

E-commerce on Hardware sales: A case study of Computer technologies Union in Owerri, Nigeria.

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Abstract

The incorporation of computers into contemporary company operations has significantly altered productivity and communication, essentially making paper-based file systems outdated. The advancement of technology has made it possible to manage data more accurately, streamline procedures, and obtain information more quickly. Better managerial skills are now a trademark of the digital age, allowing companies to accurately and quickly respond to information requests. Innovative business models have also been made possible by the transition to digital technology, especially in the areas of customer engagement and operational management. A more dynamic and responsive business environment has been made possible by the automation of repetitive processes, real-time data analysis, and enhanced communication channels. This has allowed organisations to respond to shifting market conditions with accuracy and agility. A significant advancement in this digital shift is the emergence of e-commerce platforms. These platforms have facilitated a smooth and mutually beneficial relationship between businesses and customers. Online shopping provides customers with an unparalleled level of ease, enabling them to peruse, evaluate, and buy things from the comfort of their own homes. These websites give businesses access to a wider market, an extra source of income, and insightful data analytics on consumer behaviour. By providing easy navigation, safe payment choices, and personalised experiences, the e-commerce model improves client engagement. The transition to e-commerce has increased revenues as well as customer happiness and brand loyalty by offering a convenient and effective purchasing experience. For Computer Technologies Union (CTU) in Owerri, the project's goal was to create an e-commerce website that would improve customer interaction and business operations in response to current trends. To enable simple online purchases, the website was built with a feature-rich catalogue of store merchandise and an intuitive shopping cart. The system was designed to be reliable, scalable, and effective by utilising a three-tier design. Although the middle layer, which used PHP, handled business logic with ease, the backend MySQL database ensured dependable data management. Shopping was simple and easy with the client interface, which could be accessed via a web browser. The speed and precision of service delivery at CTU Owerri were greatly enhanced by the new system after it was fully implemented. While the firm benefited from increased operational efficiency and the ability to better meet customer expectations, customers had a convenient and pleasurable shopping experience. In addition to modernising CTU Owerri's operations, this calculated decision gave it a competitive edge in the online market.

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1. Introduction

The corporate environment has undergone an irreversible transformation due to the digital age, pushing e-commerce to the forefront of strategic objectives. An online presence is now essential for companies looking to grow their consumer base, increase operational effectiveness, and broaden their market reach. A prominent player in the IT industry, Computer Technologies Union (CTU) understands this paradigm shift and is ready to use e-commerce to get beyond the fundamental drawbacks of traditional brick-and-mortar retail.

Physical shops are crucial for interacting with customers, but their restricted area frequently limits the selection of products they can offer and presents logistical difficulties. Additionally, labour-intensive procedures used in the traditional retail model, such as inventory management and customer service, can have an adverse effect on profitability and operational efficiency. CTU intends to tackle these issues by switching to an online shopping platform.

A larger consumer base can be served by an online store's ability to display a far wider variety of products than a physical one. E-commerce platforms can also automate a lot of repetitive operations, such as order processing and inventory management, which can save money and increase productivity. Operating around the clock improves accessibility and convenience for customers even more. Nevertheless, there are difficulties involved in putting an e-commerce infrastructure into place. Careful attention needs to be paid to problems including system correctness, security flaws, and the difficulties of integrating technology with business procedures. A thorough analysis of the body of research on e-commerce offers insightful information on the possible advantages and disadvantages of internet retailing.

Building on the results of this study and tackling the issues raised, CTU can create a strong e-commerce platform that will strengthen its position in the market and provide outstanding value to its clients. This project is a calculated move towards a day when technology will be the primary driver of corporate success and expansion.

2. Literature review

This review analyses the literature on online shopping platforms and highlights the advantages of computerisation as it examines the possibilities of e-commerce systems for computer hardware accessories. Consumer behaviour has changed dramatically as a result of the growth of e-commerce, which provides convenience, effectiveness, and a greater range of products (GVU Centre, Georgia Institute of Technology). According to GVU Centre research, more than three-quarters of participants had made purchases online, with convenience (65%) ranking as the main justification. Access to vendor information and avoiding pressure to buy were the next most popular reasons. Although there are still security issues, the study shows that people are becoming more confident in encryption technologies. These results point to a sizable market for user-friendly online shopping portals in the computer hardware accessories sector. Several key elements contribute to a successful e-commerce website. Usability is paramount, with features such as clear shopping cart functionality, efficient product navigation, and consistent product information layout being crucial (GVU Center). Feedback mechanisms are also essential. Users expect immediate confirmation of actions and order acknowledgements. This feedback should be unobtrusive and not distract from the core shopping experience (Norman). Research defines online shopping, also known as e-shopping, as a form of electronic commerce enabling consumers to purchase goods directly from sellers over the internet (Aldrich, 2011). This B2C (business-to-consumer) model has emerged as a major force in retail, with companies like Amazon and Alibaba leading the charge (Kuanchin et al., 2005). Online shopping systems, also referred to as web shops, offer a user-friendly interface for browsing and purchasing products, often with integrated management systems for sellers (Ram L. Kumar et al., 2004). These systems have a lot to offer because they are internet-based. Product information can be easily accessed from any location with an internet connection thanks to web-based information systems that facilitate the distribution of multimedia material (Web Information Systems Group). Internet-based systems, according to Bigne (2005), are information systems that use internet technology to provide services and information. Web browsers serve as the front-end, and databases serve as the back-end of these systems, which normally consist of web applications, capabilities, and data components. Internet-based solutions do, however, have several disadvantages. According to Franzetal (2006), the increasing amount of digital information demands interfaces that are easier for users to navigate in order to enhance the efficiency of information retrieval. Moreover, Strickland (2014) points out certain drawbacks in contrast to conventional desktop programs. In conclusion, the literature supports the potential of e-commerce systems for computer hardware accessories. Understanding user needs, prioritizing usability, and leveraging the advantages of internet-based systems

are crucial for success. Further research could explore specific features and functionalities that optimize the online shopping experience for computer hardware accessory buyers.

3. Methodology

A multimodal data gathering technique was used, combining qualitative and quantitative methodologies for detailed analysis, in order to thoroughly examine the current system and define requirements for a new e-commerce platform for Computer Technologies Union (CTU).

3.1. Interviews for Data Collection

To acquire a comprehensive grasp of the difficulties encountered by the present system and to extract particular needs for the replacement, in-depth interviews were held with a varied range of CTU employees and clients. Rich and relevant data about user expectations and wants were obtained from these interviews. We were able to pinpoint important pain areas through these discussions, including sluggish transaction processing, challenging inventory management, and a dearth of user-friendly interfaces. The user-centric design of the new e-commerce system was greatly influenced by the input that was received.

3.2. Observation

Direct observation of the operational procedures and the identification of inefficiencies were done at CTU through on-site observations. Using this technique, the project team was able to see the workflow directly and identify any bottlenecks that were impeding efficiency. Several areas were found to require improvement, including the manual management of sales records, the delayed processing of orders, and the difficulties in updating product information. The redesign efforts were informed by these findings, which were crucial in comprehending the practical use and constraints of the current system.

3.3. Document Analysis

To gather best practices and design considerations for the new system, a thorough review of all existing system documentation, including manuals and pertinent literature, was conducted. The system development process was guided by the theoretical underpinnings supplied by this analysis. Additionally, it guaranteed that the new platform will contain tried-and-true techniques for improved performance and customer pleasure, in addition to adhering to industry standards.

3.4. Data Preparation

Strict data cleaning and preparation procedures were put in place to guarantee data correctness, consistency, and completeness. This required going over and improving information gathered from several sources, including transaction logs, customer reviews, and inventory records, in order to produce a trustworthy dataset for analysis and system improvement. In order to develop a system that accurately reflects operational demands and user expectations, the provided data set was essential.

3.5. System Development and Design

System Architecture: To improve efficiency and maintainability, a modular design method was used to split the system into manageable components. The product catalogue, shopping cart, order processing, user identity, and client registration were among the essential modules. A more reliable and scalable system resulted from this modular architecture, which allowed each component to be built, tested, and maintained independently.

3.6. Top-Down Design

The system was broken down into smaller, easier-to-manage components using a top-down design process. From a general overview of system requirements to the particular design of individual modules, this approach ensured a systematic and thorough design process. It ensured coherence and integration by making it easier to comprehend how each part would interact with the rest of the system.

3.7. System Implementation

To produce a platform that is both user-friendly and efficient, front-end and back-end technologies were integrated during the development phase. While back-end development employed PHP and MySQL for server-side functionality and database management, front-end development concentrated on developing an intuitive user experience using

HTML, CSS, and JavaScript. To make sure the system is reliable and of high quality, thorough testing steps were carried out, including unit, integration, system, and user acceptability testing. Prior to deployment, these testing stages were essential for finding and fixing any problems and guaranteeing a flawless user experience.

3.8. Deployment

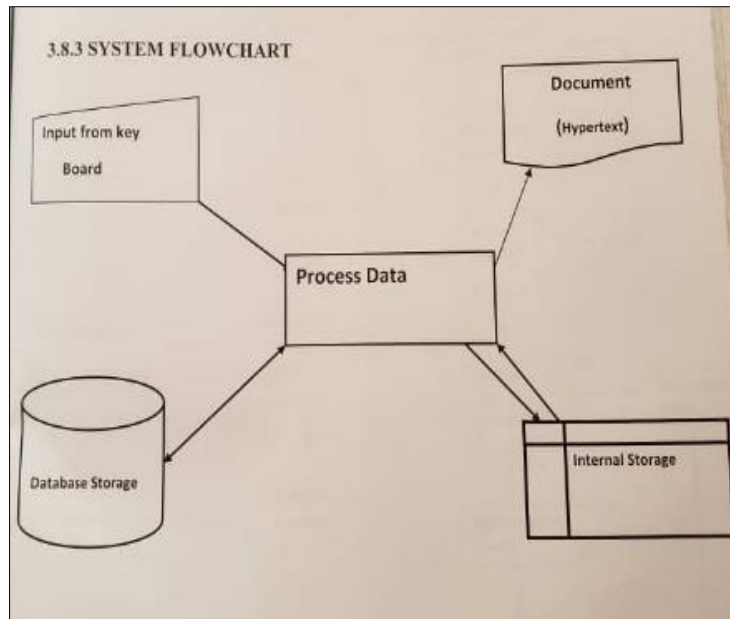


Figure 1 Representation of system flowchart

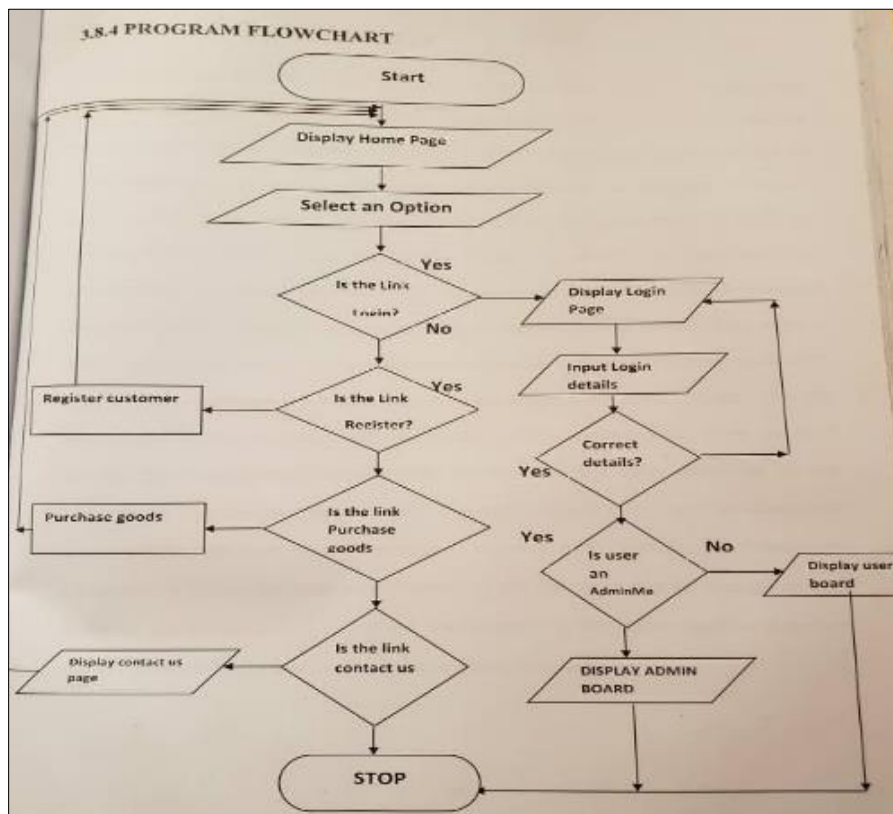


Figure 2 Representation of the program flowchart

To minimise interference with ongoing activities, a phased deployment plan was developed. Important functions like product purchases, logins, and client registration were first introduced. Later iterations of new features based on user input and performance indicators were released. Using feedback and real-world usage, this technique allowed for ongoing improvement and adaptability.

3.9. File Maintenance Module

System file management, including updates and fixes, is the purpose of this module. The system's continual evolution and progress were ensured by the tools it gave administrators to quickly update, modify, and make corrections.

3.10. Primary Menu

The primary menu of the system was designed to facilitate effortless navigation and effortless access to essential features, such as customer registration, login, product acquisition, about us facts, and contact information. Users' overall experience was improved by this design, which made it easy for them to identify and use the things they required.

3.11. Environment for system development

WAMP Server served as the development environment for the e-commerce platform, which was created with PHP, CSS, and MySQL. This combination made the platform for development and deployment strong, adaptable, and dependable. Swissmax, Adobe Photoshop, and Fireworks were utilised for design aspects, guaranteeing a polished and aesthetically pleasing interface. The implementation of the system's functionality involved the coding of multiple modules, such as customer registration and purchase processing, to guarantee a smooth and effective user interface. Prior to the system's implementation, extensive testing and staff training were carried out to make sure the personnel were ready to oversee and run the new system efficiently.

All things considered, the creation of the CTU Owerri e-commerce platform was a thorough and well-coordinated endeavour that made use of contemporary technologies and approaches to provide a reliable, user-friendly, and effective system. With the help of this project, CTU was able to efficiently service its clients in the digital age while also modernising its processes

4. Conclusion

Every project, including this research study, seeks to accomplish particular goals using a variety of techniques. In order to create and execute an online website with accuracy and efficiency, a variety of techniques and activities were used, guaranteeing that the project's objectives were satisfied. The development of a flexible e-commerce platform was the project's main goal. Through this platform, customers can easily buy a variety of things online while lounging in the comfort of their own homes. The project's success depended on following a methodical development procedure in order to accomplish this goal. In order to determine the optimal technological solutions and design strategies, a thorough analysis of the target audience's needs and preferences was conducted before moving on to exhaustive investigations. Careful design was essential to making sure the platform was both visually appealing and easy to use for a wide range of users. Thorough coding ensured that the website was safe and dependable to rely on, in addition to being functional. To provide a smooth and effective user experience, a number of subsystems, including payment gateways, product catalogues, and customer assistance, were meticulously developed and integrated. The finished result is an internet shopping portal created especially for the Sprite Mall Supermarket in Enugu. This website offers a contemporary alternative to conventional shopping methods by making it easier to buy goods and services. Online ordering, payment processing, and product browsing are all available to customers from the comfort of their homes. The platform was initially created for Sprite Mall Supermarket, but because of its adaptable design, it may also be used by other businesses. This flexibility is attained by making small changes to the current architecture, which allows the platform to be used by a wide range of retail enterprises. The design's adaptability and scalability demonstrate the project's strength and guarantee that it may be modified to suit the requirements of various organisations. This flexibility shows how strong and scalable the project is, which makes it a valuable asset for a variety of retail enterprises. The platform can be customised to meet unique business demands, whether it is a tiny neighbourhood store or a major grocery chain, providing an adaptable solution that can expand with the company. The project's adaptability highlights its worth by offering a flexible instrument that amplifies the effectiveness and scope of retail activities in a world growing more and more digital. In summary, the methodical strategy taken by this research study—which included thorough investigations, in-depth analysis, deliberate design, and painstaking coding—led to the successful development of an adaptable and scalable e-commerce platform. The platform was initially created for Sprite Mall Supermarket, but its versatility makes it a useful tool for a variety of retail establishments, highlighting the project's potential to transform retail operations and revolutionise the shopping experience.

Recommendation

The introduction of digital technology has completely changed the business environment, and computers are now essential instruments for improving productivity, connectivity, and overall operational performance. The emergence of e-commerce, which has altered both company structures and consumer behaviour, is a great illustration of this digital revolution. In order to improve corporate operations and foster closer ties with customers, the main goal of this project was to establish an online shopping platform for Computer Technologies Union (CTU) in Owerri. The realisation of the shortcomings of conventional paper-based file systems served as the initiative's cornerstone. CTU sought to improve its ability to satisfy changing customer expectations, expedite decision-making, and streamline information management by moving to a digital infrastructure. An essential part of this digital shift was the e-commerce website, which connected the real and virtual worlds to give customers a smooth online purchasing experience and gave CTU a strong platform to display its product line. A three-tier model, which has been shown to be useful in creating software systems that are both scalable and manageable, was used in the architecture of the e-commerce platform. To safely store vital business data, such as product details, customer information, and order histories, the system's backend depended on a MySQL database. The middle layer, which was written in PHP, served as a mediator between the database and the user interface by processing business logic. The frontend, accessed via a web browser, had a convenient interface that let users browse merchandise, buy things, and handle their accounts. By using this architectural strategy, CTU guaranteed the system would be reliable and adaptable enough to manage growing transaction volumes and future upgrades. The e-commerce platform's successful deployment led to a noticeable increase in the accuracy and speed of service delivery. Online shopping offered customers the advantage of convenience, as they could peruse merchandise, evaluate costs, and complete transactions at their own pace. Additionally, the platform gave CTU useful customer information and insights, which helped the company, improve its marketing plans and customise its product offerings to suit the needs of its target market.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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