

ALICE-Automated Localized Information Collecting Entity

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Abstract

Automated Localized Information Collecting Entity (ALICE) is an Android application that aids people for their day to day shopping activities. Urban life has turned busy, rush has become a habit, countless goals are to be achieved, multiple chores to be done, every ticking second is precious. In such a scenario it's very common to forget little things that has to be purchased on the daily go. Hence, we need someone to store that information and remind us of the duty we are left with. ALICE has been born just to turn out as saviour for all those busy people who require a tool to aid purchasing activities. This application not only aids in listing out the products to purchase, but also has a built-in localized search engine that helps to search and identify the shops or places nearby based on users requirement. ALICE specializes in maintaining numerous lists containing shopping items, triggered reminders for each list at its assigned time, navigating through a source and destination, wherein all the listed items are plotted on the way itself. It also displays offers for the items on your list, which is provided by nearby shops and vendors.

Keyword- ALICE-Automated localized information collecting entity, FAQ frequently asked Questions, MapQuest, Way points

I. INTRODUCTION

Mankind, since time immemorial have been smart beings. He has been seeking for commodities with at most wit and least effort. The technological advancement has played a good role in achieving man's aim to make life simpler and easier. A lot of modern technological advances are driven by people's ever-growing need to save time and money and organize their everyday routines efficiently. Taking care of day-to-day housework can be unpleasant and stressful for a lot of people; in particular, making a food shopping list and purchasing household supplies is a significant part of what needs to get done to keep a household functioning.

Latest study shows that 80 percent of shoppers use their smart phones while shopping, hence enabling an android application for listing out his groceries supplies makes a brilliant idea. While having the intuition to build such a kind of application, we considered some of the essential characteristics the application must possess, such as Consumer personalization; an app should respond to a user's personal requirements and cater to their needs. The next characteristic is Convenience; an app should be easy to use and intuitive so that a user doesn't end up wasting their time. And the last characteristic is to have Economic advantages; an app should offer ways for a user to save money, such as coupons or loyalty programs.

The proposed system is first of its kind, and it does not have any primitive from which it is developed. Therefore, the proposed system is an exclusive brain child of our team, which has been explicitly developed to cater to our needs. However, the technical aspects required for the proposed system has been studied from various other projects such as Renovate-It: A Geo-based Technical professional hiring system for repairing and maintenance services [1]. This project has features like navigation and current location to achieve geo-based searching and hiring. Similarly, other projects referred are Design of Dynamic Vehicle Routing System Based on Online Map Service [3].

II. LITERATURE SURVEY

Localized search can be done under various platforms, below are some of the related papers which had been considered for this literature survey.

A. *Renovate-It: A Geo-based Technical Professional Hiring System for Repairing and Maintenance Services*

In Pakistan, people are facing problems in finding and hiring local technical professionals to avail repairing and maintenance services for their homes and offices [1]. Because of unavailability of such type of system, new workers are also facing dilemma of finding appropriate work in their vicinity. To overcome this problem, it's immensely important to design and develop a platform in order to bridge the communication gap between the technical workers and endusers. To get the best of smart phones, this work proposes an android application for android smart phones with the name Renovate-It and a website. Renovate-It can be a great start in this context in Pakistan. It is an android app that can communicate with the user and experts possessing different technical skills It contains Google Map and its features like navigation and current location to achieve geo-based searching and hiring. Users

are allowed to see all the selected group of workers on Google Map with the help of markers. The app currently has only four categories of experts i.e. Decorators, Electricians, Mechanics, Plumbers but it is expandable. This App is designed and developed on android platform. Websites back end is developed using PHP, JavaScript and front end is designed with CSS, HTML, and Bootstraps. Firebase is used as an online server. Real-time database, push notification service and web hosting for both android and website. MySQL has been used due to unavailability of group messaging in FCM (Firebase Cloud Messaging). The main objective of this work is to develop a system comprising of a website and an android app which includes the many features, and some of them are to provide options of most needed workers i.e. Plumber, Electrician, Mechanic and Decorator, next is to Inform via push notification with work description to worker and then send acceptance push notification to customer and Distance and time duration with path from customer to worker will be shown on Google Map and the final objective Customer and worker can call or send SMS to each other.

B. Web Application Prototype for Collecting Disaster related Information Focusing on Tweets Immediately after Retweeting News Posts

In a survey it was found that approximately 33 million tweets were posted on occurrence of a disaster in Japan, and about 70s first, the text of the news post n is input to Yahoo! Key Phrase Extraction Service to extract key phrases [2]. Second, the key phrases are input to a morphological analysis. We developed a web application prototype for collecting information related to the news posts. The prototype was developed with PHP version 5 and deployed on a web server on the Internet. The user needs to set all these items. First is the URL of news post n : The user enters the URL of the news post. The number of accounts who posted tweets immediately after retweeting n will be collected: The default value is 100 and is based on the Twitter API limitation. Whether collected tweets, which are the retweets of other news posts, will be displayed: The default setting is Yes. Whether the collected tweets not including any keywords will be filtered: If Yes, only the collected tweets including one or more keywords will be displayed, i.e., the tweets, which do not include any keywords, will not be displayed. The default setting is Yes. The number of tweets that will be searched to find the tweet posted immediately after retweeting the news post n from a latest post at each account who retweeted the news post. Therefore, we can conclude by saying, in this study, we develop the prototype of a web application for collecting information related to the news posts, with the aim of developing a web application, which will enable content providers, local government staff, and general users to collect disaster-related tweets with ease.

C. Design of Dynamic Vehicle Routing System based on Online Map Service

In traditional logistics distribution operation, vehicle routing plan is often made manually [3]. However, when the number of customers and vehicles arise, transportation resources are usually utilized insufficiently. Therefore, an intelligent vehicle routing system will be very helpful to improve the distribution efficiency. Geographic information system (GIS) is a necessary part in a vehicle routing system. Two issues are essential for the development of a GIS system: map data sources and GIS developing platform. For very large countries the map data is too expensive, and also incompatible between different developing platforms. In addition, many GIS developing platforms like ArcGIS engine or MapX, are too specific and complex to use. Online map services can easily solve these problems: they share map data on the internet and provide developing APIs to public users for free. Maps request should be firstly written in flash application, and then the main program communicates with the flash application.

Address geocoding Address geocoding is the process of finding associated geographic coordinates (often expressed as latitude and longitude) of a location by the text of the address. Class Client Geocoder in Google Maps API can perform address geocoding. A Client Geocoder object communicates with Google map servers to obtain geocodes for user-specified addresses.

D. Twitter Photo Geo-Localization using both Textual and Visual Features

Twitter has unique characteristics which are different from other social media in terms of timeliness and on-the-spot-ness, they include much information on various events in the real world [4]. By mining photos from microblogs, we can get to know and understand what happens in the world visually and intuitively. To do that, locations where photo were taken and tweets were posted are useful information. In this paper, we propose a method to add geotags to twitter photos which have no geotags. Our objective is localizing a Twitter photo using both textual features and visual features. For localization from texts, we use GeoNLP which estimates location from location names and location-dependent named entity. For localization from visual features, we use image search for a geo tagged photo database. As visual features, we use local features and deep neural features and compare them. As local features, we use SIFT features and bag-off feature representation, while we use Deep Convolutional Neural Network (DCNN) features. Text-based location estimation To estimate tweet location, we use off-the-shelf text based location estimator, GeoNLP. GeoNLP extracts place names such as Tokyo and New York and location dependent named entity such as Tokyo Disneyland, and estimate locations based on the dictionary of association between location names and longitude/latitude. GeoNLP outputs multiple possible locations on a given text. Twitter photo localization by visual features Here we estimate photo locations with image retrieval for a large-scale geo tagged image database. To build the database, we use several millions of geo tagged photo tweets. As visual features for image retrieval, we use and compare two methods. One is a local-feature-based method, while the other is DCNN feature based image search. For a local-feature-based method, we use SIFT as a local feature, and Vocabulary Tree proposed by Nister et al. as an index for fast search.

III. PROPOSED SYSTEM

The proposed system is a prototype that aids in making shopping a delightful and hassle-free process. This application can be useful for both the categories of people. For the ones who are daily commuters, such as office going users, ALICE can play a productive role by maintaining their list records and reminding them to purchase these items right when the user is dismissed from the office working hours. This application makes sure that all these navigated shops falls within the route that lies between the users office and home. For the users who are travelling to unfamiliar places, it is obvious that the user might not be aware of the ATMs and other shops that fall in that route. Hence ALICE comes to rescue by helping these users to locate shops that contain their listed items. All the shop lies within the destined route, so the user need not to be deviated from his path and save a lot of time. Both the categories of people can view the offers for various items provided by the nearby shops. This application will also include capabilities to add, update and remove shopping lists, register and login, update profiles and get directions via GPS to the user's destination. The entire system can be divided into two simple modules, the admin module and the user module. The admin can login to the admins web page and gain access to privileges like approving users, adding shop offers, adding subcategory, editing FAQ. The admin uses MySQL 5.5.54 for managing the database. The server runs using Java 1.8.0 platform. The user can register, login, view profile, change password, add update and delete lists, he can make use of the alarm to set the reminders for each list and navigate. Other than this he can access his purchase history, view offers and glance through FAQs.

This prototype works in three stages. The first stage aims to collect relevant information from the user. Here the user can create as many lists he wants with numerous items in each list. While creating the list he can set up the reminder date and time. The user must also set the source and destination names to denote the route between which he is supposed to navigate to purchase. By doing so, the user can save time, since he would get all the listed items from shops that falls on the route on which he is supposed to travel. During this stage this application also preforms subcategorization of list items using the localised database to get more prominent results from the navigation search. For instance, a list item contains tomato, which on search might not yield accurate results, so this app subcategorises tomato as a vegetable shop. Thus, while searching for a commodity named tomato, the app passes the data named vegetable shop to the navigation module.

The next stage is to pass on the above information to MapQuest. MapQuest is a U.S based online web mapping service. It offers mapping services such as getting directions, planning a route, traffic and road construction data. Though Google or Waze, or even Bing are extensively used for mapping needs, MapQuest actually still commands 20 percent of the mapping space. MapQuest contains only those locations that the US Post Office officially recognizes. Once the U.S. Post Office recognizes a new location, mapping companies (who supply MapQuest with its data) update their information at their next scheduled update. Then, MapQuest updates its own data with the new road at its own next scheduled update.

Since this project is a prototype, it has made use of MapQuest for attaining geocoder data which is required for navigation purpose. Here we are using MapQuest to attain the root map, which is needed for the navigation purpose. This is achieved by obtaining an API from MapQuest using the get protocol. On receiving an API, we get 15000 free invocations to MapQuest, which makes it an apt choice for utilizing it in a prototype. MapQuest provides response in the form of a JSON file. Now this JSON file is passed using a JSON parser to take only the required information. The root map stores the information in the form of way points which is also called maneuver in MapQuest. While extracting the required information, a condition is generated to select the shops which lie within three kilometers of range from the user's location, provided that this location falls within the root which the user desires to travel. The final stage of his project is to forward request to google maps. Here we would be calling services for sending the parsed data to google maps. Google maps are used for obtaining local services. Here google once more parses the parsed file containing the root map information. Google performs this parsing once again to obtain the shop details with respect to the way points provided by MapQuest. The shop details are provided as geolocation. This geolocation contains the shop name, shop address, latitude location and longitude location. Thus, on clicking it we can start the navigation activities.

IV. ISSUES AND CONCERNS

Google maps allows users to explore the world with rich maps provided by Google. Identify locations with custom markers, augment the map data with image overlays, embed one or more maps as fragments, and much more. The Google Maps Android API allows you to include maps and customized mapping information in the app. Since google maps has made root map services paid since january 2019, we have considered to use MapQuest for this purpose. MapQuest reports that less than 1 percent of its users, contact them for any reason at all, so either very few people are getting wrong directions, or very few people are reporting errors. Still, with the volume of data MapQuest has to manage, it's simply not possible for its maps and directions to be all right all the time. Every now and then, MapQuest says to go north on a one-way street that only runs south or to turn left when you really need to turn right. Some of the most common MapQuest errors include incorrectly positioned addresses (caused by geocoding estimates), unrecognized addresses and incorrect exit numbers for highways. When MapQuest doesn't recognize an address, it's usually the result of a time delay in getting updated information into the MapQuest system. If your house is located on a street that was completed only last year, MapQuest may not know you exist yet. Street-level changes in a city can take years to get into MapQuest's database. First, the new road has to be "dedicated" by the city, which can happen days, months or years after it's finished and in use. Once it's dedicated, the U.S. Post Office officially recognizes it. Once the U.S. Post Office recognizes it,

mapping companies (who supply MapQuest with its data) update their information at their next scheduled update. Then, MapQuest updates its own data with the new road at its own next scheduled update. It's a bit of a roundabout process. Though MapQuest is not as efficient and precise as Google is, it courteously serves the purpose for developing a prototype.

V. CONCLUSION AND FUTURE WORK

Automated Localized Information Collecting Entity (ALICE) is a very efficient software that helps people in their day to day shopping. This is an intelligent shopping list management mobile application, which is capable of a built-in localized search engine that will help you search and identify the shops or places nearby based on your shopping requirements. It caters to mankind by providing various menus for creating shopping lists, setting up reminders and navigating our way to the shops. Additionally, it also provides customized requirement list, which contains the list of items that are needed to be purchased in near future. It includes various user interfaces for making the interaction comfortable. These interfaces include login interface, registration interface, list view etc. This application is high in demand due to busy lifestyle and rush. Therefore, we can conclude that this application makes us possible to save our time by planning our shopping efficiently and also makes sure that we don't miss off anything from the list.

In near future, if this application is put to use commercially, it is suggested to use the paid root map services by google for obtaining more precise geocoder location values than MapQuest. With Google Maps Android API v2, you can embed maps into an activity as a fragment with a simple XML snippet. The new Maps offer exciting features such as 3D maps; indoor, satellite, terrain, and hybrid maps; vector-based tiles for efficient caching and drawing; animated transitions; and much more. Google maps not only benefits the precision but also enhances the efficiency and avoid unnecessary errors.

REFERENCES

- [1] Kamal Dharani, Sania Bhatti, Amirita Dewani, Eman Rajput, Areeba Ayaz, "A Geo-based Technical professional hiring system for repairing and maintenance services", IcoMET Conference paper 2018.
- [2] Keisuke Utsu, Ayami Manaka, Koki Nakafuri, Osamu Uchida, " Web Application Prototype for Collecting Disaster related Information Focusing on Tweets Immediately after Retweeting News Posts", IEEE Transactional paper 2017.
- [3] RuiLi Huizhou, Chun Cheng, Mingyao Qi, Weiwei Lai, " Design of Dynamic Vehicle Routing System Based on Online Map Service", IE 2016.
- [4] Shin Matsuo, Wataru Shimoda, Keiji Yanai, " Twitter Photo Geo- Localization Using Both Textual and Visual Features", IEEE Conference paper 2016.
- [5] Arentze, T., Hofman, F., Kalfs, N., and Timmermans, H. " Data needs, data collection and data quality requirements of activity-based transport models", International Conference on Transport Survey Quality and Innovation (Transport Surveys: Raising the Standard), 24-30 May 1997, Grainau, Germany.