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A Literature Review: A Study on the Various Factors Affecting Augmented Reality and its Implications

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Abstract- The existence of augmented reality is somewhere at a midpoint between the digital and physical Worlds and it has emerged as one of the promising business opportunities for different companies. With the help of augmented reality based technologies and concepts marketers are able to superimpose digital imagery over the existing physical world and they are able to create an augmentation for any phenomenon. Augmented reality is able to specify the presence of two very important characteristics like interactivity in real time and registering in three dimensions. Due to all these factors, reflector or holographic sight would not be considered as augmented reality on the contrary it could be defined as a combination or amalgamation of digital and the physical Worlds which absolutely blends with three different dimensions. Various product or service designers have already worked with various designs, drawings and physical models to communicate their ideas with the target audience. It is observed that physical models are quite expensive to create and very time-consuming. That's why it could be an additional burden on cost structure. It can provide an excellent idea to the marketer about the final result by capturing quite complex details about the product or service design. On the contrary, digital design tools would be able to make this entire process quite simpler with the help of required modifications and reengineering of different existing models in the market. So it is quite evident that instead of a physical model, marketers are using digital models which could be cost effective for any marketer and they will be able to implement their final strategy. However it is also a fact that the digital model is lacking behind creating the real essence of the product or service and touch motivation. Now it has become quite inevitable to bridge the gap between the physical and digital Worlds with the help of augmented reality and with the help of that marketers should try to enhance their efficiency. The researcher tried to find various factors those affect augmented reality. The implication of augmented reality is also explained in the research paper. The author had done extensive literature review to find the gap between the concept and the application of augmented reality.

Keywords:- Augmented reality, Digital platform, Product design, Virtual reality.

I. INTRODUCTION

To get the details of augmented reality we need to understand various augmented reality based Technologies and various stages of the design process which is used in the mapping exercise. The field of augmented reality based Technologies are divided into three major distinctive categories. All these different categories are distinguished from one other by displaying technology used to form or

implement augmented reality onto the physical world. The users of augmented reality need to understand an extended taxonomy for augmented reality devices and at the same time they must understand the technology readiness level as without that it would not be possible to implement any augmented reality based strategies.

Hand-held devices are being used by marketers as one of the most common methods to implement augmented reality while it is used for Smartphone and Tablets and such devices able to provide a very simple and low cost platform for augmented reality. Hand-held devices also can be categorised into various subcategories depending on how the software creates a digital image of the physical world (Park, 2008).

The nature of the handle devices indicates that augmented reality is visible through the device itself as it acts as a window into an augmented dimension and it requires users to constantly hold the device which should be devoid of any breaking illusion during the process.

There are different types of technological solutions which are related to augmented reality, one of those can be mentioned as Head Mounted Display which could be considered as the most developed concept in the market. There are various forms of Head Mounted Display size namely projection, retinal, optical and video.

A new form of Technology has already been used by organised retail sectors worldwide and with the help of that the overall retail sector has gone through different kinds of transformation. With the help of all such transformation the retail sector has shown enormous growth in the global market. Such transformations include different types of immersive Technologies like augmented reality and virtual reality which eventually could revolutionize the process of shopping online and offline.

The research paper basically aims at analysing these immersive technologies and its impact on retail outlets from customer perspectives. To go ahead with the research work researchers try to analyse the background and evolution of augmented reality and various technological involvement with reference to retail setting in different contexts. Initially any emerging technologies used to be the part of science fiction but due to the advancement of Information Technology various computer processing started changing the essence of technological usage with the help of many real world applications (Park, Lim, Seo, Jung & Lee, 2015).

Such emerging technologies can be defined as internet of things, artificial intelligence, robotics and nanotechnology and its usage at various scales as per the requirement of the industry. It is also observed that augmented reality based technologies are quite flexible and with the help of that organisations would be able to compete with the existing technologies across multiple criteria in different parts of the world.

II. OBJECTIVES

Objectives of the paper are mentioned below: -

- To explain various variables those are affecting various augmented reality based technologies.
- To analyze the implications and future scope of augmented reality

III. LITERATURE REVIEW

It is always predicted at various levels that augmented reality based technologies will eventually transform personal and professional words. The popularity has grown quite rapidly over the last few years and as the computer technology continues to advance among these technologies due to those modern technologies will become much more economical and refined for the people. Most of the usage of modern technologies can be observed in the field of entertainment industry but we should not forget that other industries also started using lots of upgraded technologies.

The corporate world has realised that these modern technologies have the capabilities to influence different market places and different business processes as well (Hua & Zhang, 2011).

With the help of these modern technologies they will able to increase and improve employee productivity at reduced risk level and at the same time it could be cost effective as well. If we look particularly at the retail Industry then we will also be able to observe the extensive usage of modern technologies and with the help of that modern day retailers are trying to provide real time experience to the customer. In

recent times the quick changes in internet facilities we have seen that online shopping has grown almost exponentially each year. Now modern day retailers also realised that retail is not only focusing on just product selling but also they are trying to provide overall experience with the help of technological inclusions.

It is also observed that many retailers are not currently prepared for the transaction or shift happened due to technological advancement so rapidly. Retailers those are still struggling to integrate the internet and current technologies into their basic business model and how to connect it with emerging technologies. Most of the retailers currently are not well prepared with emerging technologies and related strategies and with the monitoring plan.

One of the reasons due to which retailers fail to integrate augmented new technologies is related to their emotional connect at a managerial level with the basic business plan that they had already formulated long back (Xin, Sharlin & Sousa, 2008).

There are a lot of organised retailers that are still refusing to use modern technologies or to upgrade to the next level. Lots of forward thinking companies have already started to invest in implementing modern augmented reality based technologies into the business model and at the same time they are trying to integrate their basic business model with that.

Companies realised the importance of immersive Technologies which is actually an umbrella term quite commonly used within the technology industry to describe various technologies such as augmented and virtual reality (Zhang, Ong & Nee, 2010).

These technologies are basically concentrating on the real world and the virtual world. Immersive Technologies that are also often used quite interchangeably with mixed reality in the market. Augmented reality helps any user to visualise and interact with the superimposed computer graphics over a real world environment and with the help of that the user will get the real essence of reality through a virtual platform.

The system should be able to display and use various relevant information to guide the user in a real time manner so as to get the reality of the platform in the best possible way. The feature related to augmented reality is not just to showcase the information on a screen but also to contextualize and segment the overall information to make it more useful for the real time users.

There are lots of new advancements which would eventually help to overcome various issues which are faced by the company but now they are trying to provide continuous augmented information to the real world which would be more efficient and relevant to the changing needs of the users' context.

There are several types of augmented reality which are available there in the market. The most basic form of augmented reality can be denoted as market based augmented reality. It basically involves various usage of a camera or other equipment to scan a QR code which then produces a virtual object over the space where actually the code is processed (Ishii, Ratti, Piper, Wang, Biderman & Ben-Joseph, 2004).

This type of basic technology is most commonly used in children's education to enhance a more immersive experience. Superimposition based augmented reality able to create more reliable and consistent real world objects and landscapes. Such technologies are basically used to enhance the real world environment for any company.

Modern day smartphone applications have already showcased the potential of Smartphones as augmented reality enablers (Furht, 2011).

Other than the media industry various Technologies related to augmented reality and virtual reality are quite extensively used up to a certain extent in various business domains like advertising, tourism, health, education etc (Azuma, 1997).

For both applications like augmented reality and virtual reality headset where ones predicted as one of the equipment to facilitate various experiences for the users. It is observed that the effects of immersive technologies are mostly visual and the significance of other sensors is also playing an important part in the overall feeling of presence in the virtual world.

It is also essential to find the sense of presence in a virtual environment which is extremely vital to feel the emotional responses with the help of the

technology which is trying to differentiate from the user. Mixed reality Technologies would be able to create an emotional connection with the user through a virtual platform. As it is already explained that among different industries organised retail is one of the trendsetting industries which is using augmented reality up to a great extent (Calife, Bernardes & Tori, 2009).

Through such technological inclusion retailers would be able to provide benefits to consumers and to the intermediaries as well. Organised retailers started implementing augmented reality inside their showroom which eventually allows customers to customise their preferred brands instantly with reference to colours and various features that they may like before going out with the final purchase decision.

Various applications also help to go ahead with the trial before going ahead with the final purchase. During the trial if any customer is not happy with the performance of the brand the retailer also would able to make necessary changes as per the preference of the customer. Augmented reality also helps customer to analyse their choice criteria as per their brand preferences. Through various other applications different organisations are also able to analyse the potential market space for the product and they will be able to work more effectively on place constraints (Marner et. al., 2011).

It is also observed that in many cases virtual stores have the better potential then the physical stores in many instances considering various difficulties faced by customers at various levels. Virtual reality and augmented reality also generated various store features which basically allow customers to browse online stores as per their comfort whenever they are asking for or any preferences.

Virtual Stores are often found to have an increased cognitive effect which will eventually drive any customer to go ahead with increased engagement. Virtual stores are quite distinctively different from physical stores on different fronts. In many cases it is also observed that the brand recall value is also on a higher side in case of virtual stores then a standard physical store (Kaufmann & Csisinko, 2011).

Nevertheless retailers must understand the kind of technology which could be best suited for their business and the decision should be on the basis of the market demand and according to the situation. All these technologies are having different types of potential benefits within the retailers do men as well as there is an impact on consumer decision making and societal thought process as well.

The practitioners need to understand the effect of Technologies on users' cognitive responses and various other measurement criteria. In technology usage resolution plays an important role and in any context standard quality resolution is required to satisfy the users' needs (van Krevelen & Poelman, 2010).

The interactivity of various Technologies is extremely important to compensate for any loss during resolution while it is compared to other traditional media. Though there are lots of researches work is going on but still there is a lack of support for design process stages at the beginning and end of the design process for augmented reality.

There is a relative lack of perceived value from user side and due to that it would be extremely difficult to monitor the ground reality of augmented reality or if there is any competitive advantage that could be achieved by any company in any context.

Various task definitions is quite often performed generally on the basis of various specifications given by the client considering various technical limitations which could be related to the modern technology or any process which may require less visualisation to understand the flow.

At the end of the design process the main documentation part is generally performed by the collating information that is generally collected over a period of time during the design process by the company and at that point of time augmented reality based systems may play an important role in recording of data during the process.

Depending on the situation, the company may go ahead with the collecting process at the end or if it is necessary during the process otherwise the whole process of collating various data could be performed later.

Many times it could be argued that the influence of various other related technologies may disturb the

overall design process and there could be a serious need for remote working eventually which may bring forward the need for an improvement in this specific fields which generally not realised by today's marketers.

IV. CONCLUSION

Most of the technologies which is already discussed are having different perspectives at different points of implementation and these technologies are also driven by the requirement which is been mentioned in front of the company for the customisation required during the overall implementation process.

There could be the presence of huge competition that may be experienced by the company in the similar systems such as a projective or video based solution which is actually not related to the development or the design process of the system.

It is also observed that there has been a considerable number of works in the development of varied technologies had already performed which could be related to the concept development preliminary layout and various other definitive layout stages across most of the Technologies dozer discussed in the research paper.

However it can be said that the spatial projection requires the largest level of Investigation. What are the emerging trends of augmented reality which is at quite advanced level there is a presence of lots of Adobe solutions which would have to mature into two different products and that can be acquired and used by different design professionals as per the requirement of the solution need. Once various steps are finalized it will be absolutely possible to find out the true impact of augmented reality in the design process and at the same time will also able to understand that which kind of competitive advantage could be gained by a company through various customizations.

In fact new methodologies would able to increase the efficiency of various technologies up to a great extent and with the help of that they will able to make the process of augmented reality smoother than ever there are many impediments or major drawbacks of different augmented reality based platforms are also researched and companies are trying to find different projections strategies for such cases.

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