

Design and Implementation of a Web-based Platform for Artisans to Collaborate and Share Resources and Knowledge

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ABSTRACT

This paper presents the design and implementation of a web-based platform aimed at enhancing collaboration, resource sharing and knowledge exchange among artisans. Artisans in traditional craft industries often face limited market access and inadequate resources for skill development, and existing digital platforms rarely account for their cultural and socio-economic diversity. Through a review of existing digital platforms, this study identifies these gaps and proposes a Culturally Adaptive Platform Framework (CAPF) that integrates cultural sensitivity, inclusivity and community-driven knowledge exchange. The platform was implemented using HTML, CSS, JavaScript, PHP and MySQL to provide registration, resource-sharing, knowledge-sharing (blog/tutorial) and administrative modules. A comparative evaluation of four frameworks — Task-Oriented Design (TOD), Community of Practice (CoP), the proposed Culturally Adaptive Platform (CAP) and a Collaborative Learning Platform (CLP) — was carried out using accuracy, effectiveness and scalability as metrics. Results show that CAP achieved the highest scores (85% accuracy, 90% effectiveness, 85% scalability), outperforming CLP (78%, 82%, 80%), TOD (70%, 80%, 65%) and CoP (65%, 75%, 75%). These findings confirm that culturally informed design measurably improves user relevance, engagement and scalability for artisanal communities, while specific mechanisms from the other frameworks can still be selectively integrated to optimise particular platform functions.

General Terms

Design, Algorithms, Human Factors, Performance.

Keywords

Web-based platform, Artisans, Collaboration, Knowledge management, Culturally adaptive framework, Resource sharing, E-commerce.

1. INTRODUCTION

1.1 Background

The growth of digital technology has reshaped how craft-based communities connect, collaborate and exchange knowledge. Web-based collaborative tools have been shown to support the creation and sharing of digital content among distributed users, offering artisans new channels for showcasing their work and exchanging expertise [1]. Comparable systems developed for micro, small and medium enterprises (MSMEs) demonstrate how tailored, web-based knowledge-management platforms can be adapted to the operational realities of small-scale producers [2], while community-driven information systems built specifically for rural artisans show that culturally grounded digital tools can

reduce knowledge asymmetry and improve market access [9], [11]. Case studies of Indian handicraft micro-entrepreneurship further confirm that digital visibility and voice are central to the economic empowerment of artisans [12].

Digital inclusion research beyond the craft sector reinforces this picture: crowdsourcing platforms have been used to connect unskilled workers in resource-constrained regions to international markets [20], while e-commerce platforms for agribusiness [21] and social-business models for e-agriculture [24] show that a well-designed digital marketplace can meaningfully improve income and market reach for producers who previously depended on intermediaries. These parallels suggest that similar design principles — direct market access, simplified onboarding, and community trust-building — are transferable to the artisanal sector.

Despite these advances, artisanal communities continue to face persistent barriers to market access, resource sharing and skill development [13]. Existing platforms typically adopt either a task-oriented model that optimises for completing discrete transactions, or a Community-of-Practice (CoP) model that emphasises collective learning [3], [4], [18]. Both approaches tend to under-account for the cultural, socio-economic and educational diversity of artisan populations, relying instead on assumptions drawn from formal education or corporate settings [6], [16].

1.2 Statement of the Problem

Existing task-oriented and Community-of-Practice frameworks for artisan platforms do not adequately account for the cultural, socio-economic and educational disparities among artisans, and rely on formal-education assumptions that do not transfer well to informal craft communities. This study proposes an enhanced framework — the Culturally Adaptive Platform Framework (CAPF) — that integrates cultural sensitivity, inclusivity and community-driven knowledge exchange specifically for artisanal communities, with a user-centric approach that allows customisation based on individual cultural and educational backgrounds.

1.3 Aim and Objectives

The aim of this study is to design, implement and evaluate a web-based platform that promotes collaboration, resource sharing and knowledge exchange among artisans. The specific objectives are to: (i) examine existing digital platforms to identify needs and gaps in the artisanal sector; (ii) develop a Culturally Adaptive Platform Framework (CAPF); (iii) implement the proposed system; and (iv) evaluate CAPF against existing Community-of-Practice and task-oriented frameworks using accuracy, effectiveness and scalability as metrics.

1.4 Significance of the Study

While established e-commerce frameworks exist for sectors such as agriculture [15], [16], artisans face distinct challenges around cultural sensitivity and resource sharing that these general solutions do not fully address. By focusing specifically on artisans, this study contributes a platform that supports market access while preserving traditional craftsmanship and cultural heritage, and offers design lessons transferable to other niche, community-based digital-inclusion efforts. The platform also incorporates a 5% commission-based revenue model on completed jobs, giving platform owners a sustainable incentive to maintain and grow the service.

1.5 Scope and Limitations of the Study

The scope of this study is limited to the design, implementation and evaluation of a web-based platform for enhancing collaboration, resource sharing and knowledge exchange among artisans, including the underlying Culturally Adaptive Platform Framework (CAPF) and its comparative evaluation against task-oriented, Community-of-Practice and collaborative-learning designs. It does not extend to a large-scale, multi-region field deployment or a longitudinal study of platform adoption, which are identified as directions for future work in Section 6. A key limitation is the difficulty of capturing the diverse and dynamic nature of artisanal communities within a single digital platform: as Deng and Guo [5] note, facilitating effective knowledge sharing in virtual communities is complicated by varying user needs and interaction patterns, and the nuances of knowledge transfer in artisanal contexts documented by Arthur-Holmes et al. [13] may not be fully captured by a generalised platform design. Consequently, while CAPF aims to provide broad, culturally sensitive support, it may not fully meet the specific needs of every artisan community, which the evaluation in Section 5 and the recommendations in Section 6 seek to partially address.

2. RELATED WORK

2.1 Digital Platforms for Craft and Artisan Communities

Capece et al. [1] developed a web-based collaborative authoring tool for virtual-reality content, showing that browser-based collaboration can support distributed creative teams. Buntoro et al. [2] designed a web-based knowledge-management system tailored to MSMEs, showing that customised digital tools can be adapted to the operational needs of small producers. In the specific context of rural artisans, Basak et al. [9] proposed the Community-driven Information System for Rural Artisans (CISRA), later extended with a blockchain-enabled supply-chain model for handicraft artisans [10] to improve traceability and trust. Bhattacharyya et al. [11] cultivated an online virtual community of purpose to reduce knowledge asymmetry and market separation among rural Indian artisans, while Anil et al. [12] documented how the Amounnee platform amplified the voice and micro-entrepreneurial reach of Indian handicraft artisans. Gomathy et al. [15] and Iyer et al. [16] examined multi-vendor e-commerce and farmer-focused portals; although developed for agriculture, both demonstrate design patterns — unified marketplaces and direct producer-to-buyer access — that transfer well to artisan platforms.

2.2 E-Commerce and Community-Based Digital Solutions

Beyond the craft sector, several studies document how digital platforms extend market access to under-served producer communities. Abudalu et al. [20] show how international crowdsourcing markets can empower an unskilled workforce in

a resource-constrained setting, offering a template for low-barrier income generation that could be adapted for artisans without formal business infrastructure. Alfaro et al. [21] developed an e-commerce platform for agribusiness that streamlines vendor onboarding and transaction handling, while Garudachar [24] describes the E-Agro social-business initiative connecting smallholder farmers to markets through a digital intermediary model. Afolabi et al. [22], [23] examined web-based recruiting and human-resource sourcing systems for the construction sector, finding that professionals respond positively to digital systems that reduce the friction of finding and securing work — a dynamic directly relevant to how artisans find and are matched with clients on the proposed platform. Together, these studies confirm that digital intermediation, when designed around the target community's constraints, consistently improves market access and reduces dependency on informal middlemen.

2.3 Knowledge Management and Collaborative Learning

Jones and Conway [4] modelled knowledge-management system design for enhancing creativity in artistic processes, while Deng and Guo [5] examined knowledge sharing in virtual communities from a network perspective, finding that network structure strongly shapes the quality of knowledge exchange. Hu et al. [6] proposed a blended knowledge-sharing framework for design professionals that combines face-to-face and digital channels, and Chai-Arayalert et al. [3] designed digital environments specifically to support handicraft co-learning. Studies of online-marketplace behaviour by Chen and Zhu [7] and Chen et al. [8] show that transparent seller-to-seller information sharing improves marketplace performance and buyer trust — insights that inform the design of resource- and knowledge-sharing modules for artisan platforms. Arthur-Holmes et al. [13], in the context of artisanal and small-scale mining, show that structured knowledge transfer between educational institutions and informal-sector workers improves both safety and productivity, a finding directly relevant to skill-development features for artisans. Conrad [27] further shows, in an online-learning setting, that a strong sense of social presence among participants is a key predictor of sustained community engagement, reinforcing the importance of features that let artisans feel seen and heard rather than merely transacting.

2.4 Cultural Adaptability, Inclusion and Emerging Technologies

Barnes [14] demonstrates how social-media tools such as TikTok can serve as relational tools within Indigenous art processes, underlining the importance of culturally attuned interaction design. Bloomberg [18] analysed community-engagement platforms in higher education, finding that a sense of belonging — not just functional features — drives sustained participation, a principle equally applicable to artisan communities. Alam et al. [17] identified drivers and barriers to tacit-knowledge sharing among automotive-workshop employees, underlining that informal, hands-on knowledge, much like artisanal craft knowledge, requires deliberate platform features to surface and transfer. Avram and Hysa [19] frame education, knowledge and data-sharing within the broader sharing economy, providing conceptual grounding for treating an artisan platform as part of this wider digital ecosystem. Chen et al. [25] describe efforts to integrate virtual-world technology with traditional heritage settings, illustrating how immersive digital tools can help bridge physical and cultural boundaries for craft communities, while Dossett et al. [26] show that carefully designed iconography and interface cues materially affect how users interpret a platform's state and intent — a usability lesson that informed the proposed

platform's emphasis on simple, legible interface elements for users with varying digital literacy.

2.5 Digital Platforms in Creative and Fashion Industries

Parallel work in the fashion and creative-craft space offers further transferable lessons. Colombi and Casciani [28] examine how digital competences and skills can be systematically built within a traditional creative industry through structured training programmes, while Cunha et al. [29] describe a next-generation fashion ecosystem that links digital tools across design, production and retail to support small creative businesses. Gallico [30] presents an integrated e-learning and Industry 4.0 platform connecting fashion education across regions, demonstrating that digital platforms can simultaneously deliver skill development and market connection. These studies collectively show that creative-industry platforms succeed when they combine an educational function with a commercial one — a combination that directly shaped the inclusion of both a knowledge-sharing (tutorial) module and a resource/commission module in the proposed artisan platform.

2.6 Theoretical Framework

The design of the proposed platform draws on five complementary theories. Social Exchange Theory holds that individuals participate in knowledge- and resource-sharing when perceived benefits outweigh costs, motivating the platform's incentive and reputation features. Knowledge Management Theory frames how the system acquires, organises and disseminates artisan knowledge for reuse. The Theory of Planned Behaviour explains participation as a function of attitudes, subjective norms and perceived behavioural control, informing onboarding and community-norm design. The Technology Acceptance Model (TAM) — perceived usefulness and ease of use — guided interface-simplicity decisions for users with varying digital literacy. Tacit Knowledge Theory, which emphasises experiential knowledge that is difficult to formalise, motivated features such as multimedia tutorials and mentorship threads that let artisans demonstrate rather than only describe their craft.

2.7 Research Gap

The reviewed studies provide strong evidence for the value of web-based collaboration, knowledge management and culturally sensitive design considered in isolation, but little work integrates all three dimensions — market access, structured knowledge sharing and cultural adaptability — into a single platform for artisans, particularly outside single-country or single-craft case studies [1]–[30]. Existing task-oriented and Community-of-Practice designs also under-account for the socio-economic and educational diversity typical of artisan populations. This study addresses that gap through the proposed Culturally Adaptive Platform Framework (CAPF), evaluated in Section 5.

3. SYSTEM METHODOLOGY AND DESIGN

3.1 Research Approach and System Architecture

The platform architecture integrates HTML, CSS and JavaScript on the front end with PHP handling server-side business logic and a MySQL relational database on the back end (Fig. 1). JavaScript issues asynchronous (AJAX) requests to the server so the interface updates without full page reloads, while PHP scripts process these requests, apply business rules and interface with MySQL to store and retrieve user profiles, resource listings and knowledge entries. This client-server design keeps the front end

responsive while centralising data integrity and security on the server.

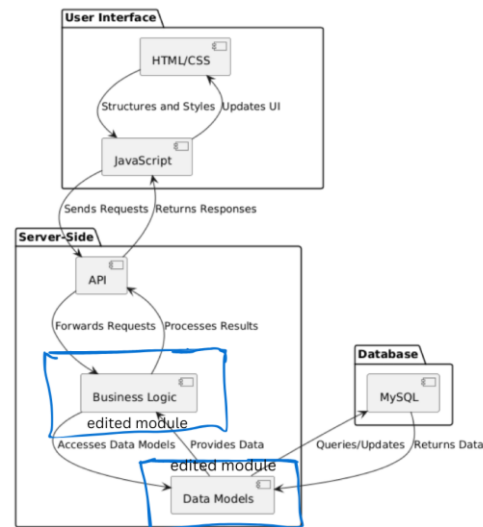


Fig 1: System Architecture

3.2 Architectural Components

On the front end, HTML structures the pages that present profiles, forums and resource listings; CSS ensures a visually consistent, responsive design across device sizes; and JavaScript adds interactivity such as real-time updates and collaboration features. On the back end, server-side scripts manage user requests, enforce business logic and integrate with the database, handling authentication, data processing and resource management, while the MySQL database stores user information, resource data and collaboration records for efficient retrieval. Communication between the two layers follows a simple request-response flow: client-side JavaScript issues asynchronous requests, the server processes them and interacts with MySQL to fetch or update data, and AJAX facilitates the resulting data exchange so that live updates and interactive elements — critical for artisan collaboration and resource sharing — can be delivered without disrupting the user's session.

3.3 Actors, Roles and Use Cases

Three classes of actor interact with the system: Artisans, who register, share resources and exchange knowledge; Platform Administrators, who manage accounts, content and moderation; and End Users, who search and consume shared resources. Fig. 2 presents the use-case diagram, covering core interactions such as account registration/profile setup and searching for and accessing shared resources.

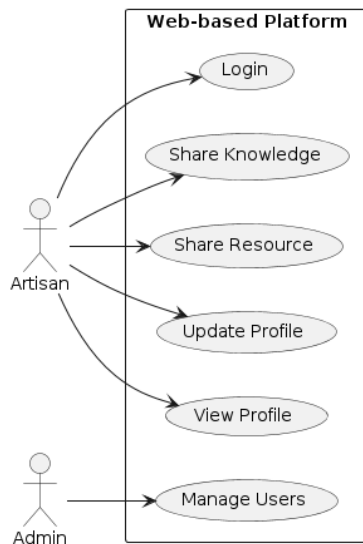


Fig 2: Use Case Diagram

3.4 Software Framework and Technology Rationale

HTML was chosen for its ability to structure the platform's content, providing the foundational layout for artisan profiles, resource listings and collaborative forums, essential for organising and presenting information clearly. CSS was selected to ensure a visually appealing and responsive design that adapts the platform's look and feel across devices, making it easier for artisans with varying levels of digital literacy to interact with and navigate the site. JavaScript was implemented to add dynamic functionality and interactivity, supporting features such as real-time messaging and instant updates that are crucial for effective collaboration and resource sharing among artisans. MySQL was used for its reliable data-management capabilities, handling the storage and retrieval of user information, resource data and collaboration records with the efficiency and security the platform's operations require. Together, these four technologies form a cohesive, lightweight stack capable of delivering a responsive experience without imposing heavy infrastructure requirements on the platform owner.

3.5 Data Framework and System Components

The data framework (Fig. 3) defines the core entities — Users, Resources, Knowledge, Messages and Comments — and their relationships, while the component diagram (Fig. 4) shows how the HTML/CSS presentation layer, JavaScript interaction layer, PHP business-logic layer and MySQL data layer are connected.

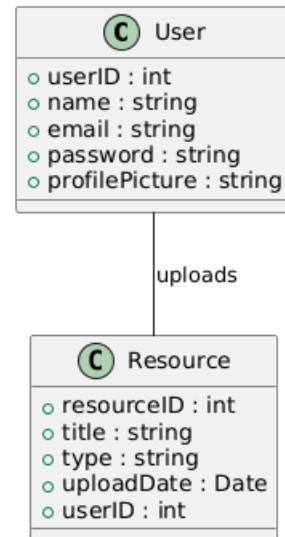


Fig 3: Data Framework

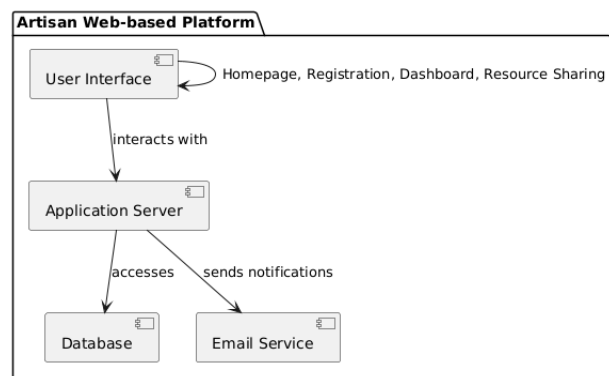


Fig 4: Component Diagram

3.6 Functional and Non-Functional Requirements

Table 1 and Table 2 summarise the platform's functional and non-functional requirements, covering registration, resource and knowledge sharing, search and collaboration, monetisation, performance, security, usability and reliability.

Table 1: Functional Requirement Specifications

ID	Description	Priority
R101	User registration with unique username and password	High
R102	User login with registered credentials	High
R103	Profile management and updates	Medium
R105	Resource sharing (tools, materials)	High
R106	Knowledge sharing (tutorials, tips)	High
R107	Search for projects, resources and knowledge	High
R108	Commenting and collaboration on shared items	High
R109	Notifications for platform activity	Medium

ID	Description	Priority
R110	Commission-based payment on completed jobs	High

Table 2: Non-Functional Requirement Specifications

ID	Description	Priority
R201	Supports up to 1,000 concurrent users	High
R202	Horizontally scalable as users/data grow	High
R203	Encrypted data and secure authentication	High
R204	Intuitive, user-friendly interface	High
R205	Cross-browser compatibility	Medium
R206	99.9% uptime with backup/recovery	High
R207	Maintainable, modular, documented code	Medium
R208	Regular automated backups and recovery plan	High

3.7 Database Design

The relational schema (Table 3) centres on five tables — Users, Resources, Knowledge, Messages and Comments — linked by foreign keys on user_id, supporting efficient storage and retrieval of profile, resource and knowledge-sharing data.

Table 3: Database Design Summary

Table	Key Fields	Description
Users	user_id (PK), username, password, email	User credentials and profile
Resources	resource_id (PK), user_id (FK), name, type	Shared tools/materials
Knowledge	knowledge_id (PK), user_id (FK), title, content	Tutorials and tips
Messages	message_id (PK), sender_id, receiver_id	User-to-user communication
Comments	comment_id (PK), user_id (FK), target_id	Feedback on resources/posts

3.8 Entity-Relationship Diagram

Fig. 5 shows the entity-relationship diagram, in which a User has a one-to-many relationship with both Resources and Knowledge entries.

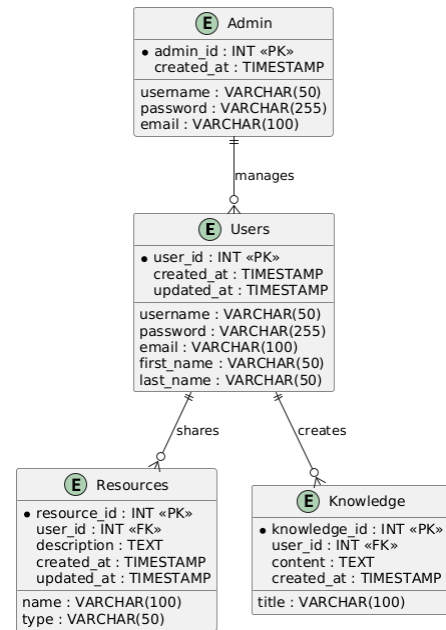


Fig 5: Entity-Relationship Diagram

3.9 Algorithm and System Flow

The platform follows an eight-step interaction cycle (Fig. 6): (i) the user submits data through an HTML form; (ii) JavaScript validates the input and forwards it to the server; (iii) the PHP API receives the request; (iv) business-logic scripts process it; (v) MySQL is queried or updated; (vi) results are returned to the business-logic layer; (vii) a response is prepared; and (viii) the interface is updated accordingly.

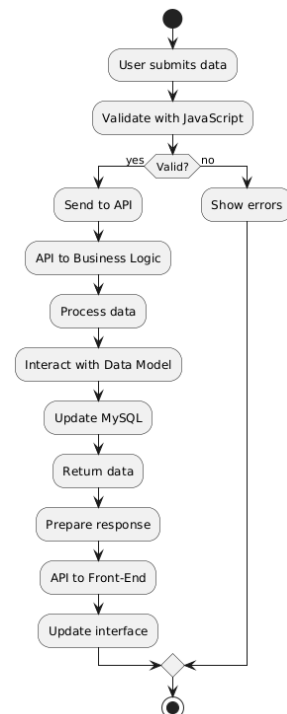


Fig 6: System Flowchart

3.10 Ethical Considerations

Development followed core ethical principles. Data privacy and security are protected through secure authentication and access control, guarding users' personal and professional information from unauthorised access and misuse. Intellectual-property

protection ensures that artisans' original works and ideas are properly credited and not exploited without permission. Inclusivity is a key design consideration, with the platform built to be accessible to artisans from diverse backgrounds, including marginalised communities, while avoiding biases that could disadvantage particular groups. Transparency regarding the platform's operations, data handling and monetisation practices — including the 5% commission on completed jobs — is maintained to preserve user trust, and community moderation is used to foster respectful, constructive interaction while preventing harassment or discrimination.

4. IMPLEMENTATION

4.1 Development Technologies

Several technologies were selected based on their capabilities, community support and relevance to the project goals; the rationale for each is summarised below.

4.1.1 MySQL

MySQL was chosen as the database management system for its reliability, high performance and ease of use. As a widely adopted open-source relational database, it offers a strong foundation for managing user profiles, posts, comments and resources, and its capacity to handle large data volumes efficiently makes it well suited to a platform whose user interactions and content are expected to grow over time — directly supporting the scalability metric used in the evaluation in Section 5.

4.1.2 PHP

PHP was selected as the server-side scripting language underpinning the platform's backend functionality. Its efficient handling of dynamic content and database interactions allows it to integrate seamlessly with MySQL, enabling interactive features such as user registration, login authentication and content management, while its extensive community support and available frameworks accelerate development and enhance scalability and security.

4.1.3 HTML, CSS and JavaScript

The front end is built with HTML, CSS and JavaScript. HTML provides the structural foundation for the web pages; CSS handles styling and layout to ensure a visually appealing experience; and JavaScript adds interactivity, enabling dynamic content updates, form validation and an enhanced overall user experience. Together these technologies create a cohesive, responsive platform catering to the diverse needs of artisans.

4.1.4 Bootstrap Framework

The Bootstrap framework was employed to expedite front-end development and ensure responsiveness across devices. Its grid system and prebuilt components facilitate a mobile-first design approach, which is important for reaching artisans who may access the platform primarily via mobile devices, while delivering a consistent user experience that promotes accessibility and usability.

4.1.5 Version Control

Git was adopted to track changes, manage code versions and facilitate collaboration among the development team, with GitHub used to host the repository, share code, manage issues and support continuous improvement of the platform.

4.2 Implementation Process

Development proceeded through five phases: (i) design and prototyping of wireframes to visualise the interface and user experience; (ii) backend development integrating MySQL and PHP for authentication, database management and server-side

functionality; (iii) frontend development using HTML, CSS and JavaScript, applying Bootstrap for cross-device usability; (iv) integration of the front and back ends to ensure seamless data flow and interaction; and (v) deployment of the platform on a secure web server.

4.3 System Interface

Fig. 7 shows the platform homepage, designed with a clean layout to orient new artisans.

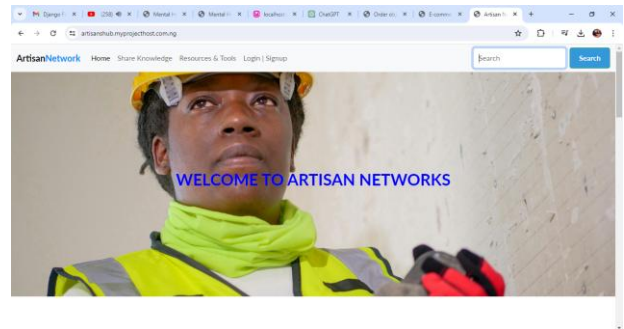


Fig 7: Platform Homepage

Fig. 8 shows the registration and login pages, through which users create an account and authenticate with a username and password.

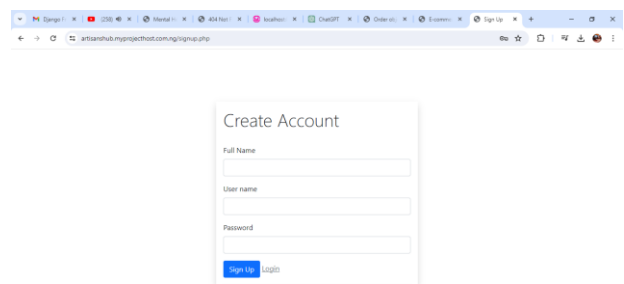


Fig 8: Registration and Login Pages

Fig. 9 shows the administrator dashboard, which centralises user, post, category and comment management.

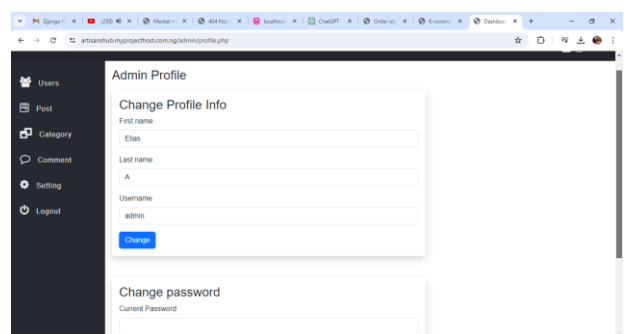


Fig 9: Administrator Dashboard

Fig. 10 shows the knowledge-sharing (blog) module, through which artisans publish tutorials and tips while other members comment and engage, supporting the platform's core knowledge-exchange objective.

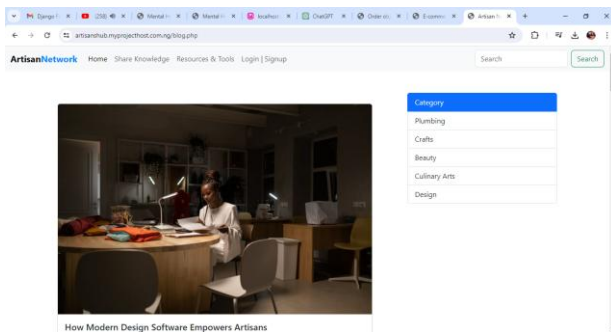


Fig 10: Knowledge-Sharing (Blog) Module

Fig. 11 shows the administrator's post-and-comment management panel, which lists titles, categories, comments and engagement metrics alongside actions to edit, delete or toggle the visibility of each post, allowing administrators to oversee content quality while monitoring user interaction.

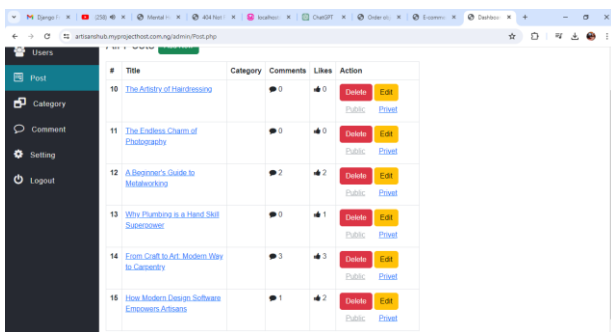


Fig 11: Administrator Post and Comment Panel

Fig. 12 shows the administrator's user-management panel, which lists registered users' names and usernames alongside an action to remove an account where necessary.

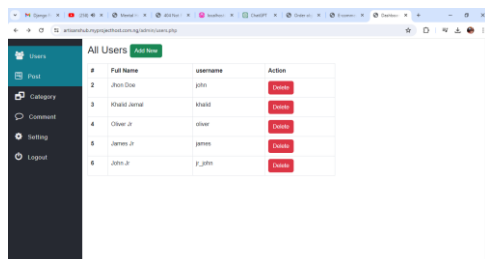


Fig 12: Administrator User Panel

Fig. 13 illustrates typical user activity on the platform, including reading knowledge posts and leaving comments, which together constitute the core knowledge-exchange interactions the platform is designed to support.

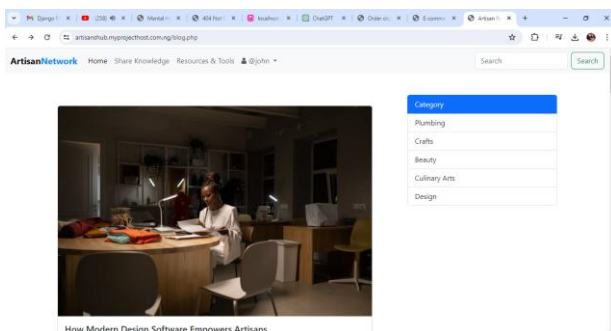


Fig 13: User Activity on the Platform

4.4 System Testing

The platform was validated through a staged testing process. Unit testing verified individual components — form validation scripts, authentication routines and database queries — in isolation before integration. Integration testing then confirmed that the JavaScript front end, PHP business logic and MySQL database interacted correctly across the full request-response cycle described in Section 3.9, including edge cases such as duplicate registrations and invalid input. Finally, a round of user-acceptance testing was conducted with a small group of test users performing core tasks — registration, resource upload, posting and commenting on knowledge entries, and administrator moderation actions — with issues identified during this round fed back into the implementation for iterative refinement before the results reported in Section 5 were collected.

5. RESULTS AND DISCUSSION

5.1 Comparative Evaluation

Table 4 compares the proposed Culturally Adaptive Platform (CAP) against three baseline frameworks — Task-Oriented Design (TOD), Community of Practice (CoP) and a Collaborative Learning Platform (CLP) — on accuracy, effectiveness and scalability.

Table 4: Comparative Results of Frameworks

Framework	Accuracy (%)	Effectiveness (%)	Scalability (%)
Task-Oriented Design (TOD)	70	80	65
Community of Practice (CoP)	65	75	75
Culturally Adaptive Platform (CAP) — proposed	85	90	85
Collaborative Learning Platform (CLP)	78	82	80

5.2 Discussion

The results are discussed by framework below, followed by a cross-framework synthesis.

5.2.1 Task-Oriented Design (TOD)

TOD scored 70% on accuracy and 80% on effectiveness, showing that a design optimised for discrete, well-defined tasks performs strongly when the task itself is the unit of analysis. Its scalability score (65%) is the lowest of the four frameworks, however, because a narrowly task-specific design is harder to extend to the broader, more varied interactions a growing and culturally diverse artisan base requires.

5.2.2 Community of Practice (CoP)

CoP recorded the lowest accuracy (65%) of the four frameworks, consistent with a design that prioritises shared, communal practice over precise, individual task execution. Its effectiveness (75%) and scalability (75%) scores are more competitive, reflecting the strength of community-driven structures at sustaining engagement and growth within an already-established network, even where they under-perform on individual precision.

5.2.3 Culturally Adaptive Platform (CAP)

CAP achieved the highest scores across all three metrics — 85% accuracy, 90% effectiveness and 85% scalability. This performance is attributable to its explicit tailoring of content and

interaction design to users' cultural and educational contexts, which reduces misinterpretation and increases relevance, while its inclusivity-first design allows artisans from a wide range of backgrounds to participate fully in both learning and resource sharing. The same cultural adaptability that drives accuracy and effectiveness also underlies its scalability advantage, since a platform designed to flex around varied user contexts extends more readily to new regions and demographics than one built around a single normative user profile.

5.2.4 Collaborative Learning Platform (CLP)

CLP was the second-strongest performer overall (78% accuracy, 82% effectiveness, 80% scalability), reflecting the value of its structured, interactive learning modules for balancing individual task completion with group-based skill-building. Its scores indicate that a platform emphasising structured, educationally oriented collaboration is a strong general-purpose option, even where it does not match CAP's culturally adaptive precision.

5.2.5 Cross-Framework Synthesis

Taken together, these results indicate that culturally informed design measurably improves accuracy, effectiveness and scalability relative to purely task-oriented or community-only designs. Each baseline framework nonetheless retains a distinct strength — TOD for precise, repeatable task execution; CoP for sustaining community-driven growth within established networks; and CLP for structured, educationally oriented collaboration — suggesting that future iterations of CAP could selectively incorporate these mechanisms to further strengthen specific platform functions without sacrificing its cultural-adaptability advantage.

6. SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Summary

This study set out to design, implement and evaluate a web-based platform to enhance collaboration, resource sharing and knowledge exchange among artisans. A review of existing literature and digital platforms first identified the specific needs and gaps within the artisanal sector, including limited market access, inadequate resources for skill development and a lack of culturally adaptive design in existing solutions. These findings informed a user-centred design phase that prioritised the needs and preferences of artisans, incorporating collaboration tools, resource-sharing modules and a knowledge-sharing (tutorial/blog) module, together with interfaces built to accommodate varying levels of digital literacy. The system was then implemented using HTML, CSS, JavaScript, PHP and MySQL, and evaluated by comparing the proposed Culturally Adaptive Platform (CAP) against Task-Oriented Design, Community-of-Practice and Collaborative Learning Platform frameworks on accuracy, effectiveness and scalability.

6.2 Conclusion

The development of a web-based platform for artisans represents a meaningful step toward enhancing their collaborative potential and resource-sharing capabilities. By examining existing literature and platforms, this work identified the unique challenges artisans face, including limited access to networks and knowledge, and used those findings to drive a tailored solution built around the Culturally Adaptive Platform Framework (CAPF). The comparative evaluation confirms that the proposed platform achieved the highest accuracy (85%), effectiveness (90%) and scalability (85%) among the frameworks tested, demonstrating that culturally sensitive, inclusive design measurably improves outcomes for artisan communities relative to task-only or community-only approaches. The emphasis on

usability throughout the design and implementation ensures that even artisans with limited technical skill can navigate the platform effectively, broadening its accessibility and long-term impact.

6.3 Recommendations

The platform offers several application areas that can further enhance collaboration, resource sharing and knowledge exchange within artisan communities, including skill development, project collaboration and networking. Building strategic partnerships with local organisations, educational institutions and industry stakeholders is recommended to broaden the platform's reach and impact; such collaborations could provide artisans with access to additional resources, training programmes and funding opportunities, while promoting the platform through these networks would raise awareness and encourage adoption. Future work should also pursue: (i) piloting the platform with real artisan cooperatives across multiple cultural and linguistic contexts to validate the CAPF metrics under field conditions; and (ii) strengthening technical scalability, for instance through horizontal scaling and caching, to support larger concurrent user bases as adoption grows.

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