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Operational Intelligence for Retail Industry

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ABSTRACT

Operational intelligence in a new domain which is being explored by every business industry to know their customers in a better way possible and satisfy their need. Whenever customers want to purchase any product from a retail website, they put a lot of time in searching for the right product at right price from right place. It becomes difficult to get all these things at one place customer has to check all the sites on which the product is available and then compare and then decide even after deciding he is not sure whether he is getting the product at right price and getting all this information at real time is tedious task. The main objective involves, getting the required information of product price from different websites at real time whenever the customer wants to make a comparison. Giving appropriate discounts on the product so that the business is not in loss and the customers are retained, sending proper messages to respective customer at proper time regarding the best offers. Tracking the customer activities and making its use to the fullest for the benefits of the business industry. The websites which are present till date to not help customer find the right product at right price no real time comparison of product prices is shown at one place. The customer select product after doing his research and then purchase the product depending on the reviews of the product and the feedback from other customers. There is no mechanism to check whether the reviews provided by other customers are genuine or not. Getting all the information about price at a single place will save time and won't keep a customer in a blind spot while purchasing the product from right place at right price. They will get instant messages regarding the rise or fall of prices or the discounts which will be provided along with that they do not need to worry about the feedback of the product as the products which are being provided is from same brand or company which other websites provide. The website is just a platform for B2C e-commerce

Keywords: Operational Intelligence, Retail Industry, Data Mining, Web Crawler, Python Django, B2C commerce

1. INTRODUCTION

Artificial Intelligence will have a major impact on the retail industry and all the retailers that aim to remain stable in the competition should not neglect the benefits of the technology. However, in the present fast-paced, data-driven economy, the business intelligence moves too slowly. Operational Intelligence (OI) is the ability to analyze live, fast changing data that provides new opportunities with immediate feedback taking the BI to another level. OI solutions run query analysis against live feeds and event data to deliver real-time visibility and insight into business and IT operations. Machine-generated data is one of the fastest developing and most complex areas of big data analysis. It contains definitive record of the user transactions, customer behavior, machine behaviors, security threats, fraudulent activity and more, thus making it one of the most

2. METHODS AND MATERIALS

2.1 Requirements

1. Web browser
2. Windows Operating System
3. Windows XP, Windows 7,8
4. MySQL Server
5. Python 3.7 version

Some methods to the most difficult business problems

1. Determine patterns in customer behavior
2. Provide proper discounts to the right customer
3. Monitor the usage of companies' resources
4. Helps in cost control
5. Scale performers in the organization
6. Eliminate time spent on data entry
7. Maintain customer relation
8. Increases sales and revenue

3. METHODOLOGY

3.1 Planning

Proposing Statement of work, scope definition and scope boundary for planning the prototype from the problem definition to decide how to use operational intelligence in retail. Deciding which software and tools to use for implementing the proposed idea

3.2 Analysis

Creating the synopsis, literature survey and feasibility study for proposed solution which will act as an input to the design phase. Navigating other websites and selecting top websites to performing web scrapping

3.3 Design

Creating a website where price comparison will be provided and discount message will be generated at real time.

3.4 Coding

- Two demo websites and 1 application will be created to show comparison using bootstrap and Android App Development with Apache web server
- Getting information from others website using web scrapper
- Tracking user at real time and sending discounts messages through SMS gateway.

There are various factors which should be known prior to developing a good product or software. It is important to know all the strengths and weakness along with the approach and feasibility of the product. The requirements should be managed and these factors ultimately maintain the cost and value of the project. The more the feasibility of the project, there minimum chances of risks and threats and more the possibility of correct development of the product. There are various types of feasibility study that can be performed on a project:

- (a) **Technical Feasibility:** It is very important to know the technical limitations and the technical feasibility of the product for proper development of the project. It says that the product must be delivered with the easily available technologies, languages and skill set. The data must be recorded in proper databases with good security. In the system we have developed, we have used node.js and firebase which are commonly used and can be easily installed.
- (b) **Operational Feasibility:** Operational feasibility will verify if the proposed system is according to the wish-list and requirements of the customer and if the project will solve the problems. The product build is the right way and works according to the process producing accurate results. In our project, the website must compare the real-time rates of the products and give the notification as early as possible.
- (c) **Economic Feasibility:** In the economic feasibility we check the estimated cost and the resources available for the project. The proposed system must be within the limits of the budget and benefit the developers along with the users. The project we have developed is economically feasible as there is only software and programming technologies required and absence of any hardware devices reduces the overall cost of the project.
- (d) **Legal Feasibility:** Legal feasibility maintains the proposed system and makes it follow all the legal requirements and checks if any government policies may be a threat to the project. Our project uses web scrapping which some of the already existing websites do not allow, thus to avoid that we have created our own new sites to scrap and display the results for the same.

(e) Procedure methodology

- Creating a demo retail website.
- After a customer login we will check whether the time period since when is the customer engaged with the website what products he had purchased and what products he had viewed by using machine learning classification algorithm.
- Depending on the customer and the product added in the cart. Discounts will be provided as per classification of the customer
- We will perform web scrapping for that product to show the customer price comparison of same product from different websites.
- Discounts will be provided at real time when the customer is navigating the website
- For Coupon codes or offers notification will be send to the user through email or SMS regarding the same.

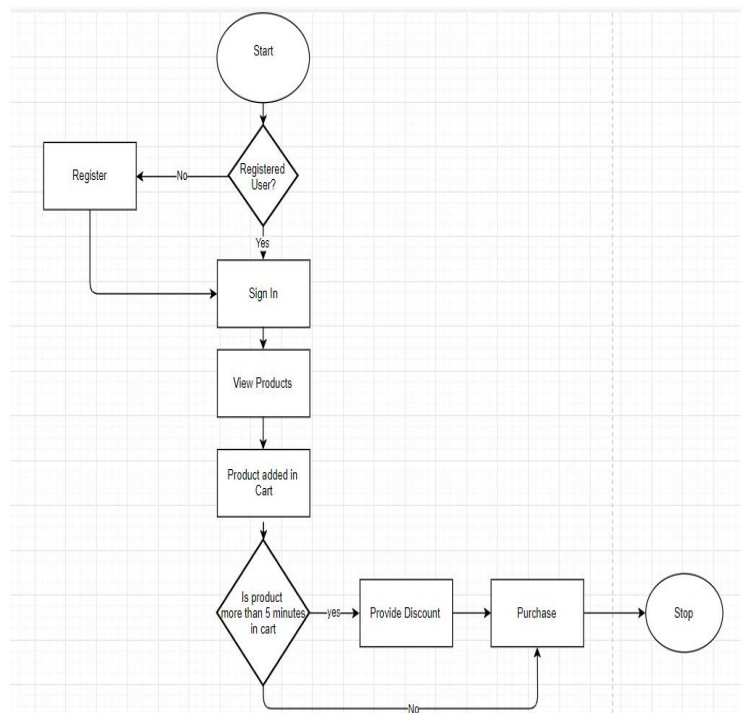


Fig. 1: Methodology Flow Chart

Major Technologies Required:

- (a) Website: - HTML5, css3, jQuery, JavaScript, bootstrap.
- (b) Web Server: - Apache.
- (c) API/Middleware: -Express.js with node.js
- (d) Cloud: Amazon web services or Digital Ocean.
- (e) Real-time Database: Firebase Real-time DB.
- (f) Android: Java + XML
- (g) Web Scrapping: Cheerio and Request.

4. RESULT

- (a) Proper and more efficient way of getting real time information of another website
- (b) Price comparison of same product from different websites at single place
- (c) Easier to track the user’s activities.
- (d) Easy way to provide discounts and send message at real time.
- (e) Customer satisfaction and retention.

5. FUTURE SCOPE

While operational Intelligence (OI) is growing rampantly in developed countries, India is still warming up to it. Product which are out of stock and are if they are available on other websites we

can display those websites Customer data is like a gold mine we can check customer loyalty and provide customized discounts at real time and Operational Intelligence can help businesses leverage this data to increase customer traffic and satisfaction and generate revenue.

6. CONCLUSIONS

1. Although no website can give result at exact real time, this project aims to minimize the time and show exact prices of product from other websites. This proposed system provides a reasonable idea to achieve and improve e- business and generate huge traffic
2. In the proposed model, a website is presented in which after customer puts the product in the cart or add to his/her wish list a real time comparison is provided to the customer of the same product from various other website.
3. Depending on the activities of customers and the information available if the price of product is more than other websites and a discount will be provided the same will be informed to customer through a message.
4. The customers can use the website to compare prices of product even though he is not interested in purchasing that particular product by seeing the discounts he will be lure to purchase it.
5. These websites can help other websites to sell their products as their websites will be mentioned in comparison list.
6. For future use we can extend the use of the website to help customer find the products which are out of stock in several websites and available on some other websites which the user may not be aware of.

7. Further the project may also tries to provide customized discounts for each customer based in their loyalty.
8. There are areas in which the proposed ides can be improved upon and further use operational intelligence to satisfy customer.

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