



What's Next in Locations Based Services

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Abstract— *The aim of this research is to provide further insight into possibilities for smart phone next-generation Location Based Services (LBS) applications, including a greater understanding of implementation and architectural considerations, and future trends in LBS. This report outlines the current state of LBS technology, research into the important issues of maintaining user privacy, and future trends such as improved visualization through augmented reality and moves towards context-based computing and Semantic Web. And more importantly to design and write Android Application to make “Traditional local news media”. Traditional local news media: It is similar to local journalism starting from a small city and expanding this application to reach to a national level to cover entire country. We start with the local newspaper’s business model in the process. The social media picks up the gossips from your social circle and interest groups, pulling readers’ attention away from the printed page. Safe to say, it’s been something of a perfect storm exploiting traditional local news media. We list quite a few hardware and software products from various vendors which will come in the market in the future.*

Keywords— *Location Based Services, local news media, social circle, interested groups, location determining technologies.*

I. INTRODUCTION

A Location-Based Service (LBS) is a mobile computing application that provides information and functionality to users based on their geographical location. First generation examples include “show me nearby restaurant”-type applications. Next-generation LBS can provide additional benefits for users and service providers, including:

- Proactively pushing only relevant information to users to help speed up decisions and activities.
- Minimizing tedious data entry by integrating applications with advanced sensors such as accelerometers, digital compasses and cameras.
- Allowing service providers to model user behavior based on their location and route information, which can support improvements of service levels in near real-time and over the longer term.
- Encouraging sharing of location-based information, such as photos and reviews, generated by other service providers and users.

As a result, analysts predict explosive growth in the LBS market over the coming years. Apart from the consumer market, there is a good prospect and potential for this technology to find its application in many industries including health, manufacturing, mining and financial services.

II. DETAILED OUTLINE

We list and give details of various items considered here.

Aim of the research - Local News Distribution Centre

We start with the design of a small local city news gathering and segregating into various categories. We will discuss various options to find out exact location of a user be on a block and street. There has never been so many sources of local news available, given the web has removed barriers to publishing, social media has got everyone accustomed to self-publishing (and self-publicizing), and smart phones are individual e-readers in everyone’s pockets. Local news is out there and people are interested in reading stuff, so distributing relevant content to the right people is one new challenge.

The focus is on giving local news to a small town. This city-based startup is aggregating local news sources, from blogs eventually to newspapers distributed in big city and finally reaching to local location like a particular street or block where someone with smart phone is going around.

Our front page uses social activity as part of how we prioritize things which is our primary way of displaying information to the user. If a news item is commonly available on different social media sites, it means the news item is quite important to be added in local database. Figure 1 shows the path of flow of local news taken from different sources and taking it to the mobile user.

Small Local City News Distribution – Design

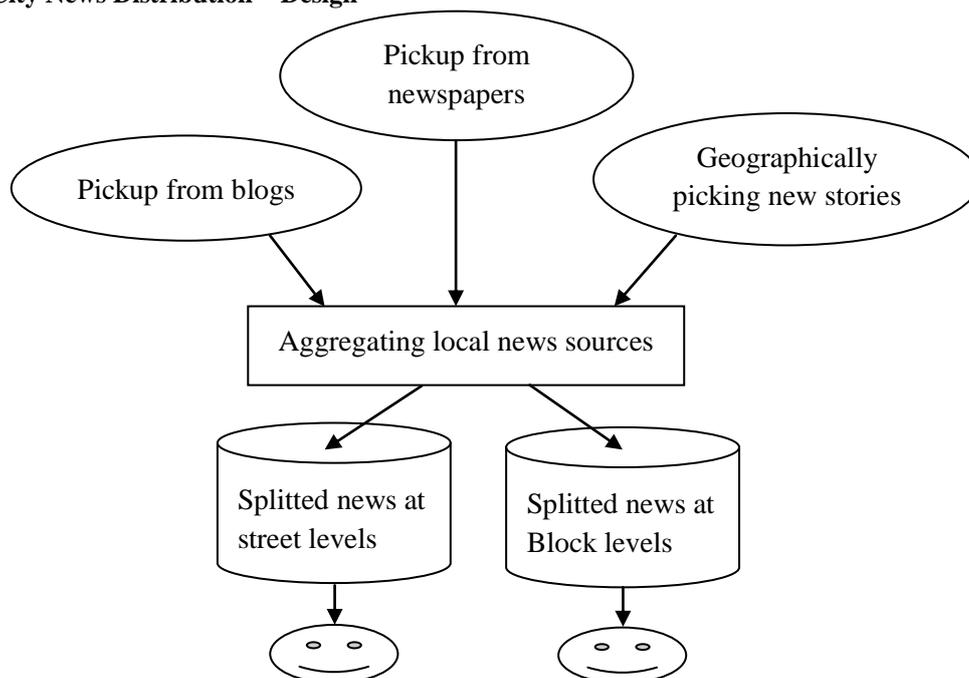


Fig. 1 Designing & distribution of small city local newspaper for Mobile user

We have been able to develop such an application in android. We have discovered that 1100 users used this site for an average of 30 to 45 minutes per day in first one week. Advantage is we did not need any marketing. The next job is to launch similar somewhat modified application in some bigger cities and in a few months do it for a very large city and eventually repeat it at country level. Another Advantage is that you don't have to be journalism professional to be associated with this system.

The startup is not purely technology driven. It is currently employing one human to keep an eye over the news stories and deciding on whether stories should be included. The categorization of news as per the location is derived using some machine learning algorithm. There's an attempt to extract location data. In this case one editor is able to handle that entire set of articles rather than same work is done by several editors for editing news articles of a large newspaper company.

III. LOCAL NEWS AT A GLANCE

Moreover, while locally motivated bloggers may be keen to cover certain types of local news, say like a new ice cream shop opening in some block, other less easy to report one community goings-on may well fall through the cracks of a citizen journalism, crowd sourced news model. We looked at the technology that came in this field over the past few years. Location-based services (LBS) have been using GIS. A location-based service can be defined as an information service provided by a device that knows where it is, and modifies the information it provides accordingly. GPS integrated with a database in a mobile device such as a cell phone can provide a powerful form of enhanced reality. A more dynamic approach results when the mobile device is linked wirelessly to the internet, allowing more-or-less continuous updating. Information on minute-by-minute changes in traffic congestion, the positions of trains and buses, and the real-time locations of flights can be continuously fed from servers, providing truly dynamic LBS.

For example, due to use of GPS, it is now possible to obtain real-time position of any train is determined and hence informs the user the time it will take more to reach an already declared railway station. Several Web services offer real-time data on traffic densities on major roads and several airlines allow users to query the locations of flights, returning the results in map form. An emergency responder may find it difficult to determine his or her current location, particularly if street signs and house numbers have been found to be not visible, or if the street pattern itself has become distorted, or if visibility is obscured by smoke or dust. In such situations it is useful to have a mobile device equipped with GPS and a map database. Several cell phone operators now provide variations on the theme of mapping friends. For example, the Find Friends service offered in some markets by AT&T. Tracking devices monitor the location of the device on a fixed interval of time. Often the major constraint on the frequency of sampling and the length of time over which data can be collected is the capacity of batteries, and this is particularly problematic when devices have to be carried by small mammals or birds. But when battery power is not a constraint, for example when tracking devices are carried on vehicles, it is common for sampling intervals to be as short as 1 second. With such rates it is possible to detect stops, starts, and changes of speed, and thus to infer many potentially useful properties.

IV. LOCATION DETERMINING TECHNOLOGIES

GPS requires the line-of-sight presence of at least three satellites for horizontal positioning, and at least four for additional vertical positioning. Unfortunately this means that GPS signal is frequently lost by mobile devices, due to tree

cover, steep slopes, and buildings – and is never available within buildings. For pedestrians and for vehicles parked in structures the percentages are substantially lower.

Many options for filling these coverage gaps in positioning technology have been explored, especially within buildings, with varying degrees of success. Beacons can be installed at fixed positions, radiating signals in various parts of the spectrum that can be used by mobile devices to determine position (Wi-Fi signals offer one of the more successful options). At this time, however, no one system appears to be ideal, and to offer smooth interoperability and transition with GPS positioning outdoors. Meanwhile research projects continue to develop prototypes of integrated indoor/outdoor positioning. Meanwhile research projects continue to develop prototypes of integrated indoor/outdoor positioning. RFID tags are now being used by major retailers to keep track of the production, shipment, storage, and sale of goods.

V. SOCIAL ISSUES

It will be apparent already that many forms of LBS raise serious and significant issues of an ethical nature, whether or not such access has been explicitly authorized. From the service provider, the 'app' is meant to help the public. Many of the applications allow third parties to gain access to information about the location of the user,

- (A) to a public safety answering point, emergency medical service provider or emergency dispatch provider, public safety, fire service, or law enforcement official, or hospital emergency or trauma care facility, in order to respond to the user's call for emergency services;
- (B) to inform the user's legal guardian or members of the user's immediate family of the user's location in an emergency situation that involves the risk of death or serious physical harm; or
- (C) to providers of information or database management services solely for purposes of assisting in the delivery of emergency services in response to an emergency."

A quite different set of social issues arises from the ability of LBS to modify other aspects of human behavior. For example, in the past it has been important for retailers, particularly of fast foods, to locate in the most visible urban sites, notably on retail strips and on street corners. But in a world of augmented reality, when the senses are aided by an array of information sources including LBS, it is no longer necessary to be able to *see* a vendor. In principle, the effects of widespread adoption of LBS on the urban retail landscape could be as profound as those of the Interstate Highway network beginning in the 1950s. At a more immediate level, LBS has the ability to assist drivers in scheduling.

VI. PRODUCTS IN THE INDOOR WIRELESS NETWORK

There are now products from the major players in the Indoor Wireless Network space Wi-Fi which enhance the functionality of the Wi-Fi access point to allow "location". Today, accuracy of RSSI-based indoor Wi-Fi location is between 6 and 12 meters depending on the building layout, and specific vendor implementations. Many of the Wi-Fi location software vendors also manufacture their own proprietary "beacon" tag which is basically a small battery operated Wi-Fi transmitter that you can attach to something that you wish to track. This tag transmits every so often and a graphical display shows you where the asset is currently located. Most Wi-Fi beacon tags are RFID class active tags. Some just transmit layer 2 packets at pre-programmed intervals, others are actual Wi-Fi clients with an IP address and can respond to events & support external sensors (temperature, push button etc).

VII. RESEARCH MODEL

Operational Definition and Survey Items of the Research Constructs:

The research constructs used in this study were measured using survey item scales with confirmed reliability and validity from previous studies. These measures were modified to fit the LBS context. In a recent study on the actual use of mobile web browsing services, correlation analyses among variables related to usage behavior were conducted, proving that usage frequency represents usage behavior very well. Therefore, actual usage behavior is measured as the usage frequency of LBS in this study.

Performance expectancy is defined as the degree to which one believes that the use of a certain technology will be useful for enhancing task performance. *Performance expectancy will positively affect the continuous usage intention of LBS.*

Effort expectancy in the LBS context, relates to an individual's expectation of being able to use LBS to obtain necessary information or services without exerting much effort or encountering much difficulty.

Effort expectancy will positively affect the continuous usage intention of LBS.

Social influence can be defined as the degree to which an individual believes that he or she is expected to use the technology.

VIII. LBS ARCHITECTURES AND PLATFORMS

A notable characteristic is that the system can provide the information in Wireless Application Protocol (WAP) specified standards. This means the system can provide services to a wider range of users. The authors have discussed a component based architecture where different components are responsible for different functions. These components interact to detect the users, to estimate their location, to authenticate them and to provide them location related data.

Case Study: Such a design based on modular architecture gives some useful insight into how complex campus information systems can be managed in an easy way. One can describe how guests or visitors can receive information regarding the surrounding environment. This is important since visitors may visit campus for conferences, seminars and

other purposes. Authors have also proposed that, users should be able to receive relevant information regarding the surrounding environment by using VoiceXML.

VoiceXML or VXML technology allows a user to interact with the Internet through voice-recognition technology. Using VXML, the user interacts with voice browser by listening to audio output that is either pre-recorded or computer-synthesized. They can provide audio input through voice or through a keypad, such as that of mobile phones. This provides an easier way for the users to query the system for information. Moreover this system will incorporate even a wider community of users receiving LBS because the user does not need a smart phone to get these services. A low cost mobile phone would be enough. However VXML on the other hand will require some other associated functions and components like accurate speech recognition and VXML platform. The delay and bandwidth requirements for VXML applications are also major issues to be investigated.

IX. TECHNOLOGY AHEAD

As the technology is heading towards Fourth Generation (4G) Communication Networks, the delivery of LBS in 4G scenario becomes an interesting topic of research. A web based GIS/LBS System has been described in. This is also a modular architecture with provisions for extensions. The location information is provided through web applications. The authors have stressed the need for dynamic map generation for providing interactive location related mapping services. They have implemented these services using Java Server Page (JSP) and MapBeans, a JavaBean component. Finally the significance of dynamic map generation as part of LBS can be demonstrated by using these maps to model the traffic situation in an area.

X. LATEST BEING TRIED BY BIG COMPANIES

(a) Nokia Steps Up Its Mapping-Quest, Buys Earth mine For 3D Street Level Imaging

Altogether, earth mine offers 3D mobile mapping systems, automated data processing pipelines, cloud based hosting services and server software, to desktop software, client side developer tools and direct integration with GIS software.

(b) Russian Search Giant Yandex Acquires Low-Power Mobile Geolocation Startup KitLocate.



Fig. 2 Russian Search Giant with Low-Power Mobile Geolocation Startup KitLocate

Russia's search giant Yandex, focused on mobile location services. It's picking up Israel's KitLocate, a maker of low-power mobile geolocation technology. KitLocate, which was founded back in 2011, offers an SDK for iOS and Android developers to make their apps location aware. Location capabilities provided by the SDK include geo-fencing, motion detection and social location.

KitLocate's flagship feature is reduced battery consumption — squeezed down to less than 1% per hour during use — thanks to its proprietary algorithms which allow location-based apps to request the device's geographic coordinates less frequently without losing too much precision.

XI. CONCLUSIONS

We have provided context-based computing and Semantic Web. We have designed and written Android Application to make "Traditional local news media". Local news was generated and displayed on a user's mobile screen. Mobile's details of location of block and street are also taken in whereas so far only location of a major road is shown by GPS.

We have deeply studied some future products in the Indoor Wireless Network, VXML, by Nokia, it's Mapping-Quest, Earthmine For 3D Street Level Imaging and, automated data processing pipelines, cloud based hosting services and server software, to desktop software, client side developer tools and direct integration with GIS software. Also we give full respect to Russian Search Giant's Yandex who has acquired Low-Power Mobile Geolocation Startup KitLocate.

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