

Tracking and positioning of mobile phones in telecommunication network

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ABSTRACT

In this paper, the easy technique for mobile telephone tracking and positioning is been done. Mobile positioning technology has developed into an essential area and plays a vital role for emergency and also for profit-making services. Mobile positioning and tracking system will give services such as emergency calls, locating stolen mobile phones, dissimilar billing tariffs based on the place where the call is originated, and through the process to guess the user movement inside region by using the cellular network. The development of an accurate and reliable mobile positioning technologies need continues development to location-dependent services and applications in the wireless system. The process said above is called Non-Line-Of-Sight (NLOS) problem, and it is a major source of error because it completely causes the mobile to show farther away from the Base Station (BS) than the actual area where it present, thereby it leads to increase the positioning error.

Keywords— Mobile telecommunication, Demand on geo-location, Mobile positioning and tracking based on handset technology, Global Positioning System

1. INTRODUCTION TO MOBILE TELECOMMUNICATION

Mobile telecommunication is the technology used for cellular communication. Mobile Code Division Multiple Access (CDMA) technology has developed quickly over the recent years. Since the starting point of this century, a standard mobile device has made an evolution from a simple two-way intercom to be a mobile system, GPS direction-finding system, an established web browser and straightway messaging application, and an inbuilt gaming console. Many specialists stated that the future of computer technology inactive in mobile computing through wireless networking. Mobile computing by means of tablet computers is carrying more appreciation. Tablets are now available on the 3G and also on 4G networks. Positioning or Tracking the current location of a subscriber within the area of a cell in a telecommunication network is also referred to as services based on location.

Mobile technology usually contains two main functions. They are fixing the call and Hands-Off Process. All the base stations help to transfer a signal with a power of 25 to 30w to the mobile system. When a user switches ON their mobile unit, it usually searches for the most concrete signal and gets automatically connected to that base station. Then the mobile unit identifies and send the signal to the base station. When the call is attached, the base station accepts the request and sends to the base station controller and also to MTSO (mobile telephone switching office). Then the MTSO searches for where the other subscriber is present and then it helps to connect the call.

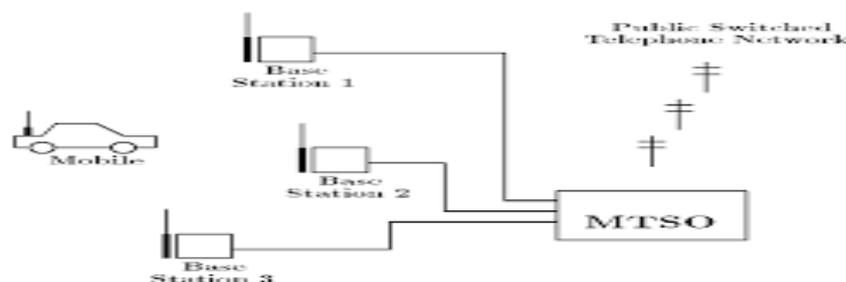


Fig. 1: Mobile telecommunication

2. DEMAND IN GEO-LOCATION

Geo-location is the identification of the location of a particular object, such as mobile phones or computer that connected internet terminal. The assessment of the location, the pronounced assessed location are mainly done by using the geo-location. Geolocation is connected to the use of positioning mobile systems and also possible dignified from it by greater importance on deciding an important location rather than finding just a set of geographic areas. For either geo-locating or positioning, the locating engine usually uses radio frequency location methods, for example, Time Difference of Arrival (TDOA) for accuracy. TDOA systems

habitually make use of mapping displays or some of the environmental data system. If a GPS signal is not available, cell towers help to get information to map the estimated position. The ability to identify the accurate geolocation of the mobile system in the cellular system helps the operators in networks to make use of new services very easily to all the mobile users. The central spontaneous catalyst in the mobile system that offers position is bettered in accidents and in emergency services. The geo-location in mobile systems provides Emergency services for client safety, Billing based on Location, Fraud detection, Smart transport services, Innovative and helpful network performance and its management.

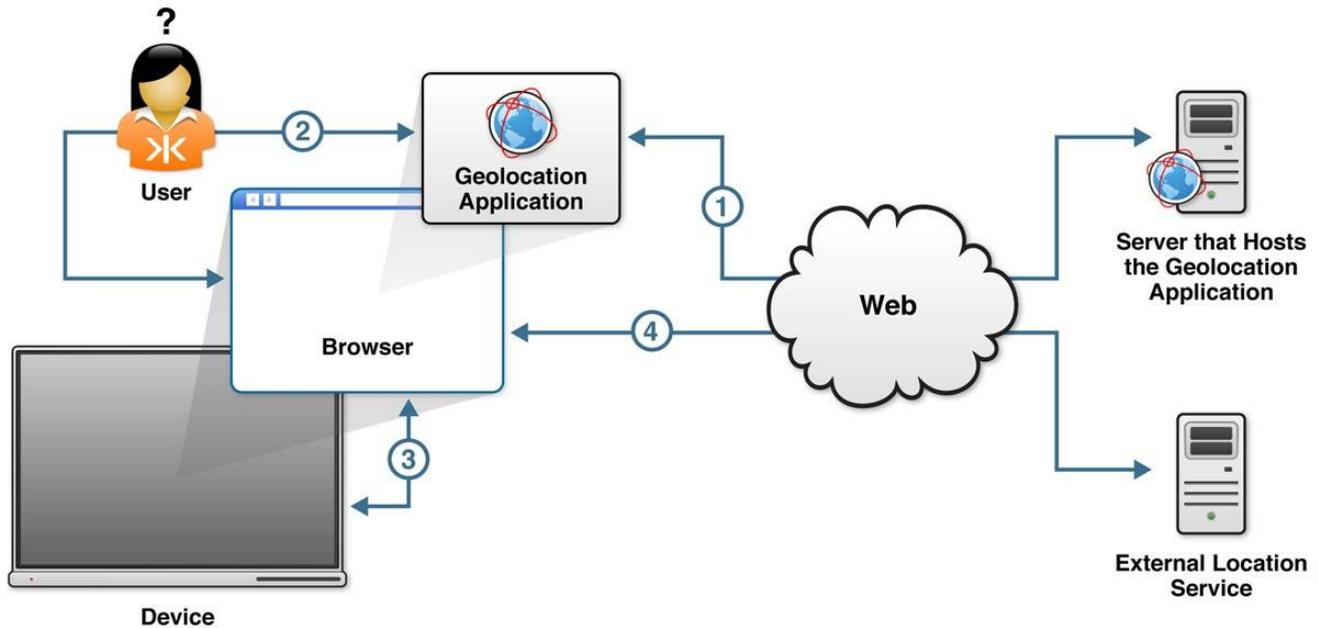


Fig. 2: Geo- Location

3. TECHNOLOGIES USED FOR GEOLOCATION

3.1 Mobile positioning and tracking based on handset technology

The technology based on the handset has need of the user software installation to find out the correct location. This system setup the handset location by finding its location by its cell concession, home power signal and cells that are nearest. If the handset is set with GPS then the carrier accepts the specific location information from the handset

3.2 Global Positioning System (GPS)

The GPS is a space-based satellite routing system that offers the information of location and time in any weather conditions at anyplace in earth or near to the Earth where there is a clear line of sight to four or more GPS satellites. The system provides scopes to public and marketable users to all around the world.

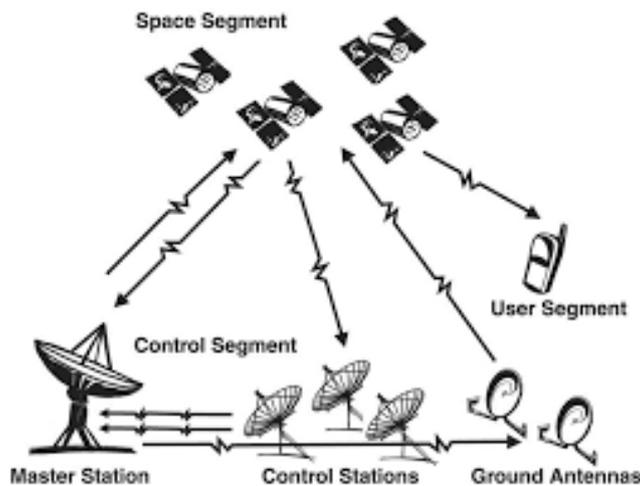


Fig. 3: Global Positioning System (GPS)

4. DIRECTION BASED GEOLOCATION

The Angle of Arrival (AOA)

This method guesstimates the signal’s angle of arrival received at the base station. When the clients switch ON the mobile, the system receives the signals auto genetically from different base stations. This is consistently used to set up the angle of arrival of a terminal that using the inequalities of the signal power that measured. Angle of arrival method is a false method used for the positioning the mobile unit because it has some drawbacks such as, it shows error if the angle of incidence is adjusted due to blockages like atmospheric particles or scattering particles etc., unless the mobile users are between in base station the correct location cannot find out, It is not applicable in indoor environments

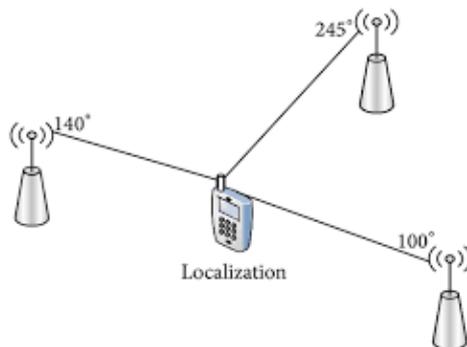


Fig. 4: The angle of Arrival

5. RECENT TECHNOLOGIES

Tracking of Vehicle

A tracking of vehicle system brings together the use of automatic vehicle location of a distinct vehicle by including software that collects rapid data to get the location of the vehicle. The progressed tracking of vehicle systems commonly use GPS technology for tracking the vehicle, but additional types of self-regulating vehicle position technology can also be implemented. The data of Vehicle can be detected on electronic plot through the Internet connection or using improved software. In large cities, public transport authorities are usually using vehicle positioning systems.

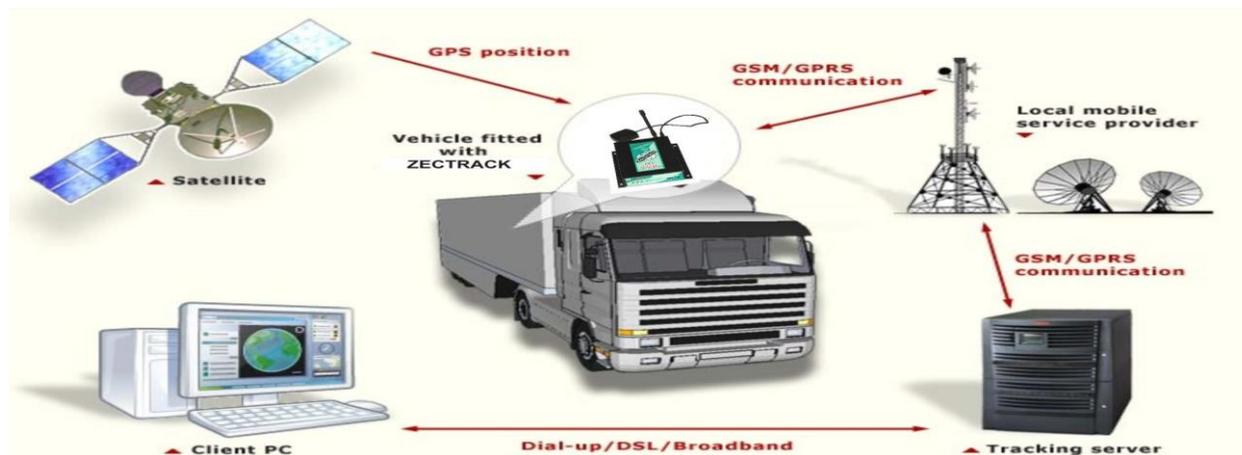


Fig. 5: Vehicle tracking system

The reasons for marketing Vehicle GPS tracker system in business expenditure are reduced. The GPS for locating vehicles for rapid management helps to make the operations systematised and reduces the complete expenditure of the business.

- At the accurate time of arrival, the closest vehicle can be determined and analysed
- The efficient routes for the vehicle can be accessed and recorded easily with the help of real-time data.
- The accident alerts and traffic alerts are sent to drivers helps to reduce delay and it provides with alternate direction and route map.
- We can identify the lost package while they are on the way to their destination to distribute
- Easily identified the workshops that helps for easy repairing and also the location of the vehicle can also be identified
- The high costing of insurance premiums can be reduced when accidents occurred by monitoring the speed or rashness of vehicles
- The correct billings are done and actions from customers can be observed.
- The efficiency of all the drivers is increased by not permitting the illegal breaks.
- Within the predetermined time, the number of deliveries can be increased by the effective working approach

6. CONCLUSION

In this paper, our outline is beneficial in that the location of a mobile phone can be tracked definitely even in the different route getaway. It has the benefits in business management, emergency services, Child safety. The drawback of mobile phone-tracking is the privacy concern. We have narrated about solid positioning of mobile units, which can be applied for several applications. While approaching a location-based technology the important consideration that has to take are the accuracy of location, cost implementation, reliability, increasing functionality.

7. REFERENCES

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