

ENHANCING SMART CITY PLANNING AT DEVANAHALLI THROUGH BIM-DRIVEN VR AND AR INTEGRATION

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Introduction:

1. Rapid urbanization in areas like Devanahalli requires advanced planning techniques to ensure sustainable and efficient development. Traditional planning methods lack immersive visualization, making it difficult for stakeholders to understand spatial layouts and future developments.
2. Building Information Modelling (BIM) provides a digital representation of physical and functional characteristics of infrastructure. Integration of BIM with Virtual Reality (VR) and Augmented Reality (AR) enhances visualization by enabling real-time interaction with models.
3. This project aims to improve smart city planning by integrating BIM with VR and AR technologies for better decision-making and visualization.

Objectives:

1. To develop a BIM-based 3D model for a selected area in Devanahalli.
2. To integrate BIM with Virtual Reality for immersive visualization.
3. To implement Augmented Reality for real-world model interaction.
4. To evaluate the effectiveness of BIM-driven visualization in smart city planning.

Methodology:

1. The project begins with collecting data such as site layouts and planning information of Devanahalli. A detailed BIM model is developed using Autodesk Revit, including buildings and infrastructure components.
2. The BIM model is then exported to visualization platforms such as Twinmotion or Unreal Engine to create an immersive VR experience. AR tools are used to overlay the model onto real-world environments.

3. Finally, the effectiveness of the integrated system is analyzed based on visualization quality and usability.

Result and Conclusion:

Initial work includes understanding smart city planning concepts and developing a basic BIM model. Preliminary exploration of VR tools has been carried out. The project is expected to enhance visualization and improve decision-making in urban planning.

References:

1. Eastman, C. et al., "BIM Handbook", Wiley, 2011.
2. Azhar, S., "Building Information Modeling (BIM): Trends and Benefits", 2011.
3. Wang, X., "Augmented Reality in Architecture and Construction", 2009.

Future Scope:

The future scope of this project includes:

1. Expanding the model to cover larger smart city areas.
2. Integration with real-time data such as traffic and environmental monitoring.
3. Use of AI for advanced smart city planning and optimization.