionnaire is to obtain e-commerce customers' opinions if such system exists. This methodology is important because it helps to collect feedback from e-commerce users regarding, their technical knowledge, whether the system will solve their issues with e-commerce, whether it is useful for the user, and will they use such system.

For this methodology, we will be taking a sample size of 700 e-commerce users. The sample size mentioned is near the maximum because it is very important to get accurate results, the decision of implementing the system will be made based on the results of

the survey, and it will help in the indication of the system's success.

The distribution of the questionnaire will be provided by google forms to the e-commerce customers. Google forms is a free online tool that allows research or any other user to collect information easily and efficiently. The questionnaire will be a series of easy multiple-choice questions and it will be non-consuming of time. The questionnaire will be broken down into 2 parts. The first part will be a series of question that will collection background information about the user, such as, does the user mostly use his phone, laptop, or desktop while performing online shopping. Also, another question would be, how often does the user buy goods and services online. This will help in obtaining which device is mostly used by the user and how often does he buy item via online. This information comes in handy before developing the system, for example, if most of the respondents use desktop while purchasing items online, the development will be focused more on desktop version. The second part in the questionnaire will be more into the e-commerce environment. For example, what kind of issues does the user face while purchasing online, is it security

issues, inaccurate details of the product, inaccurate garments measuring size, etc.

## 7.2 Data Analysis

After the online surveys are conducted, the data will be integrated from different sources. Then a data analysis tool such as Microsoft excel will be used to interpret the data. Statistical analysis will be used because it allows simpler interpretation of the data. After analysing the data, the data collected will be represented in graphs and charts.

## 8. Overview of the proposed system

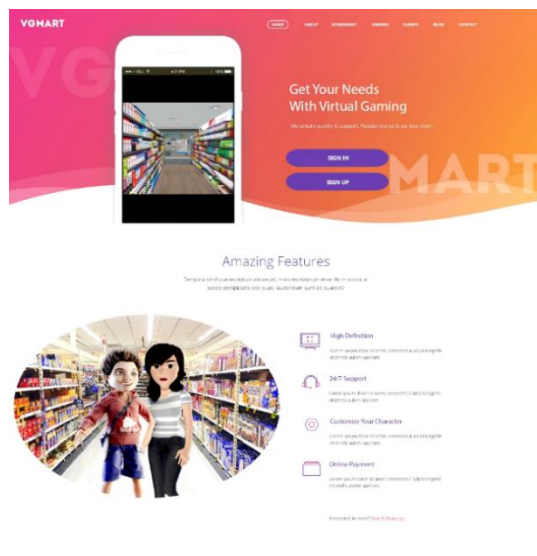


Figure 1.0

The proposed system is a browser-based E-market simulation where you can buy real goods. As shown in figure 1.0, the user will have 2 options. First, to sign in if you already have an account. You will just need to enter a valid email and password, then you will be redirected to the character customization page. Second, is signing up. You can register using Facebook or you can manually fill up all details as shown in figure 2.0.

Figure 2.0

After all inputs are fulfilled the user will be redirected to the 3d character customization as shown in figure 3.0. It is preferred that the user customizes the character to look like the user and provide his body measurements. This is important because if the user provide his body measurement the system can auto-detect his recommended size when purchasing any garments, also the user can access virtual fitting to see how the garment looks like on his 3d character look-alike.



*Figure 3.0*

After completing the character customization, the 3d character will be spawned in a virtual supermarket environment as shown in figure 4.0. The user can fully control his character and there will be a map for navigation to help user reach to his desired item or category. Also, the user can send friend requests to other users. They can meet and shop together on if the friend request is accepted. Users can

chat/talk to each other only if their 3d character are nearby each other.



*Figure 4.0*

The user can view the product in 3d mode and has the choice to add it to his/her cart as shown in figure 5.0.



*Figure 5.0*

After the user is completed with adding all his/her desired items to the cart. The user can proceed to the cash register to check out. The user can choose to pay with cash on delivery or with any other payment integration.

## 9. Conclusion

The proposed system offers solutions for e-commerce issues that lives upon us today. With such system, it is guaranteed that the system will increase customer satisfaction, increase profit, decrease the number of returned purchases, and introduce a new type of e-commerce.

## 10. References

- [8] A. Freier, P. Karlton, P. Kocher (August 2011). "The Secure Sockets Layer (SSL) Protocol Version 3.0"[Accessed 5 April 2020].
- [2] *BBC News Magazine: 'British inventor of online shopping on his inspiration'. BBC videoclip of Michael Aldrich. 16 September 2013* [Accessed 4 April 2020].
- [5] Berners-Lee, T.; Hall, W.; Hendler, J.; Shadbolt, N.; Weitzner, D. (2006). "Computer Science: Enhanced: Creating a Science of the Web". *Science* 313(5788): 769–771. doi:10.1126/science.1126902. PMID16902115. [Accessed 5 April 2020].
- [4] Berners-Lee, T. (2010). "Long Live the Web". *Scientific American* 303(6): 80–85. doi:10.1038/scientificamerican1210-80. PMID21141362. [Accessed 4 April 2020].
- [3] Berners-Lee, Tim; Mark Fischetti (1999). *Weaving the Web: The Original Design and Ultimate Destiny of the World Wide Web by its inventor. Britain: Orion Business. ISBN0-7528-2090-7*. [Accessed 4 April 2020].
- [10] Barnes, S., and Mattsson, J., 2008. Brand Value in Virtual Worlds: AnAxiological Approach. *Journal of Electronic Commerce Research*, 9 (3),p.195-206. [Accessed 5 April 2020].
- [11] Edirisingha, P., Nie, M., Pluciennik, M., Young, R., 2009. Socialisation for learning at a distance in a 3-D multi-user virtual environment. *British Journal of Educational Technology*, 40 (3),p. 458-479.
- [12] Ibáñez, M. B., García, J. J., Galán, S., Maroto, D., Morillo, D., & Kloos, C. D., 2011. Design and Implementation of a 3D Multi-User Virtual World for Language

- Learning. Educational Technology and Society, 14 (4), p. 2–10
- [13] Iqbal, n., 2020. *Fortnite Usage And Revenue Statistics (2020)*. [online] Business of Apps. Available at: <<https://www.businessofapps.com/data/fortnite-statistics/>> [Accessed 5 April 2020].
  - [9] Lee, K., C., Chung, N., 2008. Empirical analysis of consumer reaction to the virtual reality shopping mall. In Computers in Human Behaviour, 24 (1),p. 88-104. [Accessed 5 April 2020].
  - [1] Miva Blog. 2011. *The History Of Ecommerce: How Did It All Begin?* - Miva Blog. [online] Available at: <<https://www.miva.com/blog/the-history-of-ecommerce-how-did-it-all-begin/>> [Accessed 4 April 2020].
  - [15] Medium. 2016. *Fashion E-Commerce Has A Problem That Needs An Urgent Solution*. [online] Available at: <<https://medium.com/@themakers/fashion-e-commerce-s-fitting-problem-e4f3a138484d>> [Accessed 30 April 2020].
  - [14] Nicoletta Di Blas, Caterina Poggi2008 “Investigating Entertainment and Learning in a Multi-User 3D Virtual Environment Investigating Entertainment and Learning in a Multi-User 3D Virtual Environment” Human-Computer Interaction Symposium IFIP International Federation for Information Processing Volume 272, 2008, pp 175-188
  - [6] Swartz, Jon. "Company takes browser war to Netscape's lawn." San Francisco Chronicle. Thursday October 2, 1997. Retrieved on December 29, 2009. [Accessed 5 April 2020].
  - [7] T. Dierks, E. Rescorla (August 2008). "The Transport Layer Security (TLS) Protocol, Version 1.2". [Accessed 5 April 2020].