Improvising E-commerce Application based on Consumer Behaviour Analysis and Data Privacy Constraint

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Abstract In this era of internet, e-commerce is growing by leaps and bounds keeping the growth of brick-and-mortar businesses in the dust. In many cases, brick-and-mortar businesses are resorting to having a counterpart which is internet or e-commerce driven. People in the developedworld and a growing number of people in the developing world now use e-commerce websites on a daily basis to make their everyday purchases. To remain ahead in this race of digital revolution the e-commerce websites needs to understand the consumer behavior for better business. The paper discusses about the need for local vendors to boost to e-commerce platforms and increase their customer range. It also outlines different aspects of developing an e-commerce website for these vendors for making them digitally compatible with the growing market. The study goes ahead to consider the factors on which the behavior analysis of consumer is performed and need of the data privacy for an e-commerce application.

Introduction

Information development has experienced a renaissance, affected fundamentally by controls of computing cheaper than ever and the ubiquity of the web. This has driven to a worldview move within the E-commerce sector; as information is now not seen as the by-product of their trade exercises, but as their greatest resource giving: key experiences to desires of their clients, by anticipating swing in the behavior of their consumers, advertising varied methodologies to gain consumer trust and provide them items in varied range. Since e-commerce is a wide and an

upcoming market place so the base of our project will be to analyse and process what are the most searched items by consumers and overall consumer behaviour. Depending on that we will develop an algorithm for our website in which people will get the best possible product for the kind of item they want. Also, privacy is a very important aspect when we discuss any E-Commerce Application thus our project also works on the concept of data privacy and security of customer credentials.

LITERATURE REVIEW

The study of Consumer Behavior is the study of how people settle on choices to expend their accessible assets (time, cash, and exertion) on utilization of things they buy. It takes into account the investigation of what they purchase, why they buy it, when they get it from, where they get it, how regularly they buy it, and how frequently they use it. It summons up components from brain science, humanism, social human studies and financial matters. Purchaser conduct objective is to encompass the purchaser dynamic cycle, in gatherings and separately as well. It considers attributes of individual customers, for example, socioeconomics and comprehend individuals' needs. In spite of the fact that this subject examination on how and why buyers settle on choices to purchase merchandise and ventures, purchaser conduct research goes a long way past these aspects of customer conduct and envelops the entirety of the practices that buyers show while buying products online, buying using, evaluating, and discarding items that they key expect will fulfil their requirements. The sort of purchasing depends on what the customers buy at the end. This sort of purchasing practice

requests shoppers to exceptionally include inside the cycle. If there should be an occurrence of high inclusion, buyers recognize remarkable contrasts among the contending brands. Purchaser conduct objective is to comprehend the purchaser dynamic cycle, both separately and in gatherings. It considers attributes of individual customers, for example, socioeconomics and comprehend individuals' needs. In spite of the fact that this subject examination on how and why buyers settle on choices to purchase merchandise and ventures, purchaser conduct research goes a long way past these aspects of customer conduct and envelops the entirety of the practices that buyers, buying using, evaluating, and disclosing items that they feel will meet their requirements. This practice generally included shoppers settling on a buy choice. This sort of purchasing practice requests shoppers to exceptionally include inside the cycle. The straightforwardness and productivity of this methodology, notwithstanding, accompanies protection and security hazards. Classification of information is the principal obstacle in usage of cloud administrations. An immense server farms are set up in distributed computing, however the organization of information and administrations are definitely not dependable. These make different new security challenges. These difficulties are weaknesses in openness, virtualization and web, for example, SQL infusion, cross web page scripting, physical access constraint, security issue happening because outsiders have physical control of information, problems associated with identification of personality and information affirmation.

II.   SURVEY ON UNDERSTANDING CONSUMER BEHAVIOR

A general survey was conducted on several factors upon which the trend of consumers buying products online was observed. The survey included the following questions
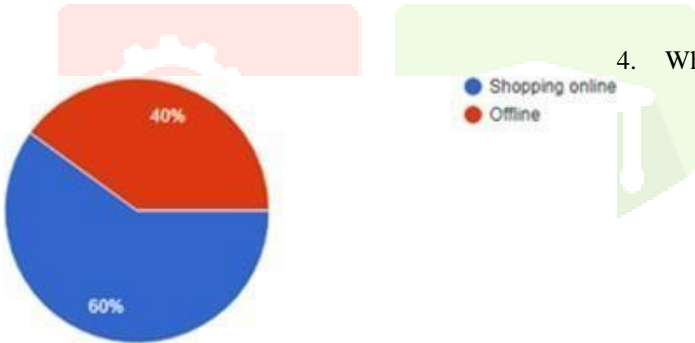
1.   What do you prefer?

Figure: 1

Figure 1 states that 60% of respondents preferred to purchase products online.

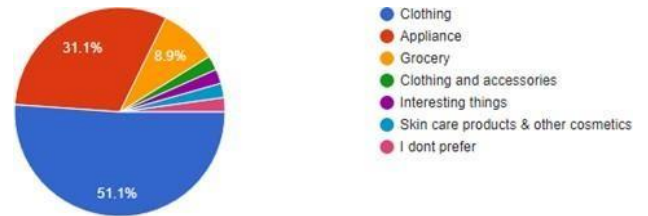2.   What do you look for when purchasing online?

Figure: 2

Figure 2 states that most of the respondents preferred clothing while purchasing products online.

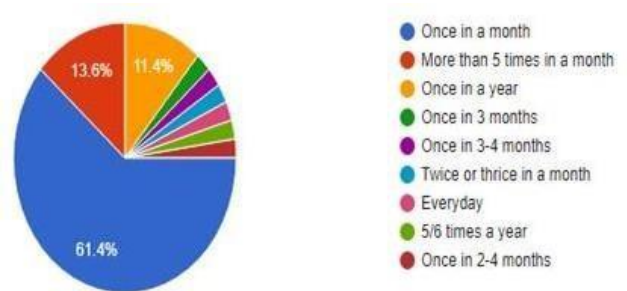How frequently do you shop online?

Figure: 3

Figure 3 states that the respondents opted for online shopping once every month.
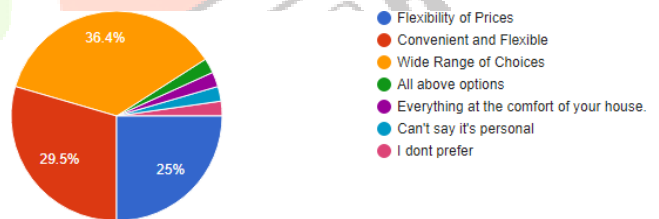
4.   Why do you prefer online shopping?

Figure: 4

Figure 4 states that most of the respondents preferred online shopping because of the wide range of choices.

Thus from these factors it can be inferred that the trend of purchasing clothing category products online has increased because of the wide range of choices available.

III. PROPOSED SYSTEM

The year 2020 has certainly been a wakeup call for the technology as it has pointed out the importance of Ecommerce, Online Transactions, Digital Payments, etc. because it has numerous advantages like anytime and quick accessibility, variety, cashless payment, price and product comparisons, discounts, etc. Small- and Large-scale businesses worldwide suffered heavy losses with the exceptions of companies like Amazon which made record making progress in this pandemic. There has been a spike of 146% in the annual sale of online market places. Now is the moment to go "Vocal For Local".

It is important to have a secured ecommerce infrastructure to connect nearest required local business to customers. Startspark is the company which connects customers with local businesses, sells their products connects two businesses, etc. In this project we aim to build an ecommerce website for the company and provide data privacy and data analysis. Data analysis done from undertaken data will provide pattern in consumer behavior. Data analysis can be done on the search engine searches, which searches trend in what period. User data can be used to understand the consumer behavior regarding which products/services are popular among which gender, age group, regions, etc. Based on the analysis recommendation can be provided for boosting the sales. Data Privacy will be applied to secure user data so that there is no misuse and the data will be protected. Along with that a secured payment gateway can be created for online transactions.

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IV. WORKFLOW

For this application there will be user side and admin side. The users can enter the site and login or create an account. Instead, they can skip it and just view the products. They can search the products and add to cart. Once the customer is ready to buy a product, the customer must be logged in into its account. After that payment option can be selected and order can be placed. Then the customer can continue shopping. Admin side sends the invoice for orders and stores the data of user, searches, orders placed, delivered, etc. Based on this data consumer behavior is understood.
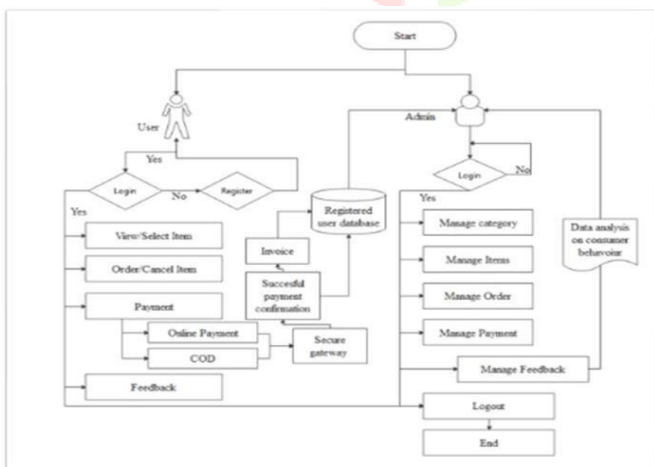
V. DATA PRIVACY GENERAL DATA PROTECTION REGULATION

With the shift from traditional general store shopping to the upcoming e-commerce shopping platform there has been a huge change in the trend of lifestyle of people. With the new shopping platforms which involve payment methods by linking their bank account and confidential details there comes the need to provide a secured data privacy techniques and platforms for the customers shopping online. The principle of privacy by design (PhD) means the privacy of the design during the entire process from design to the development of the product. For PhD to become viable it must be productively involved in the loop. From the engineer's mindset privacy is just considered from the pan aroma of data secrecy and for that reasons many regulations were put forth by the government on data protection and privacy. The GDPR states that the control of Information Security should be in the hands of European Union and European Financial Range (EFA). It too provides information outside of EU and EEA ranges. GDPR defines DPIA in its Art. 35. The outcome to high risk to rights of the individuals and freedoms of individuals should be carried out by Data Protection Impact Assessment whenever it is possible. DPIA is a tool whose main purpose is to systematically analyses, identify and minimize the risk of data processing for the rights of data subjects. In other words, it is a tool that helps the person who controls demonstrate compliance with GDPR obligations.

VI. PERSONAL DATA PROTECTION

Another such charge is the PDP charge of India which is India's to begin with information assurance charge. The Individual Information Security Charge (PDP Charge) is India's to begin with endeavor to locally administer the components for the security of individual information and points to set up a Information Security Specialist within the nation. The Charge controls the handling of citizens' individual information by government, companies consolidated in India, and outside companies that are managing with individual information of clients in India. The proposed Charge moreover permits preparing of information by fiduciaries with the assent of the person. An information guardian is a person or substance that chooses the reason of handling individual information. In any case, the Charge moreover grants single information handling without assent in a few cases like, when the government giving benefits to the person, for lawful procedures, and in therapeutic crises. The Charge directs three categories of information – Individual Information, Delicate Individual Information, and Basic Individual Data. The Charge characterizes Individual Information as any data that's collected online or offline which can be utilized to recognize an individual, like title, address, phone number, area, shopping history, photos, phone records, nourishment inclinations, motion picture inclinations, online look history, messages, gadgets clients claim, and social media

movement. Touchy Individual Information incorporates wellbeing care information (like private data you share with a specialist or healthcare apps), budgetaryinformation (managing an account and installments data), sexual introduction, biometrics (facial pictures, fingerprints, iris looks), caste or tribe, devout and political convictions. The proposed Charge gives tall need for person rights on information assurance. As per the Charge, citizens' individual data can't be collected, handled, and shared without their assent. As it where the essential information will be collected and can be utilized for pre-defined purposes as it were. The companies are required to be clear and brief on what information is collected, its reason, how it's utilized, and for how long the information will be held. The Charge too licenses clients to move their information from one supplier to another and permits clients to know the number of companies with whom the information is shared. In terms of information localization, the Charge permits exchange of individual information over borders without any restrictions. Be that as it may, limitations are set on "sensitive individual data" which must be put away in India. Touchy individual information can moreover be prepared exterior the nation on the off chance that the controller endorses it. For "critical individual data", the government will notify on its claim, which should be put away and prepared inside the country.Based on all these variables and inquire about we have created the demonstrate of our information protection will be created as per the controls of PDP. In terms of data secrecy, the model will have role-based access in which onlya fewindividuals from the companywill be given the access to the Sensitive Personal Data of the customers stored in the database who have shopped from the application and have performed actions which gives information about their sensitive personal data. In this way, using the role-based access the data secrecy of the individuals can be achieved as very less people will be given access to the confidential information. Another theory proposed in our system is that the sensitive personal data of any individual will be stored in our database for only 20 days and later the data will be vanished from our servers in this way, the secrecy and integrity of the customers data can be achieved. The period of 20 days is kept for insurance or if there is any return initiated by the customer then the money can be transferred to their respective accounts. If the data is stored for a long period of time then it becomes risky if the protective methods are not taken by the authorization, using this method the risk of data getting hindered can be decreased. Another method proposed in our system is that while making transactions online the customers are redirected to secured payment gateways so that the sensitive information of the customers remained secured.

Figure: 7

The figure 7 shows the sales of a local online store in India during the pandemic period and from the graph we can infer that the sales of the clothing section was comparatively high as compared to other categories
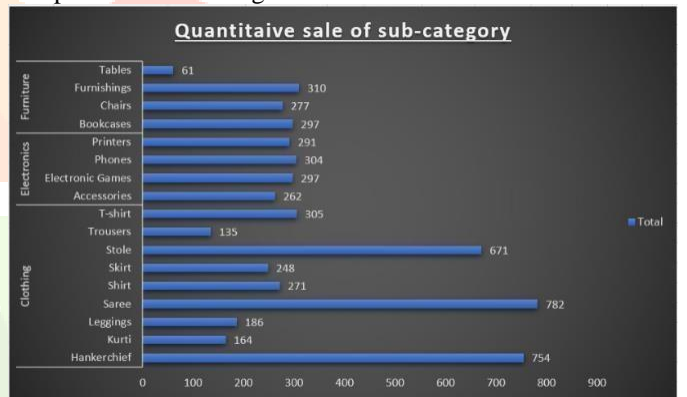

Figure: 8

This figure shows the sale of sub - category of the products the company has. From this we infer that despite the pandemic situation the company was able to make sufficient profit because of their presence in the online market whereas most of the offline companies suffered huge losses.

VII. RESULTS AND DISCUSSION

Analysis was carried out on data available from a local online store to understand the importance of the E-commerce application and its use in the current pandemic situation.

VIII. CONCLUSION

In general, today's businesses must continuously work to make another customer attractive product that buyers will be attracted towards because each and every buyer in today's world craves for new products that are, superior, and value to money. In the world of unused innovation, businesses need to change and mold themselves towards the need of the customers since it'll demonstrate to thrive their business towards victory and

survival. In the upcoming world the trend of shopping is going to shift to e-commerce platforms and companies shouldtake advantage and shift themselves to the upcoming platforms. From the start of the Web and e-commerce, the admissible outcomes have gotten to be never ending for both businesses and shoppers. Making more customer base and progressions for businesses, whereas making more available choices to choose for from for customers.

So, in conclusion the paper discusses about the data analysis and data protection of e-commerce website. It is important to have a secured ecommerce infrastructure to connect nearest required local business to customers. Also, analyzing the data provides the seller to understand the consumer behavior and plan for the present and the future of their business.

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