

### **Location-based Games (LBG):**

Location-based Games (LBG) that utilize Geographic Information System (GIS) technology are a genre of video games that blend the real world with the virtual environment. These games present unique challenges and interactions by leveraging players' actual locations.

These types of games, in addition to providing entertainment, offer a dynamic and interactive experience for users. The direct interaction between players and their real-world environment not only enhances the physical aspects of the game—such as walking and exploring—but also fosters connections with cultural and geographical places. This blend of the virtual and real worlds encourages players to spend more time outdoors while enjoying new and exciting experiences.

Location-based games have emerged as one of the fastest-growing segments of the video game industry. The market for location-based games and entertainment is expanding rapidly; in 2023, it was valued at approximately USD 3.5 billion and is projected to reach USD 24.76 billion by 2030, reflecting a compound annual growth rate (CAGR) of about 28.8%.

Location-based games that utilize mobile phones are particularly significant in the realms of entertainment and technology due to their accessibility and the widespread use of smart devices. These games can enhance cognitive skills, strengthen concentration, and foster creativity. However, prolonged periods of sitting and a lack of physical movement can negatively impact players' health. This concern, combined with the integration of GPS technology, has brought attention to a new genre of games known as location-based games. By encouraging users to move and explore real environments, location-based games play a crucial role in promoting physical activity and improving overall health.

In recent years, a diverse array of mobile games has been introduced and launched by Iranian companies. However, despite the significance of location-based games, Iranian developers have overlooked this genre. This gap in the market inspired the idea of conducting applied research, which culminated in a master's thesis in 2021. This thesis, entitled "Using Digital Twin Technology for Location-Based Game Design", by Mr. Cheraghizadeh, a master's student in the GIS Department at the School of Surveying and Geospatial Information Engineering at the University of Tehran. The research was conducted over two years under the supervision of Dr. Ali Abbaspour, Dr. Abedini, and Dr. Zare Zardiny. The findings of this thesis represent the first Iranian location-based game that has successfully pioneered new frontiers in the realm of digital gaming by leveraging the technological concept of digital twins and integrating the digital and physical worlds.

This game falls under the category of adventure games. The map utilized in the game is based on a real-world location. By navigating the actual environment corresponding to

the user's location, players can embark on the game's narrative and explore various aspects of the game world.

This game utilizes location data, positioning technology, internal mobile phone sensors, time, and weather conditions to deliver a realistic, unique, and interactive experience for users. As a pioneering effort in the development of location-based games, it aims to be part of a new generation of intelligent adventure games. The game is anticipated to be released for public use once certain technical and security challenges have been addressed.