# WEB MINED AGGREGATED DATA AND FUZZY LOGIC BASED PERSONALIZED RECOMMENDER SYSTEM

Chaudhari Upasana[1], Bhirud Dnyansudha[2], Bhosle Uma[3], Malviya Nikhil[4]

[1] *Student, Information Technology, Amrutvahini College Of Engineering, Maharashtra, India*
[2] *Student, Information Technology, Amrutvahini College Of Engineering, Maharashtra, India*
[3] *Student, Information Technology, Amrutvahini College Of Engineering, Maharashtra, India*
[4] *Student, Information Technology, Amrutvahini College Of Engineering, Maharashtra, India*

**ABSTRACT**

*The perpetually expanding number of E-business locales on the Web has achieved data over-burden. This has made it troublesome for shoppers of specific items to discover data about such items trying to buy items that best fulfills them. It has similarly diminished the volume of item deals in the E-business area. Subsequently, this paper proposes a customized recommender framework driven by fluffy rationale system. The proposed framework brilliantly mines data about the components of tablet PCs and gives proficient administrations to potential purchasers by prescribing ideal items taking into account their own needs. Fluffy Near Compactness ( FNC) idea is utilized to quantify the similitude between shopper needs and item highlights in request to prescribe ideal items to potential purchasers. Trial after effect of the proposed framework with 50 tablet PCs comprising of Acer, Dell, HP, Sony, and Toshiba demonstrates its viability.*

**Keyword :** - *E-Business, FNC, Fuzzy Logic.*

## 1. INTRODUCTION

The unremitting development of the Web has prompted quick extension of e-business in addition to other things. The substantial measure of item data on the Web postures extraordinary difficulties to both clients what's more, online organizations. More clients are turning towards web shopping since it is generally advantageous, solid, and quick; yet such clients more often than not encounter trouble in hunting down items on the Web because of data over-burden. Online organizations have regularly been overpowered by the rich information they have gathered and think that its hard to advance items fitting to particular clients. There is likewise the issue of insufficient usage of the accessible vast measure of item data from online exchanges to bolster better choice making by both purchasers and venders [1]. To address these data over-burden issues, e-business stores are presently applying mass customization standards not to the items but rather to their presentation in the on-line store [2]. One approach to accomplish mass customization in e-business is the utilization of recommender frameworks [3].

Recommender frameworks are utilized by a continually expanding number of E-trade locales to offer customers some assistance with finding items that best suit their necessities [3]. Commonly, a recommender framework dissects information about things, or connections in the middle of clients and things all together to discover relationship in the middle of things and clients. It gives counsel to clients about things they may wish to buy or look at. The suggestions made by such a framework can help clients explore through substantial data spaces of item portrayals, news articles or different things [1][2]. Different elements are considered while prescribing items to online purchasers; these include: top merchants of a specific item, demographic data of purchasers, and investigation of the past purchasing conduct of clients to foresee their purchasing practices later on. These types of proposal

incorporate recommending items to the shopper, giving customized item data, abridging group suppositions, and giving group investigates.

Customized proposal frameworks empower purchasers to effectively get to data about items they are keen on, what's more, spare time of perusing through electronic records. Besides, endeavors can become more acquainted with clients' purchasing practices better, and create proficient promoting systems to pull in various clients. Consumer loyalty's, and dependability can hence be expanded; the expansion in the meeting recurrence of clients can assist make more exchange open doors and advantage the Internet undertakings [3]. A decent customized suggestion framework ought to have the capacity to enhance client fulfillment; a key credit to client steadfastness and proceeded use [4].

This exploration proposes a fluffy rationale based customized recommender framework for items that are not habitually bought, for example, smart phones. The proposed framework is most certainly not just went for prescribing ideal items to planned purchasers, additionally, at advancing the rate at which clients visit online stores and inevitably expand deals for online organizations. Exceptionally, we observationally assess the prevalence of the proposed framework in a controlled analysis with 50 tablet PCs comprising of Acer, Dell, HP, Sony, and Toshiba. The result of the investigation demonstrates that the proposed framework impels more prominent client fulfillment. Thusly, this study shows the feasibility and attractive quality of customized proposal frameworks for clients' item determinations.

The rest of this paper is sorted out as takes after: Section II talks about the examination foundation and related works. Area III presents the design of the proposed framework and technique embraced by the examination. Area IV exhibits the exploratory result and assessment of the proposed framework, while Section V presents the conclusion and suggestions.

## 2. HISTORY & BACKGROUND

### 2.1 Recommender System

A recommender framework can be depicted as one that gives proposals and suggestions to clients when they are making a choice while confronted with various decisions. [1] depict a recommender framework as a framework which can secure clients' feelings about various things furthermore utilize these assessments to direct clients to those things that may enthusiasm to them. [1] Presents a recommender framework as one that predicts what things a client may discover fascinating or suitable to his or her needs. [1] Characterizes a recommender framework as far as personalization, as any framework that can deliver individualized proposals what's more, can guide clients in a customized way to find fascinating data on things in a vast space of conceivable alternatives talks about different arrangements of suggestion methods arranges proposal strategies regarding the basic information utilized by the framework as Shared separating, Content-based, Demographic, Utility- based and Knowledge-based. Two wide orders of suggestion methods are Social-based and Information- based strategies. [10] View the scientific categorization utilizing two key measurements: the level of robotization and the level of ingenuity in the proposals. They sketched out the sorts of recommender frameworks as non-customized, property based, thing to-thing connection, and individuals to-individuals (client to-client) connection. Further, [3] included crude recovery, physically chose what's more, measurable outline to the rundown.

Personalization, an exceptional type of separation, permits a site to react to clients' special and specific needs. The expression "personalization" is regularly utilized as a part of the setting of proposal frameworks that specifically elevate items to end-clients taking into account the investigation of prior cooperation [5]. The five phases of personalization followed in this work are: gathering client data, profiling clients, contrasting similitude, conveying and displaying customized data, furthermore, measuring client reactions.

Characteristic based recommender frameworks are the ones in which suggestions rely on upon the properties of the thing in question [6]. A large number of the customized trait based works manage suggestions including

comparable things [7]. In this our proposed framework, "customized characteristic based" accept a more extensive significance. It includes putting away and mining data about every individual client in the wake of supplying his/her inclination and prerequisites data with respect to a specific item. It likewise includes the mining of data about the qualities of the items, as acquired from specialists by means of discussion.

**2.2 Fuzzy logic System**

A Fuzzy Logic System (FLS) can be characterized as the nonlinear mapping of information set to scalar yield information set [5]. Fluffy sets have pulled in developing consideration and enthusiasm for cutting edge data innovation, creation method, choice making, design acknowledgment, diagnostics and information examination among others [2]. At the point when an issue has dynamic conduct, fluffy rationale is a suitable apparatus that arrangements with such issue [5]. That is to say, fluffy rationale discovers its quality in giving precise answers for issues that include the control of a few variables. FLS comprises of four principle parts: The Fuzzifier, A Principle Base, An Inference Engine and A Defuzzifier.

## 3. PROPOSED SYSTEM

We use freely available data on websites to build our knowledge base for various products. This data is then classified by into a proper structured dataset by a domain expert. This dataset contains crisp weightage points ranging from 1 to 10 mapped to various specification based on their relative performance in comparison to competing products. A specification base is thus created for various products.

The needs of the user are identified by the responses obtained from the questionnaire. Based on these inputs fuzzy sets are generated about the user's requirements. Membership is calculated for various requirement sets. This is the Fuzzification step. . These sets are then evaluated against a 'If X then Y' rule base to draw inference. Like if Talk time is High then Battery is Very Good. The output for these rules gives us fuzzy sets of specifications. This is the Inference step. Finally we generate crisp values from these specification fuzzy sets. This is the Defuzzification step. These crisp values are then compared to the weightage points in our specification base. Any and all products which have equal or better points for specifications are generated as recommendations.

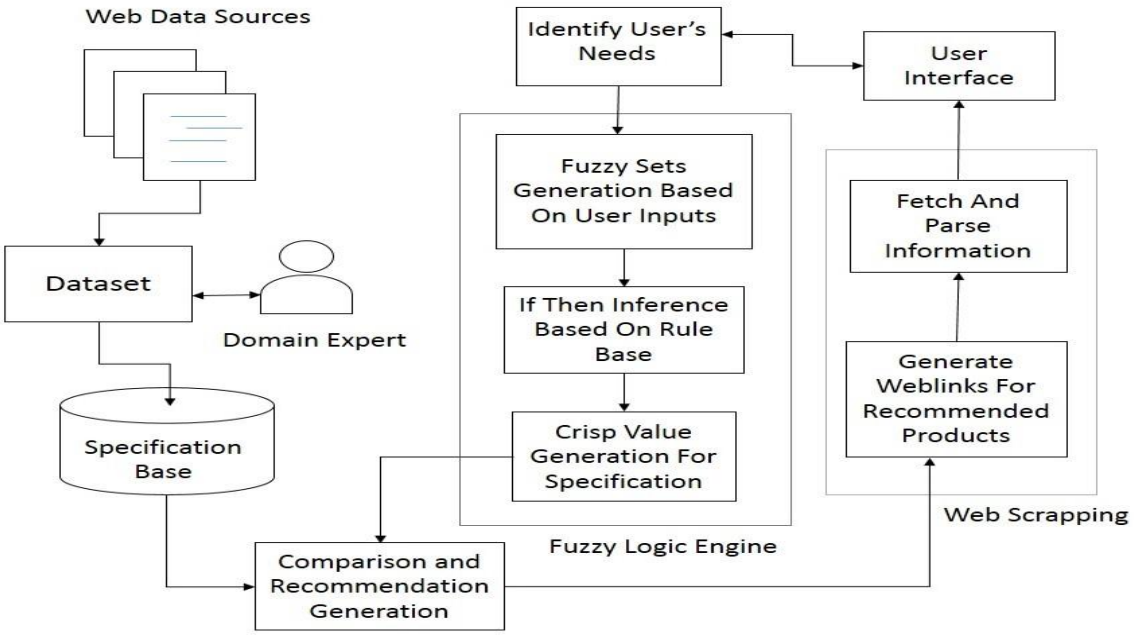


**Fig -1** System Architecture

Web links for specifications, prices, reviews etc. are generated. The corresponding web pages are then fetched and required information is extracted from them. This facilitates the user by providing all necessary detail required for making a purchase decision at a single place.

## 4. EXPERIMENTAL RESULTS

We evaluate our proposed approach by comparing it with the traditional methodology i.e. Systems based on Associative Rule Based Methodology. We use the results obtained from various shopping sites while recommending products for the traditional approach statistics. We then study the responses of a user group for their choices to test the variation in recommendation.

Following are the metrics we will use to evaluate our findings

$$\text{Precision} = \frac{\text{Correct Recommendations}}{\text{Total Recommendations}}$$

$$\text{Recall} = \frac{\text{Correct Recommendations}}{\text{Total Useful Recommendations}}$$

$$\text{Coverage} = \frac{\text{Items With Recommendations}}{\text{Total Number Of Items}}$$

**Table -1**:TABLE RESULT ANALYSIS

| Method | Precision% | Recall% | Coverage |
|---|---|---|---|
| Traditional ARBM | 82 | 74 | 60-70% |
| Fuzzy | 92 | 57 | 100% |

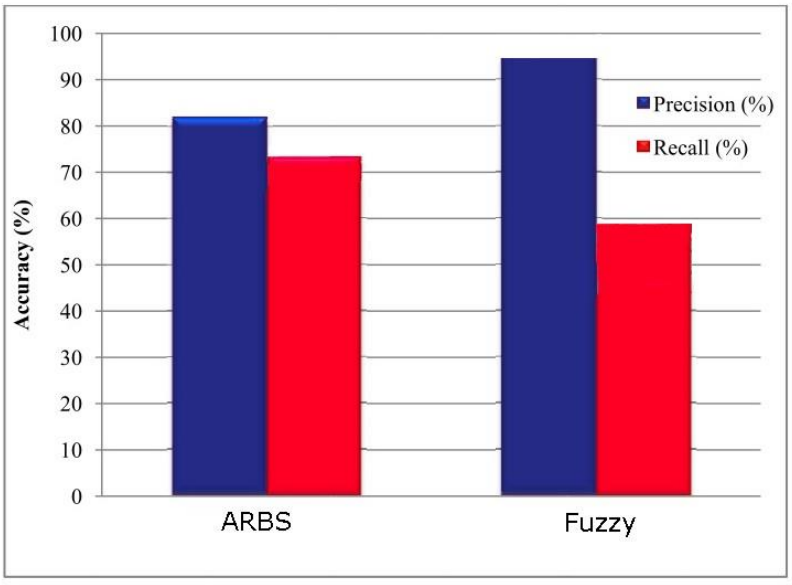


Fig -2: Comparison Chart

We can conclude that the proposed algorithm accomplishes its goal and comes out as a viable alternative to the ARBM. The experimental results shows that the proposed algorithm outperforms traditional approach in precision, recall and coverage. The outcomes are very much suitable for a recommender system.

## 5. REFERENCES

[1] Ojokoh, B. A., Omisore, M. O, Samuel, O. W, and Ogunniyi, T. O. "A Fuzzy Logic Based Personalized Recommender System" IRACST - Inter- national Journal of Computer Science and Information Technology & Security (IJCSITS), ISSN:2249-9555 Vol. 2, No.5, October 2012.

[2] Dr A. Kumar "A Fast and New Collaborative Web Recommendation Sys- tem Using Fast Adaptive Association Rule Mining" A. Kumar / (IJCSIT) International Journal of Computer Science and Information Technologies, Vol. 5 (6) , 2014, 6992-6995.

[3] Shiva Nadi1, Mohammad. H. Saraee2, Mohammad Davarpanah Jazi3 and Ayoub-Bagheri 4 "FARS: Fuzzy Ant based Recommender System for Web Users" IJCSI International Journal of Computer Science Issues, Vol. 8, Issue 1, January 2011.

[4] S-S.Weng, and M-J. Liu, Personalized product recommendation in ecommerce, Proceedings of the 2004 IEEE international conference on e-technology, e-commerce and e-service, Pp. 413420, 2004.

[5] Chen, Xi, Zibin Zheng, Xudong Liu, Zicheng Huang, and Hailong Sun. "Personalized qos-aware web service recommendation and visualization."Services Computing, IEEE Transactions on 6, no. 1 (2013): 35-47.

[6] J. Pinho Lucas, Anne Laurent, M.N. Moreno, Maguelonne Teisseire, "A fuzzy associative classification approach for recommender systems "HAL Id: hal-00797379 https://hal.archives-ouvertes.fr/hal-00797379 Submitted on 6 Mar 2013.

[7] Mohammad Javad Hosseinpour Member of faculty of Islamic Azad University Estahban-Branch m.j.hoseinpour@gmail.com Mohsen Mosalanezhad Teacher of Computer, Islamic Azad University Jahroom-Branch Mohsen.ec@googlemail.com ImanBadrooh Teacher of Computer, Islamic Azad University Jahroom-Branch Iman.badrooh@gmail.com MosaMojarad Member of faculty of Islamic Azad University Firoozabad-Branch M_mojarad@iauf.ac.ir ."An intelligent fuzzy-based recommendation system for consumer electronic products".