HANDICRAFT-TECH: A UNIFIED DIGITAL PLATFORM TO EMPOWER INDIA'S DESIGN ENTREPRENEURS

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ISSN 2277-7733
Volume 15 Issue 2,
September 2026

Abstract

India's handicraft sector, the country's second-largest employer, significantly underperforms in the global market, holding only a 2% share compared to China's 30%. This disparity stems from a fragmented support system that leaves over seven million craftspeople trapped in poverty. It is vital to connect artisan talent with market opportunities, yet their growth is hindered by relying on a patchwork of separate digital tools for e-commerce, artisan management, and marketing. This paper introduces 'HandiCraft-tech', a proposal for a unified online platform designed to address these systemic challenges. The platform provides design entrepreneurs with a single, end-to-end solution integrating essential business tools, fostering design innovation, and facilitating access to international markets. By empowering these entrepreneurs, HandiCraft-tech aims to help build scalable and ethical craft-based businesses that can align India's rich craft heritage with its global economic aspirations. The conceptual framework is an innovation hub first and an e-commerce platform second, designed to digitally enable the Triple Helix Model of Innovation (Craftspeople, Academics, and Government).

Keywords: *Design Entrepreneurship, Indian Handicrafts, Artisan Empowerment, Digital platform, Sustainable Livelihoods*

India's multi-product handicraft sector, vital to sustaining rural livelihoods and the nation's economy, faces significant challenges in the modern globalized market. Rapid industrialization and mass production have marginalized traditional crafts, leaving artisans struggling with declining demand, poor infrastructure, and limited market access. The sector is highly fragmented, with artisans disconnected from contemporary design innovations. This study proposes leveraging design thinking and design entrepreneurship to integrate contemporary design with traditional craft practices, ensuring these clusters become a prosperous part of the mainstream creative economy.

Research Objective

The primary objective of this research is to investigate how design thinking and innovation can be leveraged through for developing a sustainable model for the growth of the Indian handicraft sector. By exploring the potential of design as a tool for innovation, the research seeks to promote inclusive economic growth that benefits artisans, enhances the value of traditional crafts, and integrates these practices into the broader creative economy.

This study focuses on key research questions including: What are the specific challenges faced by artisans in India?; How can theoretical frameworks like the Triple Helix Model be adapted to create a collaborative and sustainable ecosystem for the handicraft industry?; What core features and functionalities are required for a unified platform to effectively foster sustainable livelihoods and global market access for Indian crafts?

Rationale for the Study

The rationale behind this research lies in the need for a systemic approach to revive and sustain India's handicrafts sector. Existing models for craft development often fail to account for the complexities for regional diversity, artisanal skills, and the socio-economic ecosystem. This paper argues for a digital platform to foster innovation in the craft sector. This will help the sector to be prepared to meet future market needs while maintaining the essence of traditional heritage. This spirit of innovation can lead to sustainable models that help craftspeople not just meet their daily needs, but prepare for a sustainable future and thrive. With the support of new-age digital technology with traditional craftsmanship, handicrafts will see product-service development in a new light, for a more adaptable future locally and at a global level.

Literature Review

The foundational literature review explores three primary interconnected areas essential for understanding a multi-cluster development approach. Specifically, the research considers the field of handicrafts development and effective strategies for sustainable cluster development models.

Handicraft Development in India

Handicrafts products are made by skilled craftspeople using manual techniques and traditional knowledge passed down through generations. The origin of the word handicraft combines the Old English 'hand' and 'craft', reflecting the importance of dexterity and expertise. Despite their deep cultural significance, India's handicraft sector faces many challenges such as restricted market access, weak infrastructure, and inadequate financial support. The 19th-century Art and Craft Movement, championed by William Morris, brought renewed attention to the value of craftsmanship as a meaningful response to industrialization. Morris famously argued that 'creative human occupation is essential for meaningful life' - an idea that continues to inspire Indian artisans who are now competing with mass-produced goods. (Morris, n.d.; MacCarthy, 2009). In India, figures such as Rabindranath Tagore and Mahatma Gandhi recognized the handicraft sector as a vital force for social and economic progress. Gandhi, in particular, promoted the idea that craftwork was not only integral to holistic education, but also to the country's development and the dignity of its artisans. His vision of self-reliance continues to shape approaches to handicraft policy and development today. (Nandi & Singh, 2023). Similarly, Pupul Jayakar was a central figure in the revival of traditional Indian crafts in the 20th century. By founding institutions like the National Crafts Museum and advocating for India's rich craft traditions, she helped bring recognition and renewed energy to the sector, both in India and abroad. (Jayakar, 1980).

Design Innovation and Its Role in Handicraft Development

Design innovation is essential for revitalizing traditional crafts in today's dynamic market. At its core, design means thoughtfully planning products to meet real needs, while innovation brings new value to the table. (Ceschin & Gaziulusoy, 2016; Li et al., 2019). Design-driven innovation—rooted in user-centered design thinking—can transform how crafts are created and shared. In handicrafts, a 'cluster' is a regional group of artisans or small businesses in the same craft,

fostering resource sharing and knowledge exchange. (Brown & Kātz, 2009). The Triple Helix Model of Innovation, which unites academia, industry, and government, is a powerful tool for craft clusters. By combining local expertise, business drive, and policy support, clusters can set up design labs and innovation hubs for practical, sustainable product creation. Handicrafts support millions of livelihoods, preserve culture, and contribute to the UN Sustainable Development Goals. However, development programs often overlook the unique needs of different craft clusters - a gap best addressed by embracing innovation, collaboration, and adaptability. (Adamson, 2010).

The Digital Imperative

Design can work both at the back-end, making much-needed changes in the craft processes and making systems as well as at the front end, taking the craft to the right consumer and positioning it in the market. However, the sector faces many challenges due to the fragmented nature of this unorganized sector. They are often unable to compete with the competing products from the mass-manufactured organized sector. They often end up using a patchwork of digital tools but lack a cohesive direction and platform which can help them unify the various offerings essential for innovation management.

Gaps in existing models

The existing handicraft innovation models lack many key features. These gaps prevent the sector from continuous innovation practices and contribute to sectoral growth. Many of the models lack the dynamism required in a continuously changing eco-system. They also often fail or are limited in their success due to the same approach for all clusters. The handicraft clusters are diverse with different requirements, challenges and possibilities. A model which takes into consideration this diversity is required. It should also be agile enough to factor in the changes in the eco-system. Therefore, a model which considers the dynamic nature of the handicraft sector, its uniqueness and integration of design innovation is required. Continuous innovation considering the entire life cycle of handicraft products is required. It also needs to be sustainable in terms of economic, environmental and social sustainability parameters. This holistic approach will help to ensure that the craft sector remains viable in the long term and will contribute towards its growth.



Fig. 1. Limitations of the handicraft sector

Methodology

This research study uses a largely qualitative approach. The approach is pragmatic in nature and is practice based with the view to bring about a real-life connection and make a meaningful contribution to the handicraft sector. Case study-based approach considering the diverse views of many stakeholders was used. As part of the case study method interviews, observational study and ethnographic approaches to collate observational study with cultural meaning-making were primarily used. The detailed case study conducted for this study is focused on the Miraj Musical Instrument Cluster. The approach taken here ensures an in-depth understanding of factors related to design innovation, the concerns, challenges and aspirations related to this sector.

Research Design

Detailed qualitative study enables a comprehensive investigation of the entire life cycle of the handicraft products and stakeholders associated with it at every stage. This includes studying the structure of the clusters, the making process, the craftsmanship involved, the cultural meanings associated with it, product innovations, infrastructural support mechanisms for innovations, marketing strategies and outreach activities. The research study also encompasses a longitudinal approach through interviewing multiple generations of artisans. This gave important insights regarding the evolution of the craft and the perception of different generations of artisans with respect to their craft. This approach is especially important in the handicraft sector because the knowledge of the craft is passed from one generation to the other. The practice-based research approach ensured that the study was grounded in real life experiences and facts. This would then become the basis for developing features and frameworks for understanding how design innovation can be integrated with the handicraft sector for its survival and growth.

Primary research: Data Collection Methods for Cluster study

The study employed multiple methods of data collection to ensure a holistic understanding of a cluster's functioning using a detailed case study method. Direct field observations were conducted to document the craft-making process. This included visiting Miraj musical instrument making cluster to get an in depth understanding of the various processes and methods through which these instruments are made. Observations focused on key aspects such as Product design and production processes, Ergonomics and workspace arrangements and the interaction between artisans and the tools or machinery used in production. Field visits allowed the researcher to gather first-hand insights into the daily operations of the cluster, as well as the challenges faced by artisans, such as lack of cohesion in the structure of the clusters as well as infrastructure conducive to craft requirements. Interviews and Focus Groups In-depth interviews were conducted with 25 craftspersons across 10 families within the Miraj cluster. The interviewees included master artisans, emerging craftspersons, and community leaders.



The interviews helped in the study of all aspects related to design innovation - the cultural significance and traditional aspects impacting innovation, challenges related to market outreach and consumer connect, the problems related to the rise of digital device and competition from digital musical applications, the lack of musical training prevalent among the younger generation, the uniqueness of this craft practice and the latent potential for design innovation in this sector. Apart from this, interviews and focus group discussions were conducted with designers and design entrepreneurs to understand the broader challenges faced by this sector at the policy level and larger market dynamics. It also helped in further understanding the inter-generational divide, the lack of interest in the younger generation to pursue the craft and the aptitude and sense of craftsmanship for it.
The study also included a detailed study of a document i.e. a project report document pertaining to the need assessment study for the Miraj cluster. This helped to get a historical overview of this cluster and compare the changes which have happened in the cluster over the years. The report also gave insights into the experiments done towards technological and infrastructural development for this cluster and the results at a practical level.
The visual documentation of the craft cluster including the study of the workspaces, the tools, making process and retail shops provided further insights about the cluster. Thus, data collection took a triangulation approach, gathering data from multiple sources and persons.

Table 1 - Analysis: Aspects, Problems Identified, and Research Methods Used in the Study of the Miraj Craft Cluster

Aspects of the Miraj Craft Cluster	Problems Identified	Research Methods Used
Product Design & Production Processes	Limited design innovation; dependence on traditional techniques; restricted experimentation and diversification	Direct field observations; in-depth interviews with artisans
Ergonomics & Workspace Arrangements	Inadequate infrastructure; poor workspace design; lack of cohesion and structural organization within the cluster	Field visits; photographic documentation
Artisan–Tool Interaction	Outdated tools and machinery; minimal technological advancement; absence of ergonomic considerations in tool use	Field observation of production processes; artisan interviews; process documentation

Cultural & Traditional Aspects	Traditional beliefs influencing design adaptability; erosion of cultural transmission and artisanal identity among younger generations	In-depth interviews with master artisans and community leaders; focus group discussions
Market Outreach & Consumer Connect	Weak market linkages; limited promotional outreach; competition from digital musical devices and apps	Interviews and focus group discussions with artisans; market observation
Inter-Generational Dynamics	Declining interest among youth; lack of musical training; diminishing motivation to continue the craft	semi-structured interviews with young craftspersons and senior artisans
Technological & Infrastructural Development	Incomplete or ineffective technological initiatives; inadequate infrastructure supporting production and innovation	Document study (Need Assessment Project Report); comparative analysis of past and present conditions
Policy-Level & Sectoral Challenges	Insufficient government support; policy implementation gaps; weak institutional and cluster-level coordination	Interviews with designers review of project documents
Visual & Spatial Understanding of the Cluster	Fragmented workspace distribution; lack of common facility centers; absence of organized production zones	Visual documentation of workspaces

Existing Digital Platforms for Handicraft

With the rise in digital technology, there has been a substantial increase in digital platforms and applications across sectors. The eco-system of digital platform offering supporting various handicrafts in India has also exponentially increased. The analysis of existing digital platforms for Indian handicrafts reveals significant gaps, confirming the necessity of the proposed more focused digital platform conceptual framework. While current platforms excel at e-commerce, they largely fail to integrate the comprehensive innovation and collaborative features outlined in the discussion. Most existing platforms focus heavily on e-commerce and visibility, while innovation, funding, and community integration remain limited. A comprehensive digital platform that merges market access, collaboration, innovation, and empowerment could fill this gap

Theoretical Framework based on Triple Helix Model

To address these gaps, this paper proposes a theoretical framework for a handicraft development model for design innovation. The framework draws on the Triple Helix Model of Innovation to facilitate collaboration between academia, industry, and government, thereby ensuring that clusters have access to the necessary resources and support to thrive in a competitive global marketplace.

The Value Proposition of HandiCraft-tech

The proposed HandiCraft-tech platform represents a strategic solution to these deep-seated problems. By acting as a unified digital nervous system for the sector, it would empower design entrepreneurs to manage their businesses efficiently, bypass exploitative intermediaries, and access a global market on their own terms. The platform would serve as the "industry" vertex in a novel application of the Triple Helix Model, bringing together government and academia to create a collaborative ecosystem for design innovation, skill development, and policy support. Rooted in the Triple Bottom Line philosophy, the platform would aim to generate not only economic value but also profound social and environmental impact.

Table 2 - HandiCraft-tech: Proposed Features and Problem Addressed

Proposed Feature	Problem Addressed
Integrated Artisan & Inventory Management	Fragmented digital toolkit hindering scalability and growth.
Transparent Payments & Financial Inclusion	Exploitation by middlemen and lack of financial stability for artisans.
Marketplace & Global Outreach	Limited market access and inability to compete with mass-produced goods
Branding & Storytelling Toolkit	Fading recognition of cultural heritage and inability to command fair prices.
Centralized Government Scheme Access	Information asymmetry and lack of awareness of government support.
Design & Innovation Collaboration Hub	Perception of crafts as traditional or old-fashioned.

The list of features includes integrated artisan database, inventory management, payment and financial dealings, market retail and outreach, branding and storytelling, access to govt schemes, design and innovation hub for research and development. It creates a truly transformative, rather than merely transactional, digital ecosystem for handicrafts. The conceptual framework for the HandiCraft-tech is designed to address the need for a collaborative, digitally amplified approach to design innovation in Indian handicrafts, moving beyond the limitations of one-to-one intervention models.

Core Focus: Design Innovation

Product/ Process/ Interventions: Focus on craft redesign, material innovation, and new hybrid musical instruments to modernize offerings. Emphasize workflow optimization, collaborative production, documentation, and training. Service/ System Interventions: Involve digital platforms, training modules, and brand-building tools to bridge artisans and consumers. Address cluster-level coordination, infrastructure, and networked support systems (finance, training, and marketing). Policy Interventions: Focus on craft-specific inclusion in government schemes, digital transformation programs, and public–private partnerships.

Stakeholder Integration (Triple Helix Model)

The platform functions as a digital meeting ground for three core groups, reflecting the Triple Helix Model, to ensure comprehensive development: Craftspeople/Artisans: These are the main stakeholders and the repository of traditional skills. They provide the context and skills needed for execution. Their access to current market trends through the platform addresses the problem of their traditional isolation from modern consumer segments. Academics (Designers/Researchers): Their role is to conduct and curate the necessary market research (visual, ethnographic) and technical development (materials, structures, etc.). They use this research to guide innovation. Government/Supporting Agencies: To enable innovation by providing resources and schemes (like the Design Clinic Scheme) for financial support and execution.

Platform Features and Execution

To facilitate the above framework, the platform must integrate several features that enable connection, resource sharing, and commercial viability. The platform

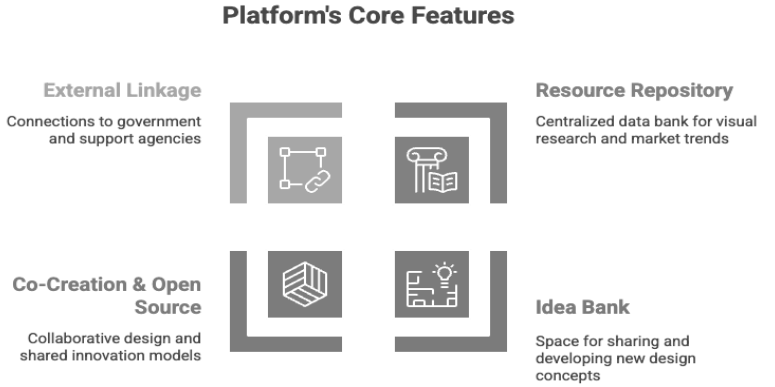
must act as a central repository that aggregates and manages information from various sources, unlike the current one-to-one models.

Visual Research Repository: This databank would host comprehensive visual research and market trends (e.g., images of user segments, home aesthetics) curated by designers, along with technical data on material exploration and process productivity. The goal is to make this research accessible to all craftspeople, helping them understand 'what to make' rather than just 'how to make'.

Idea Bank: This is a dedicated space for posting and sharing new ideas and product concepts, enabling the spread of innovation across the multi-cluster network.

Co-Creation and Open Source: The platform will facilitate co-creation between designers and craftspeople. It must also explore models for open-source designs, where the right to reproduce an innovation is shared, while potentially granting a form of royalty to the initial creators (designer and artisan) to incentivize participation.

External Linkage: Crucial for executing ideas, the platform must provide direct links to government schemes and supporting agencies to help craftspeople or collaborative teams apply for funding and support.



Conclusion

The challenges facing India's multi-billion-dollar handicraft sector - fragmentation, limited market access, and stagnation of traditional crafts - are systemic, requiring a systemic solution. By investigating the contextual background, and the gaps in existing one-to-one intervention models, this study confirms the necessity of a unified digital platform. The proposed HandiCraft-tech platform is more than an online marketplace; it is a conceptual framework designed as an innovation hub first and an e-commerce platform second. Its core value lies in digitally enabling the Triple Helix Model of Innovation by creating a direct link between Craftspeople (skills and context), Academics (market research and technical development), and Government/ Supporting Agencies (financial resources and policy). This integration is crucial for moving beyond the current limitations of isolated clusters and promoting a multi-cluster development model.

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