

TourMe: Tourist Application for Mobile Platforms

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Abstract—Tourism is important point of contact for cross-border area. Each region has own points of interest and focuses on the exchange of tourists. Also tourists become more active and organized individual or small group tours with extended program. It all leads to the problem of providing individual tourist assistant. This paper describes current state of TourMe project, tourist helper application for providing useful information for tourist, especially without organized travel groups. TourMe loads data from several sources and integrates it in one application. This project was initiated in February 2013 at Petrozavodsk State University.

Keywords—tourism, POI, attraction, Android, map, TourMe.

I. INTRODUCTION

Tourism is a part of region economy. Depending of region particular qualities tourism may be the main source of income. Tourism organized a lot of jobs, improves region infrastructure and region popularity. Foreign tourists cause the most interest because they use maximum infrastructure objects and comes as external resource. Advantages, ideas, current state and perspectives of e-Tourism have been described in "e-Tourism: The Role of ICT in Tourism Industry" [1].

From the tourist point of view there are three basic forms for organization: large group, small group and individual trip. Each form has advantages and disadvantages.

Large group is the simplest organization form for tourist. All places (hotels, museums, attractions, etc.) and transport are reserved by travel agency. All required information was prepared and presented. On the other hand, trip program compiled with large lags and contains minimum attractions and free time. The result of trip is highly depends on the neighbors in the group.

The tourist in the small group has more freedom of small actions due to smaller number of approvals in the group. Usually, small group are more mobile, visits more attractions and has more positive impressions. On the other hand, success of the trip depends on the coincidence of interests of participants. The small group can use group discounts, but mobility decreases this advantage and increase total cost. Also, trip support (guides, information, etc.) must be organized by group leaders or each tourist individually.

Individual tourism is the most freedom organization form. Tourist can dynamically organize trip program, depending on current situation, weather or mood. The individual trip usually bit more expensive, but tourist can use individual services such as personal car or renting an apartment. The support during the trip is duty of the tourist. Information is available only in open sources and often is not prepared for this trip.

In the small group and individual tourism savage tourism can be distinguished. In this case, tourist uses minimum infrastructure and in some cases uses illegal services. The savage tourism is a one of the problems for regions.

Usually, the tourist trip can be divided into the following phases. Firstly, tourist explores target region and prepares required information such as a list of interesting attractions or feedbacks from other tourists. Secondly, tourist prepares trip plan and collects all necessary information (maps, guides, etc.). Thirdly, tourist goes to the trip and uses all available information sources for more complete picture of the attractions. At the end tourist organizes gathered information, photos, notes and feelings for common feedback.

The TourMe project is aimed to support tourist during the trip. The service provides complex information about target place, gathered from various sources. The project is focused on the different types of tourist groups. For large groups with organization by travel agency the service proposes everyday capabilities such as nearest ATMs or WCs. For small groups and individual tourists service may replace a printed guide. The other main project goal is to provide recommendations to the tourist about target region.

II. COMMON USE CASE

The following use case is based on typical scenario of tourist trip. It is considered, that tourist know main attractions in target region and takes into the trip modern mobile device.

The process begins at tourist home from plan preparation. Tourist selects target regions and loads all necessary information. In this stage service represents as a data storage. It is important because tourist can enter the offline zone during the trip. Also Internet connection at the trip is slower or expensive. The next stage is a tourist support. Tourist visits interested attraction and service shows detailed information about this place and nearest

area. The information gathered from different sources includes various descriptions, images and other media data and feedbacks. Moreover service proposes other places in nearest area.

In addition tourist may use other service capabilities, such as currency exchange rate, weather, text phrasebook and country info. To use the first two features user has to be connected to the Internet. Phrasebook module will display random phrases in native language and language of visited country. The service combined these frequently used small functions for easy access.

The last stage is the end of the trip. Service lists visited places in form of travel log. In this stage tourist has permanent Internet access to publish into the web photos, videos or feedbacks. In travel log all required information for publication will be in historical sequence. Also tourist may upload travel log to the external service if it is supported.

III. SERVICE ARCHITECTURE

The service core architecture is presented at Fig. 1. The architecture is based on client-server model. Server-side component used as a storage for previously prepared information and as a third-party services parser. The information includes scaled map, selected categories of points, descriptions and recommendations for region. Also server-side component represents as a storage of links to the Internet resources.

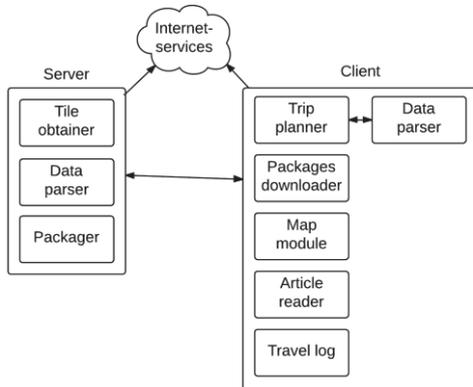


Fig. 1. TourMe service architecture

Most of the information is located on the third-party services. TourMe uses Foursquare, Yandex, Wikipedia to obtain attractions and OpenStreetMap for map data. When tourist plans the trip service tries to store or cache data from third-party services. In the trip if tourist is online he can read and write data directly to the third-party service, but if tourist is offline he can only read stored or cached data.

The client-side component represents a map application. All required information is loaded from server-side

component as set of archives and from third-party services through API (where not possible to store on server, this issues are described in Implementation section). Together with map client-side component contains a module for reading articles from Wikipedia and from service-side component.

Most of the tourist services mean having an Internet connection to provide all of their data. TourMe uses Internet for: downloading trip data (can be done out the trip) and for providing additional data during the trip. TourMe is not aimed to provide real-time tourist services like ridesharing and this is the reason why TourMe is not required in network connection during the trip like other services [2]. If user wants to get more, he need to be connected to Internet but the basis is provided offline.

The Tourist Attraction Information Service (TAIS) [3] is a similar project but there is nothing said about offline usage and the published version of this application have no such possibility [4]. This feature is one of those which the user is most interested in. The main advantage of TAIS is the same as in TourMe: application is not connected to internal database (e.g. TripAdvisor [5] is) and uses a wide variety of data sources. But there is a difference in project architecture: TAIS based on smart space concept and TourMe doesn't. TAIS is not aimed to public usage yet: user have to change data source manually from settings; generally app is not user-friendly. Probably, published version is a proof of concept.

IV. IMPLEMENTATION

Server-side component performs additional tasks for application infrastructure: parses sites for information, creates packs of information (e.g. articles about spot) and build archives with map tiles for offline usage. This part of project is only used in tour-planning mode.

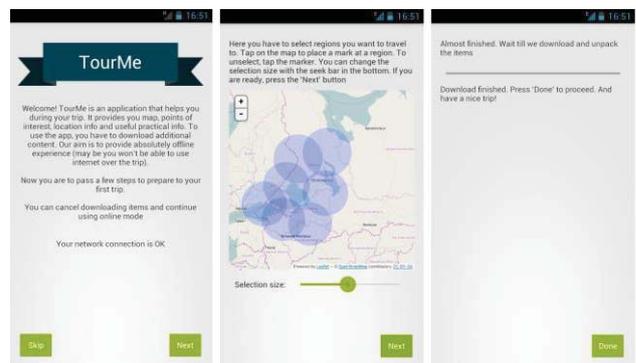


Fig. 2. Trip planning mode UI

The client-side component represents as a native Android application that works in two modes: trip planning (Fig. 2) and travel mode (Fig. 3).

Typical use case has been described above. Trip planning mode activates at first launch of the application or from menu and represents a map with possibility to select an area by placing circles of different radius. User can select only one country or a part of country and this will decrease download data size

Map module is an HTML-file with included JavaScript library Leaflet. This way of map implementation is not the best practice from the performance point of view [5], but is almost one way to make map absolutely offline (available for offline usage). There is a possibility to use official Google Maps Android API but it is available to make it offline not for all regions. Also, the process of building an offline map uses Google Maps Android application and there is no official and legal way to collect map tiles on own server and then distribute it to user. Way of using web-page for map appends additional inconveniences for developer: more intermediate objects to hold; more work to watch for WebView load process. There is no possibility to transfer objects to WebView until it is loaded.

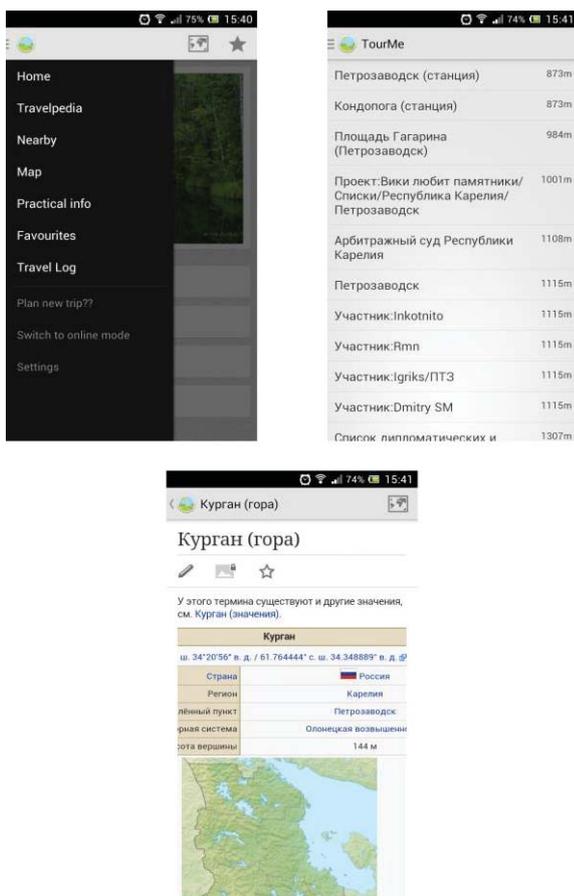


Fig. 3. Application menu, article list, article

Application is written in Java using fragments Android component — a good practice to support multiple types of screens and devices (phones and tablets).

First screen of the app is a Home screen (Fig. 3, first screenshot). It opens with opened drawer (standard Android menu pattern for quick-access). Home provides small image gallery (images represent current selected region), links to application's activities, weather forecast, exchange rate and small portion of practical info.

Second screenshot of Fig. 3 is list of Wikipedia articles for current location. For offline usage, articles for region is predownloaded and stored in device memory. Screen no. 3 will be opened by clicking on item in the list.

There are some problems of getting POIs. Most of all third-party services' APIs restrict data usage. For example, 2gis [7] have no public API and developer have to be an officially registered organization to obtain data from API. Yandex has public API [8] and doesn't allow to collect and store data on own server, but allows to cache received data. Thus, server can't store some data due to legal notices and some of obtaining procedures have been moved to mobile phone application (data parser block, Fig. 1).

Wikilocation [9] service is a free service with public API that provides list of Wikipedia articles for defined location. The problem is in returned list — a lot of service articles which user is not interested in. The built-in filter parameter is not always working properly.

There is a question on the subject of multilingual support. For example, data from Yandex service presented in Russian but the user don't know this language. Therefore, the application should somehow display data for this kind of users. Developers of tourist applications usually use translation or transliteration. Both methods is not the perfect. Automatic translation is not proper nowadays and transliteration is complex for languages with pronounce that differs from written. Also, for both ways there is a problem of 'translating' street names from one language to another. For example, 'пл. Ленина' ('pl. Lenina', Lenin's sq.) shouldn't be translated as 'pl. Lenina' because it gives no helpful information to user. OpenStreetMap provides English names for streets and cities in some locations. TourMe uses this data where possible or transliterate data for multilingual support.

V. CONCLUSION

In this paper we describe the idea of TourMe service. TourMe is not a trip planner in classic way (shops, hotels, flights). TourMe is positioned as a tourist helper during trip with plan-before-trip possibility.

ACKNOWLEDGMENT

The project is co-funded by grant KA322 of Karelia ENPI programme, which is co-funded by the European Union, the Russian Federation and the Republic of Finland.

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