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Survey on Service Based Ratings of Users by Exploring Geographical Location

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***Abstract*:-** Recommendation systems help online users with advantageous access to the items and services they may be intrested on this present reality. Because of the requirements of compelling forecast and productive recommendation, it is advantageous for the location-based services (LBS), to discover the user's next location that the user may visit. So in this paper, diverse kinds of methodologies used to discover, anticipate, and examine location based services are talked about. It is important to convey those expectation and recommendation services for ongoing real time application with direction mapping. While considering location information's, at that point the information measure ended up noticeably colossal and dynamic. Finding ideal answer for anticipate the rating in view of the location and unequivocal conduct is overviewed.

Keywords— *Location Based Services, Big Data, Recommendation System, Ratings, Product and Services.*

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I. Introduction

As of late, with the fast advancement of cell phones and ubiquitous Internet access, social system services, such as Facebook, Twitter, Yelp wind up plainly predominant. As per statistics, smart telephone users have created information volume ten times of a standard cellphone. In 2015, there were 1.9 billion smart telephone users on the planet, and half of them had accessed to social system services. Through cell phone or online location based social networks (LBSNs), we can share our topographical position data or registration. This service has pulled in millions of users. It also allows users to share their experiences, such as reviews, ratings, photos, registration and moods in LBSNs with their friends. Such data brings opportunities and challenges for recommender systems. Especially, the geological location data bridges the hole between this present reality and online social system services. For instance, when we search a restaurant considering accommodation, we will never choose a faraway one. In addition, if the land location data and social networks can be consolidated, it is not hard to find that our portability might be impacted by our social relationships as users may want to visit the places or consume the items their friends visited or consumed some time recently.

Location Based Services

The LBS is a sort of service subsidiary from the capacity in web to recognize and transmit location data's to various applications. Authors in [3] characterized the LBS, LBS are the application which incorporates with the user's location details, and this utilizes the user land locations from their cell phones and refines the results as indicated by that. So from this, the user can get nearest services at a specified time. This also reduces the ideal opportunity for data recovery and over-burden problems. The LBS techniques are designed to satisfy the users require and enhance the consumer satisfaction.

The fig 1 shows the distinctive types of services accessible in the LBS, which includes diverse direction based services which includes different trajectory based services like map, routing, navigation guidance's etc., the LBS also provides the following services like vehicle following through GPS, movement details gathering and so on. LBS also fused with numerous data services like business directory, city direction and many.

Numerous social system applications like Facebook, Twitter, Instagram, Google+ and setting advertising applications are falls under LBS. under the above classification, numerous authors proposed diverse types of applications. In any case, the location based services has tremendous challenges under each application. This survey started to discover the challenges and issues of LBS with the recommendation systems.

ISSN: 2454-4248
453 – 457

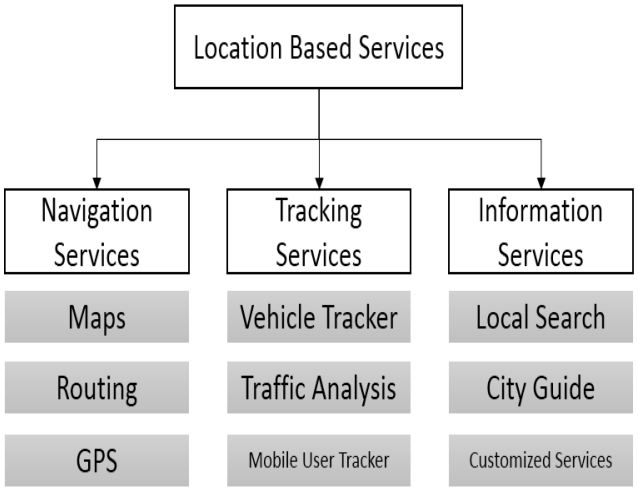

Fig. 1. Types of Location Based Services

Recommendation System

To solve the problems of data over-burden in the service requisition, the recommender systems are used. So it considered as an imperative mechanism in the service situated applications [4]. This section describes the basic data's of recommender system and the list of prior works on the recommender systems in the service related applications. Fig 2. Shows the stream of recommendation system and its necessary information and process in each step. This consist of three steps, information source gathering, technique selection, and recommendation services. The information source for recommender system will be gathered from the user profiles, their location based searches, social conduct and their direction details.

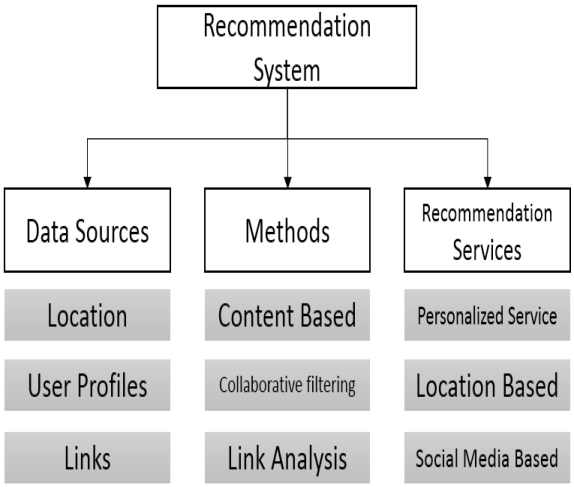

Fig. 2. Recommendation Flow

The approach in RS has sorted into three groups with the consideration of LBS.

Content-based Recommendation:

The content-based recommendation, which extracts the user profile data resembles location details, age, sexual orientation, and companion list and so forth, the location features which includes the tags that associated with the location details. Fig. 3. Shows basic architecture of CBR.

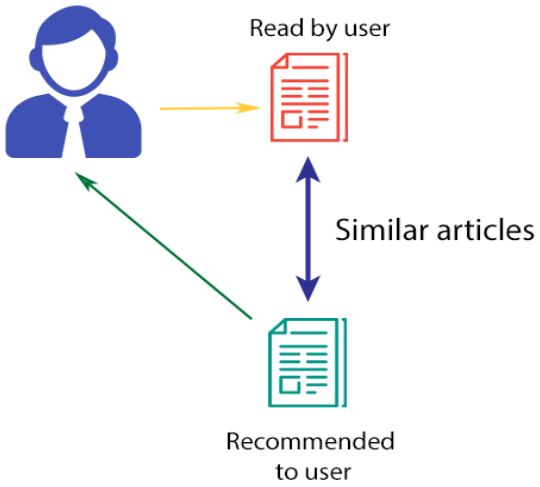

Fig. 3. Architecture of Content Based Recommendation System

Link analysis-based Recommendation

The link analysis-based recommendation utilizes link analysis models. This sort of RS uses the user click route to discover the hypertext induced topic search (HITS) and PageRank, to distinguish experienced users and interesting locations.

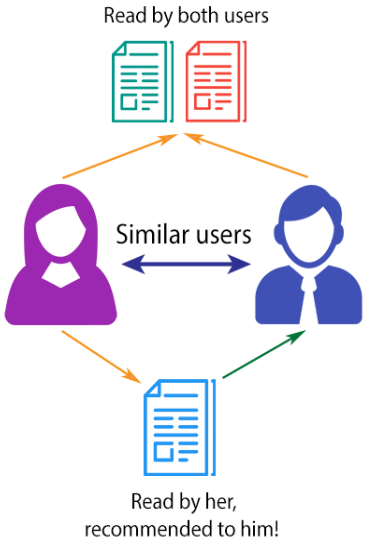

Fig. 4. Architecture of Collaborative Filtering Technique

Collaborative filtering (CF) Recommendation

The Collaborative filtering (CF) recommendation, which gathers a user's preferences from historical conduct and

 ISSN: 2454-4248
453 – 457

route history with the location data. Fig. 4. Shows basic architecture of collaborative filtering technique.

Location Based Dervices Recommendation

Content-based image recovery (CBIR) frameworks utilize the location-based recommendation methods usually use the continuous moving behaviors of users to foresee the following move of a user by considering users present and next location and prescribe the items which are identified with that location. To make precise location expectation, the location based systems always not just record users GPS trajectories like scope, longitude and time, yet in addition mine the continuous moving behaviors from the users GPS trajectories and some authors [6] used Wi-Fi history to discover the locations of users. Some of the existing location-based recommendation methods always suggest services which are all the more habitually visited by the Users using the visiting and social conduct analysis.

It leads to recommenders always suggesting low appraised services for users based just on the incessant services. As the result, recommendation won't not profit stores notwithstanding when the recommenders can precisely foresee user's next land locations. Luckily, alongside visit design mining, high utility service digging has been proposed for discovering the services with high appraising from the service log database. To enhance the relevance of the location based service recommendation system, we can embrace this later on work for discovering high evaluated service based on the recurrence and the general certain rating in every location. Numerous information mining studies have discussed the problems of foreseeing the user's next location where a portable user moves to. Personal based expectation and general-based forecast are the two approaches received for location forecast. The personal-based expectation [7] approach considers development conduct of every person as autonomous and thus uses just the movements of an individual user to anticipate his/her next location.

II. Literature Review

Xiaoliang Fan et al. [5], proposes a novel ubiquitous Web service recommendation approach to context-aware recommendation based on user location update (CASR-ULU). First, it model the influence of user location update based on user preference expansion. Second, it perform the context-aware similarity mining for updated location. Third, itpredict the Quality of Service by Bayesian inference, and thus recommend the ideal Web service for the specific user subsequently.

Md Farhadur Rahman et al. [6], not only illustrate the design and accuracy of our underlying aggregate estimation techniques, but also showcase how these estimated aggregates can be used to enable exciting applications such as hotspot detection, info graphics, etc. Demonstration system is designed to query real-world LBS (systems or modules) such as Google Maps, WeChat and Sina Weibo at real time, in order to provide the audience with a practical understanding of the performance of ANALOC.

Budsabawan Jueajan et al. [7], This project aims to develop a location-aware place recommender system on Android smart phones. Recommender system consists of two major components: 1) place recommendation and 2) Android mobile application component. A user-based collaborative filtering scheme is applied to predict the nearest places for the android user based on his/her GPS position from a mobile device.

Chuan Shi et al. [8], first study thecorrelations in real data sets and propose the expenditure aware rating prediction problem. From the data sets crawled from a well-known social media platform Dianping in China, we find some insightful correlations between expenditures and rating scores: 1) transactions or experiences with higher expenditures usually lead to higher rating scores; 2) when the real expenditures are higher than users' normal spending behavior, the users usually give higher scores; and 3) there are multiple grades of expenditure behaviors.

Jianxun Liu et al. [9], proposes a location-aware personalized CF method for Web service recommendation. The proposed method leverages both locations of users and Web services when selecting similar neighbors for the target user or service. The method also includes an enhanced similarity measurement for users and Web services, by taking into account the personalized influence of them.

Md Farhadur Rahman et al. [10], considers a novel problem of enabling density based clustering over the backend database of an LBS using nothing but limited access to the kNN interface provided by the LBS. Specifically, a key limit enforced by most real-world LBS is a maximum number of kNN queries allowed from a user over a given time period.

 ISSN: 2454-4248
453 – 457

TABLE I. *Comparisons of various techniques and method used in existing system*

S. No.	Author Name	Year	Data Source	Techniques	Merits	Demerits
1	Xiaoliang Fan et al.	2015	WS-Dream dataset	Context-aware Recommendation based on user location update	User location update is used on user preference and performing updated location similarity mining.	Personalized recommendation is not considered
2	Md Farhadur Rahman et al.	2016	Review Ratings	ANALOC	Has complete access to location data	Less point of interest attributes are considered
3	Budsabawan Jueajan et al.	2016	Social Network Dataset	User-based collaborative filtering algorithm	Personalized services are guaranteed and efficient	Low on accuracy
4	Chuan Shi et al.	2016	Social Media Content Crawl	EM (Expectation Maximization) clustering, Expenditure Aware Rating Prediction method	Overcomes the problems of baseline algorithms in the LBS	Not suited well for different types of LBS
5	Jianxun Liu et al.	2016	Web Service Dataset	Personalized location-aware collaborative filtering method	Provides effective web service recommendation based on the available information	Location information's are not detailed considered. QOS prediction time is too high
6	Md Farhadur Rahman et al.	2017	POI's Datasets	HDBSCAN-1D algorithm	Provides visual impact of LBS	Dataset used is static

 ISSN: 2454-4248
453 – 457

III. Conclusion

Because of the marvelous development and usage of mobiles and internets, recommender system influenced by numerous problems like information over-burdening, fitting service recommendation and mapping and so forth., In this paper, we have given an review on the related solution to deal with such problems in the LBS. The work is segregated into three sections like, location based services, recommender system and location based service recommender system.

This survey also provides distinctive techniques and approaches produced for location based services in the current years. Further, this survey serves as a suggestion, presenting the concepts, LBS properties, applications and challenges, and merits of prior work for recommender systems in LBNs.

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