Chapter 6
Research Analysis of Development Pipelines in Augmented and Virtual Reality Technologies

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ABSTRACT

The purpose of this chapter is to observe the 3D asset development and product development process for creating real-world solutions using augmented and virtual reality technologies. To do this, the authors create simulative software solutions that can be used in assisting corporations with training activities. The method involves using augmented reality (AR) and virtual reality (VR) training tools to cut costs. By applying AR and VR technologies for training purposes, a cost reduction can be observed. The application of AR and VR technologies can help in using smartphones, high performance computers, head mounted displays (HMDs), and other such technologies to provide solutions via simulative environments. By implementing a good UX (user experience), the solutions can be seen to cause improvements in training, reduce on-site training risks and cut costs rapidly. By creating 3D simulations driven by engine mechanics, the applications for AR and VR technologies are vast ranging from purely computer science oriented applications such as data and process simulations to mechanical equipment and environmental simulations. This can help users further familiarize with potential scenarios.

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INTRODUCTION

Background of Study

Augmented and Virtual Reality allows a user to experience computer generated environments and simulations in an immersive perspective view using head mounted devices (HMDs). This project aims at shedding light at some of the development pipelines involved in creating Augmented and Virtual Reality products. By leveraging software aimed at creating these simulative environments involving 3D assets and computer-generated levels, these Augmented Reality (AR) and Virtual Reality (VR) products can be used to provide solutions to numerous real world problems. These solutions range from environment simulators to training software that can be used by corporates and individuals to reduce costs and improve efficiency. The various pipelines used in creating these products include 3D asset development, Level Design using a Game Engine, implementation of required audio and acoustics, creating the required deliverable for the target platform and the final implementation in the operating environment.

The scope for AR and VR technologies can be seen in numerous fields ranging from game development to creating training simulations that can be used in the industry to cut operating costs as well as visualize final products in real time. Industries that can benefit from these technologies however will see the requirement of a heavy initial investment depending on the complexity and the demand of the product created. Typically AR applications are less resource hungry and can be used on smartphones and have a lower initial investment while most VR applications are bulky, resource hungry and need powerful computing environments paired with precise HMDs hence making it a more expensive yet smoother experience.

This thesis aims at understanding the development pipelines involved in making AR and VR solutions and providing a development model catered to the same. From a software engineering perspective, there are numerous models that are applicable for use in the AR and VR domain but to obtain the best possible result, it is important to have a model that is specific for these types of solutions. By conducting a thorough study on the pipelines involves, we can derive some conclusions that can help us understand the requirement of resources for each and also identify the workflow in the process. The workflow can then be further simplified by implementing a parallel model while developing the various components involved in the process.
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