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Design and Implementation of a Web-Based Artisan Finding System

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Abstract*— Many industries has been transformed with the rapid growth observed with the usage of digital technologies and AI; however, many skilled artisans in Africa and developing nations still behind due to limited access to internet and digital presence. In this study, the researcher design and implement a web-based artisan finding system that aims to connect artisans with potential clients within a digital marketplace. This system allows users to browse and locate artisans by location and service categories, in the same vein it allows artisans to register, display their services, manage bookings, and receive customer feedback. Furthermore, this system incorporates other features like geo-location search, user authentication, profile management, booking functionality, and a client review mechanisms. The system was developed using technologies like React.js, Tailwind CSS for the front-end, while Node.js, MongoDB technologies were used for the back-end logic, and data storage respectively, the system adopts an agile development methodology to ensure iterative improvement based on user feedback. This system offers a simple user interface for easy accessibility and scalability, so as to empowers artisans to manage their potential clients

Index Terms— ***Artisan Finder, Digital Marketplace, Informal Economy, Location-Based Search, Web Application.***

I. INTRODUCTION

1.1 Background of the Study

Nigerian Artisans plays a vital role in service delivery, they also contributes to the Nation's Gross domestic product (GDP), Record has it that over 90% of the Nations income comes from the informal sector in the year 2024 (News Agency of Nigeria, 2024). Artisans such as electricians, carpenters, and plumbers provide indispensable services; however, they often operate outside formal structures. In many developing nations and Nigeria, reliance on informal networks or word-of-mouth makes it difficult for customers to discover skilled artisans. Also the lack of digital platforms, and cyber-security trusts has crippled the access to these services, and building of trust through customer reviews, verification mechanisms, and location-based discovery. Even though the developed Nations benefits from similar systems like TaskRabbit and Thumbtack, which facilitates digital hiring of service providers, however these platforms still suffers some setbacks such as constant internet access and digital literacy and cyber-security which still affects countries like Nigeria. However, there is a growing need for a user-centric solution that connects clients with artisans easily, empowers skilled laborers, and supports economic growth in underserved communities.

1.2 Statement of the Problem

The lack of organized platforms and database access for artisans in Nigeria has lead to reduced client access, inconsistent service quality, and unstable income opportunities for workers. Also many artisans lack online presence, this makes them invisible to potential clients beyond their immediate community. Also, there are few platforms that enable service verification, customer feedback, or effective artisan-client interaction. All these factos contributes to limited growths in the artisan sector, which, according to reports, contributes over 50% to global employment and over 80% of on-site construction jobs in Nigeria. A digital platform tailored to local infrastructure and user needs is necessary to solve these challenges.

1.3 Aim of the Study

The aim of this project is to design and implement a web-based artisan finding system that will facilitates easy

access and interaction between clients and artisans through location-based search and service listings

1.4 Objectives of the Study

The specific objectives of the study are to:

i. Design a web-based system to onboard and manage clients and artisans.

ii. Implement user authentication, location-based search, and service management features.

iii. Test and evaluate the performance, usability, and reliability of the platform.

1.5 Significance of the Study

The significance of this study is to promotes digital inclusion for artisans operating in the informal sector in Nigeria by enabling artisans to showcase their skills and manage bookings online, the system shall increase access to a reliable services, it will enhance accountability, and facilitate local economic development. Clients can also benefit from ease of discovery, verified profiles, and transparent service reviews. The outcome of this study will guide future initiatives in other under-developed regions in Africa.

1.6 Definition of Terms

i. **Artisan**: A skilled manual worker providing services such as carpentry, plumbing, or electrical work.

ii. **Client**: An individual seeking services from artisans via the platform.

iii. **Location-Based Search**: A feature enabling users to find services near their current geographic position.

iv. **Informal Sector**: The part of the economy that is not regulated or taxed by the government, often including freelance and unregistered labor.

v. **Frontend/Backend**: The frontend refers to the user interface; the backend handles server logic and database interactions.

vi. **Scalability**: The ability of a system to handle increased load without compromising performance.

vii. **Authentication**: The process of verifying a user's identity to grant platform access.

II. Review of Related Works

The deployment of Information and technological solutions into informal labor markets has brought so many innovations, part of it is Artisan finding system. Research have shown that digital platforms has the ability to improve access to services, enhance visibility, and foster economic development for artisans and small-scale workers. Etim and Daramola [1] in there research compares different informal artisan sectors in Nigeria and South Africa, from there findings, they concluded that Nigerian artisans lack structured digital frameworks, which restricts their service reach. Also Ozili [2] and Evans [3] emphasized that digital and financial inclusion in developing countries can significantly increase economic outcomes if barriers such as infrastructure and digital illiteracy are addressed. These works underline the urgent need for context-aware systems tailored to Nigeria and African countries at large.

In actual sense, many digital platforms has been created to connect artisans with clients. Some of these are LaborHack. LaborHack is a digital platform that offers geolocation-based services and community interaction features that enable clients to connect certified artisans with a particular community, in order to render a service, the system encourages artisan accountability [4]. Others are Artiseek and ArtisanOga, which also provide digital platforms for artisans to list their services and receive job requests, while integrating a secured payment solution along with matching artisans with clients [5][6]. However, part of the problems identified with the solutions described earlier includes; limited user adoptions due to poor promotion, incomplete service verification, and inconsistent artisan availability, etc. Hajiya [7] reports that over 65% of Nigeria's GDP is linked to artisan labor, underlining the critical economic value of the sector. Inspite of this many artisans remain digitally invisible. A major limitation to this that all the existing platforms lacks the ability to structure skill assessment and standardization, which complicates trust-building between clients and service providers. Other technical challenges are poor UI/UX design, inefficient search mechanisms, and low artisan registration rates further reduce the effectiveness of these platforms.

As part of the identified problems associated with platform for sourcing skilled artisan in developing nations like Nigeria, the researcher noticed that these platforms lacks, Automation, support for mobility, complex matching Algorithms etc. However other platforms like Thumbtack, Upwork, and TaskRabbit, has benefited from a mature ecosystems, AI-powered recommendation engines, and streamlined payment systems that significantly enhance user experience. It has been observed that local solutions still lack in areas such as identity verification, real-time service tracking, and automated dispute resolution mechanisms. our proposed system is named BizBridge, BiZBridge is an Artisan finding system, that seeks to address parts of the gaps through a web-based platform tailored for local infrastructure, focusing on simple interface design, secured, accessible, and a scalable system.

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III. METHODOLOGY

In this study, the researcher adopts Agile Software Development methodology to implement the BiZBridge (Artisan Finding System). Agile development style was adopted due to its flexibility, user-centered approach, and iterative nature. Futhermore Agile Methodology ensures continuous integration of feedback and allows for adjustments during the development cycle, which is needed when developing solutions for real-world, informal sector challenges.

3.1 Research Phase

The research phase of this system, BizBridge started with requirement gathering through combination of surveys and interviews from targeted user groups; primarily artisans and prospective clients in Lagos, Nigeria. However, the objective of this Phase is to gather insights about service access challenges, the preferred communication channels, and best payment channels to be used by both parties. The outcomes are stated below, they are:

i. Ease of use and mobile responsiveness.

ii. Location-based service discovery.

iii. Profile verification for artisans.

iv. Review and feedback systems for transparency.

3.2 Design Phase

The design phase is known for translating user needs into models and interface prototypes. parts of design tools used in this study include Unified Modeling Language (UML), sequence diagrams and flowcharts tools were used to visualize interactions and system components:

i. **Use Case Diagrams** illustrated user roles and platform functionalities.

ii. **Sequence Diagrams** modeled the interaction flow from client search to booking.

iii. **Flowcharts** gives a simplified view of service and user registration processes.

The benefit of the design phase is to ensure that the system align with expected workflows and business logic before coding begins properly.

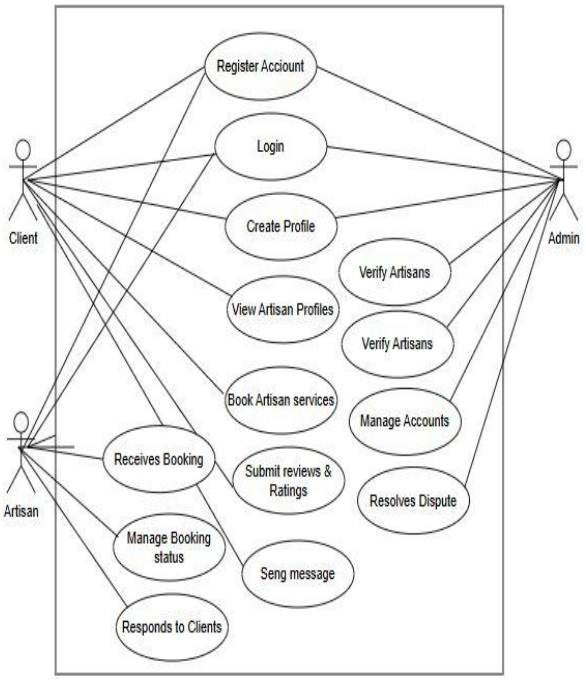

Figure 1: use-case diagram of Artisan finding system

3.3 Development Phase

The Artisan finding system termed BizBridge was developed with full stack of web technologies, with several components of the design comprising:

i. **Front end:** The user interface at the front end is constructed utilizing React.js alongside Tailwind CSS, which is pivotal for ensuring responsive user experiences.

ii. **Backend**: The Back-end: The back-end architecture of the system is design using Node.js combined with Express.js for the execution of server-side logic and the management of API interactions

iii. **Database**: Database: The system's database is built with MongoDB with Mongoose ODM to store user records, services, bookings, and reviews

iv. **Authentication**: JWT (JSON Web Tokens) is to ensure secure session control and identity management.

The development was done in sprints, with each sprint focusing on core features such as registration, search, booking, and reviews.

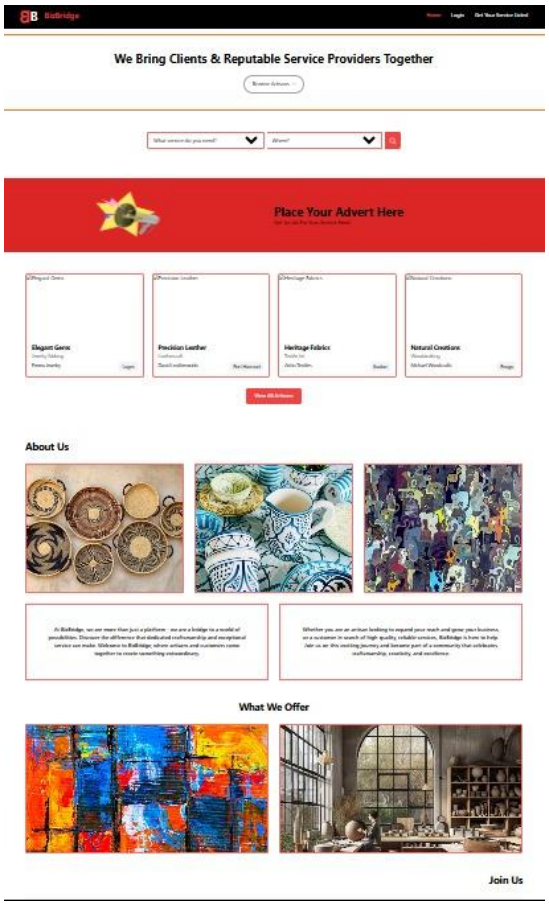

Figure 2: Home page of Artisan finding system

3.4 TESTING PHASE

The system testing was done at multiple levels of testing which include:

i. **Unit Testing**: The unit testing verifies that individual unit functions (e.g., login, booking) performed as expected.

ii. **Integration Testing**: The integration testing unit checks the proper functionality of client-server-database communication.

iii. **System Testing**: The system testing phase measures the overall system behavior under different usage scenarios.

iv. **User Acceptance Testing (UAT)**: At the user acceptance testing phase, real users are allowed to test the system's usability and intuitiveness, leading to design tweaks and usability improvements.

v. **Security Testing**: The security testing unit was done to ensure safe handling of user data and also to prevent unauthorized access and injection attacks.

CONCLUSION

The Artisan finding system named BizBridge system was designed to seamlessly streamlined the process of connecting service seekers with skilled artisans, this system eliminates inefficiencies observed in traditional artisan sourcing methods. Part of the advantages offered by this system includes, users can easily locate, evaluate, and hire artisans based on expertise availability, and customer reviews. The automation of service requests, secure authentication, and a simplified artisan dashboard for managing services are parts of the benefits of BizBridge. The outcome of system's performance and usability testing affirms its reliability and ease of use, this attributes makes it an effective tool for bridging the gap between artisans and clients. Security-wise the system can also prevent unauthorized access and injection attacks.

REFERENCES

[1] Etim, E., & Daramola, O. (2020). The informal sector and economic growth of South Africa and Nigeria: A comparative systematic review. Journal of Open Innovation: Technology, Market, and Complexity, 6(4), 134

[2] Ozili, P. K. (2018). Impact of digital finance on financial inclusion and stability. Borsa istanbul review, 18(4), 329-340

[3] Evans, O. (2018). Connecting the poor: the internet, mobile phones and financial inclusion in Africa. Digital Policy, Regulation and Governance, 20(6), 568-581.

[4] Martins, N., Brandão, D., Alvelos, H., & Silva, S. (2020). E-marketplace as a tool for the revitalization of portuguese craft industry: The design process in the development of an online platform. Future Internet, 12(11), 195.

[5] Raghavendra, P., Sahana, H. S., Prasad, M. D., Kulkarni, S., & Bhavana, G. V. (2023). E-Commerce Website for Artisans. International Journal of Research Publication and Reviews, 4(5), 4152.

[6] Onu Fergus, U., & Festus, O. O. (2020). Design of a Web-Based Artisans Services Platform (Artisans-Connect). Middle-East Journal of Scientific Research, 28(1), 22–27.

[7] Ikegwu Emmanuel, M., Ajiboye, Y. O., Aromolaran, A. D., Ayodeji, A. A., & Okorafor, U. (2014). Human empowerment through skills acquisition: Issues, impacts and consequences-a non-parametric view. Journal of poverty, investment and development, 5(1), 94-101.

[8] https://nannews.ng/2024/07/07/about-90-of-informal-businesses-contribute-to-nigerias-gdp-report/ visited on 18, August, 2025.

[9] https://www.artisanoga.com/ visited on 26th of August, 2025

[10] https://www.thumbtack.com/ visited on 26th of August, 2025.