E-Commerce with Contextual Awareness

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Abstract : Electronic-Commerce is process of doing business through computer networks. A person sitting on his chair in front of a computer can access all the facilities of the Internet to buy or sell the products. Unlike traditional commerce that is carried out physically with effort of a person to go & get products, ecommerce has made it easier for human to reduce physical work and to save time. E-Commerce which was started in early 1990's has taken a great leap in the world of computers, but the fact that has hindered the growth of e-commerce is security. Security is the challenge facing e-commerce today and there is still a lot of advancement made in the field of security. The main advantage of e-commerce over traditional commerce is the user can browse online shops, compare prices and order merchandise sitting at home on their PC. To simplify and enhance this experience for user, we are introducing contextually aware chat-bot to the website which will help customers with their shopping. The purpose of the bot would be to only show the products that the customer is looking for and not suggest something other than that particular product. The aim of our website is to be precise with the results and not allow any suggestions that may later on refine the searching algorithms.

IndexTerms **- E-Commerce, Contextual Searching, Chatbot**

I. INTRODUCTION

E-commerce is a transaction of buying or selling online. Electronic commerce draws on technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems. Modern electronic commerce typically uses the World Wide Web for at least one part of the transaction's life cycle although it may also use other technologies such as e-mail. Typical e-commerce transactions include the purchase of online books (such as Amazon) and music purchases (music download in the form of digital distribution such as iTunes Store), and to a less extent, customized/personalized online liquor store inventory services. There are three areas of e-commerce: online retailing, electric markets, and online auctions. E-commerce is supported by electronic business.

A chatbot (also known as a talkbot, chatterbot, Bot, IM bot, interactive agent, or Artificial Conversational Entity) is a computer program which conducts a conversation via auditory or textual methods. Such programs are often designed to convincingly simulate how a human would behave as a conversational partner, thereby passing the Turing test. Chatbots are typically used in dialog systems for various practical purposes including customer service or information acquisition. Some chatbots use sophisticated natural language processing systems, but many simpler systems scan for keywords within the input, then pull a reply with the most matching keywords, or the most similar wording pattern, from a database.

The term "ChatterBot" was originally coined by Michael Mauldin (creator of the first Verbot, Julia) in 1994 to describe these conversational programs. Today, chatbots are part of virtual assistants such as Google Assistant, and are accessed via many organizations' apps, websites, and on instant messaging platforms. Non-assistant applications include chatbots used for entertainment purposes, for research, and social bots which promote a particular product, candidate, or issue.

II. LITERATURE SURVEY

In order to materialize the above mentioned terminologies, we need to look into the basics of how they work and how to create them. For this purpose, we have referenced two papers which helped us understand the domain better and how to progressively work and improve it.

The paper [1] "DEVELOPING AN E-COMMERCE WEBSITE" by Syed Emdad Ullah, Tania Alauddin and Hasan U. Zaman of North South University, Dhaka, Bangladesh give a vivid idea to the readers about the fundamental pieces of an E-commerce website and their contribution.

The four main fundamental pieces that were talked about in the paper are:
- Registration Page
- Search
- Shopping Cart
- Billing

Registration Page plays a crucial role in an E-Commerce website as it is the portal where the customer submits all his/her personal information. This personal information needs to be kept safe while it also needs to be constantly used so as to curate the customer's feed accordingly.

Search is another important piece as it helps users find the commodities they are looking for. Searching needs to be fast and accurate so that it becomes easier to look for commodities. Around 74% of redirection to a commodity is through the search bar, according to the research by the authors. In order to improve searching, better searching algorithms should be employed that can utilize the information of the user along with the search contents to yield better results in a short amount of time.

Shopping Cart is another important piece of the site which temporarily stores all the commodities that the customer wishes to purchase. Items added in cart need to be updated in real-time with storage facilities so as to keep count of the quantity in check. While this sounds simple, the task itself is very complex and requires precision because if wrong data is fed to the system, it could lead to large orders without the resources to meet the demands.

Billing is the last bit of the problem. Billing deals with the payment of bill for the orders. Billing needs to be handled with care as it contains a lot of sensitive information about payment. Details like credit/debit card number, payment wallets, third-party payment gateways, etc. are stored in the database. Special security measures need to be enforced when payment is being processed, in case some threat persists.

This paper has not only provided us with some quality insight but has also instructed us in creating an E-Commerce website for ourselves. We stuck to the simple fundamental bits and made a functional website and later on proceeded to personalizing it with colours and styling. Some trivial parts of the website may not be fully functional yet but all the core features that are required for an E-Commerce website are present and completely functional.

The paper "E-COMMERCE PERSONALIZED RECOMMENDATION SYSTEM BASED ON WEB MINING TECHNOLOGY DESIGN AND IMPLEMENTATION" by Sun Lin and Xu WenZheng of Shandong University of Science and Technology, China propose a broad alternative approach for refining searching and recommending on an E-Commerce site.

According to the aforementioned authors, they employ Web Mining to make their search more extensive and thorough. Along with this, they use the same Web Mining to personalize recommendations for every user so that it becomes easier for them to purchase those products. They employ Web Mining by breaking down the website in three components and extract information out of it. These three components are:
- Server Logs
- Error Logs
- Cookies Logs

These three logs contain information about the various products and commodities the user has browsed on their website. This can be extended beyond the website itself as these logs are present in the memory of the web browser. This also makes it possible for the site to personalize the recommendations by suggesting articles and items viewed by the user on other websites.

The paper also talks about using Query Data from the PHP code of an E-Commerce website to generate what is called a "Buying Trend". Buying Trend allows them to tend to the sales of items in an orderly fashion by governing discounts on products with the help of demand and supply and statistics.

Although Web Mining is our proposed solution to the problem, we shall not be employing it as we personally feel it violates certain privacy rules. Instead, we want to address the problems with a similar approach and make our website feel as cognitive and sentient as possible.

III. CHALLENGES ADDRESSED

3.1 Personalization

Since there are thousands of products available on an E-Commerce site, it is important to know the buying trend of users so as to provide them with better suggestions. This can be achieved by monitoring the buying trend and sending personalized suggestions about the products that are added to the cart, in case it turns out to be what the user is looking for. Personalized emails can also be sent for the same purpose. Personalizing a site based on the user's needs and history is one of the best ways to retain them and refrain them from using another platform.

3.2 Search Enhancements and Site Navigations

While surfing through numerous websites and apps, search results play a vital role in converting a mere search into a profitable sale. Not only providing the user with an exact suggestion but also providing them with relevant options is important to the cause. Website navigation should also be user-friendly so as to attract and retain customers.

3.3 Buying Trend

Buying Trend accounts for the personal information of the user and their history with the site. With the help of data collected, suggestions can be personalized and sent to the user so as to make them wary of the products available that he/she might be looking for.

IV. MODULE DESCRIPTION

4.1 Login & Registration

This module is used to verify whether the user accessing the service has an account registered to their name onto the database. After a user has been registered to the website, their details get stored onto the database. A user need not register again once he/she has registered already. The login details provided are stored onto a discrete user info database and thus remain discrete.

4.2 Homepage

After the user has logged in, a homepage is displayed. It acts as a user friendly interface for ease of interaction between the user and remote database. The homepage also acts as a centralized location for all the other modules present throughout the project.

4.3 Categories

Categories contain the different types of products available on the website. Products are grouped together and are displayed accordingly so that users can easily buy similar products without having to search for them.

4.4 Cart

The Cart or Shopping Cart is where all the users add the products that they wish to buy. Products added are regulated by number of items and their respective prices. The user can neatly view all the products that he/she has added in the cart and proceed to finalize the order.

4.5 Chatbot

Chatbot is an interactive two-way communication portal where the users can ask their queries and doubts and the bot will answer, trying to answer and clear all the doubts and questions that the user might have.

V. DEVELOPMENT TOOLS

5.1 Frontend Development

For frontend development, we have used HTML, CSS and PHP to design our website.

5.2 Backend Development

For backend development, we required a Database Management System so we have used MySQL.

REFERENCES

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