Full Length Research Article

GPS MOBILE BANKING: AN ADVANCE SECURITY MEASURES

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ABSTRACT

The proliferations of smart phones are integral part of our daily lives because of its diverse and enhanced features. Online banking which is now replacing the traditional banking practice has a lot of benefits which add value to customers and eventually leading to a lot more easy life. Because of the ubiquitous use of online banking, it is important to give attention towards security measures against fraudulent activities. Therefore, it is important for the mobile user to have the Location Based Service (LBS) that has the capability to provide real time information to users based on their location of X & Y co-ordinates generated by Global Positioning System (GPS) which acts as positioning device. This application collaborated with the help of GPS facility will provide the exact location of the mobile user. Nowadays, online banking fraud is at stake worldwide and so such application with GPS facility will help to locate the user or the hacker. With special implementation to public sector or authorities, this service can be implemented by delivering the accessed location GPS address to nearest police station, registered user and concerned bank. Thus, this paper will attempt to explore the possibility of security measures on mobile banking with the help of GPS.

INTRODUCTION

In today's era, it is no doubt that people are utilizing online channels for their banking and financial services in abundance. This is a trend that shows no sign of diminishing. Mobile banking system is a financial transaction by the customer created by the bank services that can be access through a mobile device. With the advent of technology and increasing use of smartphones, the use of mobile banking facility has become so common and would enable customer to connect worldwide much more comprehensively than before. Unfortunately, the increasing use of online banking by the legitimate customers has left the door open for the mastermind criminals. And due to its ubiquitous access, online banking fraud is at risk and therefore there is a need a development of new techniques which help in detection of the hackers or the criminal involving in banking fraud. Due to massively utilization of the smart phones technologies, the legitimate users need to have Location Based Services (LBS). Location Based Service is a mobile service or application that provides

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information to users based on their location with real time information. This special application generated by the Global Positioning System (GPS) which acts as positioning device will provide the exact location and position of the user, the criminal or suspect. Thus, this paper will attempt to explore the possibility of security measures on mobile banking with the help of GPS.

Location based services

Location-based services or LBS refer to a set of applications that exploit the knowledge of the geographical position of a mobile device in order to provide services based on that information. 'Location based services (LBS) provide the mobile clients personalized services according to their current location. They also open a new area for developers, cellular service network operators, and service providers to develop and provide value-added services: advising clients of current traffic conditions, providing routing information, helping the users to find nearby shopping malls. Location-based services offer many merits to the mobile clients. For the mobile user, the examples of location based services are:

- Profile changer based on place or area
- Person Location tracking by Family Member (SMS)

- Nearest Friends notification reminder

Location based Services can be classified in 3 categories

Public Safety / Emergency Services

The location of the client can be determined by the mobilecarrier hence it finds great use during Emergency since itcan be used during the emergency/health hazard to locatethe mobile clients.

Consumer Services

Now days, smart phones like (Android, Blackberry and iPhone) provide a set of location based applications and services which helps the users to access the multiple services based on the user location.

- *Maps Navigation-* The users can use the Google Maps to get to the particular location or to trace the route between any two locations.
- *Marketing /Advertising-* Many corporate companies advertise their items based on the location of the clients. For Example – Sale in Shopping Mall near to your location.
- *Location based Reminders-* The phones can be used to set as the reminder based on the location.

Overview of global positioning system (gps)

The Global Positioning System (GPS) is a space based satellite navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The system provides critical capabilities to military, civil and commercial users around the world. It is maintained by the United States government and is freely accessible to anyone with a GPSreceiver. GPS is often used by civilians as a navigation system. On the ground, any GPS receiver contains a computer that "triangulates" its own position by getting bearings from at least three satellites. The result is provided in the form of a geographic position - longitude and latitude - to, for most receivers, within an accuracy of 10 to 100 meters. The total GPS configuration is comprised of three distinct segments:

- **The Space Segment:** Satellites orbiting the earth.
- **The Control Segment:** Stations positioned on the
- earth's equator to control the satellite
- **The User Segment:** Anybody that receives and uses
- The GPS signal.

Keeping in consideration the need of security measures using GPS at the time of mobile banking, there are few authors who have shared their thoughts and given their contribution technically in this related field which has briefly described below:

Michail*et al* (2006) introduces the notion of location based intelligence by tracking the spatial properties and behavior of a single civilian participant over a two week study period using a Global Positioning System (GPS) receiver and displaying them on a Geographic Information System (GIS). The paper clearly shows the power of combining speed(S), distance(D), time(T) and elevation(E) data with the exact longitude and latitude position of the user. The issues drawn from the observation and the civilian's personal diary are useful in understanding the social implications of tracking and monitoring objects and subjects using GPS. They also concluded by saying that while the benefits of GPS for specific applications is apparent, safeguards need to be put in place to ensure that information gathered by the GPS is not misused. One can envisage that if the wrong hands obtain location information records for individual subscribers that the potential exposures and risk might be even greater than that of stolen credit cards.

Michail *et al* (2006) discussed the usability context analyses to draw out the emerging ethical concerns facing current humancentric GPS applications. The outcome of the study was the classification of current state GPS applications into the contexts of control, convenience and care, a preliminary ethical framework for considering the viability of GPS location based services emphasizing privacy, accuracy, property and accessibility.

Wankhade and Dahad (2011) dealt with the design and developments of a theft control system for an automobile, which is being used to control the theft of a vehicle. The simulation of the circuit design and its implementation is done using PROTEUS software, which is designed to improve vehicle security and accessibility. In this project the security system is based on embedded control which provides information to the user on his request and the owner can access the position of the vehicle at any instant. The GPS receiver on the kit will locate the latitude and longitude of the vehicle using the satellite service. It is reliable and efficient system for providing security to the vehicles through GSM, GPS and serial communication.

Gupta and Reddy (2011) presents a low cost human tracking system using GPRS GPS on GSM network. The combination of both the technologies i.e., GPS and GPRS provides a constant, continuous and real time human tracking system. The cost of the overall system has been reduced by two facts, one is using GPRS instead of SMS. It has been hoped that the use of the overall system can eliminate the requirement of the traditional GPS receivers and second costly SMS based tracking system. The future scope of such system is that it is Android based tracking system, and the same application can be developed for other phones as well such as Symbion, Blackberry etc

Kushwaha *et al.* (2011) concluded by saying that after the release of android based upon source mobile phone, a user can access the hardware directly and design customized native application to develop web and GPS enabled services and can program the other hardware components like camera etc. The LBS application can help user to find hospitals, schools, gas filling stations or any other facility of interest indicated by user within certain range. Just like GPS device, its location will also be updated as soon as the user changes its position.

Rani *et al.* (2012) discussed how to implement these location based services in android. These BS are those services which provide both information and entertainment and are accessible

with mobile devices through the mobile network. They can utilize multiple technologies such as the GPS satellite network, cellular network, wi-fi networks and other technologies, LBS can be used in a variety of aspects like vehicle tracking, monitoring driving habits, locating employees, finding the route between two places. All these need the use of GPS along with some tracking programs.

Shah *et al.* (2012) discussed about system architecture and work flow. They have summarized and categorized different location based communication services. As location information tremendously being used more often in people's daily life. This paper mainly focuses on communication related to location based service, GPS and system architecture. They have also suggested in future one can extend this with context based information and their preferences, restaurant queries, traditional restaurant queries. They also change to provide better results by considering not only distance but also preferences (eg., prices, rating, restrictions), environmental context (time, weather, traffic condition etc.), restaurant context (current waiting line, closing time etc.).

Singhal and Shukla (2012) proposed the implementation of Location Based Services through Google Web Services and Walk Score Transit APIs on Android phones to give multiple services to the user based on their location. With the help of A-GPS in phones and through web services using GPRS, LBS can be implemented on Android based smart phones to provides value added services advising information finding nearby hotels, ATM etc. they have also mentioned about the various constraints while implementing LBS that include- technology constrains, infrastructure constraints, market failure. Abdul *et al.* (2012) presented that an application called Location Based Service (LBS)using GPS as the location provider are being utilized and that the application provides the user with his current location co-ordinates by displaying it on Google maps on the mobile phone. This application was also implemented as a client server system that helps user to locate their friend with whom he or she wants to share his location. The location average accuracy is believed to be within a couple of meters. They have also mentioned that the application works in the open space areas only as it relies on GPS.

Nicely and Sankaranarayan (2013) explored the mechanics of LBS using GPS technology and the use of proximity alerts on early warning signals in different scenarios to enhance the user experience and a rating system including security rating for a point of interest (POI) provided on the application which is novel and extension of Mobile Information System. Based on security data provided by police authority sources, if at any point along the route there is a crime or high alert Situation that has been logged, the user will be informed by way of a proximity alert which is another novelty of system and thus would create a more conscious and pro-active citizenry in safeguarding their own well being while at the same time restoring confidence in police personnel
Gugapriya*et al* (2013) proposed a work that provides a new way to access the bank transaction by android phones. A service called Location Based Service (LBS) was used to identify the nearest ATM centers by using GPS, thus locating ATM centers and fund transactions becomes easier. Tekawade

et al (2013) introduces a mobile tracking application based on LBS to track and locate the mobile device using geographic co-ordinates of the user as a location provider, helping the user to locate their friends and receive alerts. Their main objectives was to track the location according to radius maintained by administrator and sending SMS to the users. They concluded that further extensions can be done in getting the location from the service provider by extending the radius and providing security to the radius in order to increase the capacity between the communicating mobile devices as a location tracker.

Vanjire *et al.* (2014) proposed in developing an android application which is based on LBS and provides different location based services like profile changing of mobile from normal mode to silent mode and vice versa for certain places that the user registered. With the implementation of LBS, one can locate family members, friend's locator. For finding location the GPS technology with Google Map API can be used. As android is an open source, this application can be used for further improvements in many smart phones. After going through the surveying, they gathered that there is a huge scope of application development in mobile domain. Following the same notion, one can also develop application that can tackle following issues: Location positioning technologies, query processing and cache management.

DISCUSSIONS

From the review of the researchers discussed in this paper, smart phones and tablet based devices due to its ubiquitous access have serve mankind much more easier in many ways. An application called Location Based Service (LBS) in collaboration with GPS provides the user's position by using geographic co-ordinates and also helping the user to locate the nearest ATM's, banks, locating friends and family. The researcher's main objectives were to track according to the radius maintained by administrator and sending SMS to the users. Suggestions were given for future work that further extensions can be done in providing security to the radius in order to increase the capacity between the communicating mobile devices as a location tracker and also aim to provide better results by considering not only the distance but also preferences like prices, rating, environmental concern's as in time, weather, traffic condition etc. the location average accuracy is believed to be within a couple of meters and it works best outdoor.

Conclusion

Majority people are now using online channels for their banking and financial services. This is a trend that's shows no sign of lessening. Unfortunately, the increasing usage of online banking by legitimate customers has created opportunities for the criminal element and cyber-crime. And therefore, online banking fraud is at stake worldwide and such application with GPS facility will help to locate the user or the hacker. With special implementation to public sector or authorities, this service can be applied by delivering the accessed location GPS address to nearest police station, registered user and concerned bank exploring the possibility of security measures on mobile banking with the help of GPS.

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