A Survey on: User Impulsive Prediction and Mobile Mobility in M-Commerce

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***Abstract*—what do you mean by pattern mining, behaviour prediction and M-commerce? Pattern mining is extracting useful knowledge or digging useful patterns from a large data. Behaviour prediction is related to the user behaviour for example angry and happy. The third is a area where all these technologies are being put together to generate a useful patterns from set of user spending patterns in shops, malls which is termed as m-commerce. But if we consider a general case for angry/happy which effects behaviour prediction in m-commerce like area here it becomes a necessity. So predicting this behaviour is a challenging issue. If we consider particularly user involved in an m-commerce business transaction and classify them on behaviour would be {personal needs, interest, likes and dislikes, family needs} and if this whole is being put practically to an mobile device and being operated automatically detecting the next coming prediction of the user. This is the first novel work to be done as only mining and predicting the behaviour is being performed until now. Instead implementing on to a mobile phone/mobile terminal will be more boon to the m-commerce business economy.**

***Keywords*—M-Commerce, Mobile mobility, Analysis of user mobile behavior Algorithm (AUMBA), Data Mining and Behavior prediction, Map (Geographic reading).**

I. INTRODUCTION

Today there is an increasing trend in variety of mobile phones from simple mobile to smart phones. So why not use these devices in m-commerce field which is increasing day by day and which is specially used in the business transactions in which economy growth is much higher. More if we provide the mobile device with the latest known geographic locations with its distance and path to reach irrespective of the user location where the user will be detected and the transactions will be held on actual mobile phones related to business in the stores, markets, malls where the user searches for items in different wings of the same area i.e. how the user will be more feasible to the handheld device which will give the user a sight to look instant and have again a fast response to it. The previous work speaks about things like similarities between the items and the stores [1] but instead if we consider the location wise stores and provide the user with images of the items/products among the locations and its stores then we can predict the next coming behaviour of user. For example if consider two stores A and B and these two stores are situated in a same geographic region or more precisely (location map) a user queries for the best store from his current state for doing the transaction business from user own mobile device and path to reach then this would make an easier job to locate area wise stores. This is very first concept to be put into the field of m-commerce. So doing this avoids many overheads. The main focus is kept on the user behaviour and the related predicted products. There are applications which have similar concepts but giving user locations=stores and providing system with symbols and images is a novel work in m-commerce. The other area is of medicine where for any medical problems the user has to see a doctor for many times which is a tedious job for the patient since if the user has visited once and the doctor gives prescription of the tablets which may be available with him with same contents is there any use to go to a doctor? If at all this whole data is matched and executed by a cell phone the person's data, hospitality and so on the tablets if predicted would be great job. This whole concept is again a part of M-commerce which could be applied in different areas as a small piece of it. Now coming to a small piece of M-commerce the transactions done in shops, purchases, bills generated if at all we have advance phones where the whole app run it would be beneficial but think of persons using simple phones so this concept should work on simple to smart phones which will be an advantage to the user and the shopkeeper as well. The shopkeeper would place only such items which are sold frequently and may provide some additional offerings/discounts on it. This will increase the rate of purchase and will be pocket saver to the customers as well. This whole system should work on our phones where the user dosen't needs to work on our PC but instead work on his own personal phone where user can carry it. The user will be able to see images of various items/products on user cell phone. The paper is divided into five major concepts first is the introduction which speaks about the past and the latest happening in the world of M-commerce where we have to really focus not only on the transactions being held but to consider the ease of user and economy growth. The better understandability of the user (the one person buys the products) in any shop, malls, stores. Secondly is literature survey which speaks about all past happening in field of M-commerce. Third is proposed concept what paper is related to more of user behavior and the

expected patterns (output generated). Fourth is the implementation detail basically the working platform and the surrounding conditions. Fifth is conclusion and future scope. Fig. 1 shows block diagram where the user will be a registered with its user ID and related details then this whole data will be fetch through database(if user visits again) and to maintain the record in the dataset of the operated person. After entering all details the processing will be performed through images of locations and the store (to ease the user) based on user decision and the further action will be taken (predict) which will be depend on behavior algorithm the next behavior will be detected.

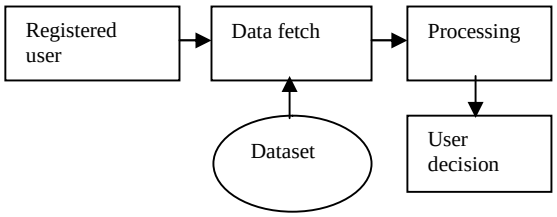

Fig 1. Block diagram of processing in the system

This whole application will be operated on user cell device. The final output will be generated (in the form of images). This system will work online to have images and the locations. As the user selects the location where user wants to visit for appropriate store images will be provided for purchasing items from the store. This system will operate on an android based phone.

II. LITERATURE SURVEY

A *Mobile commerce Explorer in M-commerce*

This section states the previous work done in an m-commerce area. The first paper [1] explains about MCE framework (MCE) which mines and predicts mobile users in m-commerce environment. This MCE is divided into three parts 1) Similarity Inference Model (SIM) 2) personal Mobile Commerce Pattern Mine Algorithm (PMCP) 3) m-commerce Behaviour Predictor (MBP). The similarity inference model just measures the similarities between the stores and the items then the second is PMCP algorithm to discover the user in mobile environment and the third is prediction of user behaviours. This will be divided into three mainly methods and elaborated.

A.1 *Similarity Inference Model*

This method calculates the similarity among the stores and the items. As the user moves through the different stores with the user identification the item purchased by a particular user are stored into the mobile transaction database. Here only similarity of stores and items is being calculated. For example there are four stores and user purchases from three of them the sequence will be (A, i1), (B, Φ), (C, i3), (D, i2) this states that the user has purchased item i1 from store A, no item has being purchased from store B, i3 item has being purchased from store C and item i2 from store D corresponding to a path. For e.g. (A, i2) --- (B, Φ) ---(C, i3) --- (D, i2) where each line indicates a path with some suffixes values. Two basic heuristic have being applied 1) two stores can be similar if they sell similar items and 2) two items are dissimilar if the stores that sell them are dissimilar. From this we can measure that for 1) a given store which items are available for sale 2) for a given item we know which store sell this item. From this similarity of stores and item is inferred. Two database have being developed from mobile transaction database namely SID and ISD where any value in SID(pq) represents user purchased item q from store p where as value in ISD(xy) represents user has purchased item x from store y. Here set theory cannot be applied and two stores are similar if their items are similar and average of them is taken. This is done for only four users and fourteen transactions have been measured. If the number of stores and items increases the computation cost also increases and may the whole process will stop. Here no user behaviour is considered.

A.2 Personal *Mobile Commerce Pattern Mine Algorithm*

This section states personal mobile commerce pattern mine algorithm (PMCP) which basically finds mobile users which is like an apriori-like algorithm this whole concept depends upon user identification. This algorithm is divided into three stages. 1) Frequent transaction mining explains that the frequent transactions done by the user that is called as candidate 2-transaction this phase is done by combining two frequent 1-transactions whose stores and user identification are same that is same number of items are common from the stores. The second stage is 2) Mobile Transaction Database Transformation this explains about deleting the infrequent records from the database to increase the working efficiency of the dataset. If at all items are not being purchased from stores then they are taken as path for e.g. (B,Φ), (D,Φ) these are considered as path and the main purpose of transformation is all the item set are represented as symbols instead of taking as large data and those non matching pairs are discarded. 3) next is PMCP Mining in this phase the frequent transactions obtained from previous step is converted into a two level tree called Personal Mobile commerce Pattern tree to gain a tree structure. The top level keeps track of frequent transactions made by the user and lower level maintains the user and path where all patterns occurs.

A.3 *Mobile Commerce Behaviour Predictor*

This section describes the future of mobile behavior which includes movement and transactions. The MCBP eliminates the problem of exact matching through SIM. This section not clearly states the working of a cell device in the shopping areas malls the functioning of its databases how the data is processed.

Simulation Model

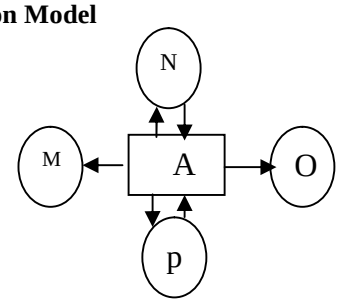

Fig 2. Simulation model with backward stores

Fig. 2 describes model of mesh network has being used for the stores and the observative value is day. Here it states that there are four neighbor stores N, M, O, and P for a single store. The probability is to move from a store to other if its neighbor store and make the transactions i.e. to purchases the items being sold their. The rectangular block shown is the main store and is connected by other corresponding neighbor stores namely N,M,O,P the user purchase some product and moves back to the original store with the back arrow to the main store. This also explains the work is done in java platform here as the similarity of stores and items have a major focus area is on simulation model that has being developed with combination of MCE framework.

B. Behaviour patterns in mobile web systems

The discovery of efficient mining and prediction of user behavior patterns in mobile web systems [2] discuss about the development in wired and wireless technology. The mobile area not specific to any application is concerned where a user if subscribes to services anywhere and anytime. It also states user needs effective information at anytime and anyplace so it is necessary to predict the behavior of the users in mobile web systems to increase the performance of the industry and automatically improve the quality of service. A data mining model has been developed called SMAP to discover the sequential patterns associated with the given request some more prediction strategies are also given to enhance accuracy and execution. In mobile web systems user surf and do not have much time for response. In this case work is done on caching and prefetching to improve the overall performance of web based systems where a service is forwarded through cellular phone like PDA, notebook with help of GSM and GPRS architectures which are being in build into the phones or cellular devices. It also states that not only the locations are to be considered but the movement is also the prime thing to take into account to discover properly the user behavior patterns. The current location can be handled by global positioning system (GPS) from where the services are to be made. The user behavior patterns in this case are a series of request from a location stream is a user behavior this behavior predicts the next service offered to the user. In this case user behavior has two things which is most important first is movement (traversal path) and the other is requested services. There is other suggested prediction mechanism but a general view is considered of web systems. The SMAP which constitutes of movement and sequence request service to discover useful data from large data where SMAP stands for sequential mobile access patterns algorithm which evaluates both. The other prediction mechanism is Markov model which predicts user behavior into three main categories and the rules are by next location, next requested service and the last is next location and its associated service with the support of N-gram model. For example, if a user visits some set of places {Delhi, Bombay, Pune} and queries for nearest restaurants then the appropriate information should fired given. Here the personal behavior is not taken into consideration.

System architecture

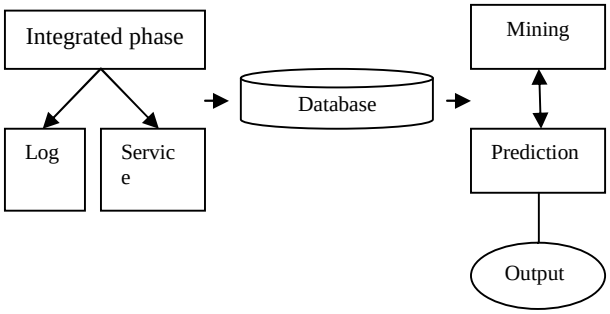

Fig 3. Architecture working of SMAP

Fig. 3 shows the system architecture which consists of three parts integration, mining, prediction phases. There are different logs provided for movement and the other is requested service which contains separate databases and these two are combined into a single for easier evaluation purpose. It also gives two databases HLR and VLR for permanent information and the temporary information with other attributes like user ID, service time, service ID, duration and area. Next is the mining phase where SMAP is applied to the mining step. The input to a SMAP–Mine algorithm is combination of movement and service related patterns. This SMAP is divided into two parts the first is generation of SMAP-tree and the other is mining sequential access patterns. The SMAP- tree is constructed due allow efficient access starting from top to bottom and result is also obtained fast one time scan is done. The second part is SMAP- Mine algorithm is based on depth–first–search this constructs SMAP –tree and traverses until reaches the termination value. This paper profound the overall work in web technologies not bounded to any specific area as such. Previous work is done on mining the useful information by using apriori algorithm [2, 3] which mines F-transactions and also generates a candidate generation. But this becomes costly approach for many large patterns [3] so a new FP-tree structure was developed to store compressed data of frequent patterns. Divide and conquer method [3] is used which was more efficient than apriori

algorithm. FP-growth [3] has been given for large databases industrial applications.

In [4] proposed a SimRank to iteratively compute the similarities between objects. The idea behind SimRank is two things are similar if they are related to similar objects. Then to reduce computation cost SimTree [5] was developed keeping relationship between the objects. In [6] developed transaction management for m-commerce for distributed transactional properties. The idea is store transactional state information and retrieves it after link, crash or application. In [7] express a new mining capability for m-commerce device association rules and path traversal and gives relation among moving and purchase behaviors. In [8] gives algorithm for frequent pattern mining based on apriori which uses record filter and intersection based apriori algorithm.

III. PROPOSED CONCEPT

Owing to the above survey there is a need to develop an actual algorithm for personal behavior of the user in various shop, mall, and arcade. The distance to and from the current location of the user in the region also should be considered. The geographical area where the m-commerce transactions are being held based on the users current location to the nearest shops should be defined. For e.g. in state like Maharashtra stores everything in the stores is available for selling and purchasing the products but for state like Tamil Nadu where most of the grains are rice so we should see practically what more benefits can be provided to the user through only cell device i.e. cell phones are capturing the market heavily why not use it in our m-commerce business field which daily transactions are being held where user behavior is the first criteria and second is to drive this by an algorithm called analysis of user mobile behavior Algorithm(AUMBA). The area wise divisions which store sell what will be naturally more beneficial to the user and the society's economy. Here we have to consider the user behavior, mining the useful data and predict next behavior through a set of images (input) to the system where we make surfing easier the user doesn't have to search around and which place what things available in the stores sell what through our cell device with the location chart.

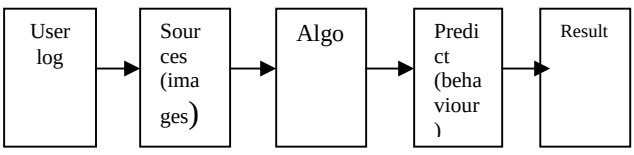

Fig. 4 Schematic working of the system

Fig. 4 shows the schematic working of the proposed system which consists of five main phase. The first is user log. Second is sources in the form of images third is analysis of the user behavior algorithm depending on all three inputs to the system the fourth phase will be predicted and finally the expected result will be seen in the fifth phase. The user log is the registered users of the system and the new users will be registered. The various sources are data collected from different areas of a mall, shops, stores and different maps etc. The third phase will work on analysis of behavior algorithm the behavior of a user may be classified on following types {needs, personal, family, may look for related items, discounts} these are some of the basic behavior where the user can be categorized into. This becomes an easier task for the user to get what he exactly needs and the store keeper also knows what products should be kept in the store(if store is the issue). If the images set and locations images are provided it becomes easier for things to search around where the user only selects for appropriate cities and its nearest store and clicks the desired product.

IV. IMPLEMENTATION DETAILS

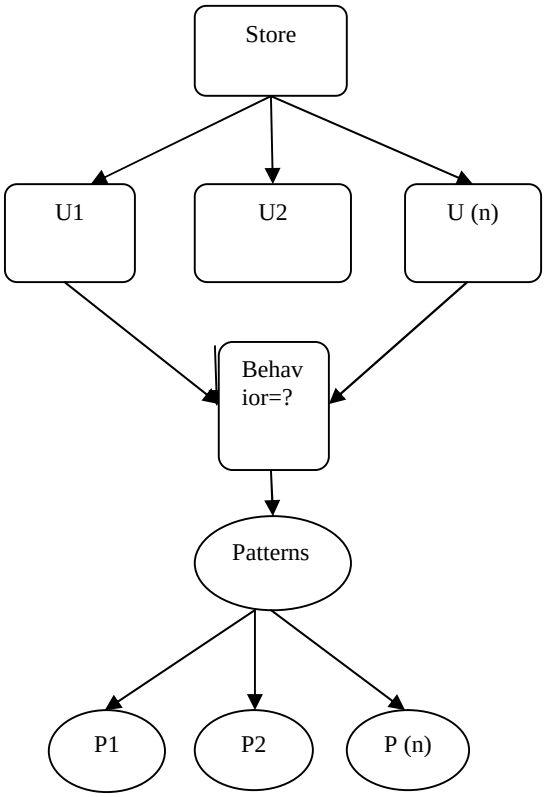

Fig. 5 General schematic of behaviour and patterns

Fig. 5 gives an general description of the system consisting of various components which consists of basically stores, user are interactive part of the system ,behavior will depend on the searching methodologies as per the further decision will be taken based on it an E-pattern will work(inter(t0),inter(t1),inter(t2)) and the maximum number of

sales will be known and the analysis behavior algorithm will come into picture. There are user1, (user2,…….user (n)) who will equally interact with system. The behavior classification will be done and based on the latest behavior upcoming behavior will be predicted and generate some useful patterns it may not be limited to one but many counts like an set of {p1,p2,p(n)}. These patterns are last output stage of the working system where it will be beneficial for both stores and the user also.

This system will work under visual studio.net, windows XP and joined with a database and a cellular device which whole system will operate.

V. CONCLUSION AND FUTURE SCOPE

As the business capitalization grows it can be joined with mobile industry to enhance economic growth. This is a novel work done in m-commerce industry where we would really think of mobile user and co-relate with business boom. The work done in this area relates to transaction management with frequent pattern tree structure no personal user behaviour is been taken into account which really increases the economic rate and also provide boost to stores and give benefit to the user. The traditional surfing methods like searching but rather selecting images will be provided. The user no more has to search but locate the area and the closest stores as the whole system will operate on cellular android device. The future scope is to design an algorithm to track the image of the user and find the location and state the appropriate area of stores.

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