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Customer purchases in e-commerce by using big data – Literature survey

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ABSTRACT

In the epoch of Bigdata, the customers view the surplus of the economy, while social commerce grows enormously. This paper started with the concept of providing the customers trustworthy product with reasonable discount and quality products in e-commerce websites. As well as, this determines the better product comparing some of the e-commerce websites. This is done by using the result of the dataset which comprises the details of distrust level, a range of discounts and the customer feedback that is analyzed using the Apriori algorithm in RStudio. The frequent quality product purchased is displayed to the customers in a user-friendly website.

Keywords— *Big Data, Apriori algorithm, E-commerce, Social commerce*

1. INTRODUCTION

The phenomenon where data sets that are too large or complex for traditional data-processing application software to adequately deal with are referred to as Big Data. This paper throws light on various methods and concepts related to the analysis of products based on the customer feedback which depends on distrust levels and discount rates.

The activity of buying or selling products on online services or over the Internet is called E-commerce [10]. Electronic commerce utilizes the subsequent technologies such as mobile commerce, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, electronic funds transfer, and automated data collection systems. E-commerce allows customers to purchase products anytime and from anywhere thereby helping overcome geographical barriers. Online and traditional markets have different strategies for conducting business. E-commerce has evolved to make products easier to discover and purchase through online retailers and marketplaces. Traditional offline retail does not allow independent freelancers, small businesses, and large corporations to sell their goods and services at the scale of e-commerce. E-commerce allows you to buy and sell products on a global scale, twenty-four hours a day without having the same overheads as you would with a brick and mortar store. For the best marketing mix and the best conversion rate, an E-commerce venture will also have a physical presence, this business is known as ass click and mortar store.

2. LITERATURE SURVEY

In previous application data surveys were conducted among various demographics of China's online social commerce market [1]. The idea that product types may determine the degree of consumers' distrust even when identical discounts are offered for those products was the main aim behind the project. The product preferences and selection were analyzed to determine if distrust negatively affected consumers' purchase attitudes from consumer feedback collected through extensive data surveys conducted as part of the project. The project selected 20 representative products commonly sold on social commerce websites in China were chosen to examine the relationships among product types, discount rates, distrust levels, and purchase attitudes. Manual data analysis was done on the data collected from these data surveys. For each product, a manual analysis was done based on the product's discounts. The consumer feedback helped to classify the products on the basis of their distrust levels. Different products from different categories were taken into account for analysis. An inductive interview was used to collect the data as well as consumers'

perceptions of the relationships. The product discounts implicated the distrust levels as a three-way classification system of high, medium and low. The results after data analysis suggested that consumers liked deep discounts, but their distrust levels increased along with the discount rates. However, the levels of increasing distrust vary according to product types.

Zhao Huang [2] et al, have proposed an article that offers a new theoretical model and a set of principles for guiding social commerce design. There is a lack of a stable and agreed-upon definition and little research on social commerce. There is no significant research on the design of social commerce platforms. This study offers a literature review to explain the concept of social commerce, tracks its nascent state-of-the-art, and discusses relevant design features as they relate to e-commerce and Web 2.0. In this study, a new model and a set of principles for guiding social commerce design have been proposed.

The model and guidelines to two leading social commerce platforms, Amazon and Starbucks on Facebook also applied in this. The research indicates that, for any social commerce website, it is critical to achieving a minimum set of social commerce design features. These design features must cover all the layers of the proposed model, which includes the individual, conversation, community, and commerce levels. There is a lack of a well-defined explanation and also there is a little study on social commerce. No significant exploration dedicated to the blueprint of social commerce platforms is available. The concept of social commerce tracks its emerging high-tech findings and discusses relevant design features related to e-commerce and Web 2.0.

A new model and a set of doctrines for guiding social commerce designs are introduced. We also apply the model and strategy to two leading social commerce platforms, Amazon and Starbucks on Facebook. It is found, for any social commerce website, it is significant to achieve a minimum no of social commerce design features. These design features must cover all the layers of the proposed model, which includes the individual, conversation, community, and commerce levels.

Similarly, Ting-Peng Liang [3] et al, presents a model that integrates several elements in social commerce research and to summarize the previous working papers and abstracts included in this singular issue. Social commerce involves using Web 2.0 social media technologies and infrastructure to support online transactions and user assistance to aid in the attainment of products and services.

Social media technologies provide a new platform for entrepreneurs for promoting innovation and raise many new issues for e-commerce researchers that necessitate the development of new theories. This could become one of the most demanding research areas in the upcoming decade. This introduction aims to present a model that integrates several elements in social commerce research and to summarize the previous working papers and abstracts included in this singular issue. The model includes six defining elements for categorizing social commerce research: research theme, social media, commercial activities, underlying theories, outcomes, and research methods.

Sanghyun Kim [4] et al, imparts that in Korea, customers trust is the major factor for the success of s-commerce and it requires more effort to gain trust. This study identifies the key factors in s-commerce such as transaction, safety, quality, reputation, and communication. The article indents to develop a successful business model for providing the customers with trustworthy services and it also relates the trust of the consumers and word-of-mouth intentions.

Mihyun Chung [5] et al, articulates the research based on ICT convergence industries of the technology revolution. The revolution of the technology has now contained various fields such as robotics, 3D printing, driverless cars, tougher materials, and biotechnology. The research is based on ICT convergence industries of a technology revolution. This paper examines the researches done in the article submitted to APIC-IST 2015 in the industrial revolution field.

These articles are related to the fourth industrial revolution that is categorized based on the keyword frequency of main issues. Most of the researches are done in the field of wireless sensor and Internet of Things. The sum of the topics such as driverless cars, nanotechnology, biotechnology, sharing economy and 3D printing are not mentioned here. It is the current and developing environment in which disruptive technologies and trends are changing the way we live and work. It is the new era that is differentiated by the scope and tremendous impact of new systems. This paper also suggests the contents in the fourth industrial revolution that need to be of focus on for further research in this field.

Xiao Liu [6] et al, investigates about the product differences in the context of individuals in the adoption of E-commerce where the consumer's behaviour is studied. This research investigates the product differences in the context of individuals in the adoption of E-commerce. A theoretical model of E-commerce adoption intention is developed and tested. In this, the consumer's behaviour is studied. This shows that purchasing of goods as compared to the services over the internet the E-commerce adoption decisions are more strongly influenced by their level of risk. While considering purchasing services on the internet, consumers perceptions of ease of use. Some recommendations for the specific use to consumers in adoption to the physical goods, businesses and service businesses are also offered. It refers to the aspects of benefits and E-commerce technology provide for the organization. This examines the consumer experience on the different product types. This considers the services and purchasing of goods with individual customers behaviour. It develops E-commerce research and provides a research framework with the people, information and technology. It strongly makes a decision for the usefulness of the product in E-commerce.

Lina Zhou [7] et al, have proposed an article that suggests a brief overview of social commerce research and practice in light of the wide attention it has drawn in the industry. The study starts by providing a brief overview of social commerce research and practice in light of the wide attention it has drawn in the industry. Then, a research framework with an integrated view of social commerce that consists of four key components: business, technology, people, and information have been proposed. The framework helps to understand the development of social commerce research and practice to date. Subsequently, a report of some preliminary findings from a bibliometric study of academic and industry publications in social commerce to reveal recent trends and research topics, as

well as some verification of the research framework, was prepared.

The concept and naming of social commerce were introduced by Yahoo! in November 2005. Social commerce describes a set of online collaborative shopping tools such as shared pick lists, user ratings and other user-generated content-sharing of online product information and advice.

David Beisel developed the concept of social commerce to denote user-generated advertorial content on e-commerce sites, and by Steve Rubel to include collaborative e-commerce tools that enable shoppers "to get advice from trusted individuals, find goods and services and then purchase them". The social networks that spread this advice have been found to increase the customer's trust in one retailer over another.

Social commerce is used to assist companies in achieving these purposes. At first, according to the customers' social behaviours, social commerce helps companies engage customers with their brands. Second, it provides an incentive for customers to return to their website. Third, it provides customers with a platform to talk about their brand on their website. Fourth, it provides all the information customers need to research, compare and ultimately choose you over your competitor.

Social media tools and content used in the context of e-commerce, especially in the fashion industry are now included in the range of social commerce. Examples of social commerce include user recommendations and referrals, social shopping tools (sharing the act of shopping online), customer ratings and reviews, forums and communities, social media optimization and applications, and social advertising. Technologies such as Augmented Reality (AR) and Artificial Intelligence (AI) have also been integrated with social commerce, allowing shoppers to visualize apparel items on themselves and solicit feedback through social media tools.

Geng Zhou [8] et al, suggests that given this range of choices, information diffusion in group-buying can greatly manipulate consumers' purchase decisions. The study uses large-scale datasets to look up two important characteristics from the top two group-buying websites in China, namely the diffusion process and scrutinize *mass media communication* (MMC) and *interpersonal communication* (IPC) during different timelines in the buying process. The study results indicate that MMC and IPC at the start of the process can positively have an effect on the sales, while it leads to reduced sales during the ending period in fixed-price group-buying. This study provides a number of theoretical observations into group-buying from a new viewpoint, as well as practical management implications.

Jingting Shao [9] et al, suggests in this article that growth in the use of programs to achieve organizational strategy has led to a requirement to understand the leadership competencies of effective program managers. This article demonstrates the results of the first stage of a larger study on the influence of leadership on program results. 15 program managers from a range of industries in China, Sweden, The Netherlands, and the UK were selected for this qualitative, inductive interview-based approach.

This qualitative study aims to develop the constructs for *program context* and *program success* in the research model in order to design a questionnaire for the subsequent quantitative study, to collect data from program managers on the magnitude and mix of leadership competencies needed for successful program management. In addition to the development of measurement dimensions for program context and program success, the results also show that program managers' leadership competencies are a key success factor in program management and program managers' leadership styles are contingent on program context.

3. METHODS AND CONCEPTS USED

The different methods and concepts used till date, their functioning with their merits and demerits are shown in Table I.

Table 1: Methods and concepts used

S. no	Concept/Name	Working / Description	Merits	Demerits
1.	E-commerce or Internet commerce	The activity of buying or selling of products on online services or over the Internet is called as E-commerce.	• It has low financial cost and enables to sell internationally 24/7. • It enables to process a high number of orders quickly and scale a business quickly.	• It is difficult to buy anything if the site crashes. • The market is highly competitive. The customers can be impatient. • It is an emerging trend and less popular than physical retail.
2.	Social commerce	Social e-commerce brings e-commerce functionality directly into social media platforms. It is when social media platforms are used by businesses to make a more personalized and targeted in-app experience shopping experience for consumers.	• Social commerce enables a company to build and maintain relationships that deepen trust and increases loyalty. • It has been proven that social media commerce actually increases the traffic to a company's website which will eventually influence its ranking on search engine results. The companies that use social commerce benefit from a continuously growing and accessible following.	• Negative reviews can greatly affect sales. • Impatient consumers can create problems. Image of an organization and brand values are highly important aspects to be monitored continuously.

3.	Big data	The phenomenon where data sets that are too huge or intricate for conventional data-processing application software to effectively deal with are referred to as Big Data.	• There are many advantages of processing Big Data Analytics in real-time such as, knowing errors instantly within the organization, in implementing new strategies, to improve service dramatically, Cost savings, better sales insights, keep up the customer trends.	• Capturing data and storage, data analysis, search, sharing, transfer, visualization, querying, updating, information privacy and data source are some of the issues faced in Big data.
4.	R Language	R is a programming language and free software environment for statistical computing and graphics supported by R foundation for statistical computing.	• The R language is widely used among statisticians and data miners for developing statistical data and data analysis. • R ranks 15th in the TIOBE index, which is a measure of the popularity of programming language. • It strength includes providing static graphs.	• R commands have less decisive memory management. • The quality of some packages is less than perfect in R. • Native R is slower than its main competitor – Python, Julia and Matlab unless code optimization is known.
5.	RStudio	RStudio is a free and open source Integrated Development Environment (IDE) for R, which is a programming language for statistical computing and graphics. RStudio is an HTML based IDE. It uses R Interpreter at the back-end.	• Viewing larger data and plots without writing to files, this becomes easy when needed to print multiple plots. • Interactive, easy debugging and has auto-complete feature. It gives a detailed view of what is happening.	• Bigger computation tasks will be slower in RStudio compared to running them directly from the command line.
6.	Apriori algorithm	The Apriori algorithm is used for mining frequent itemsets for Boolean association rules. It uses the "bottom-up" approach.	• It uses large itemsets property. It is easily parallelized and easy to implement.	• It requires many database scans. It is very slow.

4. CONCLUSION

This project creates a dataset having discount details for many different products and consumer feedback to do opinion mining. Also creating a three-level classification of distrust levels for the products based on product discounts. This project statistically analyzes the datasets and implements the Apriori algorithm on the given dataset using the R tool and to create a webpage to display the output after data analysis by linking the XML document with R tool.

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