Chapter 12

AR-VR Enabled Personalized Vehicle Exploration for Urban Mobility and Smart City Development

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ABSTRACT

This chapter explores the use of Augmented Reality (AR) and Virtual Reality (VR) for the development of immersive showrooms, where vehicles, city-wide progressive mobility, smart city development, etc. can be personalized and experienced. AR-VR

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tech can generate immersed experiences such as real-time customizing, interactive test drives, and even position the client's own vehicle into his area to study how it will function on his street, for example. This all reduces the need for physical showrooms, speeds up decision-making processes, and promotes sustainable practices. Additionally, the chapter scopes the AR-VR potential in enabling urban mobility solutions by delivering real-time scenarios simulation to optimize vehicle designs and enhance the sustainability targets. By bringing together cutting-edge technology with responsive user experiences, it sets a new bar for smart city infrastructure and next-gen mobility systems.

INTRODUCTION

A new era in urban mobility development has been enabled by the convergence of technology and urbanization. Among this revolutionary way of going through the Metaverse, Augmented Reality (AR) and Virtual Reality (VR) are some of the most defensive high-tech that cannot wait for enhancing our way of living in our personal home. New use cases and contexts for urban mobility and smart cities: augmented and virtual reality showrooms (public access) to browse customizable cars. Though the automobile sector is substantially contributing to climate change and working towards developing a new sustainable urban ecosystem, with the incorporation of AR-VR technology, the auto manufacturers are redefining customer experience and providing an enhanced mobility solution(Gabbard et al., 2019).

They're moving from gaming and entertainment into fields like education, healthcare, real estate, and retail. The automotive industry has already made a leap towards these technologies as businesses look to innovate and revolutionize business models and the customer experience. Among the biggest innovations, the immersive showrooms enable users to view cars in their tailored, interlinked configurations—and all of this without the need for a showroom. That also allows your customers to finalize their configuration and virtually experience their future cars and test in simulated prombs at the touch of a button, all without needing to travel into dealerships or other physical touchpoints(Aslan & Yıldız, 2020).

The biggest advantage of AR-VR-enabled showrooms is that they provide a personalized end-to-end experience. Instead of being limited in the same way as regular showrooms that require costly physical space, immersive showrooms push all these restrictions and matters to the side and take customer satisfaction to the next level. With AR, users are able to overlay digital images of vehicles in their environment, allowing them to visualize what a car would look like in their driveway or what a vehicle would look like rolling down their streets. The next level up from this is VR—where users not only experience a full virtual environment but interact

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