

Scrutinizing The use of Virtual Money and Recommendation System in E-Commerce

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Abstract—E-Commerce have been around for quite a long time now. Transactions through third party is a problem that still couldn't manage a concrete solution as of now. The composition of this paper provides a compendium on the use of virtual money and recommendation techniques in E-commerce. E-commerce has brought revolution in the field of business. To set a new bench mark, virtual money is used in e-commerce. Virtual money is a term for the digital currency which is generated and stored electronically. For lucrative results, recommendation system is incorporated which will recommend products to the customer based on clustering, association mining, content based filtering technique and collaborative filtering techniques.

Keywords—*e-commerce; virtual money; recommendation system; collaborative filtering; content-based filtering; clustering; association mining;*

I. INTRODUCTION

Evolution of e-commerce has notched the way of doing business. There has been tweak in the way people shop. We can trace back the history of E-commerce in late 1970's that helped people exchange business documentation electronically using the technologies such as Electronic Data Interchange (EDI) and Electronic Funds Transfer (EFT)[1]. By 2000 the meaning of e-commerce changed. E-commerce began to thrive on web. By then the world wide web began to gain popularity among the people and reinvigorated the term e-commerce using security protocols. With the advent of new technologies, the sales in e-commerce have seen an upward graph and are expected to continue in the foreseeable future.

A newer step in e-commerce can be, incorporating it with virtual money. Virtual Money is nothing but the digital currency over the web. If virtual money is used in the electronic transactions the third party involvement can be obliterated. Transactions can directly take place peer-to-peer and can open different realms in the field. This paper aims at extrapolating the use of virtual money in E-commerce.

To aggrandize e-commerce, recommendation techniques can be used. Recommendation System make things much more interactive for users, it helps to give customers a real sense of shopping by giving them the recommended products. These concepts seems to increase the total sales in the business of e-commerce. This paper presents hybrid recommendation techniques for e-commerce.

II. VIRTUAL MONEY

“The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it[2].” Virtual Currency or money is one such technology which is a step towards modern future. A purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another without going through a financial institution. Digital signatures provide part of the solution, but the main benefits are lost if a trusted third party is still required to prevent double-spending. We propose a solution to the double-spending problem using a peer-to-peer network.

Digital currency is a form of virtual currency or medium of exchange that is electronically created and stored. Some digital currencies, such as bitcoins, are crypto currencies.[3] Like traditional money these currencies may be used to buy physical goods and services but could also be restricted to certain communities such as for example for use inside an on-line game or social network.

Virtual Money is obtained by mining coins. Mining is the process of spending computing power to process transactions, secure the network, and keep everyone in the system synchronized together. All newly mined Virtual money, along with every transaction, are publicly recorded. This record is known as the block chain. Virtual Money mining becomes more difficult over time, in order to facilitate limitation on the supply. In order to mine virtual money, you have to "solve a block," and that gets harder as the network of

miners grows. To help improve the odds for success, miners often form pools, where resources are combined and any yield from the effort is divided.

Virtual Money is stored in Virtual Currency Wallets. A Wallet is where you send, receive and store your Virtual Currency. In the real world, your unique wallet ID is a string of digits that may look like: 629xzupqal9etdfshtvxv.

III. WHY VIRTUAL MONEY?

A. Removal of third party annexation

Third party does not holds control over the transactions, as transactions are direct, and hence extra amount is spent on them.

B. Security to rely on

This deals with the privacy and security of customers using virtual money, no one except the owner of the wallet can view the amount left within the wallet, the transactions can be tracked only by the official authorities of site.

C. No Transaction Costs

Sending and receiving money requires no cost as this process keep the server running.

D. Irreversible Transactions

Virtual money involves the use of ownership address, each owner has its own address. Whenever a money is transferred from one to another just the ownership address is changed, and the process is irreversible.

E. No Money theft

Money cannot be stolen as ownership details are with the owner itself, unless owner is not giving his login details to another money cannot be stolen[4].

F. Savings

Virtual Money helps in saving money as it helps to eliminate the additional charges and taxation amount.

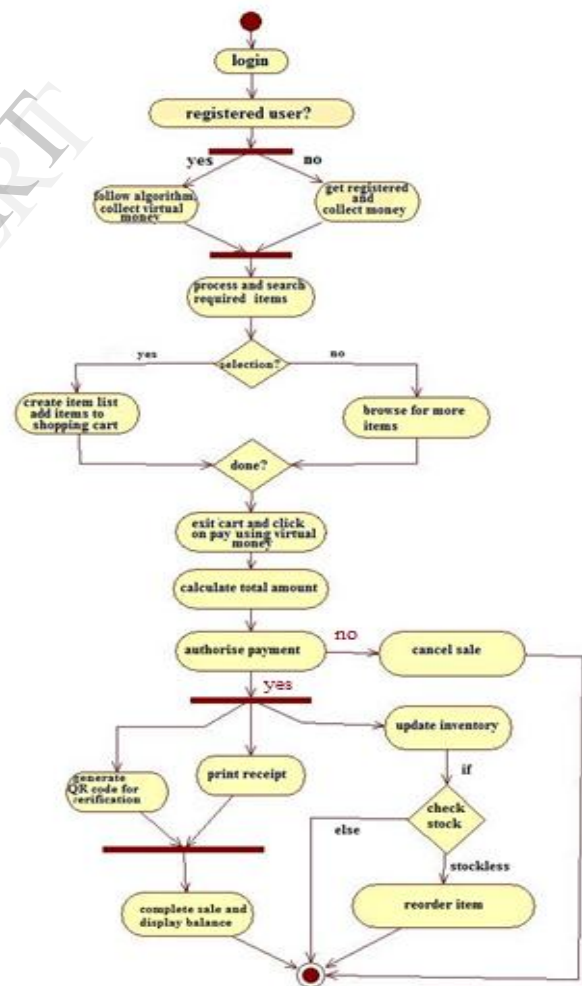
IV. VIRTUAL MONEY AND E-COMMERCE

Commerce on the Internet has come to rely almost exclusively on financial institutions serving as trusted third parties to process electronic payments. Inherent weaknesses still persists with trust based model, even though the system works very efficiently, as financial institutions cannot avoid mediating disputes, completely non-reversible transactions are not really possible. The cost of mediation increases transaction costs, limiting the minimum practical transaction size and cutting off the possibility for small casual transactions, and there is a broader cost in the loss of ability to make non-reversible payments for non-reversible services. With the possibility of reversal, the need for trust spreads. Even a small percentage of fraud is unavoidable.

These costs and payment uncertainties can be avoided in person by using physical currency, but no mechanism exists to make payments over a communications channel without a trusted party. What is needed is an electronic payment system based on cryptographic proof instead of trust, allowing any two willing parties to transact directly with each other without the need for a trusted third party. Transactions that are computationally impractical to reverse would protect sellers from fraud, and routine escrow mechanisms could easily be implemented to protect buyers. In this project, we propose a solution to the double-spending problem using a peer-to-peer distributed virtual money where no third party is involved in the transaction.

Thus, E-commerce using virtual money systems can be described in 4 basic stages:

1. Displaying variety of products under one site.
2. Transferring virtual money to the user when he registers, by charging him equivalent amount that is transferred to the organization through net-banking.
3. Purchase of the products using virtual money by being the registered user.
4. Reflecting the changes in the database.



Ecommerce using Virtual money-Activity flow chart

Fig. 1. Activity Diagram

V. RECOMMENDATION TECHNIQUES

There are several recommendation systems available which are incorporated by various web-sites. Some of them using approaches like Collaborative Filtering, Content based filtering, Knowledge based filtering, Association rule mining or Decision Tree induction. Collaborative Filtering is based on collecting and analyzing a large amount of information on user's behavior, activities or preferences and predicting what user will like based on their similarities to other users[5]. Item based collaborative filtering and User based collaborative filtering are the two commonly adopted techniques. Item based collaborative filtering techniques is a model-based algorithm for making recommendations. The similarities between the different items in the dataset are calculated by using one of a number of similarity measure and then these similarity values are then used to predict rating for user-item pairs not present in the dataset. User based collaborative filtering technique is based on ratings of other users who have similar taste to the active user. Content based recommendation systems analyze item descriptions to identify items that are of particular interests to the users. Association rule mining finds all the rules existing in the database that satisfy some minimum support and minimum confidence constraints[6].

In order to increase efficiency of the Recommendation System, we can integrate two or more techniques. Through this we can recommend our customers accurately with a precise set of products according to their taste.

VI. PROPOSED RECOMMENDATION SYSTEM

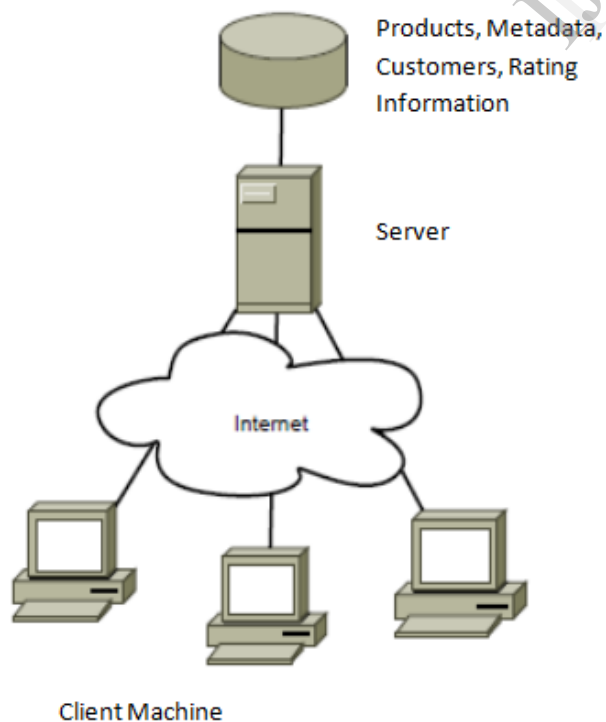


Fig. 2. Recommendation System Overview

The figure above shows the basic overview of the recommendation system proposed. There would be a main server computer where the entire processing work would be done. The server would be connected to the main repository where the customer's information, products metadata, user rating information will be stored.

Main aim of proposing this recommendation system is to tackle the problem of cold start in recommendation systems, and to increase the efficiency of the recommendation system. Hence, we have used a Hybrid Recommendation System in which User based Collaborative filtering along with content based filtering technique provides an accurate subset of recommended products to our customers. Cold Start is a potential problem in Recommendation systems, which concerns the issue that the system cannot draw any inferences for users about which it has not gathered sufficient information. We recommend our new users, by using item-based collaborative recommendation system, in order to solve the problem of cold start.

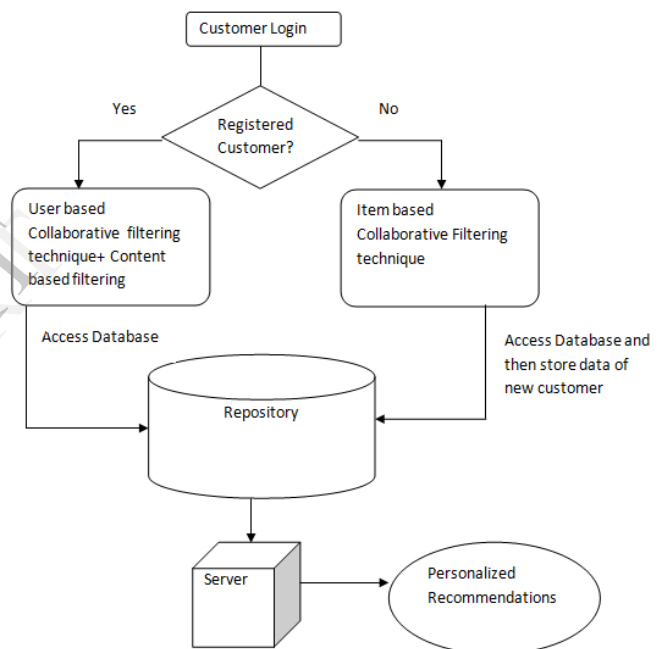


Fig. 3. Workflow of the Recommendation Process.

The above figure explains how the flow of hybrid recommendation system process. Let us consider a scenario where a registered customer logs in to our website. Two major kinds of filtering techniques would be applied to give recommendations: User based collaborative filtering technique and content based filtering technique. User based collaborative filtering technique, uses the ratings of customers with similar taste to the target customer, and content based collaborative filtering uses the metadata of a product, its type, category, sub-category to recommend products to customers. In a different scenario when a new customer, accesses the e-commerce shop, all his preferences and ratings are stored in the repository, and to prevent the problem of cold-start, item based collaborative filtering technique is used which, recommends product to the new customer, on the basis of products, he purchased in that transactions and their item-item matrix which recommends other products related to it.

Clustering technique is used to categorize customers on the basis of their tastes and the types of products they purchase. Association mining helps in recommending products that go with the set of products the customer purchases. Say in a scenario, the customer purchases a mobile phone, then products such as the back cover, its scratch guard, etc are recommended to him.

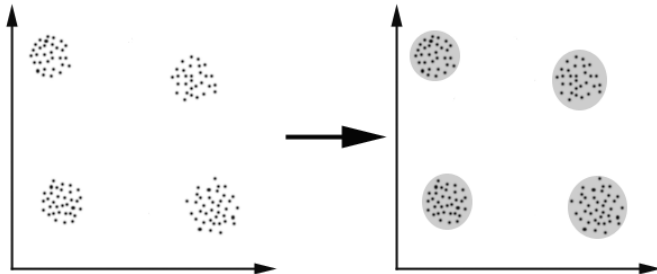


Fig. 4. Clustering Technique

Above figure shows a form of clustering, in which two or more objects which are closely connected group to form a distinct cluster. There are many more techniques to achieve clustering.

Thus, the proposed recommended system uses content based filtering technique, collaborative filtering techniques, association mining and clustering techniques to recommend customers products according to their taste.

VII. CONCLUSION

With the emergence of new technology and security systems, sales in e-commerce can grow with no bounds. The booming development of virtual currency, the transactions in

the e-commerce has become much more secured and direct. This has paved the way for a mechanism to make payments over the communication channel without the need for third party. With the recommendation system, e-shops give a more customized experience. This has made e-commerce to turn out into real shopping experience by recommending products to users, which they frequently deal with. In this paper we have dealt with the various recommendation techniques to make e-commerce much more user-friendly. This paper represents the blend of recommendation techniques and use of virtual currency to consolidate the experience of e-commerce giving the user much more personalized feel.

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REFERENCES

- [1] Bill Hazelton, "History of E-Commerce", Spirecast-Next generation SEO Analytics and Software, 2010.
- [2] Mark Weiser. "The Computer for the 21st Century", Scientific American UbiComp Paper .
- [3] Satoshi Nakamoto, " Bitcoin: A Peer-to-Peer Electronic Cash System", Bitcoin,2009.
- [4] Advantages of *Bitcoin*, Digital Currency,Stanford Projects, 2010-11.
- [5] Daniel Lew, Ben Sowell, Leah E. Steinberg, Amrit S. Tuladhar, Professor Dave Musicant,"Item-based Collaborative Filtering, Algorithms", Recommender Systems, A Computer Science Comprehensive Exercise Carleton College, Northfield, MN.
- [6] Bing Liu,Wynne Hsu,Yiming Ma, Integrating Classification and Association Rule Mining , KDD-98, New York, Aug 27-31, 1998.