



Development of A Web Marketplace for the University Community

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Abstract

Virtual marketplace, web market or electronic marketplace is an ecommerce web site that engages buyers and sellers with a variety of products and service offerings. The increasing activities on these web market is the impact increase in working hours, convenience and logistic cost associated with mortal and stone marketplaces. Therefore, the need to create a web marketplace to suit specific requirements and preferences of Federal University of Petroleum Resources, Effurun FUPRE market environment. The idea for creating this web site is to enhance and leverage a unique and effective market hub for the university marketplace. The participants were selected from students and staff of the Federal University of Petroleum Resources, while data collected were sourced from observation, interview and questionnaire methods to obtain information about their needs, behaviour patterns, product and services they purchase. To analyse the data, waterfall technique was used while Technology Acceptance Model was the bases for better understanding of the model adoption. The result revealed that a customized web marketplace will position FUPRE to take advantage of ecommerce benefits to compete favourably in this digital age and standout among equals. This study therefore, recommends policy implantation at all institutional level to promote collaboration, resource sharing and digital inclusiveness.

Keywords: Academic Collaboration, Information Dissemination, Centralized Marketplace, University Community, Web Marketplace.

Introduction

Digital technology is transforming the education sector and in particular the university landscape due to global inclusiveness and paradigm shift brought about by the internet. These marketplace platforms go beyond business transaction but also has become a community involvement for knowledge sharing, collaboration and an information hub (Brown, 2020). This paper reflects how a unique university web market for Federal University of Petroleum Resources (FUPRE) can foster and engage positive academic sharing community relation. Besides, the 21st century students are becoming digital native relying on mobile devices to achieve academic excellency (Gomez & Martinez, 2019). Thus designing a customize web marketplace for students and staff that accounts user preferences and behaviour needs will enhance users' engagement. Some

prominent ecommerce web marketplace popular in Nigeria are Jumia, Konga and Jiji (Smith and Jones, 2018). These ecommerce giants have transformed virtual shopping in Nigeria and taking advantage of web marketing for personalised regional solutions (Brown & White, 2017). Other web markets such as PayPorte and DealDey focuses on niche segment for fashion, and a variety of products and services that are affordable at discounted prices (Gomez & Martinez, 2019). These online markets enhance users satisfaction, technology usage and an increasing embrace of digital solutions for daily requirements. (Okofu et al., 2025a; Okofu et al., 2025b). At the Federal University of Petroleum Resources, Effurun, the creation of an online marketplace for the campus community is significant for improving a number of facets of academic life. By creating a strong information center for the prompt

distribution of announcements and scholarly materials, it tackles issues pertaining to information exchange. Below are examples of some various web marketplace:

Jumia: Often called the "Amazon of Africa," Jumia is influencing Nigeria's web marketplace. Electronic commerce in Nigeria and Africa has grown as a result of the company's dedication to catering to a variety of markets (Chimezie et al., 2025; Harris, 2025). Jumia founded in 2012, is a one shop to improve online marketing, offer variety of customer products at convenience with easy accessible transactional processes. Jumia has extended her offering by launching JumiaPay, a cutting edge technology Harris, 2025.

Konga: Konga is an ecommerce marketplace that offers a complete house hold items, it has effective logistic system and customer satisfaction as a key priority which has positioned the web site positively in the minds of Nigeria. Konga equally incorporated various payment options encouraging ecommerce engagement in Nigeria (Ibam et al., 2018).

Jiji: is a popular ecommerce site that has positioned and niched itself as a hub for new and second hand products from employment, services, real estate and many more. Jiji encourages buyers and sellers to participate in online transaction due to its easy navigation user interface and free classified ads. (Brown & White, 2017; Nuhu et al., 2023). This user centric environment encourages local transactions between buyers and sellers within certain proximity to negotiate and communicate before final payment (Nuhu et al., 2023).

Amazon: Amazon popularly known as The Everything Store is a multinational ecommerce known for her divest global goods and service offerings (Hansen, 2021.).

Alibaba: The Asian market is dominated by the Chinese e-commerce giant. Alibaba studies on the "Alibaba Effect" investigate how it impact on the inequality of geographical consumption (Wang et al., 2020).

eBay: eBay remains a pioneer in online auctions and sales, and a significant player in the consumer-to-consumer (C2C) marketplace. Economic insights from internet auctions are discussed in the literature (Chinedu, 2019).

Etsy: Etsy is well-known for its specialized emphasis on antique, handcrafted, and distinctive products. Sangeet Paul Choudary's book on "Platform Scale" examines its model in light of new business models (Choudary, 2015; Choudhury & Sabouri 2020).

Uber: Linking drivers and passengers worldwide, Uber is a prominent example of the sharing economy. A Harvard Business Review article discusses ride-hailing's platform business model (Eisenmann et al., 2016).

Airbnb: By offering a platform for short-term lodging, Airbnb has revolutionized the hospitality sector. Study like Zervas et al. (2017), explore how Airbnb affects the hotel sector.

Related Works

Web marketplaces have revolutionize ecommerce by connecting buyers and sellers in virtual spaces for the

exchange of goods, services, and or information (Akazue, et al. 2024a; Okofu et al. (2024a). These platforms are distinguished by their varied product offers, that promote user-friendly interfaces and interactive features (Eisenmann et al., 2016; Johnson et al., 2020). Commission-based arrangements, subscription fees, and advertising revenue are some of the business models that support online markets growth in a volatile environment (Choudary, 2015; Choudhury & Sabouri, 2020; Ehiedu et al., 2020; Okofu et al., 2025; Parker et al., 2016). The marketplaces platform's sustainability and profitability are greatly impacted by the business model that is selected (Eisenmann et al., 2009), and web marketplace success frequently depends on network reliability, which determines the platform's value to rise as user participation increases (Hagiu & Wright, 2015; Ojugo et al., 2023).

In order to maintain growth, elements including user engagement, supply-demand balance, and marketplace dynamics are essential (Akazue et al., 2024b; Nuhu et al., 2023). Researchers have emphasis that the success of web marketplace depends on users trust, system reliability and acceptance (Ehiedu et al., 2021; Okofu et al., 2023; Okofu et al., 2024). Trust promotes system continuous usage and ecommerce growth (Akazue & Aaghular, 2015; Okofu et al., 2025a). Despite positive impacts of web marketplaces, it encounters challenges such as fraud, data security and substandard product delivery (Akazue & Onyekweli, 2019; Ikem & Akazue, 2025; Ojugo et al., 2023). These web market issues arise due to its nature of globalization which have necessitated the establishment of international and national regulations to protect ecommerce buyers and merchant (Chang & Lee 2018).

Regardless of the issues in web marketing, factors as perceived benefits, easy navigation, promotes engagement and users experience (Okofu 2023; Okofu et al., 2025a; Okofu et al., 2018). However, the future of ecommerce is focus on augmented reality (AR) and decentralised financing (DeFi), with emphasis on design and implementation (Choudary, 2018; Lee & Lee, 2020). To leverage improve cooperation and resource sharing in the university marketplace. Zhang & Wang (2022), revealed that students active involvement showed better goal achievement and an added value to transactional activities. According to Diehl et al. (2022), web market design should focus on user friendly interface, implementation challenges and solutions and experiences. Hesham & Amer (2025), investigated design components and its effects on university marketplace to enhance user experiences and institutional productivity.

Manca & Ranieri (2022), researched on increasing a safe, interactive learning and scalable web marketplace to leverage learning, by ensuring reliable network connectivity, supportive infrastructure functionality specifically for campus users. Notwithstanding, Lemon & Verhoef (2016), investigated significant roles of university community web marketplace in encouraging sustainability and positive student behaviour outcome. In yet another study

by Alamri (2021), the researcher focused on the need for pedagogical and technical implications in web design platforms for academic students and staff performances. Zhang & Wang (2022) provide insights into the integration of online marketplaces in educational environments. Although the design components that contribute to platform effectiveness are mentioned in their work, a more thorough analysis is required to fully grasp the subtleties of these design features.

Harris (2025), examined machine learning language and data analytics functionality in university web marketplace and the result reveals its encourages users trust, community engagement, and users' satisfaction. From the works of Choudary (2015), on web marketplace architectural design, the study acknowledges that educational marketplace's architectural design enhances user interaction and facilitates productive teamwork.

Theoretical Review

Recent studies have paid more and more attention to the investigation of web marketplace design and implementation in university communities. Although there are not many studies that only address this particular subject, a review of relevant literature identifies a number of research gaps and recommends

topics for additional study and contribution to the scholarly conversation. The theory used for this study is Davis's (1989) Technology Acceptance Model (TAM), which specifically identified perceived utility (PU) and perceived ease of use (PEOU) as factors influencing technology adoption. The TAM model only suggests that a technology is accepted when it is used with less effort, is user-friendly/centric, easy navigation, and has a nice interface (PEOU), and enhances results through cooperation, knowledge, and resource sharing (PU). TAM also pointed out that elements like design can improve use. In order to influence inclusiveness, forecast behaviour, and explain theoretical implementation and explanation this study utilize five phases to accomplish behaviour acceptable for the web marketplace developed.

Research Method

This research uses the waterfall methodology and is organized into five stages. Data collection, analysis, design, execution, and assessment are some of the discrete stages that comprise this process. The complicated and constantly changing university marketplace serves as justification for this study, which aims to maximize involvement in a digital setting, as depicted in Figure 1.

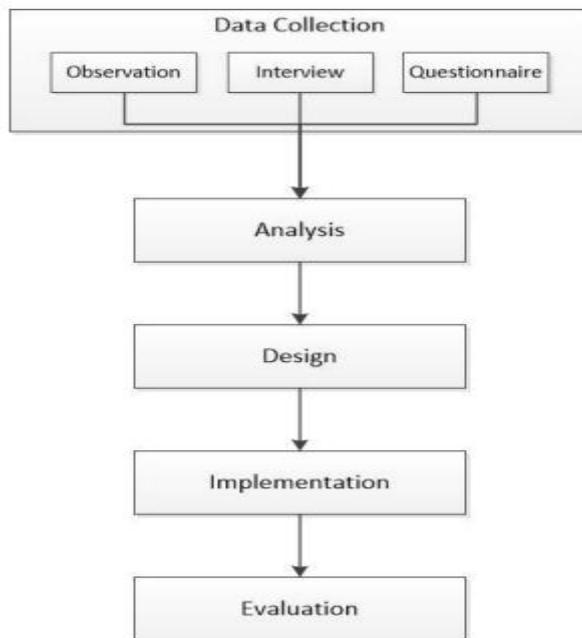


Figure 1. Flowchart of the proposed system (Source: Okofu et al., 2025)

Data collection methods include questionnaires, interviews, and observation. Academic literature is often used to examine fundamental market design ideas. The creation of an online marketplace for the university community is a cutting-edge approach to a 21st-century learning environment that will enhance communication, solve problems, and advance staff and student knowledge. Through observation, interviews, and questionnaires, the behaviour process of the respondents was directly monitored in order to get information about the needs of the products and how to meet them. On the other hand, questionnaires ask about purchasing and

selling behaviors as well as online shopping habits. Staff members and students make up the responses.

Analysis: Analyzing data is the first step in creating a functional and nonfunctional specification for the application that will be developed for the campus stalls. At the analysis stage, data was examined to generate system requirements.

Design: The stage of system design is where the intended campus stall application system items are designed. Menu design, use case diagrams, database design, and system interface design are among the tasks involved in this design. The functional and non-

functional system specifications produced by the preceding activity (analytical Phase) serve as the foundation for this design activity.

Implementation: The process of turning the design into a program (coding) is known as the implementation phase. The campus stall application system is the end product of this endeavor.

Evaluation: The evaluation process involves determining if the developed system can function effectively and satisfy user requirements. Black box and usability testing are used for evaluation in order to generate high-quality criteria.

Analysis Requirement

Systems analysis is the process of breaking down a whole information system into its constituent elements. Identifying and assessing issues and requirements to ensure that the system is designed to meet expectations. At this point, waterfall analysis was used to identify the marketplace system's functional and nonfunctional requirements for meeting the demands of the students.

Functional Requirement: This is the requirement that relates to the features and procedures of the campus marketplace system

The system has the ability to show member data and accept input data.

2. Members' dashboard menus and submenus can be managed by the system.

3. The technology is able to display ad categories and collect data.

4. The system is able to show advertising photo data and other information after receiving input.

A. Backend: Admin/Service Provider Panel:

5. The system can display a large number of images from certain advertisements after receiving input.

Tools and Equipment Used

i. Xampp: Apache: An open-source Java Servlet Container, Apache, also referred to as Server, was created by the Apache Software Foundation.

ii. MySQL server: Compared to earlier systems, it manages big databases considerably more quickly. In addition to a variety of client apps and libraries, administrative tools, and application programming interfaces (APIs), it includes a multithreaded SQL server suited for Internet database access due to its connectivity, speed, and security.

iii. HyperText Markup Language. The standard markup language for texts meant to be seen in a web browser is. It can be beneficial to employ technology like Cascading Style Sheets (CSS), which we also use to style the pages on our website. The creation of web applications gave rise to

iv PHP, or Hypertext Preprocessor, is a programming language that is executed in a specific order, starting with a PHP interpreter and then moving on to a web server module is combined by the web server.

v. JavaScript: The abbreviation JS stands for a computer language, combined with HTML and CSS to develop websites.

Results

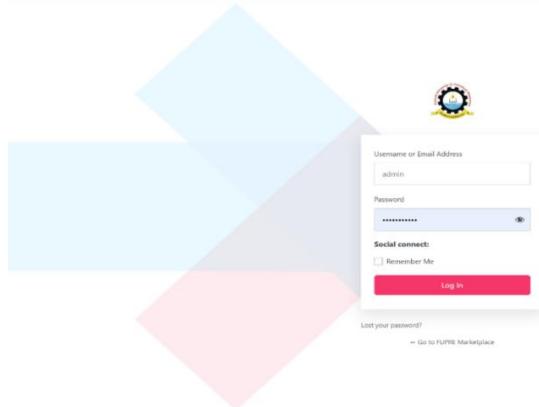


Figure 2: Admin/Service Provider Login Page

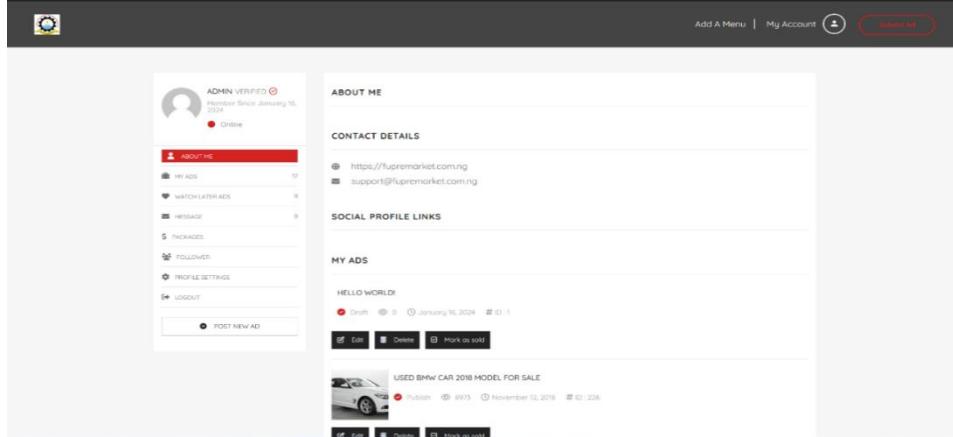


Figure 3: Admin Service Panel

B. Front-end: Service Marketplace Website:



Figure 4: Front-end of the Service Marketplace

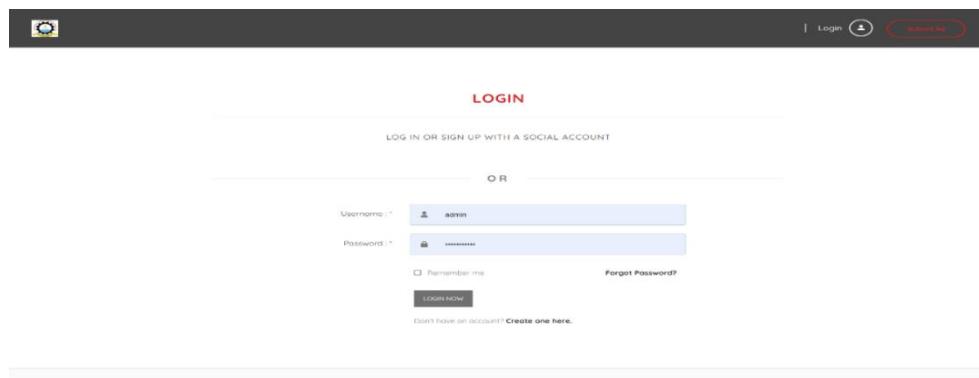


Figure 5: Customer Login/Registration Page

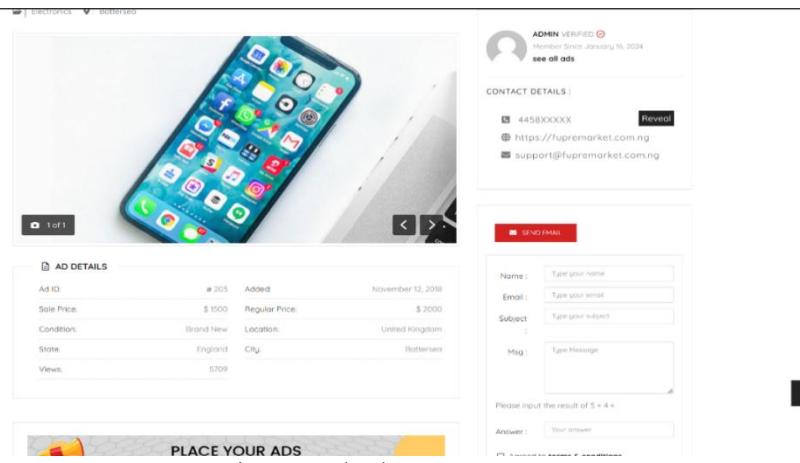


Figure 5: Checkout Page

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Conclusion and recommendations

The creation of an online marketplace for Nigerian university communities provides a customized answer to the unique requirements of higher education. The platform acts as a digital hub that promotes community involvement, resource sharing, and teamwork. The web marketplace is becoming a useful tool for improving convenience and connectivity in the academic setting as colleges continue to adopt digital solutions. The technical functionality of this work and the beneficial effects it has on the everyday lives of university personnel, faculty, and students are what determine its success. The model shows that, in contrast to the conventional classroom setting, users are more likely to collaborate, share resources, and exhibit active and constructive behaviour. In a marketplace of learning, purchasing, and selling, this model supports the waterfall technique to improve students' academic goals. According to the model, the five actions taken have a favorable impact on staff and student performance as well as communication abilities in the university marketplace.

Additionally, our model shows that consumers of cashless payments, new business model efforts, and virtual marketplace interaction have a greater influence. In order to thrive, sustain, save costs, and compete in this era of growing e-commerce, the study suggests that universities throughout the state and the nation adopt particular behaviours using digital marketplace models. Once more, policymakers are urged to promote digital inclusivity across all industries in order to close the disparity in technology, support cash-lite universities, and move toward the advantages of e-commerce, cloud computing, and customer focus. In order to meet user preferences and changing consumer behaviour patterns that impact university environmental needs for improved contextual e-commerce sustainability models, more research is advised to assess students and staff in other university environments. Furthermore, it could be argued that smaller institutions may surpass larger ones in the correct digital marketplace if the appropriate models were used to meet the needs of new consumers and take advantage of the competitive advantages that e-commerce marketplaces provide.

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