Virtual Reality and Digital Twins: A Technological Convergence

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SUMMARY

The commission 6 of FIG (Engineering Surveys) has established Working Group 6.3, with the objective of facilitating the exchange of knowledge among surveyors proficient in immersive technology, in addition to providing support to the community. This paper provides a synopsis of the collective's endeavours and furnishes a comprehensive survey of the current state of immersive technologies.

There is a considerable difference in the state of the art between different immersive technologies. Augmented reality (AR) has already become a part of our daily lives, as evidenced by its integration into Architecture, Engineering, and Construction (AEC), e-commerce, health, and tourism, as well as in the interfaces of total stations and geodata viewers on mobile devices. The implementation of virtual reality (VR) for practical applications is a more complex process, and is currently the subject of ongoing discussions and active research in various industries.

This phenomenon is of particular interest, as evidenced by the results of an online survey conducted by the FIG working group. The survey revealed that individuals who have engaged with immersive technologies once tend to experiment with the full range of technologies, but predominantly AR applications go beyond the experimental stage. It is evident that the advancement of VR applications is not impeded by technological limitations; rather, it is constrained by the maturity of the external environments in which these applications are utilised. Therefore, the development of geospatial VR applications on a larger scale is closely linked to the creation of digital twin applications and the future role of the surveyor within these environments. The great potential of VR is to serve as a conduit between reality and virtual worlds.

This paper provides a comprehensive overview of the applications of digital twins in the context of

VR, including systematic approaches to developing custom applications. In addition, it emphasises on success stories and encourages its further integration into lectures and surveying classrooms.