

Blog Based Personal LBS

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Abstract. One of the problems in the current commercial LBS (Location-based Service) is weak functionality for users to use their own generated content on the LBS. This paper proposes a new framework of *Personal LBS* which solves the problem by using blog as both a description language for the extension and a simple CMS (Content Management System). A blog entry is a kind of story. Better a story is, more easily and efficiently readers can understand it. One of the most important LBS applications is a location-based guided tour which can be created as geotagged stories on a blog. The framework allows the geotagged stories to be moved from a blog to a local software application on mobile devices as story packages for publishing, reproducing and exchanging on LBS. We also discuss the capability and importance of personal LBS for location-based communication among ourselves, families, friends, groups and all users beyond time.

Keywords: Blog, Geotag, Location-based service, Story-based LBS package, User generated content, private content, sustainability.

1 Introduction

The advent of smartphone has made it possible for many people to use various location-based services (LBS) easily in their daily lives. The GPS integrated mobile phones allow users to find their positions, search points of interest (POI), generate itineraries of their trips using complex time tables of public transportation, and navigate in the real world [1]. Furthermore, location based social networking services (SNS) such as Foursquare [3] and Facebook Places [4] become popular where users can check in venues with using their current locations acquired by GPS. Then, users can communicate one another on same venues. They also have chances to get some good things like coupons for venues if they often visit there. There has been kinds of location-based personal content recorders and managers using GPS such as Garmin Connect [5]. They can provide users with their personal content about their movement and result of training for outdoor sports. Users appreciate the personal historical content of GPS data for their movements as well as other information such as heart rate, speed and other sensors' captured data for analyzing their exercise and planning future training. This paper focuses on user generated content for personal LBS rather than the sensor generated one. Most of current commercial LBSs provide users with their generated content as a collection of only unstructured geotagged objects such as

POIs like geotagged photos and lines with less meaning for route planning and trajectory. Storylines could be more important to make a collection of geotagged objects more attractive and valuable for future LBS applications, but current commercial LBS does not explicitly support the function of the storyline depending on locations.

Current commercial LBSs are considered to be designed for everyone and the present time now. Users cannot appreciate their owned and created private content on the commercial LBS. For example, users cannot appreciate push services of their photos and blog entries when they are located near the locations of the photos and blog entries unless all content become in public on the Web or LBS. Also, users cannot find Web mappings showing past places, e.g., map of three years ago, because Web mappings of only the present time are available. Even if users have their old generated content on Web mappings, users can use only the latest maps, but cannot obtain old background maps unless they bought the background maps when they created the old content, but most people do not imagine such a bad situation happens and buy snapshots of the Web mappings. It is not reasonable for map providers to enable users to move to any temporal point for browsing old maps on the Web from the financial viewpoint, thus no map provider realizes the time machine service for Web mappings. Even if a user has his/her own maps or bought maps of certain times, there is almost no way to use it on current LBS. Most of users usually never think about time aspects of maps when they use only Web mappings and live only now. It is bad not to give users chances to think and learn real world in terms of time aspects using maps. Many of stories are created by creating relations with real places with historical relations. We have researched on personal LBS based on our developing place-enhanced blog. It provides an environment for creating and managing story-based LBS packages to solve the above problems and provides users with more meaningful experiences in the real world.

2 Basic Concepts

2.1 Place-Enhanced Blog

Many people record and publish their day-to-day occurrences on various online media like blogs, SNS and other content management system (CMS). One of the reasons why people keep recording on blogs is not only informing other users about author's opinions, but also retrieving them as needed [2]. Most of the records, however, might never be accessed in their lives. If a blog system has a function for geotagging blog entries, users could be pleased to meet their old blog entries when they are located near the places of entries.

2.2 Personal LBS

The definition of personal LBS is not decided, but they are designed for personal use and functionality for user generated content for users, groups and public. The followings are main functions of personal LBS.

1. Place-based memory refresher: It is a push service to present some content and information such as old photos and things to buy if they are located near the places of the content and information. For example, an old photo of a father is displayed when I am walking near the place of the photo. It can be interpreted as spatial alarm.
2. LBS enabler of private content: Users can appreciate private content such as maps, art, music, and books as LBS. For example, a user can use an old map as a background map for LBS, and make spatial links of music and books.
3. Location-based guided tour: Users can create content of guided tours synchronized with routes on maps, photos, videos, voices, texts and so on depending on a user's location.

2.3 Story and Package

If a *story* is poor, it may be difficult for users to understand, enjoy and memorize it. Good stories on personal LBS allow users to easily acquire and organize knowledge from the real world. A collection of user generated content on a blog is also a set of stories, but the stories are not often designed well. If users want to present some descriptions of a blog entry to others, they must consider the background of the others and design stories well for them to understand easily and enjoy well with removing useless parts and adding more context of connecting other knowledge such as events and land marks on maps and timelines as well as personal memory such as place and time of birth. We introduce a concept of story package as story with related content information which allows users to understand even if they do not know the background of the authors. The story package includes most of all information of the story, but each description of a user's blog entry may be difficult for new users to understand and often makes them not to be boring and interested in. The concept is also good for exchanging among multiple platforms and becomes independent and sustainable even if its services and platforms change and disappear.

3 Story-Based LBS Package

A story is composed of events. Figure 1 shows conceptual examples of nesting stories with three levels of a hierarchy. The levels can be chosen for use depending on levels of users such as beginners and advanced users. Our developed system adopts this structure for story-based content, called *story-based LBS package* in our developed system. The followings explain about it.

- Smallest unit is a point object. A point can include a text, a photo and an audio.
- A polyline object is a totally ordered list of point objects and vertexes they only have a coordinate.
- A package is structured as ordered lists composed of LBS objects, that is, point and line objects, and other packages.
- The package is also a unit to be read in mobile application software. It can work even if network connection is not available. Also, user's log and generated content can be both included as components of the package.

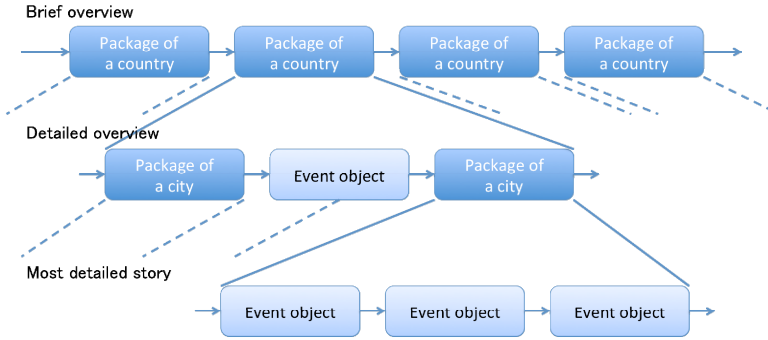


Fig. 1. Conceptual image of nested story-based LBS packages. Examples of stories about travels around the world with three levels of detail.

4 Development of Personal LBS

We are developing a networked IT service **pTalk**, which is a software family to realize our proposed framework of personal LBS. **pTalk** is composed of the following three software components. (1) Blog-based LBS: A blog system with functions of dealing with spatial information. (2) CMS (Content Management System) for LBS: It manages personal LBS objects and packages in our developed blog, and LBS objects imported from other LBS. It also communicates with LBS applications for providing and recording data through Internet. (3) LBS Application: It is a front end software running on a mobile device to realize personal LBS by interaction with users.

pTalk is a whole system composed of family software applications. Figure 2 shows a concept of the architecture of **pTalk** which is designed as an open platform to realize personal LBS based on protocols of Internet.

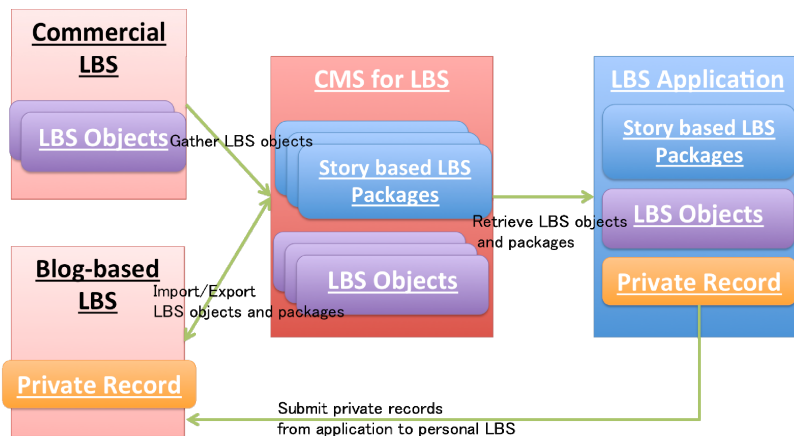


Fig. 2. Architecture of our developed system **pTalk**

Server side applications of **pTalk** include a blog-based LBS and CMS for LBS component. They are coded as Web applications. Users create their private records on a blog then the private records can be abstracted as new LBS objects and links between portions of blog entries and the new LBS objects using geotags. The new LBS objects will be transferred to CMS and managed in it. The CMS allows users to create story-based LBS packages and publish them to other users. A LBS application is a client side component of **pTalk**. It acquires user's position by GPS and retrieves story-based LBS packages by the position from the CMS. The application can plays story-based LBS packages and a user can appreciate the package interactively while moving round the real world.

Both blog-based LBS and CMS for LBS are implemented as an integrated Web application. Server scripts are processed on the Web server and the blog's user interface is constructed Adobe Flash and Google Maps API for Flash.



Fig. 3. An Example of **pTalkWeb** on Web browsers with Adobe Flash. A town guide LBS package in Hibiya. The upper-left and lower-right parts show the timeline view and a dialog of story-based package, respectively. The upper-right part displays a LBS object which is highlighted on the map in the lower-left part of the screen.

pTalkApp is an implementation of LBS application for Apple Inc.'s iPhone. **pTalkApp** connects to CMS application interface on the Web server and downloads a package, then shows details of LBS object and location on a map.



Fig. 4. Examples of pTalkApp on Apple Inc.'s iPhone. A town guide LBS package in Ginza. The screen shot at the left shows the information about the main building of a famous bread company 木村屋(Kimuraya) with the user's current location, the location of the building and its photo. The screen shot at the right shows photos of Japanese style sweet breads on the upper part and playing the audio for explaining the breads at the bottom.

5 Conclusion

The current fashion of LBS is the style of disposable digital content. Freshness of the content is more important than quality and depth. Our proposed framework of personal LBS may enables users to consider value of their own old content and to realize significance of long-term for appreciating change of places and their life. The framework also make user generated and private content become more sustainable, and gives users more chances to refresh their old memory at right places. More users use the content, longer they survive because our memory continues beyond generations. It is also possible for personal historical content to be developed to family and more general history ones.

Reference

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