International Journal of Current Trends in Engineering & Research (IJCTER)
e-ISSN 2455–1392 Volume 2 Issue 2, February 2016 pp. 126 - 131
Scientific Journal Impact Factor : 3.468
http://www.ijcter.com

WEB USAGE MINING OF ONLINE CONSUMER BEHAVIOR USING SPATIAL AND TEMPORAL INFORMATION

Janane.E[1], Sivanathan.M, M.E.[2]

[1,2]*Computer Science and Engineering Department,*
EBET Group of Institutions, Nathakadaiyur,
Erode, India

Abstract—The web has become an increasingly popular medium for consumer to exchange or find ideas, opinions, experiences on products and services. Many consumers go further than online information sharing and actually perform purchases on the web. The documentation may contain the relationships between consumer emotions and their buying behaviors. Technology-savvy consumers often use the web to find information on products and services before they commit to buying. The project proposes a semantic web usage mining approach for discovering periodic web access patterns from annotated web usage logs which incorporates information on consumer emotions and behaviors through self-reporting and behavioral tracking. The project uses fuzzy logic to represent real-life temporal concepts (e.g., morning) and requested resource attributes (domain concepts for the requested URLs) of periodic pattern-based web access activities. These fuzzy temporal and resource representations, which contain both behavioral and emotional cues, are incorporated into a Personal Web Usage data that models the user's web access activities. From this, a Personal Web Usage is generated, which enables web applications such as personalized web resources recommendation. Emotional influence has been found to contribute positively to adaptation in personalized recommendation.

Keywords –Web Usage mining, Temporal time, LBS-alignment, CTWSPM

I. INTRODUCTION

Millions of people around the world use web almost every day. The development of Internet is mainly due to the invent of smart phones because it develops the expectations and creates new thought and ideas in people mind. The outcome of perpetual growth of Web and e-commerce has led to an increased demand of new Websites and Web applications. As a result of this increased demand for new websites and the growth in technology, the internet is now flooding up with huge lot of web pages. Web usage mining is to describe and analyze the users behavior pattern over web.

The main objective of Web usage mining of online consumer behavior is to analyze the different users from different places at a particular time may have a similar web usage behavior. This analysis is to support the location based service and also to find the personal web usage based on time series, i.e to find the personal web usage based on time series database, to cluster the users based on the behaviors of users, to construct the Cluster Based Temporal Web Usage Sequential Pattern Mining and build the tree. The nodes in tree represent the group of users with similar browsing behaviors, to mine and predict of mobile movements and associated transactions to propose a prediction strategy to predict the subsequent mobile behaviors to present a time segmentation approach to find segmenting time intervals where similar mobile characteristics exist to propose a novel algorithm, namely, Cluster-based Temporal Mobile Sequential Pattern Mine (CTMSP-Mine),to discover the Cluster-based Temporal Mobile Sequential Patterns (CTMSPs).

By analyzing the behavior of consumers at a particular time interval it may help the organization to find the interest of the people over a particular place. It also used to find the frequent

pattern of items that has been purchased by the consumers at a temporal time. The sequential purchase or login may be followed and the frequent item that a particular user has been searched over web will be predicted. Clustering concepts are used to group the people based on the locations.

II. RELATED WORK

A number of approaches and algorithms have been proposed to mine the web usage pattern like fuzzy probabilistic alogrithm, sequential pattern etc.

A technique for determining the temporal access pattern in mobile access pattern by Seung-Cheol Lee was presented in 2007. But it doesn't rely on any location based mining it just explains and focus on the temporal time. In a different line of work, a number of algorithms have been proposed to enhance the methods to find the interest of the consumers over the web. Full-path algorithms are used to find the traversal pattern mining which is to mine the path of transaction through web

III. PROPOSED WORK

In this paper, we propose a novel algorithm, namely, Cluster-based Temporal Web Usage Sequential Pattern Mine (CTWUSP-Mine), to discover the Cluster-based Temporal Web Usage Sequential Patterns (CTWUSPs). Since, a prediction strategy is proposed to predict the subsequent behaviors, in CTMSP-Mine, user clusters are constructed by a novel algorithm named Cluster Affinity Search Technique (CAST) and similarities between users are evaluated by the proposed measure, Location-Based Service Alignment (LBS-Alignment). At the same time, a time segmentation approach is presented to find segmenting time intervals where similar usage characteristics exist. The project considers mining and prediction of web usage behaviors with considerations of user relations and temporal property simultaneously.

Proposed System Advantages

The advantages of proposed system are as follows:

- Predicts the subsequent user web usage behaviors effectively.
- Generate the most suitable time intervals for time segmentation.
- Mines and predicts the web usage behaviors with considerations of user relations and temporal property simultaneously.
- Suitable for Location-Based Service Environments

IV. METHODOLOGY

The information is used to gauge the emotional influence of the accessed resources on the user. To capture consumers access patterns, one promising approach is web usage mining, which discovers interesting and frequent user access patterns from web usage logs. Many web usage mining techniques have been developed for mining statistical information and user access patterns in terms of association and sequence of requested resources.

With on-going development of the Semantic Web, some recent research has focused on mining web usage data for the Semantic Web. Known as semantic web usage mining, the idea is to associate each requested webpage with one or more ontological entities to better understand the pattern of web navigation. The discovered knowledge can potentially be used for semantic web applications, such as personalized web content recommendation.

The modules split up is as follows:

1. Time Series Database based analysis
2. Clustering of web usage transaction sequences.
3. Time segmentation of web usage transaction sequences.
4. Discovery of CTWUSPs.

4.1. Time Series Database Based Analysis

In this module, the web users' log details are keyed which contains user id, date and time of URL visit, URL and number of hits details. From the data, personal web usage lattice is constructed which infers the association access patterns of the user.

4.2. Clustering Of Web Usage Transaction Sequences

In a web usage transaction database, users in the different user groups may have different web usage transaction behaviors. The first task to tackle is to cluster web usage transaction sequences. In this module, a parameter-less clustering algorithm called CAST is proposed.

Before performing the CAST, a similarity matrix S is to be generated, based on the web usage transaction database. The entry Sij in matrix S represents the similarity of the web usage transaction sequences i and j in the database, with the degrees in the range of [0, 1]. A web usage transaction sequence can be viewed as a sequence string, where each element in the string indicates a web usage transaction. The major challenge to tackle is to measure the content similarity between web usage transactions. The LBS-Alignment algorithm is proposed, which can obtain the similarity. LBS-Alignment is based on the consideration that two web usage transaction sequences are more similar, when the orders and timestamps of their web usage transactions are more similar. CAST algorithm is used to cluster the users.

4.3 Segmentaion Of Web Usage Transactions

In a web usage transaction database, similar web usage behaviors exist under some certain time segments. Hence, it is important to make suitable settings for time segmentation so as to discriminate the characteristics of web usage behaviors under different time segments.

A new time segmentation method is proposed to automatically obtain the most suitable time segmentation table with common web usage behaviors. The algorithm below shows the procedure of the proposed time segmentation method, named Get Number of Time Segmenting Points (GetNTSP) algorithm.

4.4 Discovery Of CTMSPS

In order to mine the cluster-based temporal web usage sequential patterns efficiently, we proposed a novel method named CTMSP-Mine to achieve this mining procedure. In CTMSP-Mine, both factors of user cluster and time interval are taken into account such that the complete web usage sequential patterns can be discovered. The entire procedures of CTMSP-Mine algorithm can be divided into three main steps:

1) Frequent-Transaction Mining,
2) Web usage Transaction Database Transformation
3) CTWUSP Mining.

4.4.1. Frequent-Transaction Mining

In this phase, the frequent transactions (F-Transactions) are mined in each user cluster and time interval by applying a modified Apriori algorithm.

4.4.2. Web usage Transaction Database Transformation

In this phase, F-Transactions are used to transform each web usage transaction sequence S into a frequent web usage transaction sequence S'. According to Table 3, if a transaction T in S is frequent, T would be transformed into the corresponding F-Transaction.Otherwise, the cell of T would be transformed into a part of path.

4.4.3. CTWUSP Mining

In this phase, all the CTMSPs are mined from the frequent web usage transaction database. Frequent 1-CTMSPs are obtained in the frequent-transaction mining phase. In the mining algorithm, we utilize a two-level tree named Cluster-based Temporal Web usage Sequential Pattern Tree (CTMSP-Tree). The internal nodes in the tree store the frequent web usage transactions, and the leaf nodes store the corresponding paths. Moreover, every parent node of a leaf node is designed as a hash table which stores the combinations of user cluster tables and time interval tables.

V. DEVELOPING METHODOLOGIES

5.1. Feasibility Study

The feasibility study deals with all the analysis that takes up in developing the project. Each structure has to be thought of in the developing of the project, as it has to serve the end user in a user-friendly manner. One must know the type of information to be gathered and the system analysis consist of collecting, Organizing and evaluating facts about a system and its environment.

The main objective of the system analysis is to study the existing operation and to learn and accomplish the processing activities. The authenticated group key generation process through windows application is needed to be analyzed well. The details are processed through coding themselves. It will be controlled by the programs alone.

Economic Feasibility

The organization has to buy a personal computer with a keyboard and a mouse, this is a direct cost. There are many direct benefits of covering the manual system to computerized system. The user can be given responses on asking questions, justification of any capital outlay is that it will reduce expenditure or improve the quality of service or goods, which in turn may be expected to provide the increased profits.

Operational Feasibility

The Proposed system accessing process to solves problems what occurred in existing system. The current day-to-day operations of the organization can be fit into this system. Mainly operational feasibility should include on analysis of how the proposed system will affects the organizational structures and procedures.

Technical Feasibility

The cost and benefit analysis may be concluded that computerized system is favorable in today's fast moving world. The assessment of technical feasibility must be based on an outline design of the system requirements in terms of input, output, files, programs and procedure. The project aims to promote group key for secure communication between group members. The current system aims to overcome the problems of the existing system. The current system is to reduce the technical skill requirements so that more number of users can access the application.

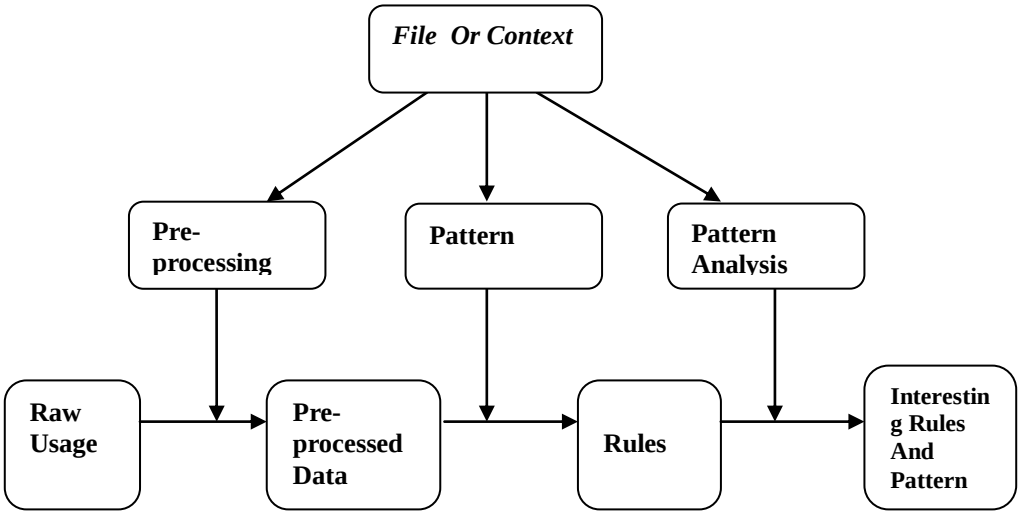

Fig: 1 Web Usage Mining

VI. CONCLUSION

Personal Web Usage Ontology of periodic access patterns from web usage logs that have been semantically enriched with information on emotional influence and resource topics. Over time, the knowledge base can capture both consumer web access behavior and emotional influence of the web resources on the user. Experimental results, both from objective and subjective tests, have demonstrated the effectiveness of our approach in providing the user with periodic web personalization based on periodic access patterns generated. Further, by varying the degrees of emotional influence, we found that emotional influence contributed positively to the results. With PWUO, consumers' periodic access behaviors can be used by software agents to provide Semantic Web services such as web personalization and semantic search.

VII. FUTURE ENHANCEMENT

Then, novel prediction strategies are proposed to effectively predict the user's subsequent behaviors using the discovered CTMSPs. To mine CTMSPs, it first propose a transaction clustering algorithm named Cluster-Object-based Smart Cluster Affinity Search Technique (CO-Smart-CAST) that builds a cluster model for mobile transactions based on the proposed Location-Based Service Alignment (LBS-Alignment) similarity measure. Then, it takes advantage to produce a more suitable time interval table. The new system become useful if the below enhancements are made in future.

- In future work, the method can be applied to real data sets. In addition, the CTMSP-Mine can be applied to other applications, such as GPS navigations, with the aim to enhance precision for predicting user behaviors.
- The application if developed as web site can be used from anywhere.
- The application can be developed, so that it can be used in any platform.

- SMS can be send based on the similarity

The new system is designed such that those enhancements can be integrated with current modules easily with less integration work.

REFERENCES

[1] Ben-Dor.A and Yakhini.Z, "Clustering Gene Expression Patterns," J. Computational Biology, vol. 6, no. 3, pp. 281-297, July 1999.
[2] D.Usha, Dr.K.Rameshkumar," A Complete Survey on application of Frequent Pattern Mining and Association Rule Mining on Crime Pattern Mining". InProc. l., International Journal of Advances in Computer Science and Technology, 3(4), April 2014, 264 – 27
[3] Ester M., Kriegel H.-P., and Xu X. 1995. A Database Interface for Clustering in Large Spatial Databases, Proc. 1st Int. Conf. on Knowledge Discovery and Data Mining, Montreal, Canada, 1995, AAAI Press, 1995.
[4] García J.A., Fdez-Valdivia J., Cortijo F. J., and Molina R. 1994. A Dynamic Approach for Clustering Data. Signal Processing, Vol. 44, No. 2, 1994, pp. 181-196.
[5] Gueting R.H. 1994. An Introduction to Spatial Database Systems. The VLDB Journal 3(4): 357-399.
[6] K.P.Chan and A.W-C Fu. Efficient time series matching by wavelets. In Proc. 15th Int. Conf. on Data Engineering, pages 126–133, 1999.
[7] Kaufman L., and Rousseeuw P.J. 1990. Finding Groups in Data: an Introduction to Cluster Analysis. John Wiley & Sons.
[8] L. Chen, M. Tamer O ¨ zsu, and V. Oria, "Robust and Fast Similarity Search for Moving Object Trajectories," Proc. ACM SIGMOD Conf. Management of Data, pp. 491-502, June 2005
[9] M. Ester, H.-P. Kriegel, J. Sander, and X. Xu, "A Density-Based Algorithm for Discovering Clusters in Large Spatial Databases with Noise," Proc. Second Int'l Conf. Knowledge Discovery and Data Mining, pp. 226-231, Aug. 1996.

