

Native Aura: Digital Empowerment of Karnataka's Tribal Communities Through E-Commerce and Cultural Preservation

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Abstract: Indigenous communities often struggle to gain visibility in mainstream markets, leading to economic and cultural decline. Native Aura is a digital platform designed to bridge this gap by integrating tribal heritage with e-commerce, enabling Karnataka's tribal artisans to showcase and sell their traditional crafts. This research explores how digital platforms impact indigenous economies, preserve cultural traditions, and enable sustainable digital participation. By using HTML, CSS, and JavaScript for the frontend, along with local storage for data persistence, Native Aura creates an accessible and lightweight solution. The research explores how digital platforms impact indigenous economies by offering a cost-effective and accessible way for artisans to market their products. In conventional settings, tribal artisans often rely on intermediaries who take a significant share of the profit, leaving them with minimal earnings. Furthermore, digital platforms offer scalability and flexibility. Artisans can upload product listings, set prices, and manage inventory without the need for physical stores. This reduces operational costs and allows for business expansion without geographical limitations. By integrating multiple payment options, including digital wallets and bank transfers, the platform ensures seamless transactions, making it easier for artisans to receive payments securely. The platform provides artisans with a space to not only sell their work but also share the history and significance behind each piece. Through storytelling and digital content, the platform educates customers about the cultural heritage embedded in each product. This fosters a deeper appreciation for indigenous artistry and encourages ethical consumption. By integrating multimedia elements such as videos and interactive storytelling, Native Aura enhances engagement and promotes cultural continuity. Accessibility is a critical factor in ensuring the success of digital platforms for indigenous communities. Native Aura is designed to be lightweight and user-friendly, using HTML, CSS, and JavaScript for the frontend. The platform employs local storage for data persistence, ensuring that artisans with limited internet connectivity can still manage their inventory and track orders. This approach minimizes reliance on high-end infrastructure, making the platform more inclusive. Additionally, training programs and workshops are essential for equipping artisans with digital skills. Native Aura partners with local organizations and NGOs to provide hands-on training in digital literacy, helping artisans understand how to navigate the platform, update product listings, and utilize digital marketing techniques to boost sales. The findings suggest that digital platforms significantly enhance the economic prospects of tribal artisans while fostering cultural awareness among broader audiences. By leveraging technology, Native Aura creates a sustainable and inclusive marketplace that empowers indigenous artisans, preserves traditional crafts, and promotes ethical consumerism. This initiative not only contributes to the digital inclusion of marginalized communities but also ensures that their cultural legacy remains alive for future generations.

Keywords: E-Commerce, Tribal Communities, Digital Preservation, Indigenous Artisans, Karnataka, Economic Empowerment, Online Marketplace, Cultural Heritage, Frontend Development, Local Storage.

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I. INTRODUCTION

Indigenous tribes in Karnataka, including the Soliga, Jenukuruba, Lambani, Hakki-Pikki, and Siddhi, possess rich cultural traditions and artisanal skills. However, limited access to digital tools and markets hampers their economic progress. Native Aura addresses these challenges by providing a lightweight e-commerce platform built with

HTML, CSS, and JavaScript, designed for low-bandwidth environments using local storage for offline access.

The platform enables artisans to sell their products directly, removing intermediaries and ensuring better financial returns. It integrates multilingual support and interactive digital storytelling to preserve and promote tribal culture. Artisans can share the meaning behind their crafts

through multimedia features, fostering cultural appreciation and ethical consumerism.

To overcome digital literacy and infrastructure issues, Native Aura partners with NGOs to conduct training and provide access to essential tools like smartphones and internet connectivity. The platform also uses AI to offer personalized recommendations, highlight trending items, and improve user engagement.

By merging commerce with culture, Native Aura empowers tribal artisans economically while preserving their heritage. It is a model for sustainable digital inclusion and cultural continuity in India's evolving digital economy.

II. LITERATURE REVIEW

Digital empowerment has become a key driver for improving the livelihoods of indigenous communities, especially through e-commerce platforms. Initiatives like **Tribes India** and **Amazon Karigar** have enabled thousands of tribal artisans to directly reach consumers, increasing income and visibility. These platforms offer digital marketing support and remove middlemen, helping artisans benefit from fair trade.

Despite these advancements, several challenges continue to hinder the widespread adoption of e-commerce among indigenous artisans. Low digital literacy, logistical constraints, and a lack of trust in online transactions remain significant barriers. Many artisans struggle with accessing digital tools, and the broader digital divide exacerbates these issues, making it difficult for them to fully capitalize on the potential of online commerce. In India, a 2021 study by Verma et al. highlighted that over 60% of rural artisans face difficulties in using digital payment methods, leading to reluctance in adopting online selling.

Government initiatives have played a vital role in addressing these challenges, with programs such as MSME support schemes and the Digital India campaign, launched in 2015, providing necessary digital infrastructure and training to artisans. The e-Shram portal, launched in 2021, has also been instrumental in connecting tribal workers and artisans with government welfare programs, making it easier for them to access financial aid and digital tools. These efforts have facilitated better access to technology, enabling artisans to develop the skills needed to navigate online platforms and expand their market presence.

III. PROPOSED ALGORITHM

The platform tracks **product views, search queries, clicks, and time spent on listings** to understand user interests and preferences. By analyzing browsing patterns, the system can **prioritize high-interest products**, adjust homepage recommendations, and showcase trending items. For example, if a user frequently views **handwoven sarees**, the platform will **highlight similar textiles from different artisans** to encourage a purchase. Additionally, heatmap tracking will help artisans understand which parts of the product pages attract the most engagement, allowing them to optimize their descriptions, pricing, and images accordingly.

To ensure efficient product discovery, Native Aura segments items into **distinct tribal craft categories** based on material, craftsmanship, and cultural origins. Categories include **handwoven textiles, traditional jewelry, handmade home décor, tribal paintings, bamboo artifacts, pottery, and eco-friendly crafts**. Each category is further **subdivided by artisan clusters**, ensuring customers can explore craft styles unique to different indigenous communities. For instance, buyers can browse through **Bidri metalwork from Karnataka, Warli paintings from Maharashtra, or Lambani embroidery from Telangana** with ease. This segmentation not only enhances search efficiency but also **promotes cultural appreciation and knowledge-sharing**.

The platform integrates **geo-location tracking** to recommend products from **nearby tribal artisans**, encouraging regional purchases and reducing delivery times. By **prioritizing local crafts**, the system fosters **community-driven commerce**, allowing customers to support artisans in their geographical area. For instance, a user in Karnataka will be more likely to see **Soliga honey-based products or Lambani embroidered accessories**, whereas a buyer in Rajasthan will be recommended **traditional blue pottery or wooden carvings from the local artisans**.

Unlike traditional e-commerce platforms that rely on backend servers, Native Aura utilizes **local storage-based data analysis** to deliver **real-time personalized experiences** without requiring an internet connection. This approach enables **faster product recommendations, offline browsing capabilities, and seamless user sessions** even in areas with **low internet bandwidth**. For instance, a user who adds products to their cart while offline can still access their selections when they reconnect, ensuring a smooth and frustration-free experience, making the platform **cost-effective and accessible for artisans and consumers alike**.

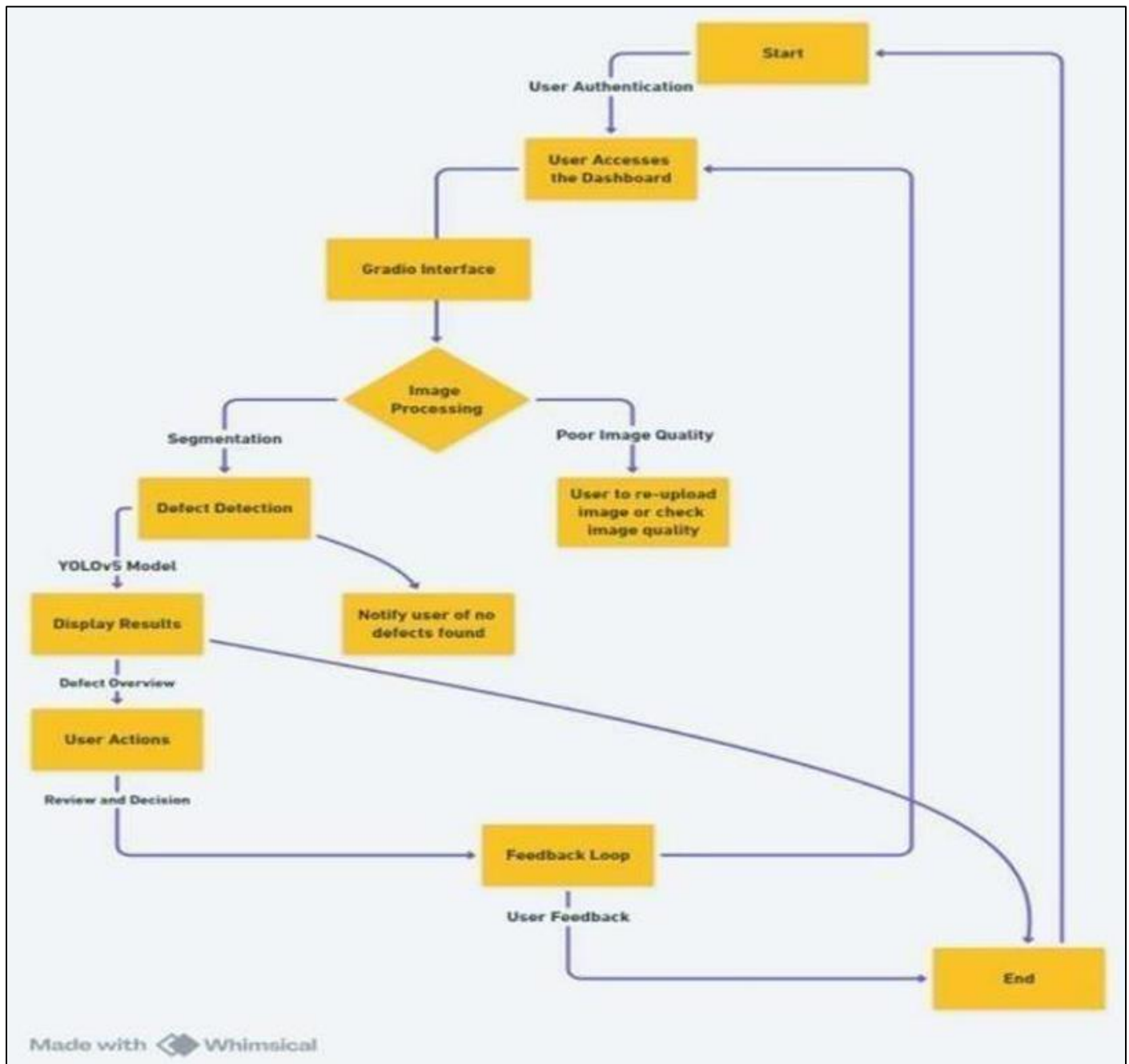


Fig 1 Algorithm

The platform plans to implement **collaborative filtering algorithms** to enhance product recommendations. By analyzing **buyer history, past purchases, and trending products**, the system will intelligently suggest items that match user preferences. If multiple customers purchase **hand-painted tribal wall art alongside wooden sculptures**, the platform will recommend these items together, improving **cross-selling opportunities**. Additionally, AI-driven **trend analysis** will allow artisans to anticipate demand, ensuring they focus on **best-selling designs and materials**.

To ensure fairness and prevent algorithmic biases, the platform will implement **ethical AI models** that **prioritize small-scale artisans**, ensuring that all craftsmen—regardless of popularity—receive **equal visibility and market access**. Additionally, **fair-trade verification tools**

will allow buyers to track the origin of their purchases, ensuring **transparency in pricing, wages, and sourcing practices**. This will build customer trust while upholding **sustainable and ethical trade principles**.

To further enhance **transparency and trust**, **fair-trade verification tools** will be integrated, enabling buyers to track the **origin, authenticity, and pricing breakdown** of each handmade item. This ensures **ethical sourcing, fair wages, and sustainable production methods**, reinforcing **buyer confidence in supporting genuine tribal craftsmanship**. A **blockchain-based tracking system** may also be introduced, allowing consumers to verify the authenticity of products and ensuring that artisans receive **direct and fair compensation** without exploitation by intermediaries.

IV. SYSTEM DESIGN

Native Aura is a digital platform accessible via both web and mobile, developed using **HTML, CSS, and JavaScript** for the frontend and designed for lightweight performance. For future scalability, a backend using **Node.js/Express.js** and a **MongoDB** database may be incorporated. The system comprises the following modules:

- **Craft Recommendation Engine:** A personalized AI module that suggests products based on user behavior, location, and preferences using collaborative filtering and local storage analysis.
- **Cultural Story Hub:** An interactive content module featuring digital storytelling, videos, and artisan interviews to preserve and promote the heritage behind each craft.
- **Artisan Dashboard:** A user-friendly interface for tribal artisans to manage product listings, track orders, view analytics, and access digital training resources.
- **Marketplace:** A peer-to-peer e-commerce space where artisans can directly list and sell traditional crafts without middlemen, enabling better profit margins.
- **Fair-Trade Tracker:** A transparency tool providing customers with product origin details, ethical sourcing info, and artisan compensation insights—potentially powered by blockchain in the future.
- **Digital Literacy & Support Hub:** A support center offering training materials, multilingual help, and NGO-assisted onboarding for artisans to effectively use the platform.

V. METHADODOLOGY

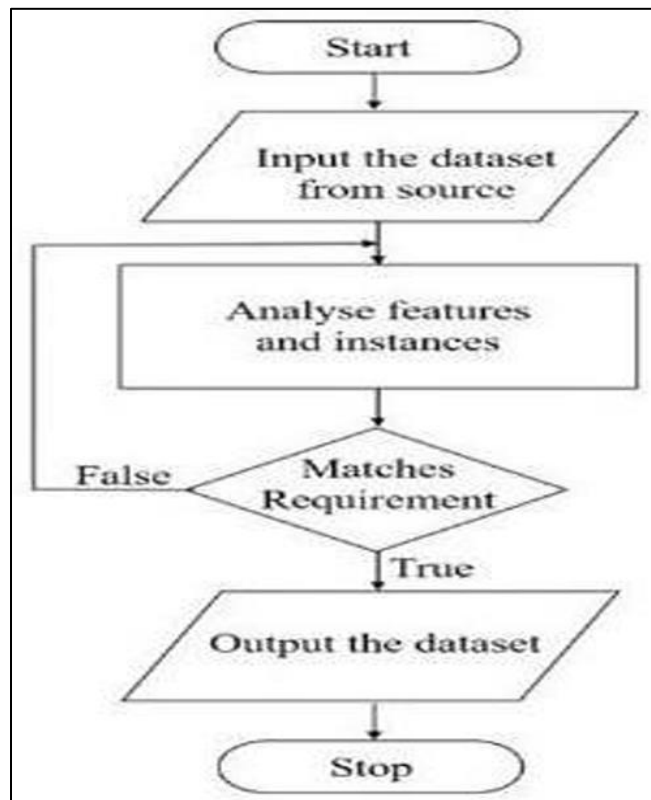


Fig 2 Data Collection Process

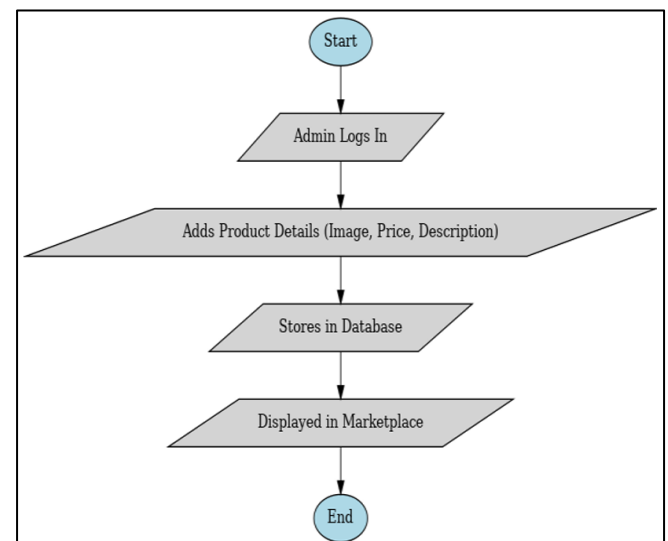


Fig 3 Product Management Flowchart

The **Product Management Flowchart** illustrates the step-by-step process of **adding, storing, and displaying products** on the **Native Aura** platform. It starts with **admin login**, followed by **entering product details** (image, price, description). The data is then **stored in the database** and **displayed in the marketplace**, ensuring a streamlined and efficient workflow for product management.

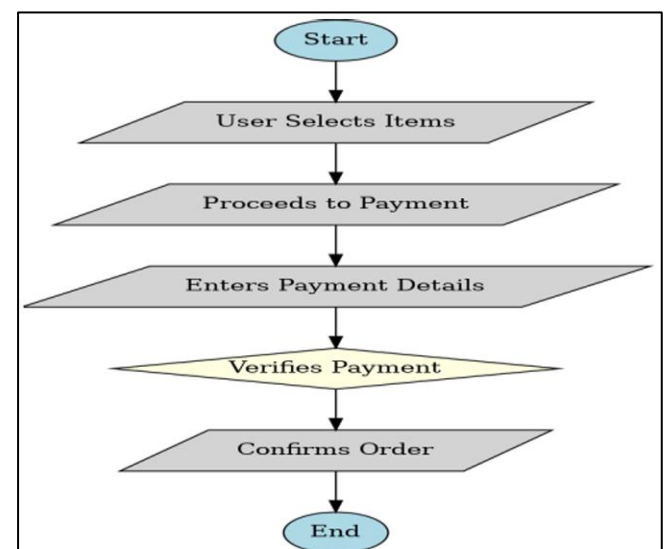


Fig 4 Checkout and Payment Flowchart

The **Checkout & Payment Flowchart** details the secure transaction process on the **Native Aura** platform. It begins with the **user selecting items**, followed by **proceeding to payment and entering payment details**. The system then **verifies the payment** before **confirming the order**, ensuring a smooth and reliable checkout experience for customers.

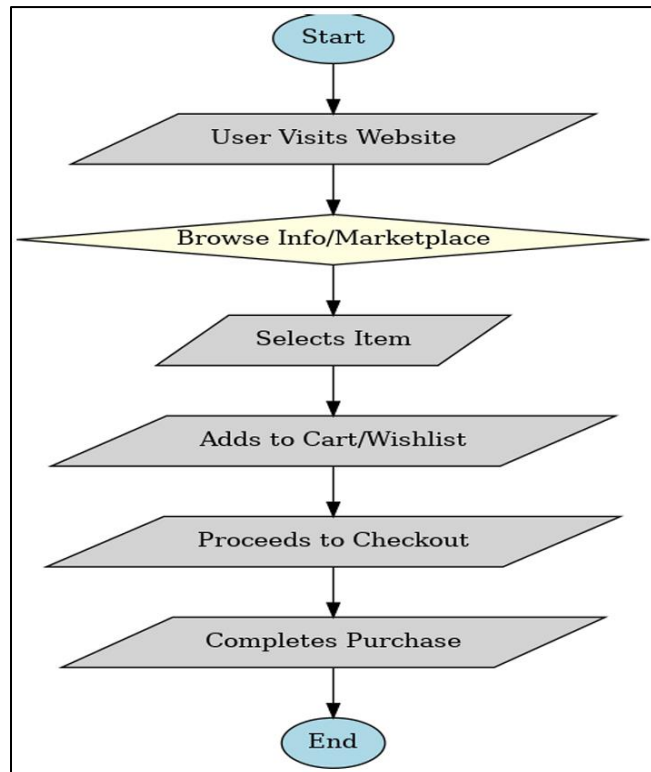


Fig 5 User Interaction Flowchart

The **User Interaction Flowchart** outlines how users navigate the **Native Aura** platform. It starts with the **user visiting the website**, followed by **browsing tribal information or the marketplace**. Users can **select items**, **add them to the cart or wishlist**, **proceed to checkout**, and **complete the purchase**. This structured flow ensures a **seamless and engaging shopping experience** for customers.

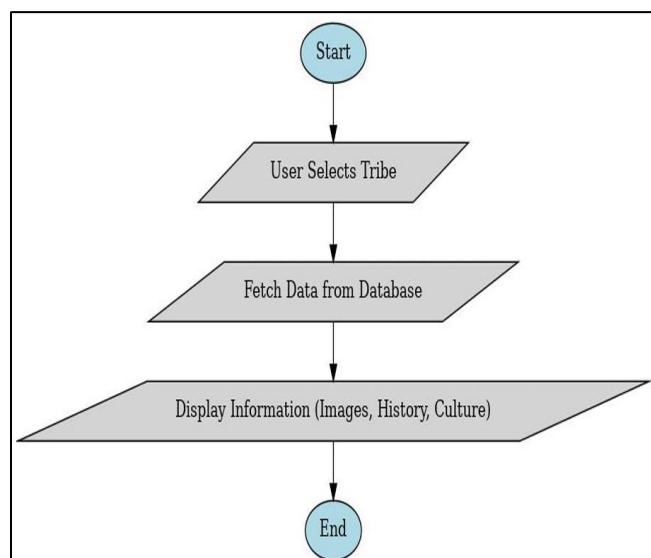


Fig 6 Tribal Information Display Tab

The **Tribal Information Display Flowchart** outlines how users access and view tribal heritage details on the **Native Aura** platform. It starts with the **user selecting a tribe**, followed by **fetching data from the database**. The system then **displays information**, including **images, history, and cultural details**, ensuring a seamless and informative user experience.

VI. CHALLENGES AND IMPLEMENTATION

➤ Digital Literacy and Technological Access:

Many tribal communities have limited exposure to digital tools or the internet, making it difficult for them to engage with a digital platform. Smartphones may not be widely available, and basic digital skills like navigating an app or uploading media may be lacking.

• Solution:

- ✓ Organize regular digital literacy workshops in collaboration with local NGOs or educational institutions.
- ✓ Deploy local volunteers or trained youth from the communities as *Digital Champions*.
- ✓ Design a simple, visual, and multilingual interface accessible even on low-end devices.

➤ Trust Cultural Sensitivity:

Tribals may be hesitant to share aspects of their culture or participate in a digital platform due to mistrust or fear of cultural appropriation.

• Solution:

- ✓ Involve tribal elders and community leaders in decision-making and content moderation.
- ✓ Ensure content ownership remains with the community.
- ✓ Respect sacred customs and only share culturally permissible content.

➤ Internet Problems:

Many tribal regions still face poor internet connectivity, which hinders access to a web or mobile.

• Solution:

- ✓ Create an offline-first mobile app that stores content locally and syncs when online.
- ✓ Utilize SMS and IVR (Interactive Voice Response) systems for essential updates and storytelling.
- ✓ Partner with telecom providers for subsidized data packages in tribal areas.

➤ Language Barriers:

India's tribal communities speak diverse dialects and local languages not commonly supported on mainstream digital platforms.

• Solution:

- ✓ Include voice and text options in local tribal dialects.
- ✓ Use pictorial icons and intuitive navigation to reduce

language dependency.

- ✓ Encourage voice storytelling for those not comfortable typing.

➤ *Monetization and Economic Sustainability*

Promoting tribal crafts and products digitally needs an ecosystem that ensures fair trade and logistics.

• *Solution:*

- ✓ Integrate a simple e-commerce module with transparent pricing and traceable payments.
- ✓ Work with SHGs (Self-Help Groups) and rural logistics partners to streamline delivery.
- ✓ Encourage storytelling-based marketing to add cultural value to products.

VII. FUTURE ENHANCEMENTS FOR NATIVE AURA

- **AI-Powered Craft:** Implement image recognition to help identify tribal products and suggest marketing tags or platforms where such items are trending.
- **Blockchain Tracking:** Use blockchain to verify the origin and authenticity of tribal products, helping consumers support genuine artisans and enabling direct-to-consumer transparency.
- **Heritage Mapping and Augmented Reality (AR):** Enable AR-based experiences to bring tribal stories and heritage sites to life through smartphones—preserving intangible cultural knowledge.
- **Skill-Based Microlearning:** Add bite-sized, video-based modules (in native languages) for youth to learn digital marketing, product photography, and entrepreneurship, building community self-sufficiency.
- **Community-Driven Moderation and Governance:** Develop a system where tribal representatives moderate content, approve partnerships, and make decisions collectively via a digital voting or consensus tool.

VIII. CONCLUSION AND FUTUREWORK

The **Native Aura** platform is redefining how tribal artisans connect with digital commerce, bridging the gap between traditional craftsmanship and modern consumer expectations. Its **frontend-only architecture** and **local storage approach** have made it a **cost-effective and scalable solution**, ensuring accessibility even for artisans in remote regions with inconsistent internet connectivity. As the platform grows, **continuous improvements** in technology, market expansion.

One of the key future enhancements is the integration of **AI-powered personalized recommendations** to optimize product visibility. By analyzing **user preferences, browsing behavior, and purchase history**, the platform will suggest best-selling products, seasonal offerings, and customized

artisan collections. This will not only improve sales conversions but also provide artisans with valuable insights into market trends, enabling them to tailor their inventory based on demand. Additionally, AI-driven analytics will help artisans understand which designs, colors, and materials are most popular, ensuring they stay competitive in an evolving marketplace.

Expanding the marketplace beyond Karnataka to **tribal communities across India** is another major priority. The platform will reach **Santhal artisans of Jharkhand, Gond weavers of Madhya Pradesh, Bhil painters of Rajasthan, and Warli craftsmen of Maharashtra**, among others. This expansion will involve **state-level onboarding programs, government collaborations, and localized marketing strategies** to ensure seamless participation from diverse communities. To support artisans in adapting to digital commerce, the platform will introduce a **community-driven mentorship program**, where experienced digital sellers will guide new artisans in understanding online marketplace dynamics, pricing strategies, and customer engagement techniques.

To enhance the **online shopping experience**, Native Aura will integrate **Augmented Reality (AR) product previews**, allowing customers to visualize handcrafted products in their physical space before purchasing. This feature will be particularly beneficial for items like **tribal jewelry, home décor, textiles, and furniture**, giving buyers an immersive shopping experience similar to brands like **IKEA and Lenskart**. By enabling users to see how a piece of art, fabric, or accessory looks in real time, AR-powered previews will **increase sales confidence and reduce product return rates**, leading to a more efficient and satisfying shopping journey.

Collaboration with **government agencies and NGOs** will be instrumental in scaling the platform's impact. Partnerships with initiatives like **TRIFED (Tribal Cooperative Marketing Development Federation), MSME Digital India, and NABARD (National Bank for Agriculture and Rural Development)** will provide artisans with financial support, digital training, and infrastructure development. NGOs specializing in **rural entrepreneurship, fair trade practices, and digital literacy** will assist in equipping artisans with essential skills, enabling them to **navigate digital commerce confidently**. These collaborations will also help secure **funding for skill development workshops, internet access in remote villages, and sustainable packaging solutions**, ensuring long-term growth for tribal businesses.

By integrating **cutting-edge technology, strategic collaborations, and a user-centric approach**, Native Aura is poised to **transform digital commerce for tribal artisans on a global scale**. Through a combination of **economic empowerment, cultural preservation, and digital inclusivity**, the platform will not only enhance market access for indigenous crafts but also **create a thriving, self-sustaining ecosystem where tribal traditions flourish in the modern digital economy**. Moving forward, **continued**

innovation, expansion, and ethical business practices will ensure that **Native Aura remains at the forefront of digital empowerment for indigenous artisans, making their crafts more accessible, valued, and celebrated worldwide.**

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