The relationship between physical reality and virtual reality in product display and visualization

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Research Summary:

There is a difference in meaning from presentation to demonstration in methods of explaining and publishing industrial product design documents. For the different methods, tools and equipment by which the process of transferring information and ideas related to the design process branches is implemented. From the point of view of design (the designer) to those who are interested (manufacturer, seller, consumer).

Presenting the design idea and its content with different methods and physical tools in the presentation of industrial product documents. All ideas about the stages of the design process are transferred to those interested. Which we seek to develop using advanced technologies. As we keep pace with the third millennium, it has become clear that many modern technologies have emerged, including virtual reality and its various applications in the field of designing the design program instead of using traditional physical methods.

It is often used to describe virtual reality and a wide variety of related applications that contain high-quality visual environments in three-dimensional theory, and also scientists have been able to add a set of sensory applications that affect decision-making through the interaction of a group of user senses such as feeling (movement) and smell, etc., so that we can deliver the user to obtain the highest levels of realism.

Virtual reality should be three-dimensional and allow real reality to be embodied in its various dimensions, visual angles and interconnected elements designed to address the visual perception in the first place, so virtual reality technology is a technological innovation that provides a three-dimensional environment that provides for those who are interested in order to realize the designs of the products and their dimensions and interaction with its elements in a way that makes him feel that he is living part of the scene that he is following in a realistic way. Therefore, attention should be paid to the differences that resulted from technological development in our modern era, to make the additive in the field of showing the industrial product.

Introduction:

virtual reality technology has changed the traditional way in which the product is designed, because it contributes to the development of the visualization of the product, the demonstration and presentation of the idea, the vision of the product, its analysis and modification quickly and more easily, testing, verification and decision-making instead of the traditional methods used in presenting two-dimensional designs and then making Prototype.

The product is the main focus of the design process. Product presentation and display methods are one of the most important aspects of the design process, and the design program.

When talking about physical reality, the meaning is methods of design presentation.

When talking about virtual reality, the meaning is methods of displaying design.

This difference in meaning from the presentation to the demonstration of the different methods, tools and equipment by which the process of transferring information and ideas of the branches of the design process is carried out. From the point of view of design (the designer) to those who are interested (manufacturer, seller, consumer).

Research importance:

Shed light on the importance of virtual reality and its types. A very important development for the process of showing design documents at all stages, and strengthens the process of persuasion when interested, to the limits of the possibilities of the physical supply.

Research problem:

The emergence of many modern technologies, including virtual reality, and its various applications in the field of designing the program instead of using the traditional physical methods.

Research hypotheses:

Virtual reality in the process of showing the product design program increases the levels of the product persuasion process, and helps in the dazzling process and saves time and costs.

Research aims:

The integration of virtual reality in the different stages of the product design program, such as the stages of ideas, models and testing. It adds to the designer and strengthens the emphasis on content and thought. It helps in change and modification in an easy and satisfactory manner.

Research Methodology:

Deductive approach.

First: Product (Design):

The product is the center of the design process through which the designer reaches to achieve the goal of the design, which is to convince the product of the user or those who are interested.

And here we are talking about the design process program, which consists of eight main branches (visualization, investigation, data analysis, design, presentation, testing, follow-up,

production). The following table shows the goals and results that the designer aspires in the design program stages.

Design documents:
Design documents are responsible for expressing all aspects of the design and its processes during the various stages of the design program.

Second: the physical reality:

We can define materialism as a type of monist philosophy that holds that matter is the basic component of nature, and that all things, including rational aspects such as consciousness, are the product of physical interactions.

Presenting the design idea and its content with different methods and physical tools, including (explanation (audio), writing, drawing, collecting and analyzing information, implementing models, adding and modifying all of the above). All that is the physical reality in the styles of presentation of industrial product documents. Through which the designer can convey all the ideas of the stages of the design process to those who are interested.

And we see in our current world the development that gives us a lot of dazzling capabilities that achieve the highest degree of persuasion of the idea (that is, the stage of presentation).

Valencos industrial designer presenting a design to anyone who is interested. With a colorful perspective that is drawn for the idea and design. We can predict the time required for the perspective drawing and coloring process. Here, we will find the difference. How much time does the designer need if he thinks or asks him for any modification for the design? Or just change the color, or display the design from the opposite side of the decree. For these reasons, we have to use modern and advanced technology to make a difference and to have the ability to keep pace with the speed of the fashion at the
era in which we live.

Below we explain some of the physical reality uses in the design presentation documents / Figure No. (1,2,)
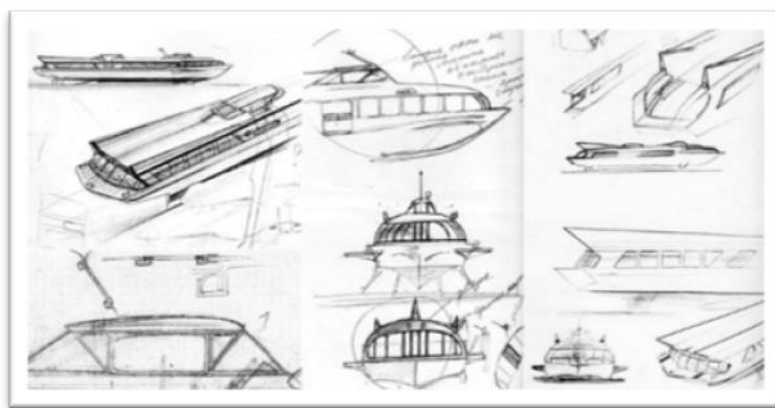
Sketches and handheld binoculars. Figure (2)

Geometric drawings (4)

Third: virtual reality applications in the field of design demonstration:

Virtual reality depends on the visual design of the real reality on the one hand, and how it is managed and displayed digitally through computer science on the other hand?! And for this reason, it is taken into account in the applications of virtual reality to be three-dimensional and to allow real reality to be embodied in its various dimensions, visual angles, and its overlapping elements designed to address the visual perception in the first place, the virtual reality technology is a technological innovation that provides a three-dimensional environment that is provided to those who are interested in order to perceive the designs of products and their dimensions and to interact with their elements in a way that deludes him that he is being a part of the scene that he follows in a realistic way.

Elements of virtual reality

1- The Virtual World

It is the content of a specific medium, which may exist in the real world or be present in the imagination of the artist who created it, and it can be designed in a way that makes others participate in it.

2- Indulgence

One of the most important elements that must be met for a successful virtual reality experience is immersion or diving into an alternate reality or a specific point of view. This element confirms the possibility of perceiving something in addition to the world in which a person lives at a certain moment in two ways: Either he perceives an alternate world knowing that he is living a different reality, or he perceives his world in which he lives those moments from another viewpoint different from his own.

2-Sensory Notes (Sensory Reaction)

Where the virtual reality experience is a means by which we can experience an imagined reality with many of our physical senses (sight, hearing, touch) and does not need to use our imaginative ability.

2-4- Interactivity

For virtual reality to appear real, it must respond to the user's movements, as it must interact with it and thus with the user himself. There is no doubt that the presence of the computer within this system makes achieving the required interaction easy, and thus the user becomes also interacting with objects, characters, and places in the imaginary virtual world.

Virtual reality is defined as a three-dimensional interactive environment designed entirely by the computer and appears to the user as realistic and in this context, it provides opportunities to build a three-dimensional virtual environment whose elements interact with the user or visitor in a way that makes him live a part of the scene that he is following.

As Jackson believes, virtual reality is the use of computer technology to design an environment that simulates real reality in contradiction to traditional user interfaces. Virtual reality puts users in an actual experience, instead of seeing the process on a screen, they are immersed in it and interact with three-dimensional worlds, by simulating many of the senses (vision, hearing, touch, and even smell), the computer turns into a gateway to the industrial world, and the only thing that limits approaching virtual reality experiences is the content and capabilities of the computer, meaning that the content may be static and incapable of electronic processing. And the embodiment of his reality in virtual environments, which limits the approach to reality on the one hand, and on the other hand, computer capabilities may be weak and impede the possibility of approaching virtual reality experiences. People may hear about virtual reality, but without knowing what it is exactly, and what equipment is used with it?

3- The importance of virtual reality and its benefits in the field of industrial design.

The importance of virtual reality lies in the fact that it is like the real reality, it is considered an effective way to simulate reality regardless of its circumstances and difficulties, through which it is possible to create different environments that tell the reality that the individual cannot access or coexist with, for example:

 The space environment is not possible for the individual educated in the school environment to live in it realistically, and here comes the role of virtual reality in creating an environment similar to the space environment and enables the individual to interact with it as if he is in the real environment.

Virtual reality technology changes the traditional way in which the product is designed, because it contributes to developing the conceptualization of the product, demonstrating and presenting the idea, seeing the product, analyzing it and modifying it quickly and easily, and testing, verifying and making decisions instead of the traditional methods used in presenting two-dimensional designs and then making a prototype.

Virtual reality technology using simulation in the field of industrial design achieves Tele-communication, Tele Cooperation, Tele-Coordination, Tele-Education, and this allows more than one designer to participate together in the making of a design through the convergence of

the proposed hypothetical environment, the communication between each of the student or the industrial designer and the industrialists. And achieving the display of the design process documents with the required persuasion of those who are interested. There are many fields in which a designer can use virtual reality technologies. The following is a review of a group of these areas.

- Findings and Recommendations:

The researcher reached a set of important results that clarify the goal of the research:

5-1- Using virtual reality techniques, the time and effort required for any modification in product design is achieved.

5-2- Reducing the money that may be wasted in the manufacture of the models and the physical design documents.

5-3- Preserving the integrity of the dealers on the design, and preserving the lives of everyone during the demonstration stages of the design process, and the experimental stage.

5-4- Exposing the trainees to all design conditions, faults and problems that may not all be available in nature, and training them on how to deal with them.

5-5- Generalize the use of virtual reality techniques in all methods of displaying design documents to reach the stages of persuasion and dazzling required in the product display process.

References:

1) https://alwafd.news/essay/31980

2) http://en.wikipedia.org/wiki/Virtual_reality

3) Physical https://ar.wikipedia.org/wiki/

4) https://www.int-arch-photogramm-remote-sens-spatial-inf-sci.net/XLII-2-W3/311/2017/

1- Yusr Muhammad Al-Hafiz, Nermin Kamel, Ahmed Kamal: Virtual Reality as an Aid in Teaching Industrial Design, Mansoura University, College of Applied Arts, First International Applied Arts Conference - Damietta, published research, May 15, 2008 AD.

2- Ali bin Mohsen Al-Asmari: Virtual Reality (Second Life), Kingdom of Saudi Arabia, College of Education, Master Thesis, 2016 AD.

3- Dalia Ibrahim Khalifa: Preparing new approaches to teach the foundations of design for non-technical university students, an unpublished master's thesis, Faculty of Art Education, Helwan University, 2003 AD.