The impact of virtual shopping with the Covid-19 outbreak

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Abstract— **The COVID-19 outbreak slowly changes the consumer's daily behavior in the shopping journey. In just a few years, a paradigm shift towards digitalization has occurred in various companies. Whereas, companies are forced to adapt the digital business in order to cope with the market competitiveness and the blur economic situation. On the other hand, the emerge of virtual reality in online shopping application has become the latest trends in shopping journey. This research study the change of consumer's behavior during the pandemic crisis and how the virtual reality technology can motivate the consumer's shopping behavior. Several journal articles and survey on the current economic will be carried out to underline factors that affect the changes in the digital economic trend and how the virtual reality can motivate the consumer's shopping behaviour. Results are discussed in terms of implications as well as the benefits of implementations of each element in the online shopping world.**

Keywords— *COVID-19; virtual reality, digital marketing, small and medium-sized enterprise, e-commerce, innovation, 3 Dimension (3D)*

I. INTRODUCTION

The COVID-19 pandemic has caused direct impacts on the economy around the world. Whereas the enforcement of the lockdowns or movement control orders (MCO), restricted several aspects of social life. The restriction of the social life indirectly causes severe economic impacts including the uncontrolled global supply chain, bankruptcies, stock market crashes and unemployment This pandemic also paralyzed the financial markets all over the world, resulting in a decline in the trading value of the Malaysian ringgit, where the price ratio against the US dollar changed from 4.2750 / 2800 to 4.3947 / 4012 Meanwhile, the expansion of e-commerce provides ease and safe access to a variety of products in the market (OECD, 2020). Therefore, the demand for online shopping creates new opportunities in unstable economic conditions.

Realizing this, late e-commerce adopters prompted to adopt online shopping. On the other hand, the application of simulation systems such as Augmented Reality (AR) and Virtual Reality (VR) has become a trend in the current era. A study conducted by Speicher, Cucerca and Krüger (2017) outlined the benefit of VR shopping experience, on which visualization can increase customer's satisfaction and shopping experience. Thus, this study aims to demonstrate how the integration of Virtual Reality (VR) technology can become the alternative solution to enhance the user's online shopping experience. Survey will be conducted and few case studies will also be discussed to support these ideas and finally a conclusion will be drawn to summarize the whole point in the discussion.

II. LITERATURE REVIEW

Electric Commerce or e-commerce is defined as all activities from business and marketing aspects that are carried out via the internet. The rapid growth of the internet results in the increased amount of trading and sales in the e-commerce field, where the number of e-commerce shoppers in 2000 has increased from 52% to 89% by 2018 (Nation Master, 2019). Based on the study conducted by Yusoff, et al 95% out of 1060 Malaysian people agreed that the use of e-commerce platforms able to engage customers easily as well as increasing the number of sales and profit. An analysis conducted by Kartiwi, et al [6]. identified the adoption of e-commerce in several SMEs enables to strategize the competitiveness to experience the cost reduction while improving the linkage with business partners and suppliers.

These studies build and add ideas on how the growth of internet overtime influences the e-commerce acceptance to engage more customers and competitive business. Figure 1 depicts some details of the growth of mobile e-commerce trend. The Malaysia's mobile commerce growth is expected to increase by 19.7% (US$ 4.4 billion) in 2023. Based on J.P. Morgan's e-commerce trends report (2020) the smartphones have become the most preferred device to access e-commerce in Malaysia, whereas it reaches up to 57% followed by desktop (42%) and tablets (6%). Meanwhile, the COVID-19 pandemic accelerates the e-commerce growth in many businesses. A study by Bhatti et al. [1] found that the e-commerce in Pakistan had increased by 10 % and 45 % of product demands during the pandemic. The evidence supported by the increased of Amazon's revenue by 200% (US$90.1 billion) since the start of COVID 19 pandemic.

TABLE I.   FORECAST OF MALAYSIA'S MOBILE E-COMMERCE MARKET SIZE [9]

Year	Value (USD billion)	Growth
2019	$ 4.5	-
2020	$ 4.9	10.8 %
2021	$ 6.2	13.7%
2022	$ 7.4	16.4%
2023	$ 8.9	19.7%

The adaptation of e-commerce applications and websites creates new opportunities for business trends, therefore the

business movement towards digital marketing needs to be considered. Other studies have identified the dramatic change in consumers' behavior due to the pandemic. Based on a recent survey, Kim [7] found that 37 % out of 2200 adults in the U.S. have shifted into online shopping after COVID-19, due to the greater flexibility in terms of time, location, and product variety.

[8] outlined the new habits, the store comes home, have enhance consumer's convenience and personalization. These researches contradict Clark, T.[2] statements, which argued that physical shopping provides better advantages due to the visibility, direct assistance, no shipping cost the uniqueness within the retail outlets. These researches identify new patterns, whereas several requirements to be adopted for the preparation of digital transformations of the market.

TABLE II.   PROPORTION OF PURCHASES BY NEW E-COMMERCE USERS DURING COVID-19[10]

Category	Prior	Current	Future
Food	5 %	14 %	14 %
Take-away delivery	8 %	18 %	18 %
Alcoholic Beverages	4 %	11 %	12 %
Prescriptions	3 %	11 %	12 %
Personal care items	5 %	13 %	14 %
Home décor	6 %	13 %	16 %
DIY tools and materials	6 %	14 %	16 %
Apparel, footwear and accessories	8 %	15 %	16 %
Luxury goods	6 %	14 %	15 %
Consumer electronics	6 %	13 %	15 %
Average	6 %	13 %	15 %

Table II. Outlines the changed of consumer behavior towards digital shopping due to the COVID-19 pandemic. This is understood by the increase frequency of consumer's demand in various category prior to the outbreak.Virtual Reality (VR) refers to an interactive computer-generated environment, that simulates a real situation [3].

The implementations of virtual reality have immersed in the shopping experience. An interview conducted by Farah, Ramdan, and Harb [4] outlined the use of VR in the shopping journey as a highly innovative way to engage their user. The e-commerce leading company named Alibaba also relies heavily on the use of VR technology for direct transactions.

Therefore, the use of VR in the shopping journey becomes the best strategy, as it provides engagement to the user in interactive ways [5].

III.   EXPERIMENTATION

Business competition has gotten tighter nowadays, especially with the COVID-19 pandemic which has caused uncertain economic conditions and unprecedented consumer demand. Thus, the finding of this research will outline an adequate solution for online shopping businesses to handle the competition. The new shopping visualization feature increases the attractiveness of users to use the app frequently.

By implementing this system, the customer not only can visualize the shopping environment, but they can also examine the 3D representation of the items before making decisions. This solution can significantly increase the chance of the customer to use your system compare to the others. Another benefit from this system is to reduce the COVID-19 spread by lessening the physical contact between shoppers.

The research method that are used for collecting data is survey. The survey will be conducted to collect quantitative data, where statically test can be done to make comparison from each sample. Survey method allows the observant to reach multiple participants at a time, it also required less time compare to other data gathering method while data collected are easy to be observed. Apart from the survey, other approaches such as use case studies will be conducted to simulate and understand the data collected from the survey and how to overcome various challenges. On the other hand, the stratified random sampling method will be used, where population will be divided based on their age.

The survey will be conducted using online survey administration software named Google Forms. The form will be shared with the respondents from different social media platform. The question that will be asked related to their awareness to the e-commerce business and Virtual Reality (VR) technology, how often they use the online shopping application and features that are the user would like to see in the system.

Various case study related to the Virtual Reality (VR) shopping will be reviewed. Several aspects including the possible issues take place within the virtual shopping experience will be highlighted and relate with the survey result to propose possible solution to overcome the challenges. Furthermore, existing VR shopping applications will also be analysed to support the findings.

In this section, the preliminary investigation result, where data is collected from respondents will be discussed. There are a total of 21 respondents from Malaysia involved in the survey, including 13 youths and 8 adults.Based on the survey, 100% of the respondents aware of the e-commerce existence. The data can be concluded that most of Malaysian people are already aware of the existence of e-commerce platforms and start using them prior to the COVID-19.

Fig1. depicts the distribution of respondents towards the amount of e-commerce platforms uses in a certain period. From the data it can be conclude that most adult and teenagers used e-commerce platforms more than once per week, with more than 25 % in total.
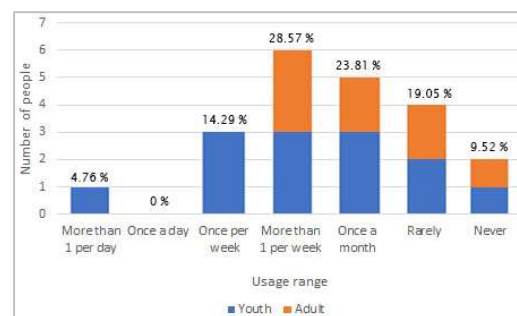

Fig. 1.   Frequency of purchasing online experience in a certain period
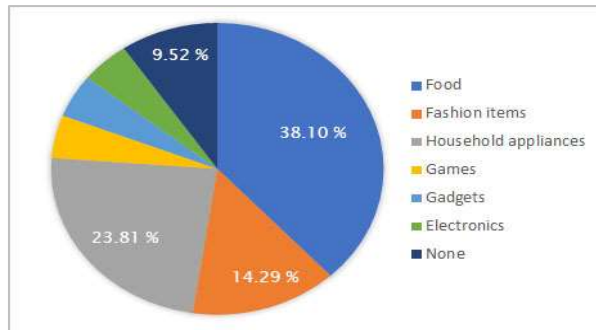
Fig. 2.   Type of products purchased online

Fig 2. shows that more than 30 % of respondents use e-commerce platforms to purchase foods, followed by household appliances which reach 23.81% in total.

Based on Fig 3., eBay is identified as the most frequently used platforms for adult. Meanwhile, most youth use Shopee as the online shopping sites. However, the Amazon Marketplace site was found to be very rarely used by the survey participant for both age.
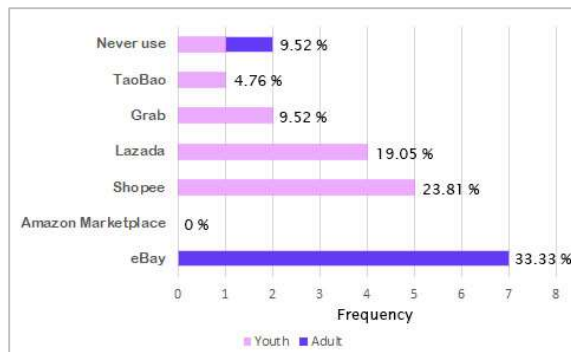

Fig. 3.   List of e-commerce sites used by the candidate

In the survey the candidate was asked to rate their online shopping experience in range from 1 (not comfortable) to 5 (very comfortable). 4 of the online shopping sites user (21.05 %) found to be very comfortable with their online shopping experience. 4 of the online shopper (21.05 %) rate 3 in their online shopping experiences. While only 1 of them (5.26 %) not comfortable with their online shopping sites. The rest of the user (52.64 %) give 4 rating from their shopping experience.
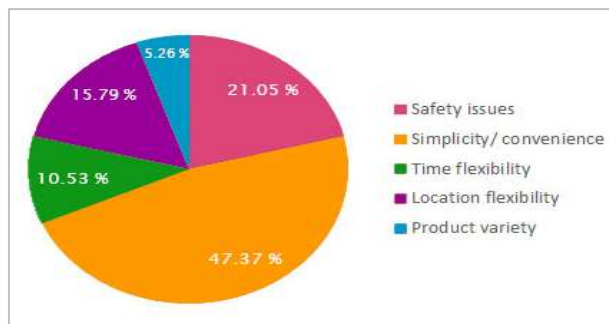

Fig. 4.   Factors to use online shopping platforms

Fig 4. depicts the factor that motivate the user to use online shopping platforms. Most of the user motivated due to its simplicity (47.37 %). Therefore, it can be concluded that the online shopping platforms have easy to be used by their user, as it helps them to purchase products easily.

IV.   PROPOSED SYSTEM

In this section, an overview of the proposed VR shopping system will be discussed. Figure 4. is the use-case diagram used to explain the system user's interaction with the VR shopping system. Based on the use-case diagram, the customer capable to operate several features, including view items, make purchase from the items, create product review and create account. While the customer views the products, they can visualize the showroom while viewing the product in 3D forms, with the product details, such as the expiry date, components and weight. Before the customer making purchase or create product review, they need to sign in to the system and the customer ID provider will maintain the authentication. The movement or purchase behavior of the customer will be tracked in real-time and stored in the system's database to help the retailers to understand the product that influences their buying decision while maintaining the number of stocks. Once the customer performed check out, the payment processing service will process the information and the payment, then pass the information to the warehouse clerk to prepare the order.
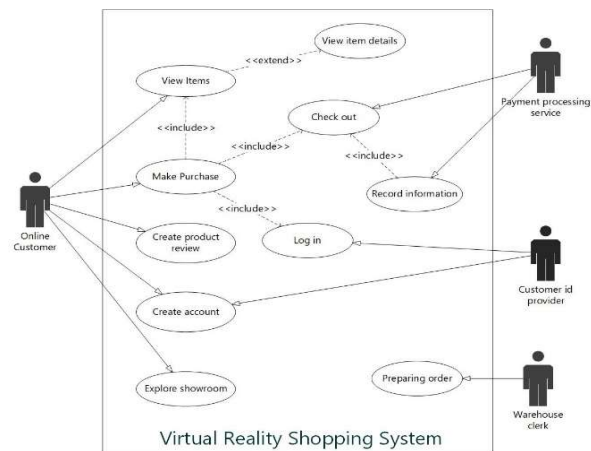

Fig. 5. VR Shopping System use-case diagram

V.   CONCLUSION

The present study proposed the integration of Virtual Reality with the online shopping application as a solution to compete with the competitors in marketing field. The new way of shopping can increase the motivation for the customer to use the application. Furthermore, the visualization and real-time customer's behaviour tracking helps the retailers to study the product that influences the customer's behavior and maintain the number of stocks. With the online shopping the number of COVID-19 sufferers can be reduced, as the customer able to purchase without physically contact with the other customers. The study still has limited evidence related to the VR limitation and drawbacks on shopping experience. Future study will be implemented to analyse and anticipate the possible impact of the VR shopping system.

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