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Analysis and Comparison of Gaming in Virtual and Real world

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Abstract— Today Location based Services are one of the largest application areas where end user is willing to pay for services. Also, Location based market is expected to grow dramatically as most Mobile phones sold now are capable of running Location based games which are major source of Interest for User. User shows an excitement to play, whether he is playing in a real world or he is playing in a Virtual world just like a real one. Location based games are the types of games that explore the unique features of GPS enabled mobile devices. Location based Games reached their peak level with the combining technologies such as Global positioning devices, Bluetooth and Wireless Networks. Location based mobile games are categorized as Learning Games, Adventures Games, Strategy Games, Searching games ,Sports games and Educational Games. A Game world is notionally superimposed into city surface where the Games narratives are influenced by the player's movements in the city. Maps represent the real opponents and Virtual objects from the game Imaginary world. Today most of the games are emphasizing on covering various public spaces and extend the gameplay in physical environment. This paper analyses the technologies used Mobile Gaming and a platform that provides access to spatial features such as building outlines, streets and real time positions of Players on the map. Further, the paper shows the implementation of few Location based Games that compares the Location in real world and actual world.

Keywords— OSM, GSM, GPS, Location based Mobile Games, Geographical Information System

I. INTRODUCTION

Location based games are relatively new in entertainment Industry, as first Location based games which commercially came in use in 2002 is Botfighters[13],the first pay-per locate GPS Game. Location based games are known for their unpredictability as the means of input in these games are user real Location. These Games provides a distinct gaming experiences for the players, as players can move from one Location to another, which can effectively increases the longevity of the games. Players can change their Location within the city to interact or avoid other players collect the items of other players or beat them. Location based Mobile Games are gaining more and more popularity day by day, as numbers of advanced 3G and 4G phones are being launched. These are the entertainment applications that can use mobile phones and the spatial data to convert the real time players into objects shown on map. Games that allow direct communication with remote participants are of great interest (multi-player games) [1]. Location based Games uses the spatial data in different ways. Some Games are designed for Single player, some are for multiple players, some games are designed for social interactions and some games are for point of interest and other for tracking users. The Technology used for Location based Games vary from GPS, AGPS enabled devices to GSM Triangulation. Location based games can run on several platforms like Android OS, iOS, Symbian OS, webOS. The basic platform for Location based Services is Java.

Today Location based Mobile Games reach a wider demographic than computer and console games. According to the study of ABI, Location based Mobile Gaming is growing fast and expected to reach around $16 billion by 2016. In general, we can say that mobile gaming will be a broad form of public entertainment in the next few years. A person with his own 3G or 4G Mobile phone shows more interest in mobile games, regardless of age and gender. As we know that typical mobile User can listen music, watch television and do other entertaining activities while playing games. Thus, Location based Mobile Gaming is a best method of learning and entertainment.

II. RELATED WORK

A broad range of location-based mobile games exists already, and an industry has formed to service this market [11].The main Categorization of games are tagging to reach the destination, collecting the objects by players, and playing in a virtual world and games based on geographical

knowledge. In this Section some of Location based games proposed and implemented by researchers are described.

Jörg Lonthoff and Erich Ortner [3] defined "Mobile Game is a location-based game that can run on a mobile device. By using various communication media the participants can exchange information with a game server and with other participants. Location based Mobile Games uses spatial data Model and Geocaching for persistence. According to research of O.Sotamma [4], the technology assisted Location based games started with invention of Geocaching.

Geocaching [5][10] is a Location based Game where players contain GPS devices ,hiding caches that contains few outdoor items and informing other players about the positions of cache. Then the players go for treasure hunting to search that cache. The players either record the findings of searched caches or replace their items.

The other early Location based Game is Pirates [6], mixed reality Location based game that uses relative positioning and sensors to create interactions between the players. These Games lack in proper positioning of Players due to non existence of GSM networks. According to research the game pirates had been disqualified due to use of sensors.

Botfighters [7] is a Location based Mobile game using GSM networks to triangulate Players. In this Game, a player tries to go nearby other players and had a battle between them through SMS.The Technology used in this Game is Cell ID.

Some of the Social networking Location based Mobile games are Gowalla, Foursquare and My Town [8][9][12].All the three games uses GPS integrated in Mobile phones with 3G connections. These Social Networking games rely on the users that create their own locations called spatial data where they wants to visit. These games uses Google API platform and are based on spatial model where spatial data is stored in spatial DBMS.In these games, players can interact with fixed locations usually real world public locations such as shops, parks etc.The advantage of using spatial data model is that it is easy to implement but disadvantage is that the players can not be tracked therefore game does to allow many player ton player game play because then games only revolves around Locations rather than players.

Tell Us Aware [12] is a Location based Mobile Game collecting Human place description from the players of game. In this Game, every player wherever they are can submit the description of their Location in textual representation. This description is stored at a Server. The position of Mobile device is automatically obtained by a GPS enabled Mobile Device and confirmed by the player with the submitted place description, a player has a chance to win a Gift Price. The limitation of this game is its spatial extent.

Another Location based Mobile game is Paper chase[2], Location aware multimedia game designed by first year students of Research and Development Institute, Germany, who tried to integrate various technologies such as Internet, multimedia and Java with wireless networks and Localization with movements. But this Game does not include spatial data.

City Explorer [3] is a Location based Mobile Game that uses spatial data. In this Game, players take georeferenced photos, localize geographic points of interest and categorize them semantically.

A Location based Mobile game Lokemon [14] was implemented using Hibernate Platform with Free open data source "OpenStreetMap" to show the Location of Players on map. OpenStreetMap is an Open source Map that displays rivers, roads, ATM,forest and expanded categorization of places on map.Figure1.1 and 1.2 shows the Location of real time players playing a Game "Lokemon".

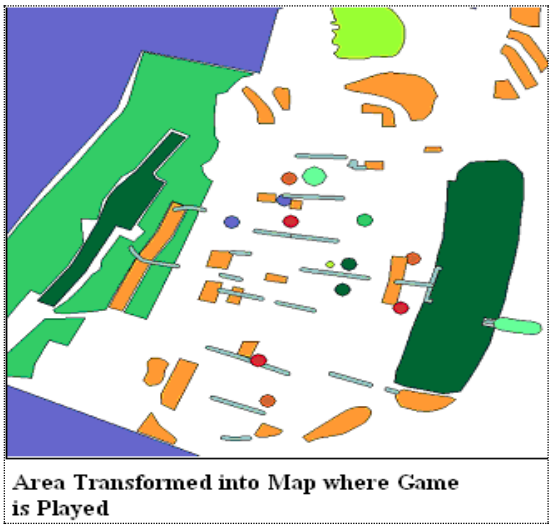

Figure 1.1 Area covered by the game on Map

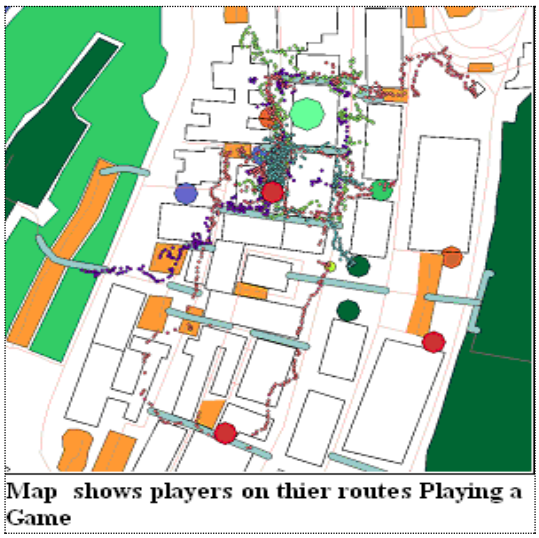

Figure 1.2. Players moving in area while playing

III. A General System for Mobile gaming using Spatial Data Provider

According to Lefebve, Maps and all kinds of "Graphic representation or projection" are representation of Space [15].Maps can be seen as communication and information system conveyed by images and signs. In Location based Games, system creates a social world which is notionally superimposed onto actual space, so that the imaginary game world is perceived a new dimension, added as layer onto actual space. Spatial provides displays Maps in combination of Raster and Vector Data Model. It is based on Geographic Information System. Various Tools are Google Maps and Open Street Maps. User has to install Google maps or Open street Maps according to the requirement of the Game. Figure 2 describes the general system for Location based Games.

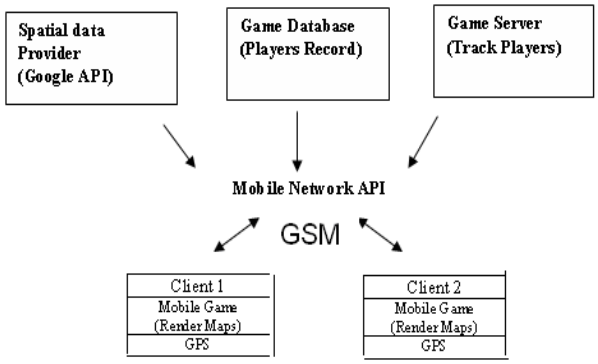

Figure 2. A System for Location based Mobile Gaming

Functioning:

A General architecture of Location based Games is divided into three components. Spatial Data Provider, Game Server and Game Database which are incorporated with Mobile Network API and GSM.

Spatial Data Provider is a component used to represent the spatial data (the location of Players in the form of maps easily accessible to Clients). A Spatial data provider is divided into three components: A parsing and processing layer used to store and read data from a data source. It parses and processes the data to make it relevant to the game developers and clients. Spatial Database used to permanently store spatial objects and an ability to perform queries on that data by the Client. It also provides the utility functions, calculations and passed them to the Client if needed. A free open data source used to represent spatial data is Google API. Google Maps represents the data in three features: points, Lines and polygons. Google Maps give higher level description of specific location like it exposes the points which are not places such as ATM's, fountains, Trees etc.Spatial data is represented by Geographical Information System. A Geographic information System is an information system designed to work with data referenced by Spatial/Geographical Coordinates. GIS is a database system with specific capabilities for spatially referenced data as well as a set of operations for working with the data. Burrough in 1986 defined GIS as "Set of Tools for collecting, storing, retrieving, and transforming and display spatial data from real world for a particular set of purposes" [15]. All Location based Geographical maps are combination of Raster and Vector Data models used for Mobile Gaming. These Maps shows the Location of Players moving in different areas. The Players use GPS enabled mobile phones with WIFI connected in order to get exact Location. The Game works on Android Operating System and basic platform for Location based gaming is Java. The snapshots showing the location of players of two games.

IV. Implementation of Location based Services

A. LOCATION BASED GAME CITY ZOMBIE

A Location based Mobile Game Zombie is a Multiplayer Survival Game where players uses real locations and fight with Zombies to save their city[16]. In this game, there is combined effort of players to save their city. The Snapshots in Figure 5 shows the Location of Players on the Map in their Virtual world just like they are playing in real world. The Location of moving players while playing are shown in Figure 3.1, 3.2, 3.3 and 3.4.

Figure 3.1. City where players are playing [16]

Figure 3.2. Location of Players during playing [16]

Figure 3.3. Multiplayers involving in a Game[16]

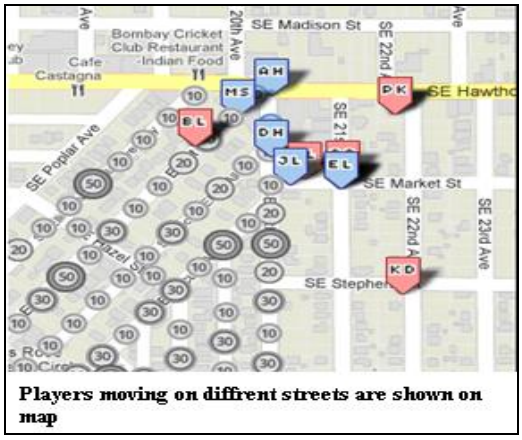

Fig 3.4 Clear Location of Players on a Street [16]

B. SECOND LIFE

Second Life is a 3D world where everyone you see is a real person and every place you visit is built by a people like us[17]. Here the Player plays with a Virtual objects and virtual just similar to a Real world. Every one can use its artistic talent in this Game. One can also share their talents with their friends through Second life. Second life is a virtual world where Avatars play like a real person and do things like we do in real life. It is multiplayer online worlds where players meet other players, socialize their world and also make group activities. Here are some snapshots of game playing in second life. Figure 5 shows Location of Players on a map along the details of Players stored in their Directories. The Players are enjoying in their imaginary world making their houses and places just like a Real world. While playing, the Map also shows nearby people so as to make social gathering if needed. The Snapshots of Players playing in the Second Life is shown in figure 4.1, 4.2, 4.3 and 4.4.

Figure 4.1. A Player who is registered in a Game can select a destination of his choice[17]

Figure 4.2. Location of Players on a Map[17]

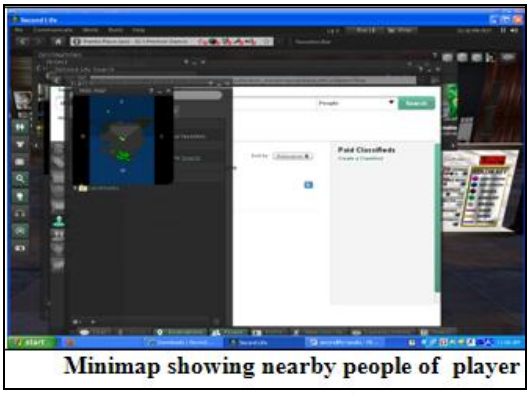

Figure 4.3. Minimap showing Location of adjacent Players[17]

Figure 4.4. Players on Directory[17]

V. IMPLEMENTATION OF LOCATION BASED SERVICES

In above games the players are moving and enjoying in their virtual world. The location of players in their imaginary world is shown on a map. The maps does not show their real location from where a player is playing.

VI. CONCLUSION

Location based Games are illustrative examples of how walking in a city can be altered by the addition of Social world i.e. combined with actuality via access to Mobile devices and Networks. In Location based Games, the willingness of players to explore and accept an imaginary game world through the use of spatial data alerts that modifies the experience of spatial practice. Location based Mobile games might be an ideal environment to test new methods of Data Collection and Service Learning, for example getting Player or Service to be agreed on Spatial Content of Place. The Purpose of our research to extend the present work by exploring the Location of Players in real world rather than a Virtual world and to show the real Locations of Players in our results.

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