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# Extraction of Product's Price using Binary Search Algorithm for Online Shopping

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**ABSTRACT:** Along with the electronic commerce development, the behavior of shopping online becomes more common. It is to be hoped that compare prices in different shopping website before you buying. As a distributed intelligent technology, multi-agent is used in Comparison Shopping Website, to improve the customer shopping experience and online shopping services quality. In this paper, multi-agent technology application for Comparing Shopping prices is proposed.

**KEYWORDS:** pricing optimization, binary search algorithm, DCTs, Python IDLE

## I. INTRODUCTION

Comparison Shopping is emerging to adapt to the development of e-commerce. It's originally aim is to provide consumers more information from many kinds of online retail website, such as commodity price, website reputation, convenient shopping. With the development of comparison shopping site, its role is not only for the convenience of online consumers, but also offer an opportunity to promote their products, the role is similar to a search engine in fact. And the information in search results from the comparison shopping website is more concentrated and more comprehensive than general search engines, such as the value, the evaluation of online retailer, etc. So comparison shopping site is evolved into shopping search engine gradually.

The aim of comparison shopping is to establish efficient collaborative work mechanism among many shopping site, and the ultimate aim is that building a "one-stop" virtual service platform between the online retailer and the public, and provide a fastservice channels of information service, to provide efficient and high-quality shopping services. So comparison shopping system has distributed informative resources, and complex conduct interaction, collaborative management and decision-making difficulties and so on. So, distributed and intelligent is the key issue that comparison shopping to faced.

In the current study of shopping system, web technologies as the mainstream technology of architecture promote the development of shopping system. With in-depth study of shopping system, the information sharing among online retailer have become more efficient high, web technology is clearly unable to meet this need. Multi-agent provided a new way for informationization of shopping system.

The goal of comparison shopping system is to provide user a one-step shopping site to compare prices and other properties, in order to guide the user shopping. This requires comparison shopping system can intelligent get more similar information from a large number of shopping sites.

Comparison shopping can be defined as "the practice of comparing the prices of items from different sources to find the best deal" [1]. Price comparison websites provide the online alternative to this and we, therefore, define online price comparisons as the online tool that allows for the comparison of item prices from different sources to find the best deal. The use of price comparison websites has been acknowledged as an important search information tool, which has strong potential to alter shopping behaviour both in the online and offline environment ([2]; [3], [4]; [5]). Osakwe and Chovancová [4] describe price comparison websites as "a near-frictionless marketing intermediary that can drive down online shoppers' search costs".



Because shoppers can easily compare prices of similar firms and/or brands in a matter of seconds, the active use of price comparison websites not only reduces search costs but also empowers shoppers to buy from firms offering the best deal. This study argues that the greater the perceived usefulness of price comparison websites, the more it is expected that shoppers will use the information available on these sites in their pre- and post-purchase decisions. It, therefore, acts as a key mediator in the relationship between key influencing factors and online switching behavior. From a consumer empowerment perspective, it is pertinent to consider how these websites influence the relationship between eSwitching and shopper innovativeness, perceived usefulness of an ad and the consumers' service experience consciousness. Each of these now discussed in turn.

DCTs (Digital Comparison Tools) [6] aim to help consumers by bringing together a number of products or services, offering a variety of ways to help them choose between options, and sometimes to make purchases or change providers. They offer two types of benefit: first, they save time and effort for people by making searching around and comparing easier and more appealing, particularly for household services that are often complicated and not immediately interesting to people. Second, they make suppliers compete harder to provide lower prices and better choices to consumers. Overall DCTs should result in lower prices and better choices, particularly where we know from past work that people often do not shop around – such as in energy and financial services. DCTs offer these benefits in a variety of ways, from the most basic 'best buy' tables, to the traditional 'Price Comparison Website' (PCW) and increasingly to more automated services enabled by newer technology. DCTs typically provide their services free of charge to consumers and make money by charging a commission to suppliers.

DCTs help consumers compare products and services by presenting a list of relevant offers from a panel of suppliers. The way they deliver comparison services can vary enormously between individual DCTs and across sectors (and indeed between comparisons for different products on the same DCT). This variety has increased over time, particularly as new and innovative approaches have developed.

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## II. LITERATURE REVIEW

E-commerce relationships can generally be modeled using a bipartite graph. One part of this chart is made up of customers and the other part consists of e-shops (dealers). Edges show customer activity when visiting websites of various online stores. These links, however, enter online price comparison sites (PCS, comparators, shopbots), such as Heureka. PCS makes it easy to compare the prices of the desired product in different online stores. These comparative pricing not only show the price in different e-shops, but also the assessment of the relevant e-shop made by customers. The issues addressed in [7] are the strategy chosen by the pricing comparator for entering the market, when it is worth closing down online pricing comparison services, etc. In this paper, network analyzes and simulation methods to model network dynamics are used to address these issues.

In [8], an online retailer, Rue La La, as an example of how a retailer can use its wealth of data to optimize pricing decisions on a daily basis is presented. Rue La La is in the online fashion sample sales industry, where they offer extremely limited-time discounts on designer apparel and accessories. One of the retailer's main challenges is pricing and predicting demand for products that it has never sold before, which account for the majority of sales and revenue. To tackle this challenge, we use machine learning techniques to estimate historical lost sales and predict future demand of new products. The nonparametric structure of our demand prediction model, along with the dependence of a product's demand on the price of competing products, pose new challenges on translating the demand forecasts into a pricing policy. An algorithm is developed to efficiently solve the subsequent multi-product price optimization that incorporates reference price effects, and they create and implement this algorithm into a pricing decision support tool for Rue La La's daily use. The authors estimated an increase in revenue of the test group by approximately 9.7% with an associated 90% confidence interval of (2.3%, 17.8%).



In [9], a generic framework and applicable techniques by applying sound machine learning algorithms to enhance right price purchase (not cheapest price) by customers on e-commerce platform is developed. This study focuses more on inventory led e-commerce companies, however the model can be extended to online marketplaces without inventories. Facilitated by statistical and machine learning models the study seeks to predict the purchase decisions based on adaptive or dynamic pricing of a product. Different data sources which capture visit attributes, visitor attributes, purchase history, web data, and context understanding, lays a strong foundation to this framework. The study focuses on customer segments for predicting purchase rather than on individual buyers. Personalization of adaptive pricing and purchase prediction will be the next logical extension of the study once the results for this are presented. Web mining and use of big data technologies along with machine learning algorithms make up the solution landscape for the study.

In [10], a brief introduction to the historical origins of quantitative research on pricing and demand estimation, point to different subfields in the area of dynamic pricing, and provide an in-depth overview of the available literature on dynamic pricing and learning. Their focus is on the operations research and management science literature, but we also discuss relevant contributions from marketing, economics, econometrics, and computer science. The topic of dynamic pricing and learning has received a considerable amount of attention in recent years, from different scientific communities.

The study “Consumers attitude towards online shopping in Jodhpur” [11], was undertaken to find out how frequently the respondents access the internet for shopping and the factors influencing online shopping on consumer behavior of selected young respondents. The study concluded that the respondents using the internet on a daily basis to support their work but accessing the internet for online shopping occasionally. Saves time, comfortable, relaxed shopping, detailed product information and easy price comparison are the main factors influencing online shopping.

In [12], an exploratory approach about the history of online shopping engines, their operating modes, categories, and business plans as well as how they are perceived, used and evaluated. Then, a detailed identification of the various shortcomings that CSEs manifest on the side of both e-consumers and e-merchants was presented in order to eventually discuss the numerous innovations and scientific research which have been developed on the subject.

### III. PROPOSED SYSTEM

#### A. Block Diagram

A comparison shopping engine is an online service centralized in a website which, based on a request for a product or a service (bag, computer, washing machine, trip, hotel reservation...), will establish a list identifying certain factors of the product/service sold by several e-commerce platforms. The first shopping engines appeared in the mid-1990s. BargainFinder was the first widely recognized product comparator; it was developed by a team led by Bruce Krulwich who worked for Andersen Consulting (now Accenture) in 1995. In 1995, BargainFinder was followed by the first price comparator, called Jango, created by the start-up Netbot, which was acquired by the Excite portal at the end of the same year. Other start-ups were also interested in comparison shopping engines technology such as Jungle, which was acquired by Amazon.com, pricewatch.com, killerapp.com and NexTag which was nominated by Times Magazine World as one of the top 50 websites in 2008.

Following the problems generated by the excessive overload of the Internet user with online sales offers. complexity of  $O(\log n)$ . This search algorithm works on the principle of divide and conquers. For this algorithm to find or the interval is empty. Binary search is a fast search algorithm with run-time

The consumer is relieved to turn to comparison shopping engines to save time and energy. In order to measure consumer satisfaction with this service, this article focused on carrying out an investigation into the comparison shopping engines. The investigation proved interesting in that several shortcomings and limitations were revealed in the quality of the services provided to e-consumers, which is still particularly dissatisfied with the lack of integration of several criteria in addition to the price in the evaluation and comparison of offers. Block diagram of proposed system is shown in figure below.



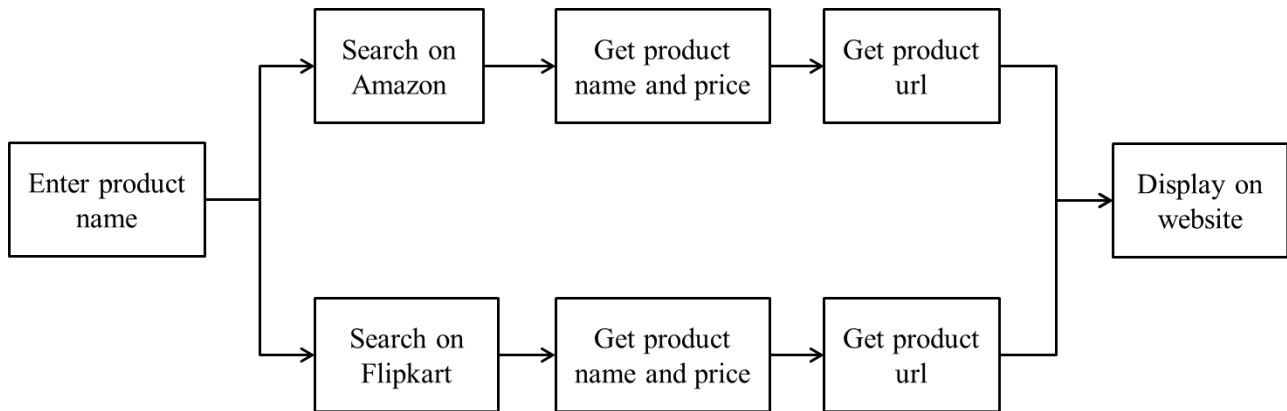


Fig. 1. block diagram of proposed system

User has to first enter product name, system automatically searches product on Amazon and Flipkart. System updates name of product and price on GUI (Graphical User Interface). System updates products url and display on website.

### B. Binary Sorting Algorithm

Search a sorted array by repeatedly dividing the search interval in half. Begin with an interval covering the whole array. If the value of the search key is less than the item in the middle of the interval, narrow the interval to the lower half. Otherwise narrow it to the upper half. Repeatedly check until the value is work properly, the data collection should be in the sorted form.

Binary search looks for a particular item by comparing the middle most item of the collection. If a match occurs, then the index of item is returned. If the middle item is greater than the item, then the item is searched in the sub-array to the left of the middle item. Otherwise, the item is searched for in the sub-array to the right of the middle item. This process continues on the sub-array as well until the size of the subarray reduces to zero.

- Compare x with the middle element
- If x matches with middle element, we return the mid index.
- Else If x is greater than the mid element, then x can only lie in right half subarray after the mid element. So we recur for right half.
- Else (x is smaller) recur for the left half.

The number of comparisons for the chosen elements remains almost constant, which coincides with the following formula:

$$no. of comparisons = \log_2(no. of elements in an array)$$

### IV. RESULTS

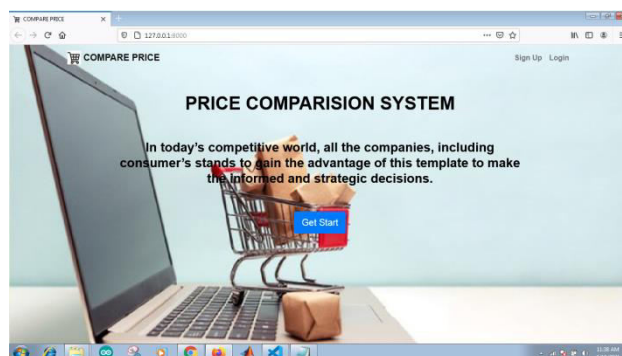


Fig. 2. Home Page



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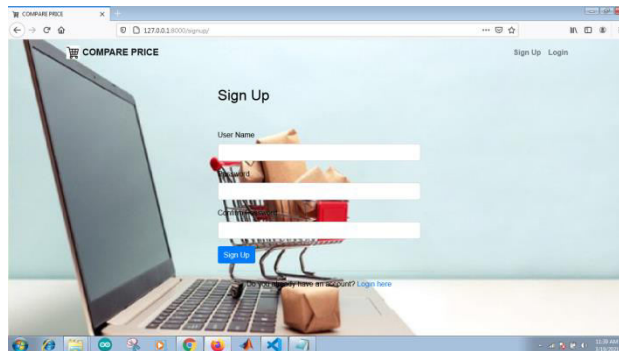


Fig. 3.Registration

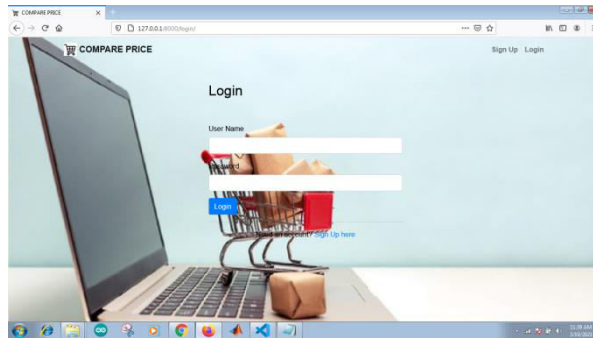


Fig. 4.Login

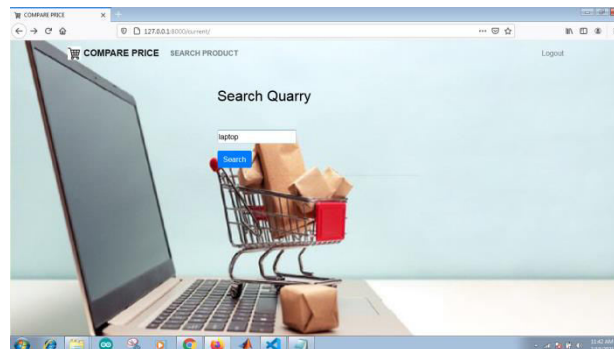


Fig. 5. Search Product

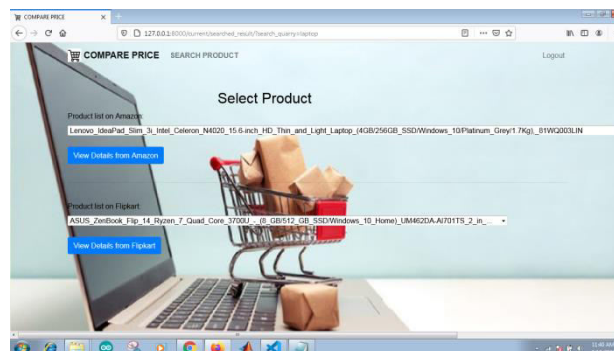


Fig. 6. Search of results and Products



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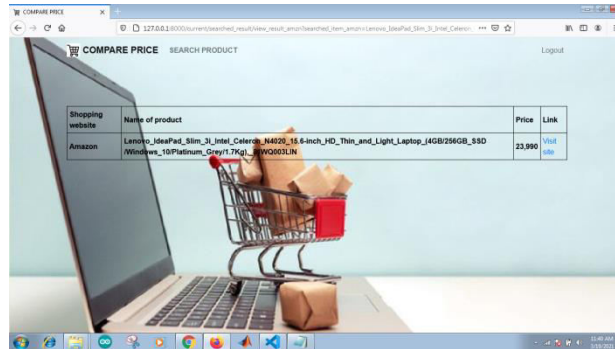


Fig. 7. Price and website link on Amazon

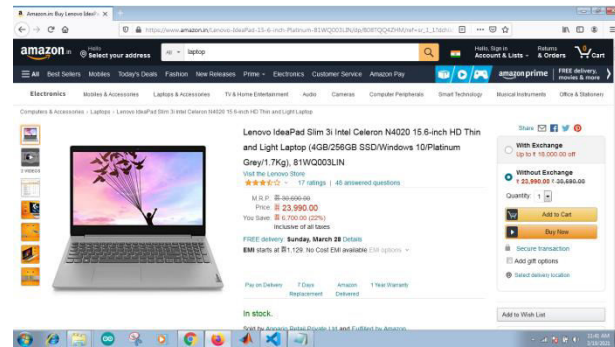


Fig. 8. Amazon Website

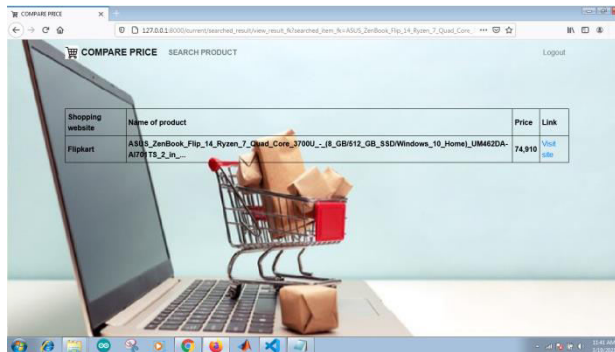


Fig. 9. Price and website link on Flipkart

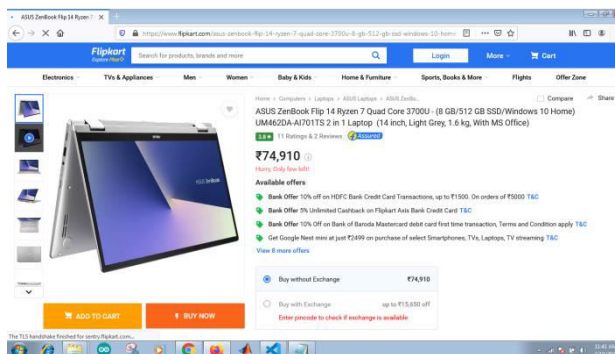


Fig. 10. Flipkart website



## V. CONCLUSION

The autonomy, learning and other characteristics of multiAgent technology are adapted to the demand that gathering commodity information intelligently in the comparison shopping sites. In this paper, a framework model of comparison shopping system based on multi-Agent present a good way of integrating and sharing among heterogeneous EC systems. It has important reference value to build an intelligent comparison shopping site.

While available online networks can include thousands or millions of users, and thus give strong statistical correlations, detailed information on why users form links is usually lacking. Thus, it is difficult to distinguish links arising from prior similarity from influence of linked individuals creating similar preferences. In our future work, we want to explore further insight into the network of interest and make a more dynamic analysis of the network possible.

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