

# DEVELOPMENT OF DATA ANALYSIS PROGRAM FOR INFORMATION ABOUT PRODUCTS PURCHASED ONLINE

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This article will introduce the role of data analysis of product information on online shopping platforms on consumer purchases and the development of merchant stores, how it will filter out the sales information of products and user evaluation information and give the basic analysis results of the system. And the main development language and development framework used by the system.

**Key Words:** shopping platform, data analysis, consumer, store, development

**Introduction.** An online trading platform refers to a website or network system that provides services for various types of e-commerce transactions (including B2B, B2C, and C2C transactions). Since the first successful online retail transaction by NetMarket in 1994, with the rapid development and update of Internet technology, online transactions and online shopping have become indispensable in people's lives. Missing part.

The ranking of the top ten e-commerce platforms in the world in December 2019: Amazon.com, the most visited platform in the world, reached 2.36 billion person-times, which was 1.56 billion people-times away from the second-place eBay website, equivalent to one fifth of the world's population. However, even the 10th-ranked Amazon UK has reached 43.32 million people. It is not difficult to see from this huge access data that the e-commerce giants occupy most of the online shopping market. This makes it difficult for small e-commerce platforms to get the attention of consumers, despite their good service attitude, the same product quality, lower product prices, and consistent safety factors.

Nowadays, in order to gain more traffic and consumers, several major e-commerce websites often discount products or promote activities, and even contact the publisher of the product to obtain the right of first launch. This makes consumers often compare the production information, prices, and transportation costs of the same product or products of the same type sold on various online platforms before conducting online shopping consumption, and conduct a comprehensive analysis through the evaluation of purchased users, and ultimately purchase needed goods. At the same time, the merchants of each platform will analyze the sales information, price gap, user information, and user evaluation of the same type of products or the same product provided by the platform (Some platforms will provide non-free product data analysis services), to provide data for store merchandise purchase and subsequent development. However, few online shopping platforms will introduce product information and evaluation information of other platforms on their own platforms, and analyze this information to allow consumers and merchants to obtain a more comprehensive consumption guide and store development guide.

**Main part.** The system developed by the proposed project will consist of three parts: client, management system and server.

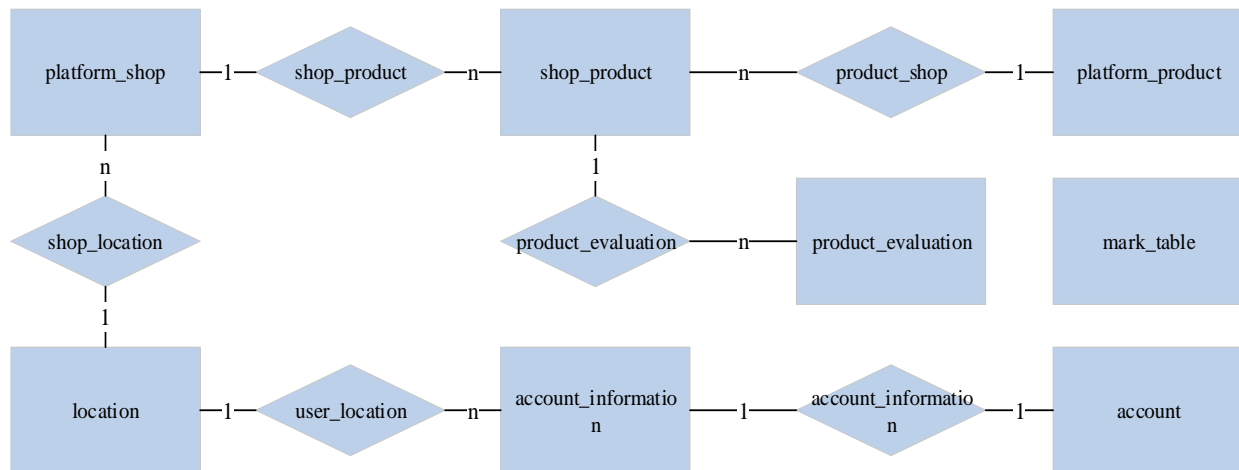
**Server:** mainly responsible for business processes, data analysis and data access management. In order to reduce the pressure on the server and the pressure of network data transmission, the server will determine whether the data analysis step is performed on the server side or all on the server side according to the analyzed data content and analysis method.

**Management system:** mainly modify the errors of the data obtained from the network, import the data into the database and perform user rights management.

**Client:** Provide users with product information retrieval, evaluation and other information, and display the processing results of data analysis. When the data analysis step is too complicated, the data returned by the server is obtained to continue to complete the unfinished data analysis of the server.

Because the e-commerce platform does not have public database links and service ports such as product information and user reviews, the project data is crawled from the network by a third-party web crawler tool. In addition, because the data storage and display methods of different online trading platforms are different, the crawled data is first stored in a local file or database, and then the administrator intercepts valid data through the management system and uploads it to the server database.

Figure 1 shows the E-R diagram of the project database. The specific database table information is as follows:



**Figure 1 – Project Database E-R Model**

- *location*: used to store location information, including country, province/ state, city, district / county, etc.;
- *mark\_table*: used to store the label information of the system, use the mark\_type attribute in the table to classify the labels;
- *account*: store account name, password, account type, last login date, etc.;
- *account\_information*: stores the details of the account owner (user), including the user's name, phone number, email address, and address. Use the primary key of the location table as the foreign key, and establish a 1-1 relationship with the account table;
- *platform\_product*: stores product information, including product name, price (lowest and highest price of all platforms in the project system), appearance, etc.; 1-n relationship with table shop\_product;
- *platform\_shop*: Stores store information, including store name, platform, network link, and physical store location. The primary key of the location table is a foreign key, and it has a 1-n relationship with the shop\_product table;
- *shop\_product*: stores the product information of the store, including the price of the product in the store, the number of items sold, the number of reviews, and network links. A 1-n relationship with the table product\_evaluation;
- *product\_evaluation*: Stores user / consumer evaluation information for the product, including consumer account name, consumer account type, evaluation date, evaluation content, number of supporters, number of reviews, etc.

Due to the phenomenon of order slipping on many platforms (similar to the online water army, using other accounts to purchase goods, which increases the sales volume of the goods in the platform database), and some data obtained on the network by web crawlers are not detailed, the system will default The number of reviews using this product is the number of sales. In order to let users better view the evaluation information of the products, the system will allow the classification of the product evaluation by keywords. The system will mainly analyze the price, sales volume, number of evaluations, evaluation types, and sales proportion of products on different platforms (only platforms that exist in the system database).

The development of the proposed project will adopt a front-end and back-end separation model, which is not just a development model, but an architectural model. The front end only needs to focus on the style and dynamic data parsing & rendering of the page, while the back end focuses on specific business logic. The back-end development will use the Java object-oriented programming language, and Spring Framework frameworks such as Spring Boot, Spring Session, and Spring MVC. The Java programming language is highly portable; Spring Boot makes it easy to create stand-alone, production-grade Spring-based Applications, most Spring Boot applications need very little Spring configuration; Spring Session provides an API and implementations for managing a user's session information while also making it trivial to support clustered sessions without being tied to an application container-specific solution; Spring Web MVC is the original web framework built on the Servlet API and has been included in the Spring Framework from the very beginning, this model is flexible and supports diverse workflows. The front end of the project will use the Node.js-based Angular CLI framework, TypeScript, and the HTML and CSS necessary for web front-end development. Angular is an application design framework and development platform for creating efficient, complex and sophisticated single-page applications; TypeScript is a superset of JavaScript, so it does not have a default template. On the contrary, other the project has its own TypeScript bootstrap template and its own context. And, in order to make the front-end code more concise and easier to develop, the UI component ag-Grid of Angular CLI will be used in the project. It is a data grid for Angular with enterprise style features such as sorting, filtering, custom rendering, editing, grouping, aggregation and pivoting.

**Conclusion.** The development of the target project will help consumers to understand the details of the products more comprehensively when shopping online, and a more comprehensive evaluation of the products will help to understand the quality and use of the products, and enjoy the advantages of online consumption more conveniently. It also helps commodity sellers and manufacturers to more fully understand the popularity of such products in the market, so as to use this information to regulate the bulk purchase and manufacturing of commodities, and help merchants and manufacturers develop. Finally, if the functions of the program are improved, users can purchase products from other platforms directly on the platform, or have the support of databases or database interfaces of other online shopping platforms, which will make the development possible for commercialization, allowing consumers and businesses and manufacturers enjoy better services.

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