

Impact of various strategies of Recommender system to improve customer loyalty for Electronic CRM: A Survey

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Abstract: In today's scenario, the growing e-business provides automated personalized websites for understanding the behavior and preferences of every consumer. This automated process predicts the future consumers in electronic CRM by using recommender system. Various technologies are used for qualitative recommendation which is beneficial for both consumer and marketers of electronic CRM. The aim of electronic CRM is to help organization for better management of present and future aspects of consumers and to develop an integrated electronic CRM analytics framework with recommendation system strategies. This automatically predicts the purchasing behavior and preferences of consumers and gain consumer satisfaction and loyalty for improving the quality of electronic CRM. This paper researches on both recommender system and electronic-CRM which can be implemented across various organizations for development.

Index Terms: Electronic CRM, Recommender System, Recommendation Strategies, Customer loyalty, Consumer behavior

I. INTRODUCTION

In this technological era, the E-CRM is rapidly developed and user uses the concept of recommender technologies to enhance customer satisfaction. E-CRM is an efficient operational system that includes integrates the strategies of sales, marketing and services and enables customer identification, customer attraction and customer retention [1]. It is used to establish the relationship with consumer to improve the profitability and increases the competitive power that maximizes the benefits of an organization [2, 3].

The various important outcomes of E-CRM are improved efficiency, reduced cost, increased profitability, increased sales, enhanced customer value and customer satisfaction and improved customer loyalty [4]. The E-CRM technology provides new opportunities to organizations to provide better service and to increase the sales and customer satisfaction that is helpful to gain customer loyalty as a positive outcome.

The Recommender systems are used to reduce the overloaded information for users of internet and to efficiently retrieve information. It is a system that recommends an accurate product or service by learning consumer behavior and desire [5]. Based on consumer's profile and interest the recommender system recommends a product or service. [6]. Recommender system basically deals with product, agents and customer profile present on websites [5, 7, 8, 9, 10].

This paper explains the kind of recommender systems that is used in personalized application which has strategic values that affects the consumer perception with respect to the organization for building a strong relationship with customers and positioning the brand name. A recommender system is useful for the consumers to search for the items which are likely to purchase by creating a recommended item lists and uses as a tool for strengthening the customer loyalty. It deals with performance improvement, accurate prediction and consumer satisfaction for classification of consumers and recommender systems.

Various websites of large e-commerce organization are using recommender systems to help the consumers to find various products for purchasing. This paper provides various strategies of Recommender systems that increase sales by taking feedback from consumers.

II. LITERATURE REVIEW:

As considering the growing stage of E-CRM, more number of recommendation technologies are used to gain the customer satisfaction. Good relationship in between organization and consumers gives higher customer satisfaction. Bradway and Purchia (2000) stated that E-CRM is act as a bridge between online market and customer. [11].

E-CRM is considered as a marketing activity, tool and technology through internet networking that is able to build and enhance relationship between business organizations and consumers. (Lee-Kelley et. al., 2003 p.241) [12].

E-CRM increases the customer satisfaction and creates competitive advantages to attract customers. As per Aileen (2006), E-CRM is helpful for an organization to understand consumer online behavior and predicts consumer preferences and improves the profitability [13].

According to Dotan (2008), E-CRM is used to improve the customer relationship through improved customer service and customer profitability [14]. E-CRM is responsible to create customer loyalty and expand customer life cycle by increasing customer value and satisfaction. (Ravi, K., Macia, R., 2001). [15]

The mass marketing and production changes the behavior of consumers through increase in availability of products, developing new interactive way with products. So, E-CRM helps businesses to evaluate customer loyalty and profitability and the familiar relationship is established between the organization and customers through a developed recommendation method by making new products that should be personalized and enhanced. (Injazz J. Chen and Karen, 2003)[16].

Lots of good recommendation strategies are there but it is still a challenge to get the increased accuracy and diversity of these strategies to fulfill consumer demands and their needs.

Recommender systems are used by various online sites to give suggestion and provide information to the consumers that are helpful for them to take decision about purchasing of products. Recommender systems analyze customer's online buying behavior and current information about products to match customer's preferences. It employs quantitative and qualitative methods that discover the products which are suitable for customers.

The various forms of recommendations are providing suggestions about products; provide information about personalized products, summarization of community opinions and providing community views. Recommendation techniques are used to provide individual purchasing decisions for each customer.

Various current recommender systems like content based filtering (17), collaborative filtering (18); decision trees (19), association rule and semantic approach of data mining concept etc. are used to recommend the products with high probability of purchasing products.

From the above it is shown that the contribution and impact of various recommender systems strategies is useful for the organization to gain the customer satisfaction and improve customer loyalty using E-CRM in their e-commerce websites.

III. METHODOLOGY:

PROBLEM STATEMENT:

Because of the huge demand of online marketing and growing software technologies and networking concept, various services have been developed which are widely used today like email, search engines, blogs, online shopping, entertainment etc, which brings a digital lifestyle. Traditional CRM solutions doesn't capable to solve today's problem. So to attract more number of consumers, electronic CRM is used with a recommender system that is helpful to gain customer satisfaction by providing better decision making concept to customers for purchasing of products and improve customer loyalty for expanding the online business of an organization.

OBJECTIVES OF THE STUDY:

The objective of this paper is:

- i. Understanding the E-CRM customer engagement and recommendation.
- ii. Identification of customer's interest and preferences.
- iii. Understanding various recommendation system strategies and analyze its impact to gain customer satisfaction and improve customer loyalty.

i. E-CRM Customer Engagement and Recommendation:

In today's era, customers buy items as per their choice by observing price and product configurations. So customer buying behavior is more individualized, more complex and curated and need to be able to access and leverage incredibly, timely and relevant insights that empower for better selling and providing better service to customers. The specific aspects of E-CRM are suitable to be used in E-commerce sites are:

a. Customer Profiling:

It treats every user in different way that depends on individual characteristics or profiles, which determine the different form of acting. It is a concise description of any consumer. It is a combination of analyzing data from customer interactions while comparing various demographics within customer profile in E-CRM. It includes the physical characteristics like age, location, gender, income, education, religion, living standards, neighborhood, interests etc.

b. Personalization:

It is the process of adapting the presentation of information to user in basis of the profile. This mechanism makes use of user's profiles to select and to show to user the contents that adjusts to the profiles. Personalization means interacting with a consumer through content or software in a way that makes them feel that their interests are being taken into account. It is the art of offering tailored marketing.

A recommendation system could benefit significantly from customer service data that resides in E-CRM systems. This is a customer item engagement signal, which focuses on extracting customer engagement data from E-CRM.

The signals are implicit signal, explicit signal and signal from customer service. The implicit signal from customer engagement is that where a consumer interacts with an item in various ways like: browsing products, reading the review of item, placing item in shopping cart and purchasing item. Explicit signals correspond to explicit rating of an item by consumer after the conversion event has happened. The user may contact the customer service after the conversion event.

Out of these three, implicit signal is always there and other two are may or may not be present. Using appropriate consumer engagement signals from various sources is critical for an effective recommendation system.

ii. Identification of customer's interest and preferences:

Internet technology bridges the gap world wide web. Various people have same thought, perception, styles and accessibility. Now-a-days, e-shopping became globalized and it facilitated all information about any item from anywhere and anytime which have 24/7 accessibility. So various organization implements new strategies for online buying and selling of products, because the preferences of consumer's changes rapidly in case of quality, services, choices etc. that shows the enthusiasm to choose products for buying and selling.

The consumer plays three different roles i.e. buyer, payer and user towards the research of consumer behavior for purchasing products. Consumer behavior reflects the decision of consumers in totality with respect to the consumption, disposition and acquisition of services, products, experiences, activities, ideas that is helpful for decision making that includes why, what, when, how and where to purchase products which influences the future evaluation and analysis that is helpful to increase customer loyalty. All decisions of marketing are concerned on consumer behavior's knowledge and assumptions, which is a critical process.

The various organizations can apply E-CRM to know its potential customers through the following steps those are:

1. Effectively target various consumers,
2. Provides customer satisfaction and values,
3. Expanding the base knowledge in marketing,
4. Create competitive benefits,
5. Development of various new products and services,
6. Increase company values,
7. Applying various marketing strategies towards positive social effects,
8. Understand the comparison process of their product and rival products by customer.

Consumer behavior consists of ideas, feelings, experiences with additional environmental factors like prices, comments and ads. Also, because of the continuous changes in ideas, perceptions and activities of consumers as an individual or as a group, the consumer behavior is considered as a dynamic process. So before the promotional activities of any business, organization must know what a customer want and why so is, which is helpful towards the identification of customer's interest and preferences. The various processes towards this case are:

i. Identifying customers:

The first step towards the identification process is to identify a customer which is done through a thorough market research which is helpful to understand the potential customer for any organization. The key characteristics for identifying the customers are: age, gender, profession, income, location and activities.

ii. Understanding the reason for online shopping:

Once a potential customer is identified, organizations have to focus on what is motivational factor that influences consumer to do online shopping that is buying and selling of products and services. The decisions for purchasing a product is based on the following factors those are: work demand, family needs, budget, social needs, emotional needs and preferences of brands.

iii. Identify the shopping tactics:

Organization always try to understand how customer do online shopping that is either through mobile phones or any electronic gadgets or in stores and understand how the customer take decision on the spot spontaneously and carefully for purchasing products.

iv. Considering customer budget:

Numerous consumers spend different amounts while purchasing products online. So organizations have to observe the financial capacity and budget of their customers by considering their average income, what portion of income consumer spend for buying products and that will come in their budget or not.

v. Learning the thought process of customer:

Organization must try to learn the customer's views and expectations about the product services, customer services and due to this organization can compete with their rival companies and sustain in market.

vi. Identifying customer needs:

This is the last step for any organization to gain customer satisfaction and improve customer loyalty in the direction of understanding the customer's interest and preferences. Identification of customer needs includes answering the questions of customers and get the feedback from the customer about a product. It gathers the detailed information from the customers through regular communication that will helpful for making strategies for product recommendation and gaining customer satisfaction and their loyalty.

iii. Understanding various recommendation system strategies and analyze its impact to gain customer satisfaction and improve customer loyalty:

A recommender system is a system that filters the information that aims to predict the preferences of a customer regarding a product. It is useful to predict the consumer's interest and to recommend products which are most suitable for them based on the feedback, previous interactions, search and buying history.

Recommender system consists of processes that enhance the various e-commerce websites and organizations that are:

- a. **Conversion of Browsers to Buyers:** Websites visitors most of the time only visit the site but don't purchase, but by recommender system's help customer find various products which they want to buy.
- b. **Increased Cross-Sell:** Recommender system is very helpful to improve cross-sell by providing suggestion about additional products for customers to buy.
- c. **Loyalty Building:** Customer loyalty is one of the important concepts. Availability of wide range of new and innovative products has improved the customer experience and loyalty. By creating a value-added relationship between e-commerce websites and the consumer, recommender systems improve the customer loyalty.

Recommender systems provide personalized suggestions and product information which are available in the system. A recommender system recommends vital information and provides strategies that consumers implement to achieve their goals.

A recommender system is basically a data filtering system which expects to foresee the position or inclination a client is probably going to provide for a thing. These systems expect to anticipate clients' inclinations and prescribe things that might be generally reasonable for them, in view of their past association, search and purchasing history. This study gives five contributions towards the application of recommender systems in online marketing. Those are:

1. To start with, we analyze how conventional advertising techniques gave an establishment to the development of recommender frameworks as a promoting apparatus in Ecommerce.
2. We present a scientific categorization for Recommender Applications, arranging them dependent on the contributions to the recommender procedure, the technique used to produce proposals, the yields of the suggestion procedure to the client, and the level of personalization.
3. We look at the examples that rise while thinking about the scientific classification and distinguish five models of recommender applications.
4. We depict four areas of future investigation for new recommender framework applications dependent on parts of our scientific categorization that have not been enough investigated by the current applications
5. At long last, in the informative supplement, we consider security gives that are advancing as more goals execute recommender applications.

Various Recommendation System Strategies and its impact:

Recommendation of a product consider as prescient offers which is a strategy for offering customized support to each and every customer. The effective recommendation of a product enables various organizations to analyze consumer information, and then utilize the results of that examination to make it precise and individualized customer profiles. Recommendation of product delivers content based that estimate the requirement of the customer.

To prioritize the needs and preferences of customer the recommender system meet the following criteria. Those are:

1. Rich information
2. Entire business income age attitude
3. User Experiences
4. Strategized recommendation using AI, Machine learning or data mining technique

The various techniques for recommendation system used to gain customer loyalty and customer satisfaction using E-CRM are:

i. Content Based Recommender System:

Content based recommender system focuses on classified customer specification problem and integrate with E-CRM approach. It is used to analyze the consumer activities and buying behavior. This technique is widely used in various information systems to get consumer needs for less frequent purchase products.

Content-based recommender systems utilize characteristic information that is information based on keywords, classifications and customer profiles and interest. The speculation is that if a customer was keen on or purchased a particular item before, they will again be intrigued to purchase or select a similar item later on.

In this system, keywords are utilized to portray the things and afterward a customer profile is worked to demonstrate the sort of thing this client likes. The system further gatherings comparative items dependent on their highlights. The recommender system uses the client's profile and item highlights to make proposals.

The center idea of this system is that if a customer likes a product then similar kind of products also liked by the customer, which is recommended by past transaction.

ii. Collaborative Filtering:

Collaborative filtering depends on customer preferences, which not only reflect the choice of single consumer but also set of information needed to determine the closest one. This techniques is useful in order to use not only keywords, but also quality, choice or fields of interest to determine the product of a website.

These systems use customer collaborations to channel for things of intrigue. Synergistic separating techniques gather and break down data on clients' practices, exercises or inclinations. It at that point predicts what clients will like, in light of their closeness to different clients. This methodology doesn't require machine analyzable substance and is better prepared to precisely prescribe things without expecting to 'comprehend' the product.

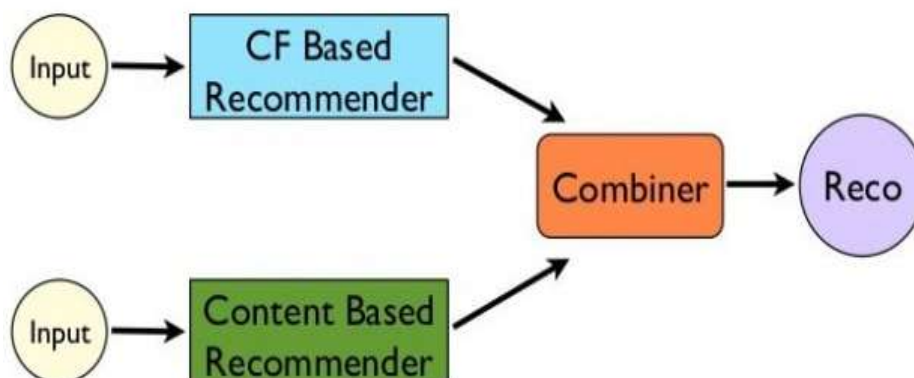
It spotlights on examining consumer behavior, exercises or interest so as to foresee appraisals or recommend products. It gathers a lot of data on consumer behavior, exercises or interest so as to anticipate what customer will like dependent on the comparability with different customer. Customer attributes like socioeconomics and psychographics are utilized in distinguishing comparative clients.

Collaborative filtering is divided into user-based and item-based filtering, where user-based filtering means similar-minded consumer based on their common rating patterns and an item-based filtering means similarity between product pairs are calculated.

iii. Hybrid Systems:

This method combines both content and collaborative information. This approach uses not only collaborative and content based mechanism but also includes knowledge based approach and demographics. Knowledge based system suggests products based on the customer profile.

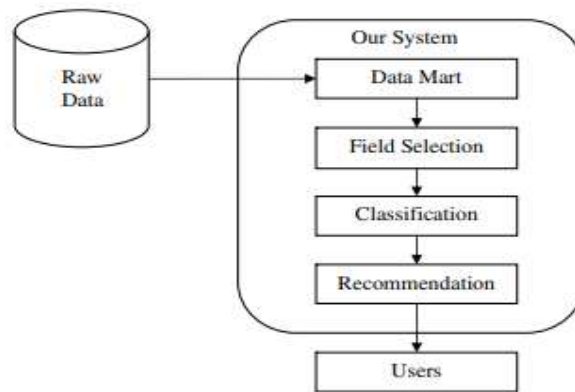
This technique utilizes classified web pages, which provide a tool that is able to relieve website users from repetition of web surfing to some extent.



iv. Data mining Techniques: Decision Tree:

Decision tree is a Data Mining method utilized for grouping and expectation. Here, one information enters root of the tree, and afterward it is chosen where child node will go. The procedure as above will repeat until the information reach to the leaf node. In the proposed framework, customers can pick up suggestions from the framework. Since the procedure is application-oriented, various applications may require distinctive characterization approaches as proper. For present purposes, the Decision Tree is utilized as our characterization work.

The condition created by decision tree calculation will show the attributes of consumer behavior that can lead to customer misfortune. Such discoveries will fill in as the reason for showcasing system proposals to forestall future customer misfortune.



IV. CONCLUSION:

Recommender systems are generally a good match with organizations that have and utilize broad information and that can actualize and profit by these systems. Upgraded customer experience and expanded deals are a consequence of good recommender systems. Suggestions make it simpler for clients to get to the substance they favor by accelerating the hunt procedure. The information about the information is utilized to send those customized offers or further proposals that are bound to bring about a buy or determination. This outcome in better client experience and the client is bound to remain faithful to the administration or brand and buy more. With extensive information on every client, the business increases a huge upper hand over the opposition.

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