Virtual Reality Implementation of Al-Amin Science Techno Park 360 Tour

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Abstract

Technological developments in the modern era encourage new innovations, including the use of Virtual Reality (VR) in various fields, one of which is education. The Panca Budi Development University Foundation, as an educational institution, requires interactive information media that can introduce its facilities and buildings to the wider community and students. This study aims to develop and evaluate the implementation of a 360° Virtual Tour based on Virtual Reality Photography 360° (VRP) as an information media for Al-Amin Sience Techno Park. Using the Multimedia Development Life Cycle (MDLC) method, this study went through six main stages: concept, design, material collection, design, testing, and distribution. The development process was carried out using an insta360° X3 camera for 360° image capture, and 3DVista software for creating virtual tours. The results of the study show that this 360° virtual tour is able to present comprehensive and interactive information about the Foundation's facilities. Latifah & Antique (2025)

Keywords: *Multimedia Development Life Cycle (MDLC), Al-Amin Sience Techno Park, Virtual Reality Photography 360° (VRP), Interactive Information Media, 3DVista*

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Introduction

The development of information and communication technology in the era of the Industrial Revolution 4.0 has brought significant transformations in various sectors, including higher education and research development. Universitas Pembangunan Panca Budi (UNPAB) as one of the leading educational institutions in North Sumatra seeks to increase competitiveness through digital innovation, one of which is the development **of the Al-Amin Science Techno Park** which has just been inaugurated on February 14, 2026. The area is designed as a comprehensive research and development center that focuses on the agriculture, livestock, and downstream technology sectors to answer the needs of industry and society. However, the introduction of the Science Techno Park Al-Amin area to the wider community, prospective researchers, students, and industry partners still faces challenges. Conventional methods such as print brochures, static websites, and in-person visits have limitations in presenting **immersive and interactive information**, especially for those who cannot physically access the location. These limitations are a significant obstacle in promoting the region's potential and attracting interest in cross-disciplinary collaboration.

Literature Review

Virtual Reality (VR)

Virtual Reality (VR) is a technology that allows users to interact with computer-simulated virtual environments, creating immersive experiences. In education, VR is used to simulate 3D objects and take students to a variety of situations without leaving the classroom. Solvila - Debora Opa Ora et al. (2026)

Web-Based Virtual Tour

Virtual tours are a collection of 360° panoramic images that are popular in the tourism, education, and hospitality industries. Web-based virtual tours can be accessed through a browser without the installation of a special app, offering accessibility, convenience, and interactivity. Key advantages include: Accessibility: Accessible from a variety of devices with a browser, Low cost: More economical than physical visits, Interactivity: Users can navigate and explore independently. Daud et al. (2016)

360° Panorama Technology

The 360° panorama provides a full view of the environment with a 360-degree viewing angle, allowing users to look in all directions as if they were in a real location. The development using *the Insta360 X3* camera and 3DVista software produced comprehensive and interactive information.

In the campus virtual tour application, users can visually see the environment with a 360° panoramic view and walk to various locations using the navigation buttons provided.

MDLC Method. The Multimedia Development Life Cyle (MDLC) consists of six stages: concept, design, material collection, assembly, testing, distribution.

This method has proven to be effective for the development of interactive virtual tours with excellent due diligence results. Fatimah et al. (2025)

Research Methodology

This research uses the Development Research Life Cycle method with six stages. Concept: Determining the destination, target user, and specifications of the virtual tour, Designing: Designing the navigation flow, wireframe, and information architecture, Material Collection: Taking 360° panoramic photos at the Al-Amin Science Techno Park location, Production: Integrating the material into a VR web platform using a responsive framework, Testing: Testing functionality, usability, and user satisfaction, Distribution: Deploy web applications and digital promotion. Stuttgart et al. (2026)

Instruments and Technology

360° insta photography: delivers 360° photos/videos with advanced stability for panoramic shooting, as well as AI-based editing integration for an immersive visual experience, responsive web hosting technology: ensures sites are fast, secure and perform optimally across a wide range of screen sizes, with CDN services, SSL certificates, and 24/7 performance monitoring for a consistent user experience. 360° Insta camera for panoramic shots.

Data Collection Techniques

Observation: Direct observation of the Science Techno Park location, 360° photo: Panoramic shots in each zone of the Region, Interview: With UNPAB to understand the needs of the system, Literature Study: Journal references about VR and virtual tours. Stuttgart et al. (2026)

Results

Virtual tour It has great potential to become an effective digital promotional medium. This media is expected to increase the interest of visitors, students, and external partners in Al-Amin Science Techno Park, as well as support the digital transformation of educational institutions in the industrial era.

There are several images taken from the insta360 camera:

Figure 1. Utility and Maintenance Areas

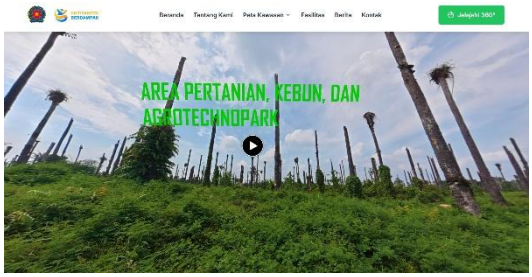

Figure 2. Agriculture, Garden and Agrotechnopark Areas

Conclusion

This research successfully implements the Virtual Reality Web of the Al-Amin Science Techno Park Tour as an innovative digital media to introduce the facilities and potential of the UNPAB research area in an immersive and interactive manner. Based on the development stages of the Multimedia Development Life Cycle (MDLC), the resulting virtual tour is able to present a realistic exploration experience with 360° panoramic technology, web-based VR framework, and responsive hosting that can be accessed through a browser without the need for a special VR device. The novelty of this research lies in the first implementation of virtual reality web tour for Science Techno Park in Indonesia, which integrates 360° panoramas, interactive multimedia, and responsive web interfaces to support the ecosystem of research, innovation, and downstream agricultural and livestock technology This virtual tour has the potential to be an effective digital promotional medium to increase the interest of visitors, students, and external partners in the Science Techno Park Al-Amin area. as well as supporting the digital transformation of educational institutions in the Industrial era. Stuttgart et al. (2026)

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