

The Role of Augmented Reality in Next-Generation Digital Systems

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Abstract: *Augmented Reality (AR) is also turning out to be a key Industry 4.0 expansion driver. With its ability to superimpose digital information onto real-world environments, AR is gaining much attention due to its application in industrial manufacturing systems. This has spurred establishment of Industrial Augmented Reality (IAR), in which technologies of AR are utilized to enable and automate industry processes. By enabling users to have access to necessary information in real time as well as interact with overlays virtually when undertaking a task, AR allows for more informed decision-making and accuracy in functioning. Such improvements provide improved efficiency and productivity, gaining real economic value to organizations that adopt AR in their workflows. Its integration with other technologies such as the Internet of Things (IoT), smart sensors, and sophisticated algorithms is also propelling it towards further promise and application. Existing research are actively searching for ways to make AR more efficient in real-world application to industry, solving issues of usability, scalability, and integration. Apart from its use in the industry, AR is also gaining traction in education, tourism, games, and advertisement, in which it achieves interactive and immersive user experience."With software like Vuforia, computer programmers are developing AR applications that superimpose virtual objects over real-world environments so that users can interact with digital objects with smartphones or smart glasses. The applications aim to enhance learning, better the user experience, and aid in business innovation. The development of such systems involves different phases, from research to design, prototyping, testing, and deployment, which are typically implemented in collaboration with users, clients, and domain experts. The impacts of AR solutions are measured by metrics like the level of engagement, user satisfaction, retention, and overall effectiveness in reaching beneficial goals. Through the fusion of digital components with actual environments, AR is reshaping the way people interact with technology and holds a high level of promise for transforming digital systems within a wide range of industries. Augmented reality technology is one of the most mainstream technologies in the context of Industry 4.0. The promising potential application of augmented reality in industrial production systems has received much attention, which led to the concept of industrial augmented reality. On the one hand, this technology provides a suitable platform that facilitates the registration of information and access to them to help make decisions and allows concurrent training for the user while executing the production processes*

Keywords: Augmented Reality, Industry 4.0, Vuforia SDK, Unity 3D, AR Splash Screen, Image Target Recognition, Mobile AR Application, Human-Computer Interaction (HCI), Real-Time Information Overlay

