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An effective role of Virtual Reality, Augmented Reality and Mixed Reality in Product Design

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Abstract:

Virtual Reality VR, **Augmented Reality** AR and **Mixed Reality** MR are all new technologies for product designers. They create new work situations and open up doors to new possibilities. But, at the same time, they come with numerous challenges that industry experts need to be aware of. Thanks to the emerging technologies in the 21st century that enabled product designers to generate ideas more creatively and predict and solve design problems before they even arise. This not only creates the possibility for an efficient manufacturing process but also reduces the cost and time needed for both design and production. This indicates that the product manufacturers will be using all their resources to make the most of their efficiency. VR is already used in several product designs and production cycle stages. Designers first use it to assess the potential, strengths, and weaknesses of a design before actually working on a product. Afterwards, they can test how a product works and examine its details before allocating the company's resources to produce this particular product, saving the company time and money. **Statement of the Problem:** The research problem can be summarized in the following questions: Do product designers realize the full potential of using virtual reality technologies in their design process? Do product designers have sufficient knowledge of integrating VR and related techniques into different product design and development practices? Do they have the design tools and techniques well-matched with these new technologies? **Objective**: Help product designers explore the effective impact of virtual, augmented, and mixed reality technologies and learn how these newly introduced technologies can change the design and production processes. In addition, the study attempts to review the effectiveness of using virtual reality, augmented reality, and mixed reality in product design. **Methodology**: The study employs a deductive approach supported by an analytical descriptive method. **Results** showed that; the younger generation of product designers are fully aware of the benefits they are going to gain by employing the new VR and related technologies in their design process, and design evaluation. They are mindful that the technology provides them with a safe environment to work in. The use of VR and related technologies in product design allows the creation of dangerous situations that are usually thought-provoking or even intolerable to create in real life. As a result, designers can make all the essential adjustments that would permit them to fine-tune a product to its perfect state before it reaches the production line. The older generations are all aware to some extent of the capabilities of those technologies but they feel reluctant to employ them at their full capacity.

Keywords:

Virtual Reality VR, Augmented Reality AR and Mixed Reality MR, Visualization, Design process

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