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Shri Vile Parle Kelavani Mandal

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Improving Shopping Experience: Goods Economic Information System Using Content-Based Filtering Algorithm (Case Study on One of The Sports Equipment Companies)

Abstract

The owner's income drop in a sports equipment firm stems from insufficient consumer interest in the physical store of a particular sports equipment company, attributed to unattractive product displays and a difficult-to-access location. This study presents a product recommendation system based on searches for items analogous to the desired sports, which can significantly enhance the owner's revenue and streamline the purchasing experience for consumers without necessitating a visit to a physical store. The study utilizes a descriptive methodology for data acquisition, encompassing observation, interviews, and literature reviews. The employed system development methodology is Rapid Application Development (RAD), while the approach utilized is Content-Based Filtering (CBF).

Implementing the CBF approach in the product recommendation information system can facilitate consumers' selection of necessary things without visiting a physical store, consequently enhancing the owner's revenue at the specific sports equipment company. This research indicates that improving the shopping experience via technology can reconcile online and physical retail, resulting in increased consumer happiness and loyalty and sustainable company growth for the owner.

Keywords : *Product Recommendation Information System, Content-Based Filtering (CBF), Customer, Owner*

INTRODUCTION

Marketing is widely recognized. In his book "Marketing 4.0: Moving from Traditional to Digital," he asserts that the emergence of e-commerce characterizes contemporary globalization. E-commerce facilitates online transactions using a few clicks on a smartphone, enabling access to purchases without needing to leave home or visit physical stores. The influence of e-commerce substantially impacts sales volume and consumer satisfaction.

A retail establishment offering diverse sports equipment encounters multiple localized and particular issues. The store's location is suboptimal, being distant from schools and sports facilities, which hinders accessibility for numerous potential customers and leads to comparatively low foot traffic. Furthermore, the chaotic and inadequately structured product displays hinder clients' ability to locate the required items, diminishing sales figures.

The interplay of these elements results in diminished sales and inadequate customer engagement with the offered products. In this context, implementing a content-based filtering recommendation system at the sports equipment company is becoming increasingly pertinent. This approach facilitates clients in efficiently and swiftly identifying products that satisfy their requirements, eliminating the necessity of in-person store visits or difficulty locating items.

System

A system is a collection of interacting or interrelated components that operate according to established rules to create a unified entity. It is encircled by and affected by its environment, defined by its borders, structure, and purpose, and manifested by its functions. In systems theory, a system is the focal point of investigation.

Information

Kristanto states, "Information is a compilation of data transformed into a more useful and significant format for the recipient." A system cannot work efficiently without knowledge and may fail to operate. An organization without information cannot function or operate" (Badriyah et al., 2018).

Information System

Shiau (Nallamala et al., 2020) defines an information system as a formal, sociotechnical organizational framework intended to collect, process, store, and disseminate information. An information system, from a sociotechnical viewpoint, comprises four elements: tasks, individuals, structure (or roles), and technology" (Parthasarathy & Sathiya Devi, 2023).

Website

A website is a compilation of pages that convey several forms of information, encompassing textual data, static or dynamic images, animations, audio, video, and their different combinations, whether static or dynamic. These pages provide an integrated framework, each linked through hyperlinks accessible via a browser application. A browser is an application that renders web content through translation. This procedure is executed by elements within the browser application, typically known as the web engine, which converts all web content for presentation. Popular web browsers include Google Chrome, Mozilla Firefox, and Opera (Eliyas & Ranjana, 2022).

Promotion

Hermawan (Khatter et al., 2021) elucidates that promotion is a primary focus among diverse marketing operations, informing consumers about a company's introduction of a new product and motivating them to participate in procurement activities. Rambat Lupiyoadi describes promotion as an action undertaken by a corporation to convey the advantages of a product and to sway consumers in their purchasing or service utilization decisions based on their demands (Li et al., 2021).

Products

A corporation undoubtedly possesses particular products that it can provide to clients. A product is any item available in the market that can capture attention, be acquired, utilized, or consumed, and fulfill desires and requirements (Yadalam et al., 2020).

Recommendation System

A recommendation system is software intended to aid users in decision-making by supplying pertinent information that facilitates the attainment of objectives, such as selecting particular products (Putriany et al., 2019).

Content-Based Filtering

A recommendation system employing content-based filtering proposes things akin to those previously favored or selected by the user. The resemblance of items is determined by the characteristics inherent in the items being compared. This method is user-independent, indicating that it does not depend on the item's novelty (whether any user has previously selected it). Upon ordering a dish from a designated category, the system will endeavor to suggest analogous foods available at alternative restaurants that the user may also appreciate. A limitation of content-based filtering is that it restricts suggestions to related items, precluding the discovery of unforeseen goods (Wayan Priscila Yuni Praditya et al., 2021).

Rapid Application Development (RAD)

The subsequent phase is the User Design stage, wherein the design conforms to user

requirements, guaranteeing that the project tackles current issues and is shown utilizing Unified Modeling Language (UML) tools. The Construction phase commences, entailing code to convert the design into a usable application. The Cutover step entails comprehensive testing of the complete system via Black Box Testing, emphasizing functional specifications to reduce faults. This research uses the RAD technique to develop an efficient product suggestion information system using content-based filtering algorithms to enhance product sales and facilitate customer convenience.

Unified Modelling Language (UML)

Zubair et al., (2024) asserts that UML (Unified Modeling Language) is a language employed to specify, visualize, construct, and document artifacts involved in the software development process. Artifacts may encompass models, descriptions, or software of software systems, including business modeling and other non-software systems (Thannimalai & Zhang, 2021).

The author will concentrate on developing a recommendation system utilizing the Content-Based Filtering algorithm for a sporting goods company. This project aims to address the highlighted issues efficiently while simultaneously enhancing the store's sales potential. By employing this advanced algorithm for personalized product recommendations, the author aims to improve consumer experience and pleasure, fostering more revenue and a more effective inventory management system.

METHOD

The research method utilizes a descriptive approach to thoroughly analyze a sporting goods company's status and examine the challenges it encounters, including product organization and retail location accessibility. Three primary strategies are employed in data collection: observation, interviews, and literature review. Researchers use observations to assess consumer interactions and product placement in the store directly. In contrast, interviews with the owner and consumers seek insights about their wants and expectations for the recommendation system. The literature review aims to elucidate the Content-Based Filtering algorithm and its utilization in recommendation systems.

The system development process employs the Rapid Application Development (RAD) methodology, facilitating swift development that is attuned to user feedback. The methodology employed to establish this recommendation system is Content-Based Filtering (CBF), which emphasizes the analysis of current product content and the correlation of qualities with user preferences. This strategy is anticipated to enable the suggestion information system to aid consumers in choosing preferred products without visiting a physical store, while simultaneously enhancing the revenue of the sporting goods firm owner.

RESULT AND DISCUSSION

System Analysis and Design

1) Analysis of the system and the process of the system that is currently running

The system analysis of one of the sports equipment companies currently running is as follows:

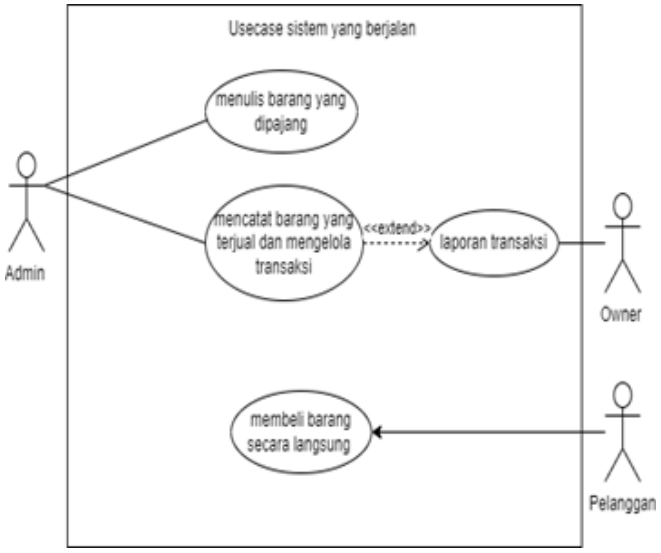

Figure 1. Analysis of the system and the process of the system that is currently running

2) Proposed system analysis Proposed Use Case Diagram

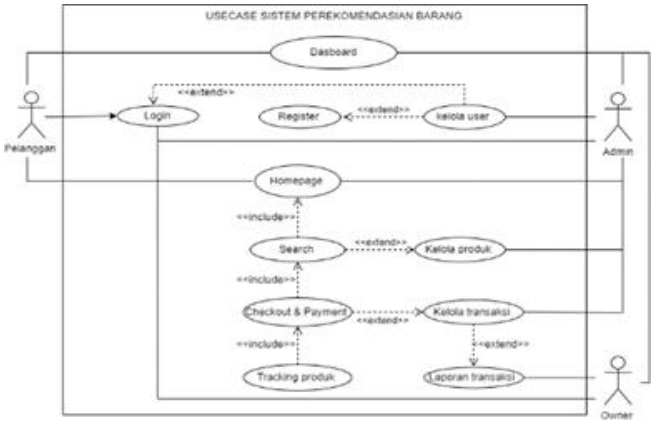

Figure 2. Proposed Use Case Diagram

3) System Design

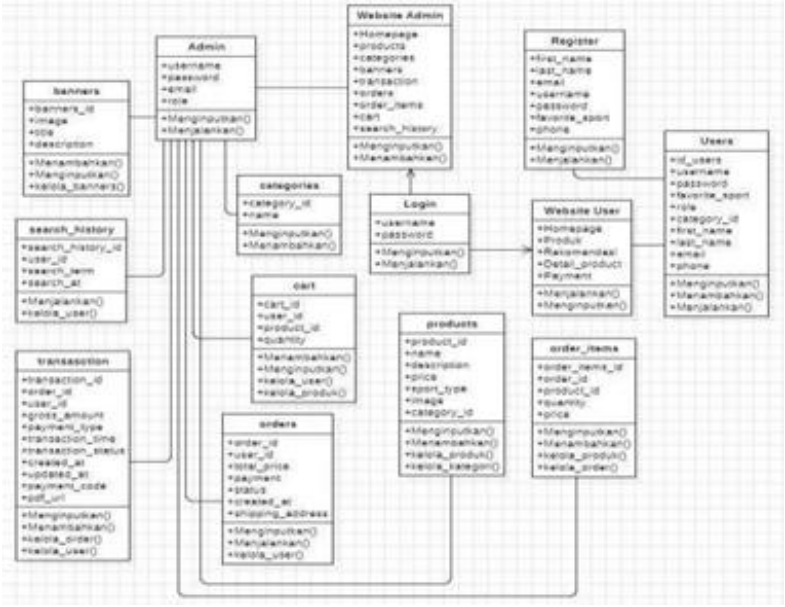

Figure 3. Database Design

5 System Implementation

System implementation is the phase of executing a designed and developed system, enabling it to function and be utilized by its users.

Figfure 4. Implementation of Dashboard Page

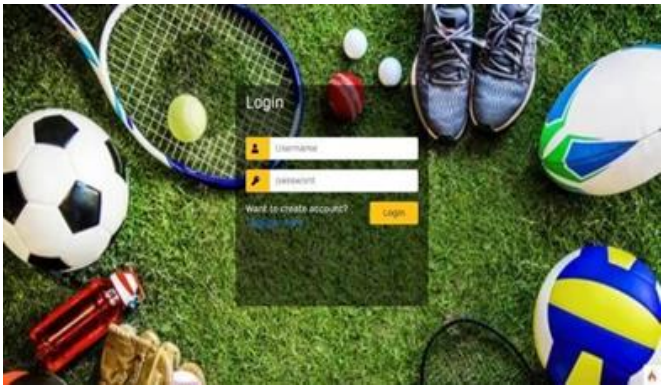

Figure 5. Customer Login Page Implementation

Figure 6. Customer Registration Page Implementation

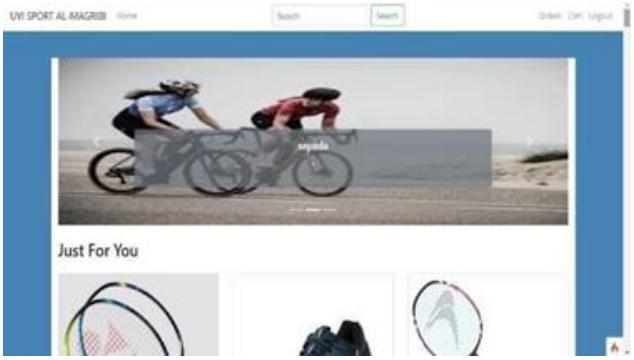

Figure 7. Home page implementation

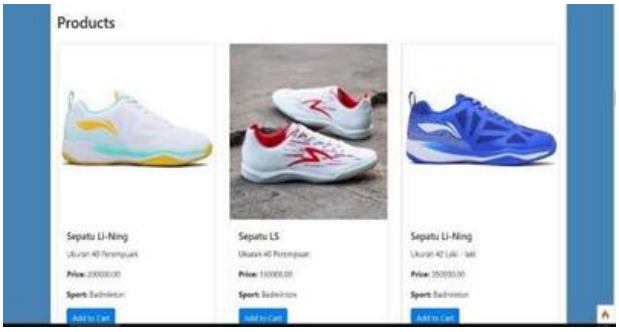

Figure 8. Product Implementation

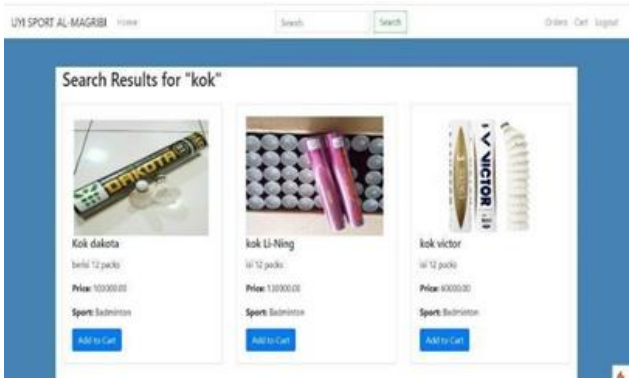

Figure 9. Search Implementation

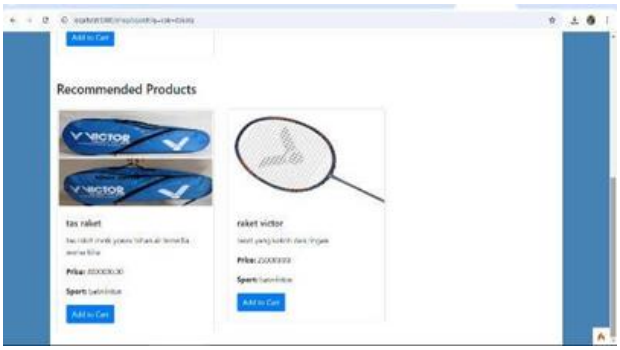

Figure 10. Implementation of item recommendations

Figure 11. Implementation of Add Category

Figure 12. Implementation of Add Banner

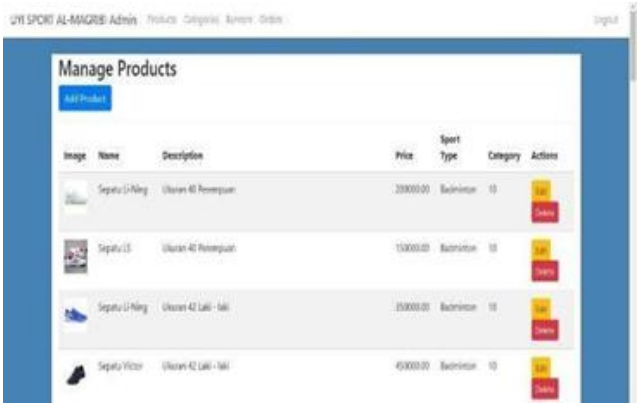

Figure 13. Implementation of Add Product

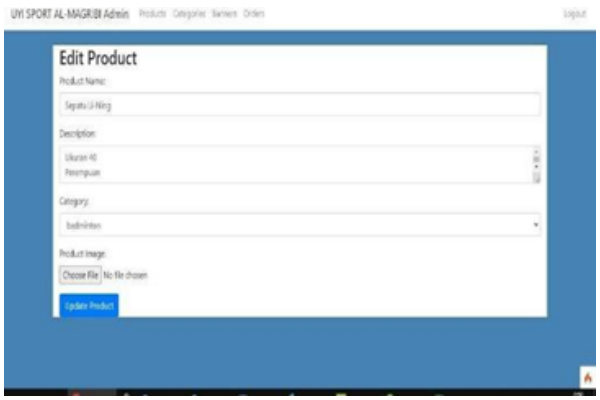

Figure 14. Product Edit Implementation

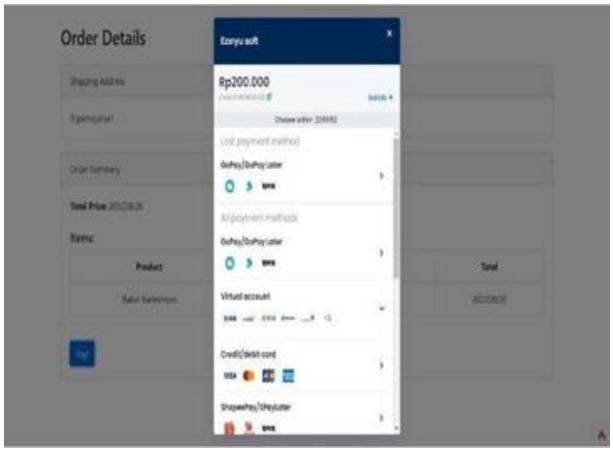

Figure 15. Implementation of the payment page

CONCLUSION

Numerous conclusions can be derived from the conducted analysis, design, and testing processes. Following the assessment of the existing system in a sporting goods enterprise and the creation of the recommendation information system, product sales are expected to function efficiently, leading to enhanced revenue for the proprietor. Moreover, clients will

experience enhanced ease in locating desired items and obtaining pertinent recommendations via the information system.

The author proposes enhancements and other advancements to the program. This information system will be employed successfully and appropriately within its context. The author proposes the creation of a user profile feature to enhance user satisfaction, which would include options for users to post profile images, manage admin and owner profiles, and facilitate the automated and permanent preservation of user addresses within their profiles. This information system is anticipated to be deployed in an Android format, facilitating, optimizing, and enhancing efficiency for all users.

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