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# Development of an Online Community Marketplace for University Entrepreneurial Ecosystems

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## ABSTRACT

*Abstract: In recent years, the significance of fostering entrepreneurial ecosystems within universities has gained considerable attention. These ecosystems play a pivotal role in nurturing innovation, supporting student and faculty startups, and promoting collaboration between academia and industry. To further enhance and streamline the dynamics of these ecosystems, this study introduces the concept of an "Online Community Marketplace." This research explores the conceptualization, design, and implementation of an Online Community Marketplace tailored to the unique needs of university entrepreneurial ecosystems. The platform serves as a digital hub where students, faculty, alumni, mentors, investors, and industry partners can interact, share resources, and collaborate on entrepreneurial initiatives. This study contributes to the growing body of literature on entrepreneurial ecosystems by the development of an online community marketplace for use in the university entrepreneurial ecosystem.*

## 1.0 INTRODUCTION

Entrepreneurship is the process of creating new businesses, often involving risk and innovation [1]. Entrepreneurial Ecosystem is a network of individuals and organizations that support entrepreneurial activities [2]. On the other hand, University Entrepreneurial Ecosystems (UEEs) are networks within universities that foster and support entrepreneurial activities among students, faculty, and staff [3]. The increasing significance of entrepreneurial ecosystems within universities has become a focal point in academic and policy discussions due to their critical role in fostering innovation, nurturing startups, and bridging the divide between academic research and industrial application. As higher education institutions (HEIs) continue to emphasize the value of entrepreneurship, the need for innovative tools and platforms that can amplify and streamline these ecosystems is more pressing than ever [4].
This paper introduces the concept of an "Online Community Marketplace" as a digital solution designed to meet the unique demands of university-based entrepreneurial ecosystems. A community marketplace is simply put, an online marketplace tailored to a specific community [5]. Also, Recommender systems are used in online marketplaces to suggest products to their customers based on the top overall sellers on a site, based on the demographics of the customer, or based on an analysis of the past buying behaviour of the customer as a prediction for future buying behaviour [6].

The research was borne out of the need to find a platform for the actors of the university entrepreneurial ecosystem to collaborate. This research aims to explore the synergistic relationship between technology and entrepreneurship, examining how technological advancements can be leveraged to drive entrepreneurial success. "
This platform enables the various actors in the university entrepreneurial ecosystem- students, faculty, alumni, mentors, investors, and industry partners—can interact, exchange resources, and collaborate on entrepreneurial ventures. The paper delves into the model design process, implementation strategies, and the measurable impact of this online community marketplace in university entrepreneurial ecosystems.

### 1.1 Literature Review

[7] and [8] worked on AI Entrepreneurship which refers to the process of creating, launching, and growing businesses that are fundamentally based on or heavily leverage Artificial Intelligence (AI) technologies. It combines the principles of entrepreneurship with the transformative power of AI to develop innovative products, services, or business models that address specific problems or opportunities.
[9] presented Development of Entrepreneurial Ecosystem through University's New Companies. The emergence of new companies from universities is a cornerstone in the

development of a vibrant entrepreneurial ecosystem.
[9] also presented University-Based Entrepreneurship Ecosystems: A Conceptual Framework and Empirical Evidence. The study analysed the role of universities in fostering entrepreneurship and innovation through the development of university-based entrepreneurial ecosystems (U-BEEs). U-BEEs are defined as a network of actors (universities, businesses, government agencies, support organizations, and investors) that interact and collaborate to support the creation, development, and growth of new ventures.
[10] presented "Educational Innovation Supported by ICT to Identify Entrepreneurial Skills in Students in Higher Education.
The study describes the development and implementation of an e-learning course designed to help students in higher education identify their entrepreneurial skills.
[11] presented The Digital Entrepreneurial Ecosystem. Existing frameworks often fall short in addressing the complex dynamics at play in the digital age, particularly in how they influence and shape entrepreneurial activities. This paper introduces a novel conceptual framework designed to bridge this gap by integrating two well-established concepts: the digital ecosystem and the entrepreneurial ecosystem.
[12] presented Online marketplace: Entrepreneurship in the Digital Age: Harnessing the Power of Online Marketplaces. This study investigates the impact of online marketplaces on entrepreneurship, examining how these platforms have influenced accessibility, cost-efficiency, data utilization, community building, and service delivery.
[6] also presented an overview on Recommendation System for Ecommerce Systems. The different types of recommender systems were discussed, as well as similarity measures in recommendation systems.

### 1.2 Motivation for Research

This research was borne out of the need to find a platform for the actors of the university entrepreneurial ecosystem to collaborate. This research aims to explore the synergistic relationship between technology and entrepreneurship, examining how technological advancements can be leveraged to drive entrepreneurial success.

Most universities now have a center of entrepreneurship, the government had realized that having a skill is as important as getting a degree. FUTA is no exception. The FUTA Centre of Entrepreneurship collaborates with all the academic departments in the institution to train students on different entrepreneurial skills required in their field of studies. However, there is need for a technology platform to ensure better collaboration among the members of the university entrepreneurial ecosystem.

## 2.0 THE SYSTEM DESIGN

### 2.1 System Architecture

The model presented in Figure 1 clearly shows the interactions between the actors in an online community marketplace. The web-based online marketplace was developed using React.js with Typescript for the frontend and Node.js and Flask Application for the backend. MongoDB was used for the database while Cloudinary was utilized for storing and serving media assets such as images.

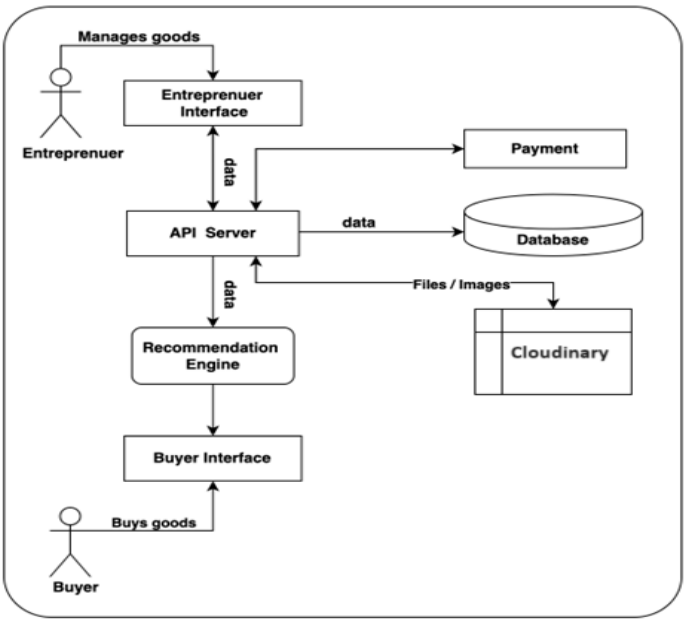


Figure 1: Interactions between the actors in an online community marketplace

Figure 2 and Figure 3 shows some of the user dataset generated and the cosine similarity matrix.

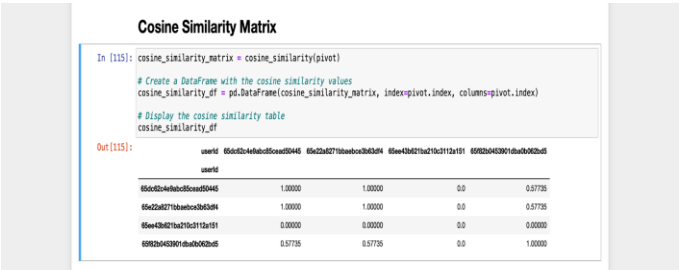


Fig 2: User Dataset

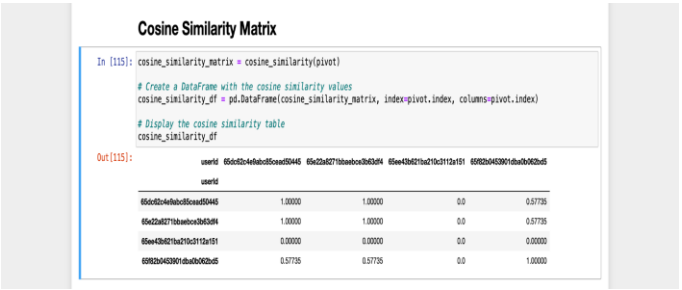


Fig 3: Cosine Similarity Matric

Home Page: The Welcome Page of the marketplace website is the initial point of interaction for customers and plays a crucial role in setting the tone for their shopping experience.

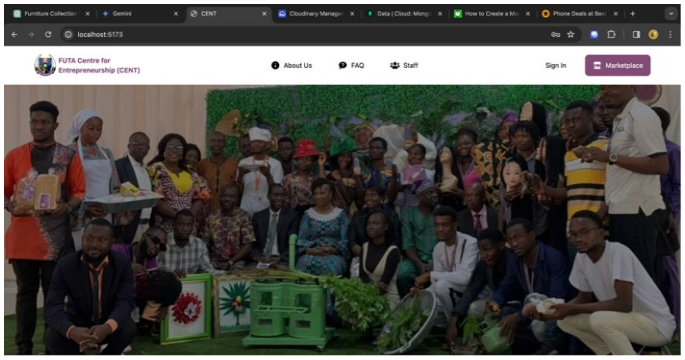


Fig 4: Home Page

Login Page: The login page provides registered users with secure access to their accounts, enabling them to ersonalize their shopping experience and access exclusive features. To safeguard user credentials, the login interface features robust authentication mechanisms, including password hashing and JWT token-based authentication.

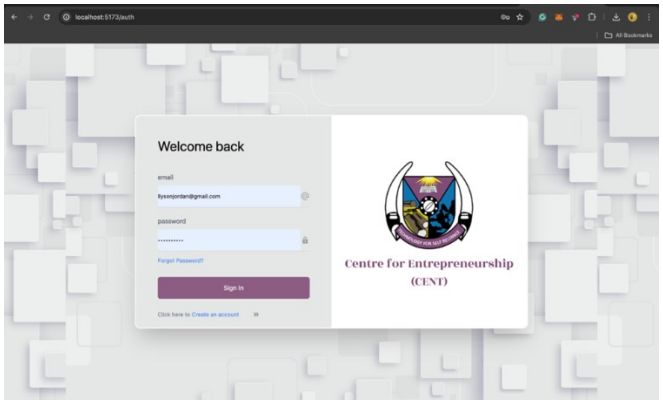


Fig 5: Login Page

Registration Page: The registration page offers new users a streamlined process to create accounts and join the online marketplace community. The registration form is designed for simplicity and ease of use, guiding users through the necessary steps to provide essential information such as username, email address, and password

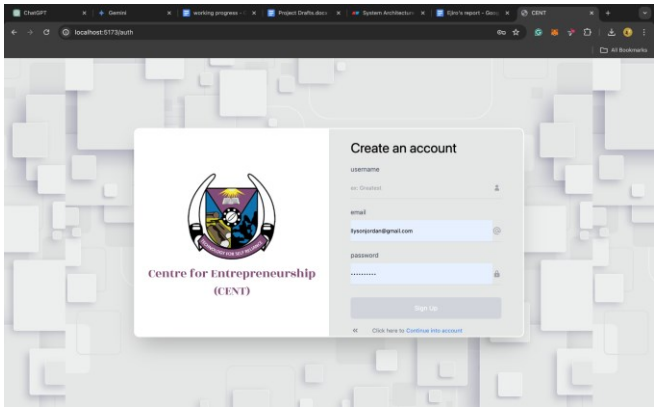


Fig 6: Registration Page

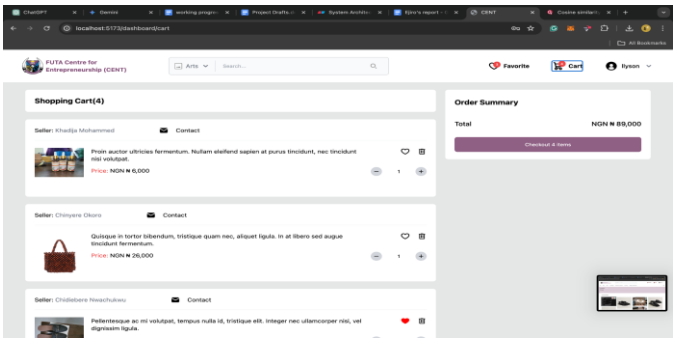


Fig 7: The Cart Page

Checkout Process: The checkout process streamlines the purchasing journey for users, guiding them through the steps to complete their transactions efficiently and securely.

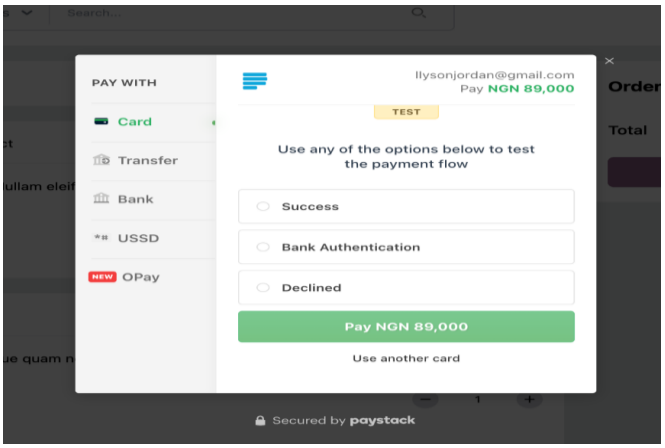


Fig 8: Checkout/Payment Page

## 3.0 SYSTEM EVALUATION

The system was evaluated using user experience evaluation.

### 3.1 Results and Discussion

The study focused on the development and evaluation of a web-based community marketplace. FUTA Community users who visited the website were engaged to submit user experience feedback. Through an analysis of the user feedback across various performance metrics, several key findings emerged.

In terms of system user-friendliness, 53% of respondents rated it as excellent, 43% as good, and about 3% as fair. Regarding system accuracy, 26.7% of users rated it as excellent, while 73.3% considered it good. When it came to system efficiency, 16.7% of respondents found it excellent, 76.7% rated it as good, and 6.6% deemed it fair. For system usability, 13.3% of users rated it as excellent, 73.3% as good, and 13.3% as fair. Finally, system effectiveness was rated as excellent by 33.3% of users, good by 63.3%, and fair by 3.4%.

The summary of users' feedback is shown in Table 1.

Table 1: Users' Feedback Summary

| S/N | REMARKS | EXCELLENT | GOOD | FAIR | POOR |
|---|---|---|---|---|---|
| 1. | System user friendliness | 16 | 13 | 1 | 0 |
| 2. | System accuracy | 8 | 22 | 0 | 0 |
| 3. | System Efficiency | 5 | 23 | 2 | 0 |
| 4. | System usability | 4 | 22 | 4 | 0 |
| 5. | System effectiveness | 10 | 19 | 1 | 0 |

Figure 9, Figure 10 and Figure 11 show the pictorial representations of the results.

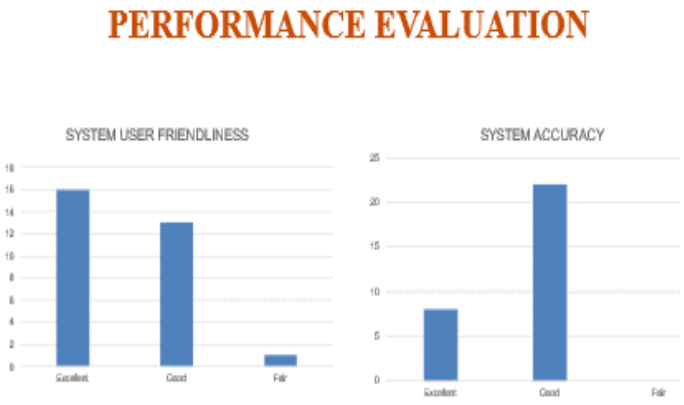


Fig 9: System User Friendliness and Accuracy

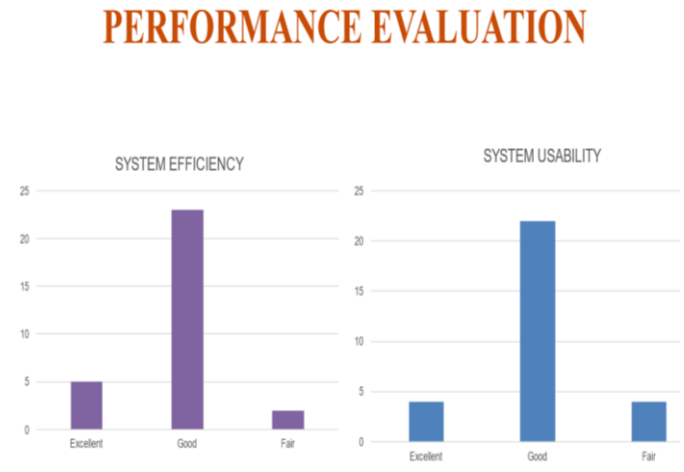


Fig 10: System Efficiency and Usability

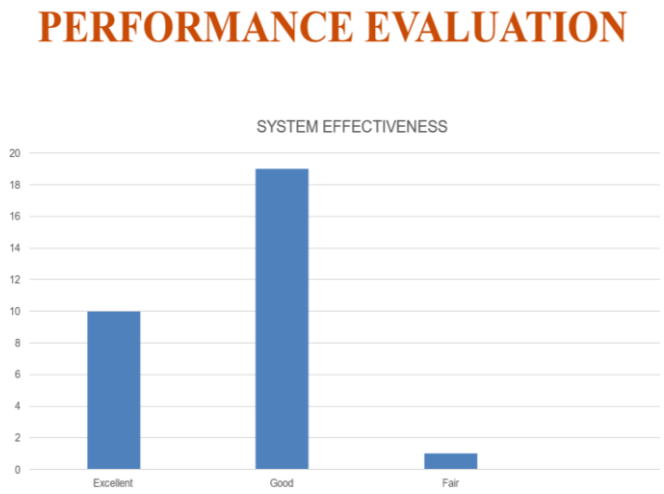


Fig 13: System Effectiveness

## 4.0 CONCLUSION

The Online Community Marketplace is a pioneering initiative that can significantly enhance the entrepreneurial capabilities of university ecosystems. It serves as a testament to the power of digital platforms in driving collaboration, innovation, and entrepreneurship, ultimately contributing to the broader goal of fostering a robust and sustainable culture of entrepreneurship within academic institutions.

### 4.1 Recommendations

The development of an Online Community Marketplace for university entrepreneurial ecosystems offers a transformative approach to fostering innovation and collaboration. Enhancing user engagement, providing tailored support services, integrating the platform with academic programs, and fostering strong industry partnerships are key recommendations for maximizing its impact.

Future research should focus on advanced analytics, scalability, blockchain integration for security, and inter-university collaboration. Conducting longitudinal studies will help assess the long-term impact on entrepreneurial outcomes.

## REFERENCES


[1]. Hisrich, R. D., & Peters, M. P. (2020). Entrepreneurship. *McGraw-Hill Education.*

[2]. Nicotra, M., Romano, M., Del Giudice, M., & Schillaci, C. E. (2017). The role of the entrepreneurial ecosystem for innovation-based startups: *A European perspective. Technological Forecasting and Social Change,* 127, 63-79.

[3]. Cunningham, J. A., Menter, M., & O'Kane, C. (2019). Value creation in the entrepreneurial university: The role of societal impacts. *Studies in Higher Education, 44(1), 124-141.*

[4]. Smith, A. (2020). Fostering local commerce: The impact of community marketplaces. *Journal of*

*Economic Geography, 22(2), 90-104.*.

[5]. Archer, P., & Wang, Y. (2021). Designing digital community marketplaces: Best practices for user engagement and scalability. *Journal of Digital Commerce, 13(2), 45-58.*

[6]. Farah Tawfiq Abdul Hussien & Abdul Monem S. Rahma & Hala B. Abdulwahab, 2021. "An E-Commerce Recommendation System Based on Dynamic Analysis of Customer Behavior," *Sustainability, MDPI, vol. 13(19), pages 1-21, September, 2021.*

[7]. Liu, Y., Sun, Z., & Guo, J. (2023). AI entrepreneurship: Opportunities, challenges, and strategies. *Technological Forecasting and Social Change, 184, 121995.*

[8]. Li, Z., Xu, J., & Zhao, X. (2022). AI and the New Era of Entrepreneurship: Opportunities and Challenges. *Journal of Entrepreneurship Research, 24(2), 211-229.*

[9]. Vekić, Aleksandar & Borocki, Jelena & Fajsi, Angela. (2019). Development of Entrepreneurial Ecosystem through University's New Companies. Management: *Journal of Sustainable Business and Management Solutions in Emerging Economies*

[10]. Portuguez-Castro, M., & Gómez-Zermeño, M. G. (2020). Educational Innovation Supported by ICT to Identify Entrepreneurial Skills in Students in Higher Education. *In 8th International Conference on Technological Ecosystems for Enhancing Multiculturality (TEEM 2020). Salamanca, Spain: Universidad de Salamanca.*

[11]. Sussan, F., & Acs, Z. J. (2017). The digital entrepreneurial ecosystem. *Small Business Economics, 49(1), 55-73.*

[12]. FasterCapital. (n.d.). Online marketplace: Entrepreneurship in the digital age - Harnessing the power of online marketplaces. https://fastercapital.com/content/Online-marketplace--Entrepreneurship-in-the-Digital-Age--Harnessing-the-Power-of-Online-Marketplaces.html [13]. N.A. Khan, B.R. Hemmelgarn, M. Tonelli, C.R. Thompson and A. Levin (2005). Prognostic value of troponin T and I among asymptomatic patients with end-stage renal disease: a meta-analysis. *Circulation*, 112: 3088– 3096.