

AN ANALYSIS OF SELECT INDUSTRIES FOR SUSTAINABLE LIVELIHOOD GENERATION

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BY

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CERTIFICATE

This is to certify that the thesis entitled “**An Analysis of Select Industries for Sustainable Livelihood Generation**” being submitted by **Mr Shivam Singh** to the Indian Institute of Technology Delhi for the award of the degree of **Doctor of Philosophy** is a record of original research work carried out by him. He has worked under my guidance and supervision, and has fulfilled the requirements for submitting this thesis, which, to my knowledge, has reached the requisite standard.

The results contained in this thesis have not been submitted, in part or in full, to any other university or institute for the award of any degree or diploma.



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यत्करोषि यदश्नासि यज्जुहोषि ददासि यत् | यत्तपस्यसि कौन्तेय तत्कुरुष्व मदर्पणम् ||

The Shloka 27 (श्लोक) expressed above refers to Chapter 9. It states that ‘all actions, big or small, should be dedicated to Bhagwan to achieve spiritual perfection and inner peace, transforming everyday life into a devotional act (तात्पर्यः जीवन के हर कार्य को भगवान की सेवा मानकर करना चाहिए)’. I dedicate my successful doctoral journey to Bhagwan (ईश्वर) and pray that I always be involved in work devoted to Bhagwan in the right direction, contributing to the role of Shrishti (सृष्टि) and being dedicated to God.

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ABSTRACT

India's Micro, Small, and Medium-Sized Enterprises (MSMEs) span a diverse range of sectors that are integral to nurturing cultural identity, sustaining traditional livelihoods, and promoting inclusive economic development. The Indian handicraft sector is a special MSME sector that represents an intersection between artistry, heritage, and functionality. These industries form a significant cluster of select industries, such as Banarasi textiles, Khurja ceramics, and Firozabad glassware, that embody craftsmanship accumulated over generations, reinforced by Geographical Indication (GI) recognition. Despite their cultural and economic importance, these industries face increasing challenges driven by mass production, shifting consumer behaviour, limited access to technology, and inadequate marketing infrastructure. The resulting market marginalisation and declining intergenerational engagement have jeopardised their long-term viability. This emphasises the need for an integrated, multidisciplinary framework to advance the sustainable development of these select handicraft industries in terms of revenue and market sustainability.

This thesis undertakes a comprehensive and interdisciplinary analysis to strengthen the sustainability and competitiveness of handicraft businesses in India. The thesis presents an integrated framework that operates across four structural domains, encompassing sectoral diagnostics, policy evaluation, consumer behaviour modelling, and innovative operational strategies. By establishing a foundational research framework, the study also lays the groundwork for future endeavours across similar industries to improve business sustainability from both the production and consumer ends. The study adopts a framework applicable to the case of pottery and the handcrafted apparel industry. The selection of case studies is motivated by the enrichment of skills and techniques used in making these products, which have a long-standing traditional and cultural legacy. The present study examines the challenges faced by artisans working in these industries and critiques the prevailing government schemes designed to benefit these sectors. This exploration from the production end helps in identifying the key issues and target areas that require improvement.

Furthermore, the study focuses on the marketing aspect to enhance the visibility and demand of the product in the market by introducing subscription retailing as an innovative retail strategy. The study examines consumer adoption behaviour towards the subscription of handcrafted products from select industries. Following this, the thesis focuses on designing

a subscription bundle package that can be adopted to operationalise the subscription of handcrafted, select products. The multifaceted objective involves an integrated assessment of the industry, government policies, marketing, retail, and operational segments, providing insights to build operational strategies and policy reforms that contribute to the business sustainability of indigenous select industries.

To establish the study framework, the research begins with a literature review that systematically surveys research on production ecosystem bottlenecks, government policy interventions, behavioural modelling, and emerging retail paradigms, most notably subscription-based retailing. The literature consistently highlights the decentralised and informal nature of business operations in select industries. Literature identifies various policy interventions that target skill training, infrastructure and technology upgrades, credit support, branding, and marketing support. Despite these efforts, the literature highlights persistent implementation gaps, including bureaucratic delays, a lack of contextual customisation, and inadequate monitoring and outreach. Literature identifies the factors that affect subscription adoption behaviour in customers, which vary from product to product and are mainly categorised as motives and barriers. The factors broadly studied include subscription motives, perceived subscription risks, personal attitude, subjective norms, and social and environmental factors. The literature also identifies subscription packaging and their pricing strategies, which mostly revolve around bundling and are qualitative in nature.

The literature review identifies several distinct gaps, such as the lack of integrated barrier assessment from stakeholder perspective, insufficient alignment between government scheme objectives and ground-level challenges, minimal empirical evaluation of innovative retail mechanisms for handcrafted products, limited understanding of consumer willingness to adopt such mechanisms, and a dearth of studies connecting behavioural insights to operational retail models that optimize for profitability and inclusivity. Addressing these gaps, this thesis is motivated to develop an empirically grounded and operationally viable framework linking industry diagnostics, policy evaluation, and consumer-focused retail strategies for the sustainable advancement of select MSMEs.

As one of its core objectives, the thesis identifies and prioritises the prevalent barriers in handcrafted textiles and pottery. It investigates the interrelationship of barriers within the system, which helps identify both causal and effect barriers. The barrier assessment is

conducted through a four-stage approach. The first stage involves identifying extreme barriers in different domains. The study leverages Porter's Value Chain and PEST (Political, Economic, Social, and Technological) analysis to identify the barrier domains. The barriers are identified and finalised through a literature review and discussions with experts. The second stage involves categorising barriers into respective domains with the help of experts. In the third stage, the fuzzy analytical hierarchy process is used to rank barriers based on their relative weight. In the fourth stage, the DEMATEL method is applied to identify the interrelationship linkages among the barriers. The overall analysis generates actionable insights for targeting influential obstacles and structured effective policy responses.

As another core objective, the study assesses broader schemes and policies launched by the government and measures their alignment against priority intervention zones as identified via barrier assessment. This analysis highlights the points of convergence and critical misalignment. Government schemes are reviewed through a thematic analysis of launched schemes over the last five years for these industries. Based on the assessment of the schemes, the study proposes the cluster park model as an effective policy. By clustering products specially identified under One District One Product (ODOP) and Geographical Indication (GI)- tagged products based on similarity criteria, the framework proposes sectoral parks specialising in distinct crafts, equipped with common facility centres, marketing, and other infrastructural amenities. Such parks are positioned to address core operational, marketing, and welfare gaps, support socioeconomic upliftment, and facilitate sustainable, inclusive growth tailored to artisan communities.

On the market side, the thesis examines the adoption of subscription retailing for handcrafted textiles and pottery, incorporating behavioural and demographic analyses through structural equation modelling (SEM). The empirical framework examines how various factors, categorised as motives and barriers, influence subscription intention. The moderation analysis assessing the relationship between motives and subscription intention under the influence of obstacles, as well as the relationship between constructs across different demographic traits, provides insights effective for drafting differentiated engagement strategies.

Another objective of this study revolves around the operational segment, involving the design and optimisation of subscription packages. The study uses Choice-Based Conjoint (CBC)

analysis to model discrete consumer choice, estimating part-worth utilities for product attributes. The package utility and reservation price are calculated to strike a balance between desirability and profitability. Mixed Integer Linear Programming (MILP) is employed to maximise expected profit, accounting for cost thresholds, box selection constraints, and probability-adjusted adoption rates. The resulting framework generates package portfolios that reconcile consumer value with operational feasibility and stakeholder interests, supporting sustainable business models for artisanal handcrafted industries.

The study exemplifies strong alignment with the key Sustainable Development Goals (SDGs) 1, 5, 8, 9, 10, 11, and 12, both directly and indirectly. The study empowers artisan communities with improved livelihood opportunities (SDG 1) and fosters decent work and inclusive economic growth (SDG 8). Through the cluster park model, the study advances sustainable innovation and development in select industries (SDG9). Through effective marketing and retail models, the study promotes responsible production and consumption by encouraging sustainable demand for handcrafted products (SDG12). Focusing on the reduction of socio-economic inequalities, the study aims to reduce inequalities and support empowerment (SDG10). The business development of select industries strengthens community identity and recognition of handcrafted products (SDG11).

Overall, the thesis presents a comprehensive and actionable framework for revitalising handcrafted MSMEs in India, encompassing industry barrier assessment, policy coherence evaluation, and strategising innovative retail methods through consumer adoption and price optimisation. By focusing on textiles and pottery sectors as representative domains, the research demonstrates the potential for tradition-based enterprises to evolve and compete effectively in contemporary, digitised marketplaces. The study offers actionable insights for respective stakeholders, policymakers, social enterprises, and the broader academic community to strengthen cultural preservation, generate sustainable livelihoods, and promote inclusive economic development in these select industries.

Keywords: MSME, Select Industries, Handcrafted Products, Innovative Marketing, Policy Convergence, Pricing, Bundling, Pottery Industry, Handcrafted Textiles and Apparel

सार

भारत के सूक्ष्म, लघु और मध्यम उद्यमों (MSME) का दायरा बहुत व्यापक है। ये अलग-अलग क्षेत्रों में काम करते हैं और हमारी सांस्कृतिक पहचान को बचाने, पारंपरिक रोजगार को बनाए रखने और सभी वर्गों को साथ लेकर आर्थिक विकास करने में महत्वपूर्ण भूमिका निभाते हैं। भारतीय हस्तशिल्प क्षेत्र एक विशेष MSME क्षेत्र है, जहाँ कला, परंपरा और उपयोगिता एक साथ मिलती हैं। बनारसी वस्त्र, खुरजा की चीनी मिट्टी के बर्तन और फिरोज़ाबाद के काँच के सामान जैसे उद्योग ऐसे बड़े क्लस्टर बनाते हैं, जिनमें पीढ़ियों से चली आ रही कारीगरी दिखती है और जिन्हें भौगोलिक संकेत (GI) का दर्जा भी मिला हुआ है। इनकी सांस्कृतिक और आर्थिक अहमियत होने के बावजूद, ये उद्योग तेज़ी से बढ़ते बड़े पैमाने के उत्पादन, बदलती उपभोक्ता पसंद, तकनीक की सीमित पहुँच और कमज़ोर विपणन (मार्केटिंग) ढाँचे जैसी चुनौतियों का सामना कर रहे हैं। इसके कारण बाज़ार में इनकी पकड़ कम हो रही है और नई पीढ़ी का जुड़ाव भी घट रहा है, जिससे इनका भविष्य असुरक्षित हो गया है। इसलिए ज़रूरत है कि इन चुनिंदा हस्तशिल्प उद्योगों के लिए ऐसा समग्र और बहु-विषयी ढाँचा बनाया जाए, जो उनकी आय और बाज़ार में टिकाऊ बने रहने दोनों को मज़बूत कर सके।

यह शोध भारत के हस्तशिल्प व्यवसायों की स्थिरता और प्रतिस्पर्धात्मकता बढ़ाने के लिए व्यापक और अंतःविषय (इंटरडिसिप्लिनरी) विश्लेषण करता है। शोध में एक समेकित ढाँचा प्रस्तावित किया गया है, जो चार प्रमुख हिस्सों पर काम करता है - क्षेत्रीय/उद्योग विश्लेषण, नीतियों का मूल्यांकन, उपभोक्ता व्यवहार का मॉडलिंग और नए तरह की संचालन एवं विपणन रणनीतियाँ। यह ढाँचा एक बुनियादी शोध रूपरेखा भी देता है, जिससे ऐसे ही अन्य उद्योगों में उत्पादन और उपभोग दोनों स्तरों पर व्यवसाय की स्थिरता बढ़ाने के लिए आगे और अध्ययन किए जा सकें। इस ढाँचे को इस शोध में मिट्टी के बर्तनों (पॉटरी) और हस्तनिर्मित परिधानों के उद्योग पर लागू किया गया है। इन मामलों (केस स्टडी) को इसलिए चुना गया है, क्योंकि इन उत्पादों के निर्माण में विशिष्ट कौशल, तकनीक और लंबी सांस्कृतिक-पारंपरिक विरासत जुड़ी हुई है। यह शोध उन कारीगरों की समस्याओं की जाँच करता है जो इन उद्योगों में काम कर रहे हैं, और साथ ही इन क्षेत्रों के लिए बनी सरकारी योजनाओं की कमियों और सीमाओं की समीक्षा भी करता है। उत्पादन स्तर से की गई यह पड़ताल उन मुख्य समस्याओं और सुधार की ज़रूरत वाले क्षेत्रों की पहचान करने में मदद करती है। आगे, शोध विपणन पक्ष पर काम करते हुए उत्पादों की बाज़ार में पहचान और माँग बढ़ाने के लिए सब्सक्रिप्शन रिटेलिंग (सदस्यता आधारित बिक्री) को एक नई खुदरा रणनीति के रूप में प्रस्तावित करता है। अध्ययन यह समझने की कोशिश करता है कि चुने गए उद्योगों के हस्तनिर्मित उत्पादों

की सदस्यता लेने के प्रति उपभोक्ताओं का व्यवहार कैसा है और वे किन कारणों से इसे अपनाते या नहीं अपनाते। इसके बाद, शोध ऐसे सब्सक्रिप्शन पैकेज (बंडल) तैयार करने की रूपरेखा बनाता है, जिन्हें अपनाकर इन हस्तनिर्मित उत्पादों की सदस्यता को व्यवहार में लागू किया जा सके। इस तरह बहु-आयामी उद्देश्य पूरा करते हुए यह अध्ययन उद्योग, सरकारी नीतियाँ, विपणन और संचालन—इन सभी पहलुओं का संयुक्त आकलन करता है और ऐसी रणनीतियाँ सुझाता है जो इन स्वदेशी चुनिंदा उद्योगों के टिकाऊ व्यवसाय के लिए नीतिगत और व्यावहारिक सुधार का आधार बन सकें।

शोध का ढाँचा लागू करने के लिए सबसे पहले साहित्य समीक्षा की गई, जिसमें उत्पादन तंत्र की रुकावटों, सरकारी नीतिगत हस्तक्षेपों, व्यवहार आधारित मॉडलिंग और उभरते खुदरा मॉडल, विशेषकर सब्सक्रिप्शन आधारित रिटेलिंग पर उपलब्ध अध्ययनों की व्यवस्थित जाँच की गई। साहित्य से पता चलता है कि चुने गए उद्योगों का व्यवसाय ढाँचा अधिकतर बिखरा हुआ (विकेन्द्रीकृत) और अनौपचारिक है। विभिन्न नीतिगत हस्तक्षेपों में कौशल विकास, अवसंरचना और तकनीकी उन्नयन, ऋण/वित्तीय सहयोग, ब्रांडिंग और मार्केटिंग सहयोग जैसे कदमों का ज़िक्र मिलता है। इसके बावजूद, अध्ययन बताते हैं कि नीतियों के ज़मीनी क्रियान्वयन में कई खामियाँ हैं, जैसे प्रशासनिक देरी, स्थानीय ज़रूरतों के अनुसार योजनाओं का पर्याप्त अनुकूलन न होना और निगरानी व पहुँच की कमज़ोरी। साहित्य से यह भी पता चलता है कि ग्राहकों द्वारा सब्सक्रिप्शन अपनाने के पीछे के कारण (मोटिव) और रुकावटें (बैरीयर) उत्पाद के प्रकार के हिसाब से बदलती हैं और इन्हें आम तौर पर प्रेरक कारणों और बाधाओं के रूप में वर्गीकृत किया जाता है। प्रमुख रूप से जिन कारकों का अध्ययन हुआ है, वे हैं - सब्सक्रिप्शन अपनाने की प्रेरणाएँ, ग्राहकों द्वारा महसूस किए गए जोखिम, व्यक्तिगत दृष्टिकोण, सामाजिक दबाव/मानदंड तथा सामाजिक और पर्यावरणीय कारक। इसके साथ ही, साहित्य में सब्सक्रिप्शन पैकेजों के संयोजन (बंडलिंग) और उनकी मूल्य निर्धारण रणनीतियों का भी उल्लेख मिलता है, जो अधिकतर गुणात्मक रूप में हैं।

साहित्य समीक्षा से कई महत्वपूर्ण शोध खामियाँ सामने आती हैं, जैसे - हितधारकों (स्टेकहोल्डर्स) के नज़रिए से बाधाओं का समग्र आकलन न होना, सरकारी योजनाओं के उद्देश्यों और ज़मीनी चुनौतियों के बीच पर्याप्त तालमेल की कमी, हस्तनिर्मित उत्पादों के लिए नए खुदरा तरीकों (जैसे सब्सक्रिप्शन) की बहुत कम व्यावहारिक जाँच, उपभोक्ताओं की ऐसे मॉडल अपनाने की वास्तविक इच्छा के बारे में सीमित समझ, और लाभ व समावेशन दोनों को संतुलित करने वाले खुदरा संचालन मॉडल से उपभोक्ता व्यवहार संबंधी निष्कर्षों को जोड़ने पर बहुत कम काम होना। इन खामियों को देखते हुए, यह शोध इस बात से प्रेरित है कि एक ऐसा ढाँचा विकसित किया जाए जो व्यावहारिक आँकड़ों पर आधारित हो, व्यावहारिक

रूप से लागू किया जा सके और जो उद्योग विश्लेषण, नीति मूल्यांकन तथा उपभोक्ता केंद्रित खुदरा रणनीतियों को जोड़ते हुए चुनिंदा MSME उद्योगों के सतत विकास में मदद करे।

शोध का एक मुख्य उद्देश्य हस्तनिर्मित वस्त्रों और पॉटरी उद्योग में मौजूद बाधाओं की पहचान और उनकी प्राथमिकता तय करना है। अध्ययन प्रणाली में मौजूद अलग-अलग बाधाओं के आपसी संबंधों की जाँच करता है, ताकि यह समझा जा सके कि कौन-सी बाधाएँ मूल (कारक) हैं और कौन-सी उनके परिणाम के रूप में उभरती हैं। बाधा मूल्यांकन के लिए चार चरणों वाली पद्धति अपनाई गई है। पहले चरण में अलग-अलग क्षेत्रों में अत्यधिक प्रभावी बाधाओं की पहचान की जाती है। इसके लिए पोर्टर के वैल्यू चेन मॉडल और PEST विश्लेषण (राजनीतिक, आर्थिक, सामाजिक और तकनीकी पहलुओं पर आधारित) का उपयोग कर बाधा क्षेत्रों को चिह्नित किया जाता है। बाधाओं की सूची साहित्य समीक्षा और विशेषज्ञों से चर्चा के आधार पर तैयार और अंतिम रूप दी जाती है। दूसरे चरण में विशेषज्ञों की मदद से बाधाओं को उनके संबंधित क्षेत्रों में वर्गीकृत किया जाता है। तीसरे चरण में फ़ज़ी एनालिटिक हाइअरार्की प्रोसेस (FAHP) का उपयोग करके बाधाओं की सापेक्ष महत्ता के आधार पर उनकी रैंकिंग की जाती है। चौथे चरण में DEMATEL पद्धति से बाधाओं के बीच आपसी संबंधों और प्रभाव की दिशा को समझा जाता है। इस पूरी प्रक्रिया से ऐसे व्यावहारिक निष्कर्ष निकलते हैं, जिनके आधार पर सबसे अधिक प्रभाव डालने वाली बाधाओं को लक्ष्य बनाकर नीति और हस्तक्षेप रणनीतियाँ तैयार की जा सकती हैं।

दूसरे प्रमुख उद्देश्य के तहत, अध्ययन सरकार द्वारा शुरू की गई व्यापक योजनाओं और नीतियों का विश्लेषण करता है और यह देखता है कि वे बाधा मूल्यांकन के ज़रिए पहचाने गए प्रमुख हस्तक्षेप क्षेत्रों से कितनी मेल खाती हैं। इस विश्लेषण से यह पता चलता है कि कहाँ योजनाएँ ज़मीन से जुड़ी ज़रूरतों के अनुरूप हैं और कहाँ पर महत्वपूर्ण असंगति है। चुने गए उद्योगों के लिए पिछले पाँच वर्षों में लागू की गई योजनाओं की थीमैटिक (विषयगत) समीक्षा की गई है। इस मूल्यांकन के आधार पर अध्ययन “क्लस्टर पार्क मॉडल” को एक प्रभावी नीतिगत समाधान के रूप में सुझाता है। इस मॉडल में “वन डिस्ट्रिक्ट वन प्रोडक्ट (ODOP)” और GI टैग वाले उत्पादों को उनकी समानताओं के आधार पर समूहित कर ऐसे सेक्टर पार्क बनाने का प्रस्ताव है, जो विशेष तरह के हस्तशिल्प में विशेषज्ञ हों और जहाँ सामान्य सुविधा केंद्र, मार्केटिंग सुविधाएँ और अन्य बुनियादी अवसंरचना उपलब्ध हो। ऐसे पार्क उत्पादन, विपणन और कल्याण से जुड़ी मूलभूत कमियों को दूर करने, कारीगर समुदायों के सामाजिक-आर्थिक विकास को बढ़ावा देने और इनके अनुरूप टिकाऊ व समावेशी विकास को प्रोत्साहन देने में सहायक हो सकते हैं।

बाज़ार के स्तर पर, यह शोध हस्तनिर्मित वस्त्रों और पॉटरी के लिए सब्सक्रिप्शन रिटेलिंग अपनाने की संभावनाओं की जाँच करता है, जिसमें उपभोक्ताओं के व्यवहार और

जनसांख्यिकीय (डेमोग्राफिक) पहलुओं का विश्लेषण स्ट्रक्चरल इक्वेशन मॉडलिंग (SEM) के माध्यम से किया गया है। प्रायोगिक ढाँचा यह जाँचता है कि प्रेरक कारणों (मोटिव्स) और बाधाओं (बैरियर्स) की अलग-अलग श्रेणियाँ सब्सक्रिप्शन लेने की इच्छा पर कितना और कैसे प्रभाव डालती हैं। इसके साथ ही गई मॉडरेशन विश्लेषण यह देखती है कि बाधाओं की मौजूदगी में प्रेरक कारणों और सब्सक्रिप्शन इंटेंशन के बीच संबंध कैसे बदलता है, और विभिन्न जनसांख्यिकीय समूहों में इन तत्वों के बीच संबंधों में क्या अंतर आता है। इससे अलग-अलग तरह के ग्राहकों के लिए अलग-अलग जुड़ाव (एंगेजमेंट) रणनीतियाँ बनाने में उपयोगी निष्कर्ष मिलते हैं।

शोध का एक और उद्देश्य संचालन (ऑपरेशनल) पक्ष से जुड़ा है, जिसमें सब्सक्रिप्शन पैकेजों की रूपरेखा बनाना और उन्हें अनुकूलित (ऑप्टिमाइज़) करना शामिल है। इसके लिए चॉइस-बेस्ड कॉन्जॉइंट (CBC) विश्लेषण का उपयोग करके उपभोक्ता के चयन व्यवहार को मॉडल किया गया है, जिससे उत्पाद के विभिन्न गुणों के प्रति ग्राहकों की पसंद (पार्ट-वर्थ यूटिलिटी) का अनुमान लगाया जा सके। इसके आधार पर पैकेज की कुल उपयोगिता और वह अधिकतम कीमत (रिज़र्वेशन प्राइस) निकाली जाती है, जिस पर ग्राहक पैकेज लेने के लिए तैयार हो सकता है, ताकि ग्राहक को मिलने वाले मूल्य और व्यवसाय की लाभप्रदता के बीच संतुलन कायम किया जा सके। इसके बाद, मिक्स्ड इंटੀजर लीनियर प्रोग्रामिंग (MILP) तकनीक का प्रयोग कर संभावित लाभ को अधिकतम करने की कोशिश की जाती है, जिसमें लागत सीमा, पैकेज चयन की शर्तें और ग्राहकों द्वारा पैकेज अपनाने की संभावना जैसे तत्वों को शामिल किया जाता है। इस तरह तैयार ढाँचा ऐसे पैकेज पोर्टफोलियो सुझाता है जो ग्राहक के लिए आकर्षक हों, व्यवसाय के लिए व्यावहारिक हों और विभिन्न हितधारकों के हितों के बीच संतुलन बनाए रखते हुए हस्तनिर्मित उद्योगों के लिए टिकाऊ व्यापार मॉडल को बढ़ावा दें।

यह अध्ययन प्रत्यक्ष और अप्रत्यक्ष रूप से सतत विकास लक्ष्यों (SDGs) 1, 5, 8, 9, 10, 11 और 12 के साथ गहरा जुड़ाव रखता है। यह कारीगर समुदायों की आजीविका के अवसरों में सुधार कर गरीबी में कमी (SDG 1) और सम्मानजनक काम तथा समावेशी आर्थिक विकास (SDG 8) को बढ़ावा देता है। क्लस्टर पार्क मॉडल के माध्यम से चयनित उद्योगों में टिकाऊ नवाचार और उद्योग-विकास (SDG 9) को मज़बूत किया जाता है। प्रभावी मार्केटिंग और रिटेल मॉडल के ज़रिए यह अध्ययन हस्तनिर्मित उत्पादों की टिकाऊ माँग को बढ़ावा देता है, जिससे ज़िम्मेदार उत्पादन और उपभोग (SDG 12) को प्रोत्साहन मिलता है। सामाजिक-आर्थिक असमानताओं में कमी लाने पर फोकस के कारण यह असमानताओं को घटाने और सशक्तिकरण (SDG 10) में योगदान देता है। चुनिंदा हस्तनिर्मित उद्योगों के व्यापार विकास से स्थानीय समुदाय की पहचान मज़बूत होती है और हस्तनिर्मित उत्पादों की सामाजिक मान्यता बढ़ती है, जो टिकाऊ समुदायों और शहरों (SDG 11) के लक्ष्य के अनुरूप है।

समग्र रूप से देखा जाए तो यह शोध उद्योग की बाधाओं की पहचान और उनके समाधान, नीतियों के बीच बेहतर तालमेल, उपभोक्ता केंद्रित नवीन खुदरा रणनीतियों और मूल्य अनुकूलन के माध्यम से भारत के हस्तनिर्मित MSME क्षेत्र को पुनर्जीवित करने का व्यावहारिक और समग्र रास्ता प्रस्तुत करता है। वस्त्र और पॉटरी को प्रतिनिधिक क्षेत्र के रूप में चुनकर, यह शोध दिखाता है कि कैसे परंपरा आधारित उद्यम आधुनिक, डिजिटल बाजारों में प्रतिस्पर्धी बन सकते हैं। यह अध्ययन नीति निर्माताओं, सामाजिक उद्यमों, उद्योग से जुड़े अन्य हितधारकों और शोध समुदाय को ऐसे ठोस सुझाव देता है जो सांस्कृतिक संरक्षण, टिकाऊ आजीविका और समावेशी आर्थिक विकास को मज़बूत करने में सहायक हो सकते हैं।

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Abbreviations

AVE	Average Variance Extracted
CBC	Choice-Based Conjoint
CB-DPSP	Cluster-based Development Parks for Select Products
CB-SEM	Covariance-based SEM
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CHCDS	Comprehensive Handicrafts Cluster Development Scheme
CLF	Common Latent Factor
CMB	Common Method Bias
CMIN/DF	Chi-Square Minimum / Degrees of Freedom
COA	Centre of Area
CR	Composite Reliability
DEMATEL	Decision-Making Trial and Evaluation Laboratory
DOI	Diffusion of Innovation Theory
EFA	Exploratory Factor Analysis
EUO	Enjoyment and Uniqueness Orientation
F	Financial Constraints
FAHP	Fuzzy Analytical Hierarchy Process
FIO	Fashion Identity Orientation
GFI	Goodness of Fit Index
GI	Geographical Indication
	Gramodyog Vikas Yojana – Kumbhar Sashaktikaran
GVYKSP	Programme
H	Workforce Issues
HTMT	Heterotrait-Monotrait Ratios
IFI	Incremental Fit Index
IFM	Intrinsic Fashion Motivation
IFO	Innovative Fashion Orientation
IRT	Innovation Resistance Theory
KVIC	Khadi and Village Industries Commission
L	Logistical and Operational Infrastructure Constraints

M	Market Dynamics and Limitations
MILP	Mixed Integer Linear Programming
MITRA	Mega Investment Textile Region and Apparel
MLE	Maximum Likelihood Estimation
MLE	Maximum Likelihood Estimation
MoMSME	Ministry of Micro, Small and Medium Enterprises
MoT	Ministry of Textiles
MSE-CDP	Micro & Small Enterprises – Cluster Development Programme
MSME	Micro, Small and Medium-sized Enterprises
NFI	Normed Fit Index
NHDP	National Handicraft/Handloom Development Programme
NI	Normative Influence
ODOP	One District One Product
OTT	Over-the-top
OVOP	One Village One Product
P	Institutional and Regulatory Limitations
PAC	Perceived Access Constraints
PAR	Perceived Access Risks
PCFI	Parsimony Comparative Fit Index
PLS-SEM	Partial Least Squares -SEM
PMEGP	Prime Minister's Employment Generation Programme
PMS	Procurement and Marketing Support
PMVY	Pradhan Mantri Vishwakarma Yojana
PNFI	Parsimony Normed Fit Index
PR	Performance Risk
PSR	Perceived Subscription Risks
PUI	Product Utility Impediments
PUV	Product Usage Values
PVB	Product Value Barrier
R	Resource Availability Constraints
RMSEA	Root Mean Square Error of Approximation
RMSS	Raw Material Supply Scheme

S	Socio-Economic Environment Issues
SCT	Social Cognitive Theory
SDGs	United Nations Sustainable Development Goals
SEM	Structural Equation Modelling
SFURTI	Scheme of Fund for Regeneration of Traditional Industries
SHV	Subscription Hedonic Values
SI	Subscription Intention
SOS	Subscription-based Online Services
SR	Subscription Risks
SRMR	Standardised Root Mean Square Residual
NI	Normative Influence
SUR	Subscription Utility Risk
SUV	Subscription Utilitarian Values
T	Technological Capability Limitations
T&A	Textile and Apparel
TAM	Technology Acceptance Model
TFN	Triangular Fuzzy Numbers
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UR	Process Risk
UTAUT	Unified Theory of Acceptance and Use of Technology
WTP	Willingness to Pay
WTS	Willingness to Subscribe

CHAPTER 1

Introduction

This chapter provides an overview of the work accomplished in the thesis. It highlights the current landscape of select industries that produce handcrafted products and the existing problems these industries face, which affect overall business sustainability. The section then highlights the motivation behind this work and provides a brief overview of the thesis.

1.1 Preamble

Select Industries refer to specific sectors or groups of industries that are identified for focused support and intervention due to their cultural, economic and strategic importance (R. Mishra et al., 2022). Primarily, these industries comprise artisan-based Micro, Small, and Medium-sized Enterprises (MSMEs) in India, renowned for their traditional skills and regional heritage, which have been passed down through generations of dedicated craftsmanship (T. Mishra et al., 2023). Select industries producing handcrafted items such as Khurja Ceramics, Firozabad Glassware, and Banarasi Sarees occupy a unique intersection between artistic expression and everyday practicality (Ministry of Textiles, 2024). Rooted in tradition, these crafts transcend mere function, embodying collective memory, cultural narrative, and an enduring sense of place (S. Mishra et al., 2025). Their methods speak to inherited expertise and deep local knowledge, passed down through generations of artisans who infuse meaning and skill into every creation (T. Banerjee et al., 2023). These select industries play a vital role in generating livelihoods, as artisanal communities often operate predominantly through decentralised, home-based production modes tightly connected with regional identities (A. Singh et al., 2022). Recognising region-specific products with tags such as One District One Product (ODOP) and Geographical Indication (GI) helps safeguard intellectual property and acknowledge originality and cultural uniqueness (Nirosha & Mansingh, 2025). The tags distinguish the products in international markets and serve as a crucial marker of authenticity and legitimacy, further elevating artisanal value in the global marketplace (Khan, 2022).

However, despite their cultural and socioeconomic significance, handcrafted MSMEs face mounting challenges amid sweeping tides of modernisation (Dalal et al., 2024; Kashyap & Shukla, 2023). The growth of these industries is increasingly restrained by the increase of mass-produced substitutes, evolving consumer preferences, and limited access to contemporary

supply and distribution chains (Majumdar & Sinha, 2018). Staples of local economies such as jute bags, bamboo baskets, earthen jars, and clay toys are being rapidly supplanted by cheaper, readily available plastic alternatives, which lack the environmental and cultural integrity of traditional crafts (Yadav et al., 2023). The reach of genuine, handcrafted products is further hindered by a lack of robust marketing systems and digital visibility, particularly in global markets where demand for sustainable, authentic goods is increasing (A. Banerjee et al., 2023).

Previous literature identifies that the production ecosystem of the select products is marked by fragmentation, informal labour structures, and pronounced regional dependencies (Bag et al., 2021; A. Banerjee et al., 2023; Dalal et al., 2024; Nath & Agrawal, 2023; Sinha et al., 2023). The decentralisation inherent in these industries fosters resilience but also persistent inefficiencies. Artisans often operate within fragmented supply chains, where the procurement of raw materials is inconsistent and vulnerable to seasonal variations and market volatility (Majumdar & Sinha, 2018). Empirical studies document how infrastructural deficits, such as insufficient storage, poor packaging, and underdeveloped logistics, impede artisans' ability to fulfil bulk orders or maintain product consistency, thereby undermining competitiveness and long-term sustainability (Yadav et al., 2023).

These operational challenges are compounded by limited access to formal credit systems and institutional support (Garg & Kashav, 2022). This compels artisans to rely on informal capital generation alternatives due to their easy availability, thereby avoiding the typical process of accessing capital from banks and similar agencies (Nithya & Selvendran, 2019). However, these informal capital generation means often lead to exploitative situations and diminished margins (Sasidharan & Reddy, 2021). Despite this, many artisans continue to function within informal networks, constrained by inadequate access to credit, technology, and market intelligence (Dalal et al., 2024). Younger generations, witnessing economic volatility and the absence of institutional support, are increasingly reluctant to inherit traditional crafts, thereby threatening the continuity of these rich industries (Uppendar & Ramulu, 2016). It's a matter of concern that, despite the cultural richness and heritage embedded in these crafts, the production systems remain fragile, with inefficiencies directly impacting livelihood sustainability and market competitiveness.

Government initiatives such as ODOP (One District One Product), SFURTI (Scheme of Fund for Regeneration of Traditional Industries), and GI promotion schemes have attempted to

redress these challenges (Kaur & Jyoti, 2016; Ministry of Food Processing Industries, 2024; Ministry of Textiles, 2024; PTI, 2020). SFURTI, for instance, aims to build capacity through skill training and physical infrastructure, while ODOP focuses on promoting district-specific products through branding and market access (M. Jain et al., 2021; Thomas et al., 2024; Yadav et al., 2024). The policies focus on cluster development, skill upgrading, infrastructure and branding, striving to invigorate production, boost market access, and protect artisanal intellectual property (Bhavan, 2023). Yet, the tangible impact of such schemes on ground-level business growth and artisanal livelihood sustainability remains limited (Choudhary & Sangwan, 2018). The literature reveals a disjuncture between the technical design of schemes and their implementation at the grassroots. Amrita et al. (2024) identified that many schemes suffer from bureaucratic delays, a lack of contextual customisation, and weak monitoring mechanisms. Artisans often remain unaware of available benefits or face procedural hurdles (Vasani & Abdulkareem, 2024). Moreover, these schemes focus more on finance, production, technology, and infrastructure. Behavioural demand modelling and retail strategies are crucial for market responsiveness and long-term viability (Sinha & Sainy, 2021). M. Jain et al. (2021) emphasise that integrating consumer insights and operational feasibility into policy frameworks is crucial, as these initiatives risk becoming top-down interventions with limited transformative impact without doing so. The disconnect between institutional objectives and artisan realities continues to undermine the potential of these schemes to catalyse sustainable growth (Amrita et al., 2024; Roy et al., 2016; Yadav et al., 2023). The enduring disconnects between policy objectives and the complex realities of these decentralised industries have precipitated stagnation, and in some cases, outright decline.

Overall, the persistent vulnerabilities in select industries erode livelihood security and reduce industries' overall market agility. Recognising these multifaceted challenges, researchers started exploring innovative pathways to improve the business of these select industries. The studies identified the need for innovative pathways to enhance the demand and supply of handcrafted products (Yadav et al., 2023). The studies highlighted the need for improved manufacturing techniques to improve the quality and quantity of production (Garg & Kashav, 2022). Studies suggested the integration of digital platforms for enhanced market access and demand stimulation (Yadav et al., 2023). Studies also mentioned the use of data-driven frameworks for production optimisation. Some scholars emphasise the importance of experiential learning and community engagement as means to preserve traditional knowledge

and adapt practices to changing contexts (Patel & Joshi, 2023). Few studies have suggested that improving government policies can safeguard the business of select industry products (Agarwal et al., 2023). However, as competitive pressures intensify and sustainability concerns multiply, a compelling need arises for exhaustive, context-specific inquiry integrating sectoral diagnostics with operational, behavioural, and policy innovations (Bharadwaj et al., 2018).

Market studies highlight the interest of customers in handcrafted items that cater to their needs, provided these products meet the desired quality standards and are readily available in the market (Dalal et al., 2024). Studies highlight that customer satisfaction determines the purchase level, which hinges on the development of transparent retail mechanisms and robust service assurance (D. R. Sharma & Singh, 2021). Additionally, the literature underscores the necessity of behavioural modelling of these mechanisms to understand the drivers and barriers to consumer adoption of handcrafted products. Quantitative approaches, such as regression and probabilistic models, have been employed to analyse consumer preferences and their willingness to adopt specific products and services (Meyer et al., 2017). For example, V. Rao et al. (2021) illustrated the effectiveness of conjoint analysis in identifying which product and service attributes most influence consumer affinity, empowering artisans to tailor their offerings in line with market demands. Similarly, Mehta & Kapoor (2020) highlighted that psychological factors, such as authenticity, storytelling, and perceived uniqueness, strongly shape consumer engagement and purchasing intent, revealing that handcrafted goods are valued as cultural artefacts rather than merely functional commodities. However, existing research on consumer behaviour in this sector is largely qualitative and exploratory, often lacking a connection to actionable operational models. As a result, there is limited evidence on translating behavioural insights into scalable and feasible retail strategies, leaving the full potential of behavioural modelling to bridge the gap between artisan output and consumer demand underexploited, particularly given the market access constraints artisans face.

Moving towards an innovative retailing concept known as subscription-based retailing has gained popularity globally as a mechanism for generating steady income, particularly in services and consumable products (Bray et al., 2021). Some prominent areas utilising subscription-based retailing and marketing include entertainment, food and beverages, beauty and fashion, software, games, and more. Subscription retailing improves customer retention, facilitates inventory planning, and generates predictable revenue streams (T. Chen et al., 2018; Woo & Ramkumar, 2018). Kim et al. (2021) demonstrate that subscription commerce can

enhance consumer engagement by providing personalised experiences and fostering brand loyalty. In the Indian context, however, research on subscription models tailored to handcrafted MSMEs is sparse. Patel & Joshi (2023) explore the feasibility of subscription frameworks in rural craft clusters, suggesting they can foster deeper consumer-artisan relationships and reduce market volatility. Yet, rigorous modelling does not incorporate operational constraints, consumer preferences, and demographic comparisons (Notaro & Paletto, 2021).

Furthermore, configuring and optimising subscription packages from the consumer's viewpoint highlights operational efficiency, which is currently lacking in the literature (Ramkumar & Woo, 2018). Moreover, subscription behaviour assessment remains incomplete without assessing consumers' willingness to pay for the proposed subscription package (Kirmani & Khan, 2018). Most existing work focuses on urban artisan collectives or e-commerce platforms, leaving a gap in understanding how subscription models can be adapted for decentralised, resource-constrained MSMEs. Integrating behavioural data with modular optimisation techniques for package design and pricing remains an open area for research, with significant potential to transform how handcrafted products are marketed and monetised.

The above discussion makes it evident that select industries focused on handcrafted products require a comprehensive, multi-dimensional analysis to effectively identify areas for development, particularly for sustainable and innovative retail mechanisms that can enhance their marketing and sales performance. However, previous studies have addressed challenges like production inefficiency, policy shortcomings, and fragmented marketing (Celetti, 2020). However, most studies have focused on a segment of the system and neglected the interconnected realities faced by MSMEs. This fragmented approach has led to missed opportunities for implementing innovative retail strategies, especially for these industries. Even for new retail techniques, studying their adoption intention and willingness to pay remains inadequate, which limits the scalability of such marketing innovations (Pavithra, 2020). Subscription retailing is an innovative retail mechanism (Aminah et al., 2021). Overall, the absence of a holistic, interdisciplinary methodology that combines barrier identification, policy evaluation, and advanced retail operationalisation is a critical gap in achieving sustainable growth and resilience in these artisanal sectors.

1.1.4. Research Gaps and Motivation for Present Work

Select industries manufacturing handcrafted products fall into a special segment of Indian MSMEs that require upliftment, as these industries are facing sustainable development issues in terms of product sales and the livelihoods of artisans (P. Sharma & Bansal, 2020). The literature indicates that efforts to improve the business of these industries are fragmented and lack in-depth analysis throughout the value chain (Khan, 2022). The thesis addresses the following identified challenges in the sustainable livelihood generation of select industries, aiming to bridge the gaps in the existing literature.

- There is a lack of integrated assessment of industry barriers and their interrelationship from the stakeholder's viewpoint, covering broader value chain elements. Most of the work revolves around a specific segment of the value chain and lacks an overall study of different value chain elements within a single composite system. The thesis addresses this gap and presents an integrated evaluation of industry barriers from the artisans' viewpoint. It first examines the relative importance of the severity of different obstacles. Then it extends the analysis to identify the barriers as cause-and-effect groups and investigate the influence of causal factors on others.
- Few studies evaluate the existing schemes independently, but lack a comparison of scheme objectives to the identified target zones. Such studies are essential for identifying areas of scheme convergence and examining whether the schemes effectively cover the affected areas. Such studies help determine whether the issue lies in adopting appropriate schemes or in the effective implementation of those schemes. This study evaluates scheme convergence by underlining the scheme objectives of recently launched schemes and comparing them with the identified target areas from the barriers assessment study.
- There is minimal empirical research focused on innovative retailing approaches for handcrafted products. Such research is crucial because retail formats and marketing strategies significantly shape how consumers perceive and adopt handmade goods. Without this understanding, demand for these products remains constrained, limiting both market growth and the potential income of artisans. The study addresses this gap by introducing a subscription retailing strategy for such products.
- Few studies have proposed using online retail channels to enhance the market reach of handcrafted products. However, these suggestions remain largely conceptual, without supporting evidence from real consumer behaviour. As a result, there is limited

understanding of whether consumers are actually willing to purchase such products through online platforms. This thesis studies the willingness of consumers to subscribe to these products and examines the factors that favour and retard the subscription behaviour. The study then extends the analysis to identify differences in behaviour among various demographic traits.

- There is a lack of strategic consumer behaviour analysis to build an effective operational retail model. Without this behavioural insight, it becomes challenging to structure retail operations that align with how consumers make purchase decisions based on the set of options available. This limits the ability to develop feasible retail strategies that effectively match fundamental purchasing dynamics. Identifying the factors that most strongly drive purchase intention is necessary to set pricing that aligns with consumer value perception. This study bridges the gap by deriving optimised subscription packages for handcrafted products and services based on consumer preferences and estimating their willingness to pay and the estimated profit.

Addressing these challenges, the thesis contributes to the development of select industries that produce sustainable handcrafted products, in addition to supporting the Sustainable Development Goals. The thesis works on the three-fold assessment of two broad selected industries, pottery and handcrafted textiles, to highlight (a) the overall industry assessment from the artisans' viewpoint, (b) examine the policy convergence, (c) explore and design an innovative retail model to aid sustainable livelihood and product marketing. The motivation behind choosing pottery and handcrafted textiles as the case study lies in the sustainable nature of the products these industries manufacture. The following key motivations contributed to the conduct of this study.

- Promotion of Sustainable Industries: Pottery and handcrafted textile items are eco-friendly in nature and cause minimal harm to the environment, as they use sustainable materials and techniques that motivate improvement in the business sustainability of this industry.
- Alignment with Sustainable Development Goals: These industries directly contribute to SDGs related to decent work, responsible consumption, rural development, and cultural preservation, which offer strong global relevance for the study.
- Economic importance for rural communities: The selected industries provide livelihoods to many indigenous local communities, sustaining local economies in many regions.

Studies to improve the livelihoods of artisans in these industries will significantly enhance income generation, employment stability, and social well-being.

- Preservation of artisanal skills and techniques: Pottery and handcrafted textiles share a unique reliance on artisanal skills, making it essential to preserve these distinctive arts and styles of product making. Innovative and sustainable retail strategies are necessary to enrich demand in the market and keep artisans attached to their passion as their livelihood.
- Preservation of cultural and heritage value of crafts: Both pottery and handcrafted textiles carry deep cultural significance. Their preservation not only promotes livelihood but also preserves heritage and cultural value in society.
- Paucity of multidimensional research: The existing literature often studies these industries in isolation, focusing either on production issues, policy issues, or economic issues. The three-fold assessment provides an integrated evaluation encompassing all aspects of the industry value chain elements, from artisans' and consumers' perspectives.
- Poor Livelihood of the artisanal community: The artisans of pottery and handcrafted textiles depend heavily on this business for their livelihood. Artisans face a hampered demand for their products in the market, which hampers the sustainable livelihood of artisans involved in making these products. Additionally, the artisans are underpaid for their work and products, which affects their livelihood.
- Limited market penetration and heavy threat from industrialisation: The mass-produced, machine-manufactured products have hindered the demand for pottery and handcrafted textiles. This motivates studies in this sector to create opportunities for interventions for the business revival of these industries.
- A paucity of research assessing policy convergence: Select industries are aided by proper government schemes and policies. However, there are rare studies that evaluate the significance and convergence of these schemes in these industries, which motivates the assessment of whether the schemes launched for these industries are accurate and whether they are appropriately implemented.
- Scope for Innovation in Retail and Market Access: Select industries, such as pottery and handcrafted textiles, often lack modern retail channels, effective branding strategies, and targeted marketing techniques. This motivates us to introduce innovative retail methods for these industries, connecting artisans with a large consumer base outside the local market.

Based on the motivation highlighted above, this thesis aims to address significant gaps and provide comprehensive insights to improve the livelihood and business sustainability of the select industries. The study's findings offer managerial implications for industry stakeholders involved in these industries. The insights can support enterprises and entrepreneurs in improving their businesses by adapting innovative marketing and retail techniques, aiding in the sustainability of livelihoods for artisans. The insights also bring implications for policymakers to develop and implement proper schemes that align with the needs of artisans involved in select industries. The present study can be extended to other select industries facing similar operational, financial and marketing barriers, making the study broadly scalable.

Based on motivation and the gaps identified in the literature, this thesis aims to address the following research problem and achieve the respective research objectives.

1.2 Research Problem and Objectives

This section outlines the identified research problem and the corresponding research objectives related to the sustainable livelihood of select industries.

1.2.1 Research Problem

The literature survey highlights a lack of proper assessment of industry barriers, which can help identify the causal factors that require government and concerned stakeholders to implement appropriate interventions. The absence of studies examining government policies from the artisans' perspective limits the effectiveness of these schemes, as without alignment to stakeholder realities, their overall purpose and utility are not fully achieved. Furthermore, there is limited research on improving marketing and retail through innovative retail mechanisms, their adoption behaviour, and operational strategies. The handicraft industry requires exceptional support from government schemes to ensure their effective implementation. Moreover, they require innovative marketing strategies that can generate sustainable livelihoods. Thus, the problem statement for this thesis is: "Developing a framework to identify industry barriers, to assess the alignment of existing schemes with these barriers, to analyse consumer adoption behaviour of subscription retailing, and to develop optimal subscription package designs, thereby linking empirical analysis with operational retail strategies for sustainable livelihood generation". Therefore, the title of the thesis is given as:

"An Analysis of Select Industries for Sustainable Livelihood Generation".

1.2.2 Research Objectives

The thesis aims to achieve the following objectives: to develop a framework that provides a multidimensional approach to improve the business of select industries, thereby bringing sustainability to the livelihoods of artisans involved in these industries.

Research Objective 1. To identify the industry barriers impacting the performance of handcrafted textiles and pottery industries, prioritise the key barriers, and explore their interrelationships to determine cause-and-effect linkages.

Research Objective 2. To compare the objectives of prevalent government schemes with the identified target areas from barrier assessment and formulate a framework for the sustainable development of select industries.

Research Objective 3. To examine the factors influencing subscription adoption intention for handcrafted textiles and pottery products, and analyse behavioural variations across demographic traits to understand consumer behaviour more effectively.

Research Objective 4. To develop feasible subscription packages for handcrafted textiles and pottery products based on consumer input and market conditions, and evaluate both willingness to pay and estimated profit.

Figure 1.1 outlines the research framework developed to achieve the research objectives and address the research problem. The following sections provide a brief discussion of the fulfilment of each objective.

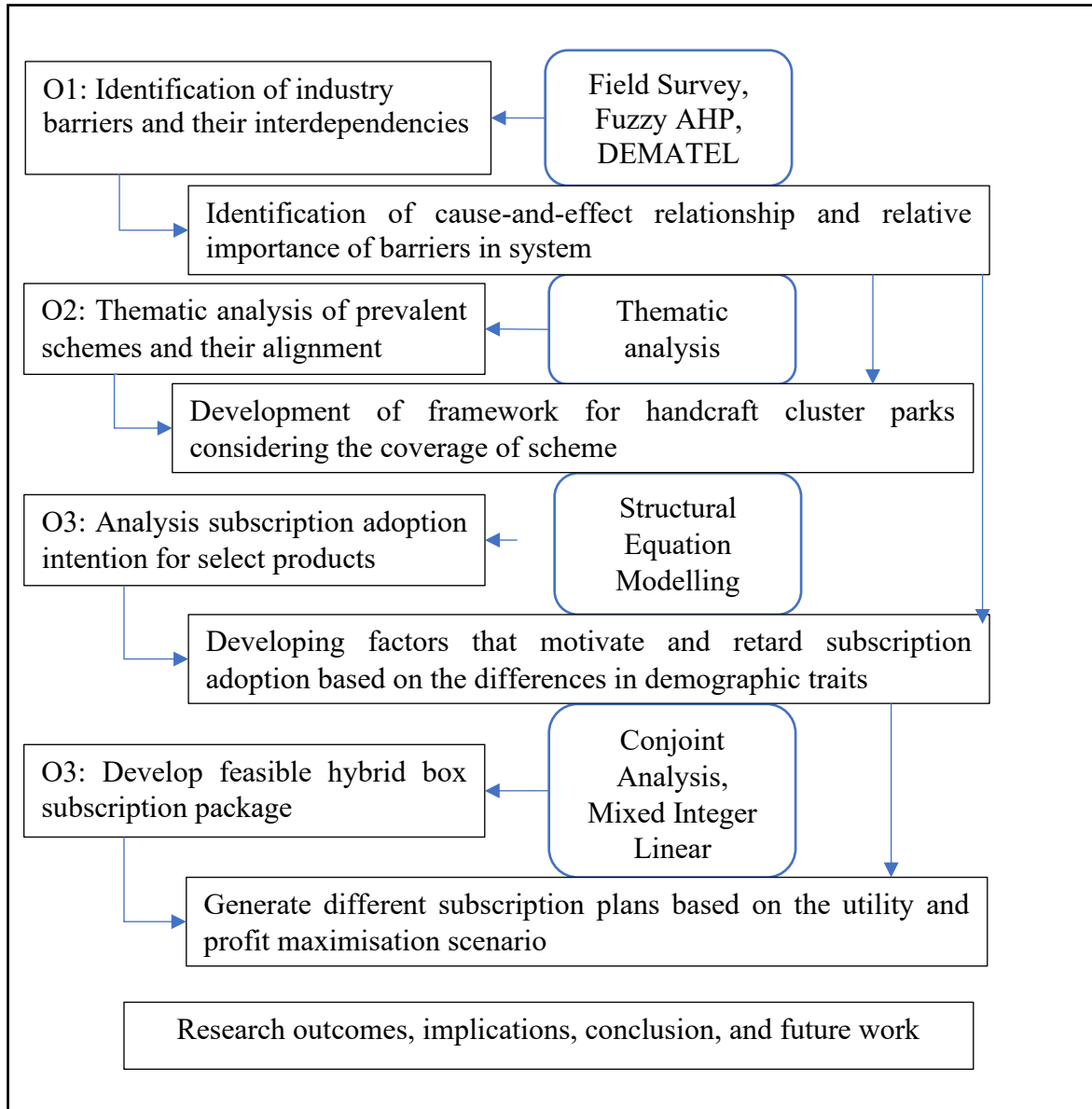


Figure 1. 1 Research Framework (Source: Author)

The fulfilment of the research objectives will significantly contribute to the development of the business of select industries, thereby improving the livelihoods of artisans involved in these industries. The following section outlines the thesis.

1.3 Thesis Outline

The thesis is organised in seven chapters, the outline of which is presented in Table 1.1. The brief details for each chapter are as follows.

Chapter 1: This chapter highlights the study background, research motivation, problem identification, and outlines the research objectives. The chapter explains the motivation for adopting pottery and handcrafted textiles as the select industries for this study.

Chapter 2: This chapter comprehensively reviews the literature relevant to the present research work and identifies the research gaps that this study aims to address. The chapter reviews the pottery and handcrafted textiles industry to understand the industry and the challenges these industries face. This is followed by a review of the policies introduced for these industries and the assessment methods used by the researchers. Furthermore, the literature reviews innovative retail methods and assesses the factors that affect the adoption intention of retail strategies, helping to develop an effective retail strategy for these products. The section also involves reviewing various methods to develop the retail strategy. This thesis examines subscription retailing as an innovative retail strategy for generating sustainable revenue for industry artisans. The section highlights the literature gaps identified from the literature review that the present work aims to address.

Chapter 3: This chapter examines the barriers prevalent across the select industries and identifies their relative importance. The study also analyses the interrelationship of different obstacles to help determine the causal-effect relationship of hurdles within the system. The assessment employs the Fuzzy Analytical Hierarchy Process. The chapter identifies different barriers across eight domains: finance, raw materials, human resources, marketing, policy and regulations, logistics, technology, and social. The findings provide valuable insights for policymakers and other stakeholders to develop effective policies and business strategies that enhance performance.

Chapter 4: This chapter assesses the prevalent schemes launched by the Indian government for select industries, particularly pottery and handcrafted textiles, on the eight domains identified in Chapter 3. Furthermore, the chapter compares the coverage areas of schemes with the barriers identified in Chapter 3. Additionally, the chapter highlights an effective scheme that brings maximum coverage to the prevalent barriers in the select industries and ensures effective implementation. The results have effective implications for policymakers to modify the schemes and their implementations that effectively tackle the barriers identified by industry stakeholders.

Chapter 5: This chapter explores subscription retailing as a strategic approach for effective marketing and generating recurring revenue. To develop an effective subscription strategy for marketing select products, this study assesses the motives and barriers affecting subscription intention for these products, particularly for pottery and handcrafted textiles. The study assesses the influence of factors, particularly subscription utilities, perceived subscription risks, normative influence, product usage values and barriers, market-oriented barriers, and personal norms, on subscription intention. Furthermore, the study examines the impact of barriers on the relationship between motives and subscription intention. Additionally, the chapter also identifies if the factor affecting subscription intention varies across different demographic subgroups or not. The results provide valuable insights for marketers to develop effective strategies for creating subscription retailing plans tailored to customers across diverse demographic populations.

Chapter 6: This chapter discusses operationalising appropriate subscription retail packages customised according to customer utility for various included package features, along with the optimal pricing of the packages. The study uses Choice-Based Conjoint (CBC) analysis (discrete choice modelling) and Mixed Integer Linear Programming (MILP). (mathematical optimisation) as the methodology for developing a generalised framework for subscription package design. CBC analysis helps in calculating the part-worth utilities for each level of the subscription package attributes. The MILP method identifies optimal packages that maximise the expected profit and achieve high desirability. The technique calculates profit as the average profit that can be predicted by offering a subscription package, taking into account the package's profit margin and the likelihood that customers will choose it. The outcomes of this chapter benefit marketers and their respective stakeholders in developing subscription packages that ensure high desirability and profitability. Moreover, the methodology highlighted in the chapter can be adopted at any time to revise the subscription package, depending on changes in customer behaviour, making the method versatile and effective.

Chapter 7: This chapter summarises the thesis work, including the key research findings and contributions. The chapter also outlines the limitations of the thesis. It provides future research directions to enhance the livelihood sustainability of select industries that are struggling with business performance, sales, and the market presence of their products.

The outline of the thesis is presented in Table 1.1. This thesis introduces a multi-fold assessment to improve the business of industries that hold significant cultural and

environmental sustainability value, while providing livelihoods to rural communities, but face challenges in revenue generation and product penetration in the market.

Table 1.1 Thesis Outline

Chapter	Title of Chapter	Objective Achieved
Chapter 1	Introduction	
Chapter 2	Literature Review	
Chapter 3	Identification of Industry Barriers Impacting the Performance of Handcrafted Textiles and Pottery Industry	Objective 1
Chapter 4	Policy Evaluation and Framework Formulation for Sustainable Development of Traditional Industries	Objective 2
Chapter 5	Analysis of Factors Influencing Subscription Adoption Intention and Behavioural Variations Across Demographic Traits	Objective 3
Chapter 6	Developing Feasible Subscription Packages for Handcrafted Textile and Pottery Products	Objective 4
Chapter 7	Conclusion	

1.4 Summary

This chapter provides an overview of the research, starting with the motivation behind the work. This is followed by the formulation of the research problem and the outlining of the research objectives that this thesis aims to achieve. This section further presents the research framework for achieving the research objectives. Additionally, this section summarises each chapter of this thesis briefly. The following chapter reviews the literature in various sections, forming the foundation for the work presented in this thesis.

CHAPTER 2

Literature Review

This chapter presents a literature review that discusses prior research on key themes presented in the thesis, providing a comprehensive overview of the work contained in this thesis. The chapter summarises the findings from previous studies, followed by the identification of major research gaps and prevalent challenges in the areas that this thesis aims to uncover and resolve. The review provides an overview of the key themes addressed in this thesis's subsequent chapters.

2.1 Introduction

As the thesis focuses on the improvement of select industries for sustainable livelihood generation, taking the cases of pottery and handcrafted textiles, the literature review begins by understanding the pottery and handcrafted textiles, followed by the challenges identified in the literature prevalent in these industries. Further, the literature examines the policies launched for these select industries. Similarly, all key areas are reviewed and carefully discussed, as they play a significant role in the thesis.

A literature review is essential for identifying and examining existing work in the relevant areas to analyse them better and identify existing gaps that form the basis for ongoing research. To ensure a comprehensive global overview of the literature, a scientometric analysis based on bibliometric data, specifically using keyword co-occurrence mapping, was conducted using VOSviewer. To ensure methodological rigour and transparency, the literature review followed a structured search strategy using the Scopus database. The search was conducted using combinations of keywords aligned with the four research objectives of the study, covering: (i) handicraft industry barriers, (ii) policy and government interventions, (iii) consumer behaviour and subscription adoption, and (iv) pricing and optimisation in subscription models. The search strings were applied to TITLE-ABS-KEY fields using Boolean operators (AND/OR), and results were refined based on the relevance of the research. The retrieved datasets from all four objectives were then combined and de-duplicated to create a comprehensive corpus for bibliometric analysis.

While these clusters are internally well-developed, the analysis reveals limited integration across them, particularly between human capital development, market-oriented strategies, and consumer-driven subscription models. This fragmentation indicates that existing research largely treats production-side challenges, policy interventions, and consumer behaviour as isolated domains rather than interconnected systems. This structured mapping enables a deeper understanding of the intellectual landscape and interconnections among research domains.

The present thesis is positioned at the intersection of these clusters, aiming to bridge these gaps by integrating artisan-level challenges, policy support mechanisms, consumer behaviour, and pricing strategies into a unified analytical framework. This positioning enables a more comprehensive understanding of sustainable livelihood generation through innovative market mechanisms such as subscription-based retailing.

The literature review is categorised into the following categories, as highlighted in Figure 2.2. Each thematic section serves as a building block to fulfil the objective outlined in this thesis. This approach ensures a cohesive narrative, where the identified research gaps are systematically addressed in subsequent chapters.

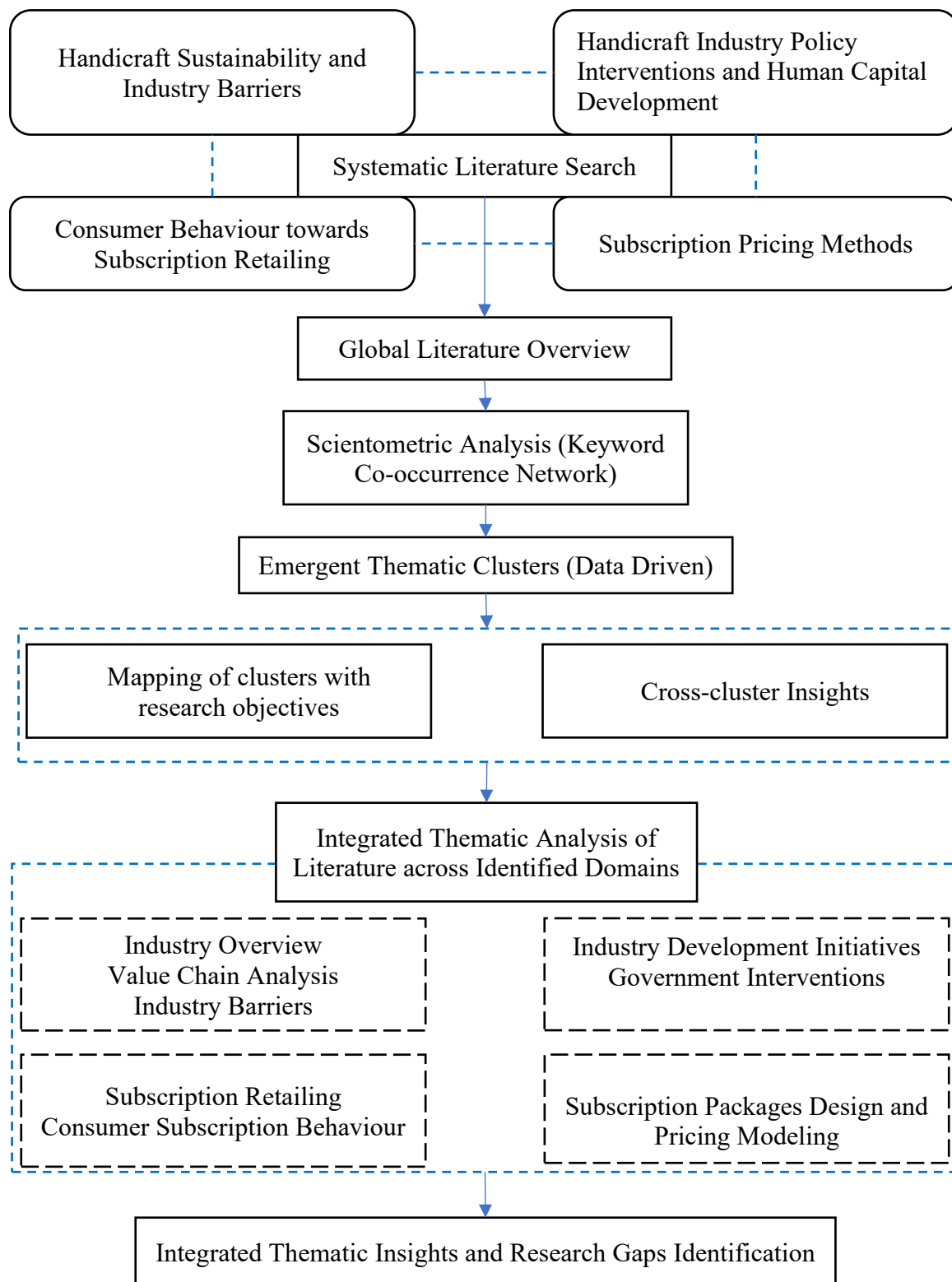


Figure 2. 2 Literature Review Classification-cum-Framework (Source: Author's Analysis using VOSviewer)

2.2 Select Industries

Select Industries in India refer to specific sectors that hold significant cultural, economic, and social value, which is why they are identified as priorities for national policies and interventions (Majeed, 2018; Shafi, 2020). The select industries play a significant role in preserving traditional skills, supporting rural livelihoods, and contributing significantly to the preservation of cultural and heritage values, as well as exports and employment (Akilandeewari & Pitchai, 2016). Industries identified as select industries are focused on development efforts, tailored support schemes, and protection measures by regulatory bodies that distinguish them from the broader landscape of general industries (Khanna, 2018; S. Kumar et al., 2024).

The select industries comprise a major segment of traditional, artisan-based, and regionally significant industries in India, including handcrafted textiles, pottery, metalwork, and other handicrafts (Ministry of Textiles, 2024). Traditional craft industries, particularly pottery and handcrafted textiles, are critical sources of livelihood in developing economies, serving as repositories of cultural heritage and facilitating intergenerational knowledge transmission (Pal, 2021; Panigrahi & Rao, 2018). These labour-intensive sectors provide employment opportunities concentrated in rural and semi-urban regions where formal sector employment remains limited, thereby contributing substantially to inclusive economic development strategies (Pegu, 2019). Despite their key role in employment generation and cultural preservation, these industries face a range of structural and operational challenges in India (Idrissu & Oliveira Lopes, 2024; S. Mishra et al., 2025; Silveru & Sankineni, 2024). Therefore, they are selected by the regulatory government for their protection and sustainable development through sustained policy interventions to ensure their survival and competitiveness in a rapidly industrialising economy (Kaur & Jyoti, 2016; Ministry of Textiles, 2024; Patel & Joshi, 2023). The following section discusses the pottery and handcrafted textile industry studied in the thesis.

2.2.1 Pottery Industry

India's pottery industry has a rich heritage that traces back thousands of years and remains a key element of rural livelihoods, traditional artistry and day-to-day life (Akilandeewari & Pitchai, 2016; Idrissu & Lopes, 2024; Silveru & Sankineni, 2024). The market for pottery and ceramics in India is estimated at over \$750 million in 2024 and is projected to grow at approximately 5% annually through 2030 (Kiernan Robert, 2023). Pottery holds a diverse

product range, including earthen kitchenware, tableware, water vessels, storage containers, decorative items, religious items, idols, artistic sculptures, and traditional toys (Akilandeewari & Pitchai, 2016; Kiernan Robert, 2023; Pal, 2021). Pottery items are valued not only for their utility and aesthetic appeal but also for their inherited cultural significance and health benefits (Asri et al., 2022). The sector is mostly run by skilled artisan communities as their primary source of livelihood. India holds a prominent place in the global ceramic trade, especially in artware and tableware, exporting to major markets like the USA, China, UK, and Germany (Dahiya et al., 2022; Emerson Lila, 2024).

Globally, pottery represents a vital primary and supplementary income source for socially and economically marginal families and communities (Mefful et al., 2024; Sen & Bhattacharjee, 2021). Despite its traditional and social significance, the pottery industry faces critical barriers affecting the livelihood of its artisans. Many artisans use conventional tools and techniques that limit their innovation and production capacity. The potters often face the issues of inadequate working space, unavailability of firewood, clay and other raw material shortages (Dashti et al., 2022). In addition, there are financial constraints, limited market linkages and a lack of societal and institutional support that further hinder business growth and sustainability (D. V. Menon & Vadakepat, 2022). Due to limited literacy, artisans struggle to access formal credit or effective government schemes (Garg & Kashav, 2022). Moreover, the stiff competition from industrially produced goods such as ceramics, metalware, glass, and plastics has impacted the sales of pottery items (D. V. Menon & Vadakepat, 2022; Yirgu et al., 2022). The industrially produced goods are cheaper and easily available in the market, having better scalability that hinders the demand for earthen items (Akilandeewari & Pitchai, 2016; B. S. Wayessa, 2023). These challenges are compounded by inconsistent product standards and restricted digital presence that impact both domestic and international sales (Das & Sen, 2025; Mukherjee & Chanda, 2024). As a result, the traditional pottery sector is losing relevance, prompting urgent calls for research, innovation, and targeted interventions to revitalise this artisan skill and support the livelihoods of artisans working in the pottery industry.

2.2.2 Handcrafted Textiles and Apparel Industry

The Textile and Apparel (T&A) sector remains one of the largest sectors in the world with richness in the raw material, workforce and innovative style of product (Ministry of Textiles, 2024). The global textile market is valued at about USD 1.11 trillion in 2024 and projected to

reach USD 1.61 trillion by 2033, growing at a combined annual growth rate of 4.2%(Fatorachian & Ramesh, 2025). The global apparel market alone is expected to hit USD 1.84 trillion by 2025, accounting for 1.6% of world GDP (Fatorachian & Ramesh, 2025). For the case in India, the textile and apparel industry was valued at USD 222 billion in 2024 and is projected to grow rapidly to USD 647 billion by 2033 with a combined annual growth rate of 11.98% (Ministry of Textiles, 2024). The sector contributes 2.3% to GDP, 13% to industrial production, and 12% to exports (Ministry of Textiles, 2024). The industry absorbs 45 million employees directly and 60 million employees in allied form. India is the second largest manufacturer and exporter of textiles in the world after China, with a share of 4% in global textile and apparel trade (Invest India, 2025; Ministry of Textiles, 2024).

Within this sector, handcrafted textiles and apparel hold a distinctive position. Handcrafted textiles and apparel account for 8.2% of India's total exports (2023-24), with the USA and EU being the largest buyers of Indian handloom fabrics, carpets, and ethnic apparel (Ministry of Textiles, 2024; UJA, 2025). Millions of artisans and weavers are engaged in handloom and handicraft production, making it a major livelihood source and a cultural heritage industry (Ministry of Textiles, 2024; Pant & Palanisamy, 2025). India is one of the largest contributors to this segment (Ministry of Textiles, 2024). Also, countries like Bangladesh, Vietnam, and parts of Africa significantly contribute to the global handcrafted textile supply. Although handcrafted textiles are estimated to be less than 5% of the global textile market, they provide higher value per unit due to their artisanal nature (Awasthi, 2018; Majeed, 2018).

Specific attributes of handcrafted textiles make this textile segment valuable compared to machine-made textiles and other fashionable textiles and apparel (Deb, 2025; Kurup, 2008). Handcrafted textiles rely on natural fibres, eco-friendly dyes, and consume low energy, which limits the adverse effect on carbon footprint as compared to machine-produced goods. The handcrafted products are long-lasting, designed for cultural and functional use, unlike fast fashion's disposable nature (Anumala, 2021; Dissanayake et al., 2017; Prusty & Mallick, 2022). The industry supports the livelihood of thousands of artisans, ensuring community empowerment. The artisans involved in this industry use traditional techniques and styles for weaving, embroidery, dyeing and other value chain processes that safeguard India's heritage (Guru et al., 2022; Wanniarachchi et al., 2020). There is an increasing demand for sustainable and ethical fashion that enhances export potential, especially in premium markets (Agrawal & Chanana, 2021).

2.3 Prevalent Problems in Select Industries

Research demonstrates that pottery and handcrafted textiles embody multidimensional value extending beyond monetary income (Yan & Chiou, 2021). These crafts facilitate cultural continuity, community upliftment, and women's empowerment, and produce environmentally sustainable products utilising local, natural materials with lower ecological footprints than industrial alternatives (Prakash et al., 2016; Yadav et al., 2024). However, due to numerous barriers, these industries are facing sustainability issues. The following section discusses the existing problems in the pottery and handcrafted textile industry.

2.3.1 Barriers in the Pottery Industry

Different parts of India are known for an indigenous style of pottery making, validating the richness of culture that this industry and pottery products hold and preserve for generations (Asri et al., 2022; Pal, 2021). The pottery industry of Majuli district in Assam, India, exemplifies regional case studies documenting traditional craftsmanship and livelihoods (Dutta & Hazarika, 2020). However, in recent years, the advent of cheap and durable alternatives has affected their business. Research on Salmora village pottery reveals that artisans experience low incomes, unstable employment and limited market access, compounded by seasonal demand fluctuations, transportation constraints in riverine settings, and vulnerability to natural disasters (Pokharel et al., 2023). Similarly, pottery communities in Madhya Pradesh, particularly among Bhil Adivasis and the Prajapati artisan community, have historically bartered handcrafted earthenware for agricultural products and essential goods in reciprocal exchange systems (Emerson Lila, 2024; Palmer, 2020; Saha, 2019). However, changing climate patterns, rising temperatures, economic constraints, and influx of machine-made alternatives have rendered pottery an increasingly precarious livelihood (Djastuti et al., 2020; D. V. Menon & Vadakepat, 2022).

The vulnerability of pottery as a livelihood intensifies with generational transitions, as younger individuals demonstrate declining interest in pursuing the craft due to perceived low profitability and social status, threatening intergenerational skill transmission and cultural continuity (Garg & Kashav, 2022; Saroha et al., 2022; B. Singh et al., 2012). Barriers identified in the literature are categorised in the area identified using PEST analysis (Aguilar, 1967) and Porter's Value Chain Framework (Porter, 1985).

- **Financial Constraints:** Limited capital access forces reliance on informal capital lending at high interest rates, adding additional constraints to profit margins (Jakhar, 2023). The limited availability of credit and constrained profit margin create hurdles in scaling up the business by artisans (Sankarappa et al., 2015; Upendar & Ramulu, 2016).
- **Raw material constraints:** Rising cost of raw materials, including clay, kiln fuel, and glazing materials, imposes substantial financial burdens on potters, especially those who lack access to formal credit systems (Kiradoo, 2020; D. V. Menon & Vadakepat, 2022). Moreover, there is limited availability of the required raw materials locally, which increases the hardship of procuring the required raw materials both financially and logistically (Jakhar, 2023; Narassima et al., 2025).
- **Decline in Workforce and Skill Loss:** Only a few of the younger generations in the pottery communities are choosing pottery as the primary livelihood option due to the perception of low income and low social acceptance (Khurana, 2022; Panigrahi & Rao, 2018; Saha, 2019). This concerns the loss of the skilled workforce and the art of indigenous pottery making.
- **Market Access and Distribution Constraints:** Traditional potters rely heavily on local markets that are geographically saturated and offer minimal profit margins, fundamentally limiting their capacity to scale production and generate sustainable incomes (Majeed, 2018; Shafi, 2020). Research highlights that artisans may receive only 30-40% of final retail prices in traditional distribution chains where multiple intermediaries exploit these artisans by extracting successive margins (Majeed, 2018). This dependency on intermediaries and weak direct-to-consumer channels reduces artisans' price capture and market power significantly (Yirgu et al., 2022). Although e-commerce brings opportunity to access broader markets, it takes a lot of capacity building, technical skill and infrastructure investment that is not affordable by many artisans (Bhadu et al., 2022; Khanna, 2018; Uttam et al., 2022). Price competition from industrial production creates continuous downward pressure on artisan incomes, particularly for products where traditional techniques offer limited perceived added value to price-sensitive consumers (Shafi, 2020).
- **Technological Limitations:** Product design misalignment with contemporary market tastes adds pressure to the sales of traditional pottery items with traditional designs. Many traditional designs do not appeal to all types of customers, especially modern customers (Dahiya et al., 2022; Wayessa, 2020). Yet, artisans lack proper technology, resources, skills and market knowledge to innovate designs appropriately (Vishwakarma et al., 2022, 2024).

Traditional production technologies may limit productivity and quality consistency, although research emphasises the need to balance technological upgrading with preservation of traditional techniques that provide both cultural value and market differentiation (Majumdar et al., 2021; Mefful et al., 2024; Pan et al., 2025). Poor internet access limited digital literacy, and inadequate logistics infrastructure in craft-producing regions hampers e-commerce adoption and modern market participation (Pegu, 2019).

- ***Social Challenges:*** Younger generations in pottery artisan communities perceive limited economic viability and lower social status relative to alternative employment (Angeles, 2022; Mohan et al., 2024; Shaw et al., 2024). This demographic shift threatens both livelihood sustainability and cultural heritage preservation, particularly in contexts where apprenticeship structures and knowledge transmission have already weakened (Khani et al., 2023).

Studies identifying different barriers prevalent in the pottery industry are tabulated in Table 2.1.

Table 2. 1 Sources of Identified Barriers in Pottery Industry

Source	F1	F2	F3	R1	R2	R3	H1	H2	H3	M1	M2	M3	P1	P2	P3	P4	L1	L2	L3	T1	T2	T3	S1	S2	S3
Das & Sen (2025)			✓							✓							✓				✓				
Dahiya et al. (2022)	✓	✓				✓	✓	✓	✓	✓			✓				✓	✓		✓	✓	✓			
D. V. Menon & Vadakepat (2022)	✓			✓	✓	✓				✓	✓	✓							✓	✓	✓	✓	✓		✓
Bhadu et al. (2022)							✓	✓	✓							✓									
Yirgu et al. (2022)			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓							✓	✓	✓
Ghazinoory et al. (2020)	✓	✓	✓				✓	✓	✓	✓			✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Islam et al. (2020)				✓	✓			✓	✓	✓	✓										✓	✓	✓		
Álvarez Dopico (2020)	✓									✓													✓		
B. Wayessa (2020)	✓	✓		✓				✓		✓				✓									✓	✓	✓
Saha (2019)	✓			✓	✓		✓			✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Marques et al. (2018)	✓	✓		✓		✓			✓	✓	✓	✓								✓		✓	✓		
Elya et al. (2017)	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓										✓			

2.3.2 Barriers in the Handcrafted Textile Industry

Like the pottery industry, the handcrafted textile industry also faces numerous issues across different dimensions:

- **Financial Insecurity:** Weaver households often operate with limited working capital, due to which most weavers struggle to secure affordable bank loans (T. Mishra et al., 2023). Reliance on private moneylenders, such as traders, incurs high interest rates. Further, delayed payments, irregular income, supply chain inefficiencies, and lack of financial literacy lead to difficulty in cash flow management. Weavers also face constraints to market prices and production costs that limit their profit margins (Khurana, 2022; Shaw et al., 2022).
- **Raw Material Supply Issues:** Research often finds that sourcing quality yarns and dyes at fair prices is often a struggle due to supply chain inefficiencies, lack of direct access to suppliers, and market volatility (Kazancoglu et al., 2020; Narassima et al., 2025). This results in costly delays in the supply chain, impacting the business financially and undermining its credibility in the market. To fulfil the orders and maintain the timeline, weavers use substandard materials, risking the quality of the products and image of the weavers (Naik et al., 2025).
- **Shrinking Skilled Workforce:** Traditional textiles require skilled labour at every step, but many experienced artisans are leaving due to low wages and poor working conditions (Khurana, 2022). Low education levels and insufficient training limit the inflow and upskilling of new talent. The poor working, social and economic conditions add to a lack of motivation among workers and new generations to continue this weaving business (T. Mishra et al., 2023).
- **Market and Branding Challenges:** Literature recognises that handmade textiles face stiff competition from the machine-made textiles, which are budget-friendly, rich in variety and are easily available (Naik et al., 2024). Despite unique craftsmanship, weak branding, over-reliance on intermediaries, poor marketing, and limited exposure to wider markets, this results in low sales and low profits (Verma & Mishra, 2018).
- **Policy and Bureaucratic Hurdles:** Government regulations significantly influence the stability and growth of cottage-based textile enterprises. Many weavers remain unaware of them or struggle with complex and time-consuming procedures required to access these benefits (Wanniarachchi et al., 2020). The implementation of government initiatives is often

weak, with limited monitoring and inadequate alignment to the actual challenges faced by artisans (Ali et al., 2024). In addition, weavers encounter issues such as insufficient information, a lack of proper guidelines, delays in approvals, inconsistent communication, and limited assistance from relevant authorities. Furthermore, policy decisions frequently lack continuity and are sometimes influenced by electoral or political considerations, reducing their effectiveness on the ground (Khokhawala & Iyer, 2022; Naik et al., 2025).

- **Logistic Bottlenecks:** Logistical challenges significantly weaken supply chain efficiency and disrupt the overall handloom value chain. Delays caused by poor logistics often result in lost orders and financial losses. Inconsistent demand and weak coordination further create inventory and storage issues (Kazancoglu et al., 2022). Additionally, high transportation costs and inadequate infrastructure restrict access to wider markets, forcing artisans to rely on intermediaries, leaving them with earnings far below what they deserve (Vishwakarma et al., 2022).
- **Technology Infrastructure:** Research finds that many cottage weavers still use outdated tools and production methods (Raut et al., 2019). While some studies highlight that adopting modern technology is financially burdensome for local weavers, others point to the lack of technical skills needed to use advanced equipment (Majumdar et al., 2021). The high initial investment and uncertainty on the desired profit margins after incorporating the latest technology at a high cost create hesitation among weavers. As a result, weavers more often prefer familiar and traditional techniques (Sivasakthi & Rabiyaathul Basariya, 2018).
- **Societal Challenges:** Traditional textile workers often face low social recognition, limited educational and healthcare options, and discrimination based on gender, caste, and community (Agrawal & Chanana, 2021; Nivedha & Sutha, 2019). Further economic and social exploitation due to poverty with limited growth opportunities discourages young weavers from pursuing this business (Dissanayake et al., 2017).

Studies identifying different existing barriers in the textile industry are tabulated in Table 2.2. While the above barriers are largely industry-specific, the literature also emphasises the role of human capital development in sustaining artisan-based industries. Human capital encompasses skills, education, training, entrepreneurship, and knowledge transmission, all of which directly influence productivity, innovation, and livelihood outcomes, contributing to the sustainability of handicraft industries (Naik et al., 2025).

A thematic analysis using keyword co-occurrence (Figure 2.3) identifies a distinct cluster centred around training, education, empowerment, entrepreneurship, and social capital, with strong linkages to gender-related aspects such as women and rural communities. This indicates that the literature primarily frames human capital within a social development and empowerment perspective.

However, the visualisation also reveals that these human capital themes remain weakly connected with pricing, market access, optimisation, and business model clusters, suggesting a lack of integration between skill development and economic or market-oriented strategies. Existing studies focus on informal skill transfer, vocational training and empowerment initiatives, but do not adopt a structured talent management or capability-building framework aligned with value chain competitiveness and revenue generation. This disconnect highlights a critical research gap in linking artisan skill development with market mechanisms, consumer behaviour, and sustainable business models.

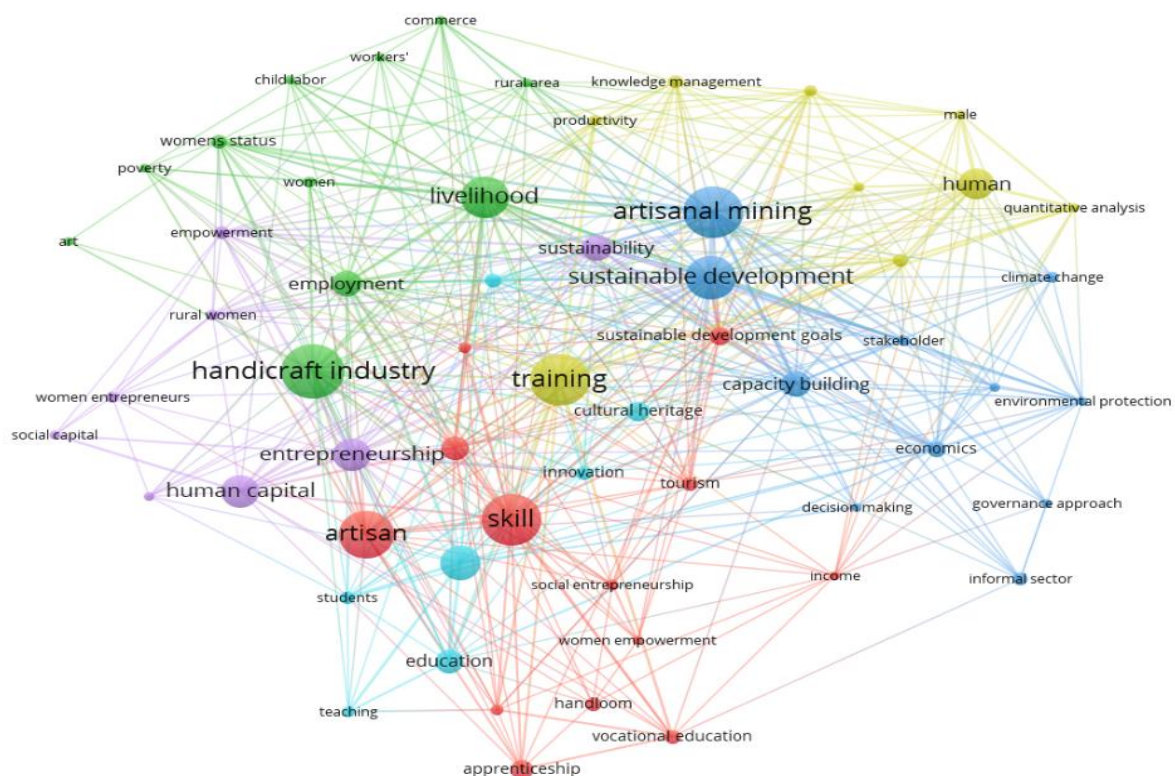


Figure 2. 3 Thematic Map of Human Capital and Skill Development in Artisan Literature (Source: Author's Analysis using VOSviewer)

The findings emphasise the need for integrated frameworks that connect human capital development with economic and market outcomes.

Table 2. 2 Sources of Identified Barriers in Handcrafted Textile Industry

	Barriers																									
Source	F1	F2	F3	R1	R2	R3	H1	H2	H3	M1	M2	M3	P1	P2	P3	P4	L1	L2	L3	T1	T2	T3	S1	S2	S3	
Naik, Bhardwaj, and Mishra (2025)	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓		✓					✓	✓			✓	
Dohale et al. (2023)							✓		✓			✓	✓							✓						
Mishra, Chatterjee, and Thakkar (2023)	✓			✓		✓	✓			✓	✓	✓	✓	✓		✓	✓	✓	✓							
Shaw, Majumdar, and Govindan (2022)	✓	✓				✓		✓		✓		✓	✓	✓								✓	✓	✓		
Naik, Bhardwaj, and Mishra (2024)						✓							✓				✓									
Kazancoglu et al. (2022)		✓	✓	✓	✓		✓	✓	✓											✓					✓	
(Vishwakarma et al. 2022)					✓			✓					✓	✓		✓		✓		✓	✓	✓				
(Raut, Gardas, and Narkhede 2019)		✓	✓	✓	✓		✓				✓						✓		✓		✓					
(Khurana and Muthu 2022)										✓		✓	✓				✓		✓		✓	✓				
(Mukherjee 2018)	✓				✓	✓	✓			✓		✓				✓		✓		✓	✓	✓				
(Khokhawala and Iyer 2022)					✓	✓	✓			✓			✓	✓		✓										

For the different barriers identified above, there are different initiatives taken by different stakeholders that are outlined in the literature and discussed below.

2.4 Initiatives for development

Literature witnesses different interventions in the select industries, particularly pottery and handcrafted textiles. The initiatives are taken in multiple forms, ranging from design and development initiatives to digital integration, regulatory reforms and community-based revitalisation models (Majeed, 2018). Through workshops, partnerships, and other collaborative programs, professional designers work with artisans with a focus on improving the contemporary appeal of products, improving market research to identify consumer preferences, and documenting traditional techniques to inform adaptations (P. Rao et al., 2023). Evidence suggests that sustained engagement models, which establish ongoing feedback loops between designers, artisans, and market actors, are more effective than one-off workshops. Policy frameworks such as the National Handicraft Development Programme (NHDP) have institutionalised design and technology upgradation through structured workshops, often lasting 25 days, that help artisans develop prototypes suited to modern tastes while introducing new production techniques alongside traditional skills (Ministry of Textiles, 2024).

Researchers have focused more on digital integration as another critical intervention. E-commerce platforms have expanded market reach and improved revenue with case studies reporting increases of 30-50% income among artisans who successfully adopted digital marketing and sales channels (Shafi, 2020). However, this digital adoption remains uneven due to barriers such as limited digital literacy, lack of technical knowledge, financial limitations and so on (G. Kumar et al., 2022). Research emphasises that sustainable success in digital markets requires bundled interventions that address multiple barriers simultaneously (Pant & Palanisamy, 2025). Effective programs combine subsidies for devices and connectivity, targeted training in digital literacy and business skills, technical support, logistics assistance, and guidance in digital marketing strategies (Angeles, 2022; T. Banerjee et al., 2023; Panigrahi & Rao, 2018). Community-based revitalisation models represent another pathway to strengthen the livelihood of craft-based artisans, which emphasise local product differentiation and target market strategies while encouraging community participation (Prusty & Mallick, 2022). By leveraging social capital and integrating craft development into broader rural development initiatives, these models ensure inclusive participation across gender and marginalised groups

(Dalborg & von Friedrichs, 2020; Usha Rani, 2018). Researchers have stated that group production models and artisan organisations are effective in reducing fixed costs, enhancing bargaining power, and establishing stronger neighbourhood market presence compared to individual operations (Giderler & Vanclay, 2024). Likewise, different government initiatives are implemented with a focus on the sustainable development of these industries. The following section discusses the same.

2.5 Government Interventions

The government has identified select industries based on attributes such as products, cultural significance and potential of livelihood generation for rural communities (M. Gupta et al., 2020; Khanna, 2018). For the progressive development of these industries, the state and central government have launched different schemes over different spans of time, playing a central role in supporting these artisans (Khamba & Nanda, 2018a). The schemes focus on different segments of the value chain, such as credit and finance, infrastructure and technology, skill development and capacity building, marketing and export promotion, and institutional support, including research and training (Agarwal et al., 2023). Research highlights that policy effectiveness in this domain requires coordination across national, regional, and local levels, alongside participatory program formulation that engages artisans and heritage stakeholders (M. Jain et al., 2021).

Scholars have categorised these interventions according to their objective roles. Policies focusing on the financial aspect include mechanisms such as direct grants, equipment subsidies, microcredit programs, working-capital grants, and production supports aiming at overcoming capital constraints that inhibit business expansion and technological upgrading (Vasani & Abdulkareem, 2024). The National Handicraft Development Programme (NHDP) provides production-focused financial assistance, while the Kumbhar Sashaktikaran Programme offers toolkit incentives and equipment subsidies that enable potters to invest in modern technologies (Press Release: Press Information Bureau, n.d.). Research consistently indicates that financial support is most effective when combined with complementary interventions such as skills training, market linkages, and business development support (Kore et al., 2021). Artisans receiving capital in isolation often struggle to translate it into sustained business growth or income improvement (Khanna, 2018).

There are welfare and capacity building policies focused on workforce skill development, and basic social amenities such as medical, education, food, water and electricity (Bharadwaj et al., 2018). NHDP conducts intensive workshops for the capacity building of artisans, integrating traditional skills with contemporary design innovations (Press Release:Press Information Bureau, n.d.). Similarly, comprehensive skill development programs are adopted in policies focusing on introduction to digital tools, marketing research, and business management skills such as pricing and inventory management (Kaur & Jyoti, 2016). Then there are schemes focusing on market support and promotion through initiatives such as trade fairs, export incentives, subsidies, buyer-seller meets, cooperative formation, and the opening of government retail outlets. NHDP also emphasises the marketing component of the value chain and organises domestic buyer-seller meets, enabling artisans to showcase products directly to buyers and bypass traditional intermediaries (Press Release:Press Information Bureau, n.d.). Successful programs combine physical infrastructure, such as exhibition spaces and retail outlets, with digital infrastructure, including e-commerce platforms, logistics assistance, market intelligence, and brand development services. Digital literacy and business skills are essential for artisans for participation in digital marketing platforms (Angeles, 2022).

Further, infrastructure development policies further strengthen artisan competitiveness. Governments have invested in the development of clusters (McDowell et al., 2023). One of the cluster-based approaches is the Dinoyo ceramic industry development policy in Indonesia that demonstrates how localised infrastructure investment can facilitate artisan consolidation, production scale development, and design collaboration (Asri et al., 2022). Similarly, there are other interventions such as common facility centres for design and quality testing, raw material depots, workspaces, warehouse logistics, and digital infrastructure (MoMSME, n.d.). However, effectiveness depends on consistent governance, community participation, and sustained resource allocation across government cycles (K. Singh & Rastogi, 2023).

Finally, there are regulatory and institutional measures such as certifications and product recognition through initiatives such as GI registration and One District One Product, offering special incentives and reservations to boost product demand and awareness among customers (M. Jain et al., 2021). The PM Vishwakarma Yojana, launched in 2023, specifically targets traditional craft workers, including potters, carpenters, and metalworkers. By late 2024, the scheme had received 25.8 million applications, with 2.37 million registrations and nearly 1 million beneficiaries receiving toolkit incentives, reflecting its scale and ambition in integrating

artisans into domestic and global value chains (Press Release:Press Information Bureau, n.d.). In Indonesia, the One Village One Product (OVOP) scheme demonstrates a community-based approach that emphasises local product differentiation, design and quality improvement. OVOP scheme depends on community participation, community participation, and technical expertise (Asri et al., 2022). Similarly, Latin American policies supporting indigenous artisan communities highlight the importance of integrated approaches that combine indigenous rights, cultural preservation, education, and community cohesion (Toombs, 2023). These policies recognise that artisan practice is embedded with cultural and social contexts and require holistic responses rather than standalone measures. However, to determine whether the launched schemes are achieving their intended objectives, a systematic and comprehensive assessment of these schemes is essential. Some researchers have assessed these schemes on different parameters (Jha et al., 2015).

Researchers have used qualitative case studies, cross-sectional surveys, document analysis, and stakeholder interviews to evaluate the schemes (B. G. Menon & Mahanty, 2015). Some studies have used quasi-experimental approaches to measure the impact of the schemes, which are comparatively rare. Some studies employ participatory methods such as field visits, surveys, and interviews to identify real-world and on-ground reality of schemes utilisation by the scheme benefiter (Balavignesh et al., 2015; Garg & Kashav, 2022; Turpin et al., 2017).

Overall, empirical assessments in the literature present mixed overviews. Comparative research highlights that program design quality and implementation capacity are critical determinants of success. Policies with strong governance structures, clear objectives, and regular monitoring mechanisms produce more durable market outcomes than those with weak institutional capacity (Deshmukh & Chavan, 2024). Many policies are dependent on government funding and lack mechanisms for self-sufficiency. Limited private sector engagement and insufficient market support further constrain the long-term viability (Dalal et al., 2024). While cultural or social programs not explicitly designed for heritage preservation may indirectly support artisanal continuity, they often fail to address core livelihood sustainability constraints without targeted economic measures (Shafi, 2020). Policy coherence across economic development, education, housing, cultural preservation, and social welfare domains enhances overall effectiveness.

In some cases, the schemes fall in the intended objectives they try to achieve and on the other hand, there are issues with the implementation of the schemes (Mukherjee, 2018). Policy assessment studies find that many beneficiaries of the schemes are unaware of the schemes and their processes to avail the benefits (Kore et al., 2021). There are bureaucratic hurdles, the presence of intermediary actors that capture a substantial share of the value added, poor implementation design, and a changing ruling government that hinders the long-term effectiveness of the schemes (T. Banerjee et al., 2023; Kashyap & Shukla, 2023; Sonar et al., 2024). Researchers also mentioned the lack of monitoring the progress of the schemes due to the poor utilisation of the benefits from the prevalent schemes. It is identified that coordination across national, regional, and local government levels is challenging with unclear responsibility divisions, inconsistent priorities, and limited communication.

The literature reiterates that government initiatives intended for the development of select industries and the artisans involved with these industries lack in effective implementation and utilisation at the ground level for numerous reasons (Sahu et al., 2022). There is a paucity of research on policy alignment and convergence studies to understand the effectiveness of the schemes launched from time to time. Moving ahead, the literature also remarks about the ineffectiveness of traditional retail methods in attracting customers towards select products such as pottery, handcrafted textiles and apparel. The present thesis discusses introducing subscription-based retailing for the marketing and sales of select products. The following section discusses subscription retailing.

2.6 Subscription-based Retailing

Subscription retailing, also known as Subscription-based Online Service (SOS), is an innovative retailing model that has gained popularity globally as a mechanism for steady income generation, particularly in services and consumable products (S. F. Bischof et al., 2020). For customers, this unique retail format offers subscribers the convenience of scheduled delivery and access to selected products and services during the subscription plan for a recurring fee (Huh et al., 2010). It also reduces the ownership burden for customers (Woo & Ramkumar, 2018). For retailers, this hybrid commerce platform offers steady revenue streams, enhanced market outreach, and long-term customer retention. In 2024, consumers had an average of 8 subscriptions and spent about \$118 monthly on subscriptions (Dean, 2024).

Subscription business grew by over 300% between 2012 and 2018. Its market worth reached nearly USD 300 billion and is projected to reach USD 539 billion in 2025 at a combined annual growth rate of 65.2% and USD 6370 billion in 2033 with a CAGR of 41.38% (Dean, 2024). Subscription retailing has undergone a significant transformation, expanding from traditional magazine and utility subscriptions to encompass diverse digital content services, curated physical product boxes, and bundled offerings that integrate multiple service categories (T. Chen et al., 2018; Tan & Chen, 2021). Some prominent areas utilising subscription-based retailing and marketing include entertainment, food, beverages, beauty and fashion, software, games, and more. Different products are retailed via subscription using different models (Tyagi & Bolia, 2024).

Freemium digital services are dominant in sectors such as music streaming, cloud storage, productivity software, and gaming, aiming to reduce service adoption barriers by offering basic services at no cost while charging for premium features (Kato & Dumrongsiri, 2022). Research highlights that the conversion from free to premium tiers depends on the perceived value of service, fairness of pricing, and limitations of free tiers (Biraglia et al., 2022). Freemium models are effective in striking a balance between providing sufficient utility in free tiers to sustain engagement while motivating for upgradation through premium feature differentiation (Niemand et al., 2019).

Curated product subscriptions for tangible products such as fashion, beauty, food and lifestyle subscription boxes are another segment of subscription retailing (Sebald & Jacob, 2020). The boxes combine convenience benefits, including home delivery, reduced shopping time, and hedonic values such as expert curation, surprise elements, and product discovery (S. F. Bischof et al., 2020; Johnson et al., 2021). The boxes differ in tiers based on the factors of price, personalisation, and features, adding to convenience and utility (D. Bhatt et al., 2021). Another segment of subscription box services is replenishment subscriptions, where the boxes with products are delivered periodically as per the frequency set by the customer (Aversa et al., 2021; Tan & Chen, 2021). One such example is e-commerce giant Amazon's 'Subscribe-and-Save' replenishment subscription that allows users to receive selected items periodically at a discounted price (Ho et al., 2021). Then, there are access-based subscriptions encompassing video streaming platforms, music streaming services, gaming and software services that emphasise unlimited access to content availability for the subscription plan at a recurring fee (T. Chen et al., 2018; Dubois & Weststar, 2022). The value lies in the accessible features and

content in the respective subscription plan, such as multi-device access and so on, with the active subscription (Brecko, 2023).

Subscription retailing improves customer retention, facilitates inventory planning, and generates predictable revenue streams (Kar et al., 2022). Kim et al. (2021) show that subscription commerce can deepen consumer engagement by offering personalised experiences and fostering brand loyalty. In the Indian context, however, research on subscription models tailored to handcrafted MSMEs is sparse. Patel & Joshi (2023) explore the feasibility of subscription frameworks in rural craft clusters, suggesting they can foster deeper consumer-artisan relationships and reduce market volatility.

The rise of the subscription economy has stimulated extensive research into consumer behaviour, examining adoption drivers, retention mechanisms, value perception processes, and psychological factors influencing commitment and cancellation decisions (Baek & Kim, 2022). Literature emphasises that behavioural modelling of such mechanisms is essential to identify the motives and barriers influencing the adoption behaviour of such mechanisms (Liu & Wang, 2024). Regression and other probabilistic models have been employed to understand consumer preferences and willingness to use products and services (Uner et al., 2020). V. Rao et al. (2021) demonstrate how conjoint analysis can help identify the attributes affecting product and service affinity in the market, enabling artisans to align offerings with market expectations. Mehta & Kapoor (2020) delve into the psychological drivers of consumer engagement with artisanal goods, noting that authenticity, storytelling, and perceived uniqueness significantly influence purchase intention.

Bibliometric analysis of subscription-related literature (Figure 2.4) highlights that consumer behaviour forms the central node, strongly connected with willingness to pay, customer satisfaction, continuance intention, and marketing strategies. In parallel, a closely linked cluster emphasises business models, cost structures, and pricing strategies, indicating that subscription research is driven by both behavioural and economic perspectives.

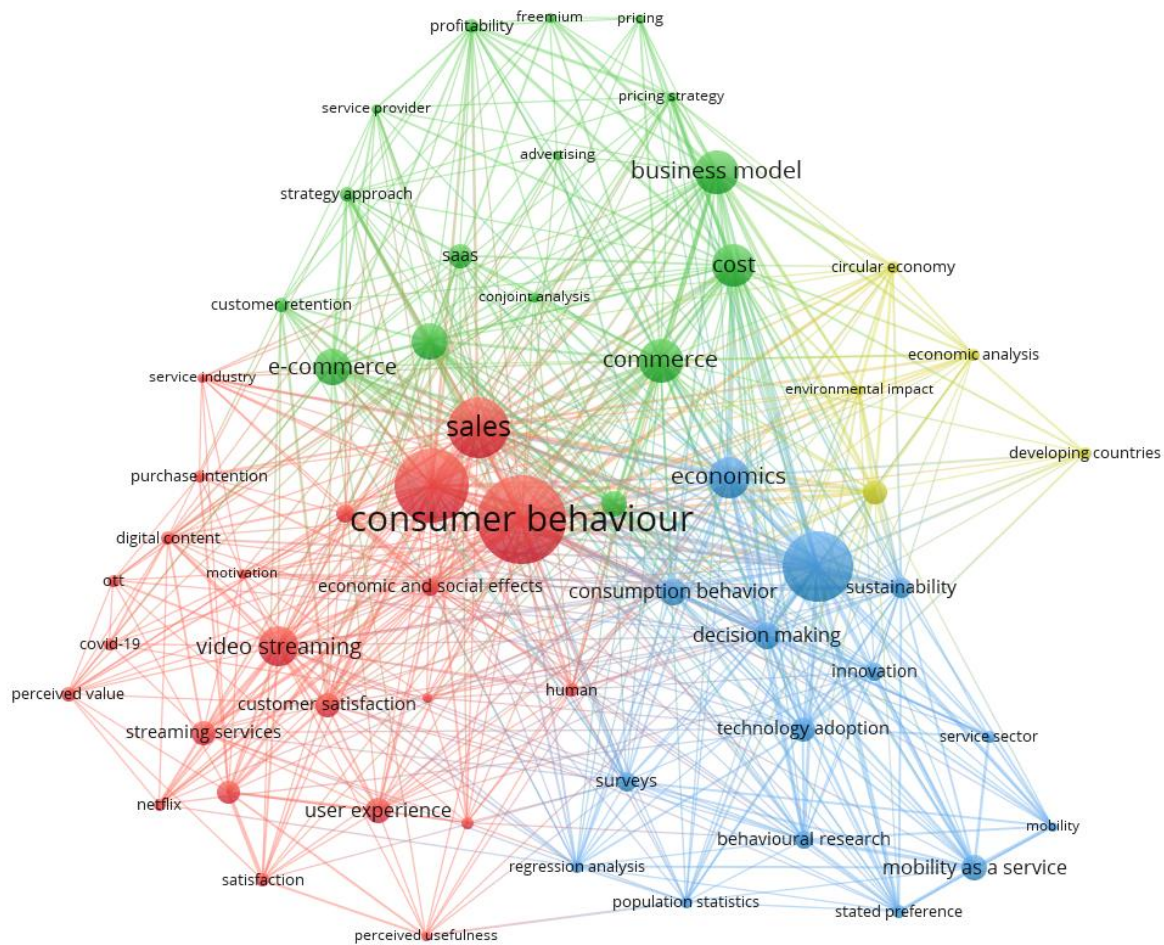


Figure 2. 4 Keyword Co-occurrence Map of Subscription and Consumer Behaviour Literature (Source: Author's Analysis using VOSviewer)

These insights emphasise the necessity of the study of factors that influence subscription intention of select products, particularly pottery and handcrafted textiles, in our case. Customer behaviour varies depending on the influence of motives and barriers, which may vary among different demographic traits (Sim et al., 2022; Smith et al., 2022). The factors behaving as motives and barriers bring useful insights for entrepreneurs and other stakeholders to model subscription retailing of these products for effective results (Sahu et al., 2022). The following section discusses the factors affecting willingness to subscribe.

2.6.1 Factors Affecting Willingness to Subscribe

All significant factors affecting subscription intention either promote or limit subscription purchase. Research consistently identifies perceived subscription value as one of the strongest predictors of subscription adoption and retention, which includes multidimensional emotional

value derived from entertainment, enjoyment, and hedonic pleasure (Bray et al., 2021). Different researchers studied various factors that drive or retard willingness to subscribe to different subscriptions, which are discussed below:

- ***Subscription Utilitarian Values (SUV)***: Subscription utilitarian motives refer to practical and functional benefits that drive purchase intention. Attributes such as task completion, data availability, customisation, variety, selection, accessibility, safety, security, quick and easy transactions, time, money, effort savings and more reflect the utilitarian benefits of Subscription (T. Chen et al., 2018; Kang et al., 2024). Research indicates that younger consumers, particularly Gen Z and Millennials, view subscriptions as convenient shopping methods due to time-saving qualities and automated replenishment. Multi-device synchronisation, seamless user experiences, and elimination of transaction friction reduce cognitive burden and foster subscription stickiness.
- ***Subscription Hedonic Values (SHV)***: Subscription hedonic motives enrich customer delight by focusing on multisensory traits such as excitement, enjoyment, entertainment, adventure, sensory gratification, surprise, idea, role, trend discovery and more (Arnold & Reynolds, 2003; Y. K. Chen et al., 2025; Ramkumar & Woo, 2018). Epistemic value, linked to novelty and discovery, sustains engagement and reduces subscription fatigue, particularly in curated services (Tyagi & Bolia, 2025). Personalisation and discovery also play a central role. Customised content, curated product selections, and algorithm-driven recommendations sustain engagement and perceived continuing value (D. P. Singh, 2015). Surprise and delight elements, particularly in curated subscriptions, generate positive emotional responses and foster loyalty through novelty and hedonic pleasure (Im & Lee, 2023).
- ***Product Usage Values (PUV)***: Product Usage Values (PUV) refer to the perceived benefits, utility, and importance of a product to the consumer based on its functional and emotional attributes (Uzir Hossain Uzir et al., 2021). It encompasses how well the product addresses customer needs, its sustainability, cultural significance, quality, ease of use, and aesthetic appeal (Chaudhary et al., 2022). In the context of handcrafted products like pottery and textiles, PUV highlights values such as environmental friendliness, preservation of tradition, unique craftsmanship, and practical utility. These values shape consumers' attitudes and contribute significantly to their intention to subscribe, as consumers are more likely to adopt subscriptions for products they perceive as valuable

and aligned with their personal and social beliefs (To et al., 2007). Moreover, product usage values influence both the functional satisfaction derived from the product and the emotional connection customers feel, reinforcing loyalty and repeat engagement (A. Kumar & Kashyap, 2018; Mohd Suki, 2016).

- ***Perceived Subscription Risks (PSR)***: Inhibitors restrict consumers from subscribing to products or services. These barriers arise from several sources, such as society, culture, environment, market, retailers, retail platform, and the product itself, reducing subscription likelihood (S. F. Bischof et al., 2020). They encompass issues with privacy, security, fair billing practices, product functionality, brand image, trust, convenience, social engagement, sensory experience, sustainability and more (Nath & Agrawal, 2023). Friction in cancellation processes, though extending short-term retention, often generates negative experiences and reputational damage that deter initial adoption (Vadakattu et al., 2015). Similarly, trust and transaction efficacy are essential for overcoming adoption barriers that include multi-dimensional factors such as platform reliability, product quality consistency, transparent pricing, responsive customer service, and privacy protection (Nagaraj et al., 2021; Sivathanu, 2018).
- ***Normative Influence (NI)***: Normative influence is more commonly reflected by personal, social, and subjective norms guided by individual attitudes, societal expectations, and perceived social pressure that influence subscription decisions (Leong et al., 2023). For instance, peer recommendations, word-of-mouth communication, influencer endorsements, and perceived social approval shape consumer decisions (Fishbein & Ajzen, 1975). In streaming subscription contexts, moral judgements regarding piracy and perceived responsibility towards content creators influence the willingness to pay for legitimate services, identifying the positive role of normative influence in subscription intention (Guo, 2022). Social value emerges from identity signalling, status expression, and community belonging, especially in visible consumption categories like fashion and speciality food (Myin et al., 2023).

Studies applying consumer value theory suggest that upgrade decisions are driven primarily by economic and functional value, whereas long-term retention depends more on emotional and epistemic dimensions (A. Kumar et al., 2021). The assessment of these factors helps in identifying the cases which favour willingness to subscribe and revising the cases for which the willingness to subscribe declines (Jo, 2024). Subscriptions in handmade apparel and

pottery serve dual purposes: they promote eco-friendly fashion and design while ensuring economic sustainability for marginalised artisan communities (Tao & Xu, 2018). This model amplifies visibility for GI-tagged and regionally distinctive products and enables behavioural nudges toward ethical consumption. Understanding what drives consumers to adopt such subscriptions and how these drivers vary across demographic traits is essential for designing inclusive, scalable, and impactful retail strategies (Erdogan et al., 2020).

Once the analysis of willingness to subscribe is completed, it is necessary for the marketers to design suitable packages and their respective pricing. The following section discusses the subscription package selection and pricing for subscribed products and services.

2.6.2 Subscription Packages Selection

The empirical pricing literature on subscription pricing and package selection has evolved from traditional bundling theory into sophisticated, utility-based frameworks that explicitly incorporate consumer behaviour and self-selection attributes. Previous studies have highlighted that bundling retail strategies that involve packaging multiple products can enhance surplus extraction when consumers differ in valuations (McCardle et al., 2006). However, these models are largely static and focus on one-time purchases (Arora, 2011). Recent studies have extended this foundation to multi-period settings, integrating usage-based pricing (pay-per-use versus subscription trade-offs), and behavioural phenomena such as flat-rate bias and commitment effects (Jo, 2024; Schlereth et al., 2011). Together, these contributions prove subscription pricing as a distinct research domain that modifies both firm decision-making and consumer choice dynamics compared with traditional pricing models (Yao et al., 2012).

For the formation of efficient packages, literature has emphasised the utility-based consumer choice models where consumers maximise expected utility by comparing subscription package options varying in price and features (Daas et al., 2014). Researchers have converted these utilities into a systematic component capturing subscription features, costs and other intangible components (R. Sharma & Kakkar, 2019). This framework helps in identifying optimum subscription packages and their respective fees under various assumptions about demand intensity, usage uncertainty, and cost parameters. Optimum subscription design is highly sensitive to heterogeneity in willingness to pay and package utility value, reinforcing the importance of diverse subscription plans based on the customers' segmentation (Tyagi & Bolia, 2024).

While designing subscription packages, firms also rely on the principles of self-selection and mechanism design to ensure that heterogeneous consumer segments are effectively served (Swinyard & Smith, 2003). Self-selection refers to the process by which consumers voluntarily choose the option that best aligns with their preferences, while mechanism design provides the theoretical framework for constructing menus of subscription offerings that induce such choices (Lee & Yang, 2016). Central to this framework are two constraints: the participation constraint, which requires that subscribing yields greater utility than non-adoption, and the incentive-compatibility constraint, which ensures that each consumer type prefers the package intended for them over alternative options (Anjaria et al., 2025; Stopka, 2020). Using constrained optimisation techniques helps in determining optimal price and feature combinations resulting in the formation of different subscription tiers that allow firms to serve both low- and high-demand segments while preserving profitability (Jeong et al., 2024; Myin et al., 2023; Zahara et al., 2022).

Another important consideration in subscription package and pricing selection is multi-unit demand and product variety (Vieira, 2018). Traditional bundling models often assume single-unit consumption, whereas subscription models involve multiple service components or variable usage levels (S. A. Chang & Tayi, 2009). Studies demonstrate that the interaction between usage structure (subscription versus pay-per-use) and product variety can overturn classical results: component selling may outperform pure bundling under pay-per-use when consumers strategically adjust variety, while subscription models can re-establish the advantage of bundling by encouraging broader and more frequent consumption (Adhikari, 2015; Alsheikh et al., 2020; Jang et al., 2020). To handle this complexity, many authors complement analytic work with computational and numerical experiments, which allow them to incorporate richer heterogeneity, demand lift effects, and operational constraints that are analytically intractable (Hu, 2023; Wu et al., 2020).

Within this theoretical landscape, four major pricing mechanisms feature prominently: freemium, tiered pricing, usage-based pricing, and bundling strategies (Tyagi & Bolia, 2024). Freemium models, common in digital services, provide a basic version for free while monetising premium features or enhanced access (Syahrivar et al., 2022). Freemium models function as both a user acquisition channel and a risk-reducing trial, with optimal conversion rates depending on marginal costs, network effects, and competitive intensity (Kato & Dumrong Siri, 2022). Tiered pricing offers multiple subscription levels with distinct feature sets

or usage allowances and is widely observed in streaming, cloud services, and telecommunications (Rapple, 2011; Ribeiro et al., 2024). Studies find that multi-tier pricing outperforms single-plan offerings when consumers are heterogeneous (Cao et al., 2015; H. Li et al., 2020). Researchers suggest careful positioning of the middle tier to capture the largest customer segment, low-end tiers for market expansion and high-end tiers for extracting surplus from intensive users (Parvasi et al., 2023; Rapple, 2011).

Usage-based pricing often charges customers in proportion to actual consumption and is prevalent in utilities, telecom, and cloud computing (Bitran & Ferrer, 2007). Research shows that employing multi-unit demand and pay-per-use schemes can outperform bundled or flat-rate models when consumption is highly variable or uncertain across users (Chae, 1992; Shao & Li, 2019; Winter, 1996). Under usage-based models, consumers may concentrate on usage to manage costs, whereas subscriptions can encourage diversification of consumption (Shin et al., 2016). Hybrid pricing models combining fixed fees with variable usage charges often emerge as an optimal strategy enabling firms to serve low-usage, price-sensitive customers alongside high-usage customers without extreme cross-subsidisation (Ribeiro et al., 2024).

Bundling strategies integrate multiple products or services within a single subscription and are frequently analysed through multi-service game theoretic frameworks (Caiati et al., 2020; Niyato et al., 2016). They are categorised into pure bundling and mixed bundling strategies (Winter, 1996). Findings suggest that bundling is particularly powerful when marginal costs of additional components are low and when the bundle meaningfully enhances perceived value, reduces search costs, or creates complementarities (Lin et al., 2020; Xie et al., 2024). For example, in telecommunications and digital ecosystems, bundling over-the-top (OTT) content with connectivity or logistics services can shift market shares and average revenue per user, with mixed bundles often outperforming pure component or pure bundle strategies by enabling self-selection while preserving synergy gains (Kim et al., 2021).

An emerging consensus from the literature is that hybrid and combined strategies such as subscriptions with usage-based overages, bundling, or freemium tiers layered over core subscription models can dominate pure approaches in many realistic settings. These hybrids better align with heterogeneous demand, complex cost structures, and strategic consumer adoption behaviour. Consequently, recent work emphasises the need to evaluate pricing

mechanisms not in isolation but as elements of a broader, configurable pricing architecture (Meyer et al., 2017; Parvasi et al., 2023).

The literature on consumer choice in subscription contexts highlights several key drivers beyond nominal price. Utility of package, quality sensitivity, risk preferences, availability of substitutes, and price sensitivity shape willingness to pay, further deciding the uptake of different tier plans characterised by package attributes and their pricing (Meyer et al., 2017). Usage patterns and demand uncertainty are particularly salient in subscriptions, where consumers often misestimate future needs (Schlereth et al., 2011). Flat-rate bias leads many users to favour fixed-fee plans for their perceived insurance value and budgeting simplicity, even when pay-per-use would be cheaper (Randhawa & Kumar, 2008). Further, the intention to maximise perceived value within tier thresholds impacts the subscription pricing and its adoption (Kang et al., 2024).

To address heterogeneity in these behaviours, research on segmentation and personalisation has expanded. Data-driven segmentation methods, such as clustering on usage features, identify natural groups with distinct demand patterns, while model-based segmentation relies on self-selection models to model optimal packages targeted at inferred consumer types (Chun, 2020; W. Wang et al., 2012). Advances in machine learning and real-time analytics enable personalisation to an extent, including individualised offers and dynamic pricing (Chaab et al., 2022). They also help in assessing churn prediction and customer segmentation (Kolomiiets et al., 2021). Studies also note that effective segmentation must balance predictive accuracy with operational simplicity and communication clarity to avoid overwhelming consumers with overly complex packages (Tan & Chen, 2021).

From a revenue optimisation perspective, the consensus is that subscription offerings typically enhance profitability relative to pure pay-per-use or single plan structures, though the magnitude of gains depends on cost conditions, demand heterogeneity, and competitive dynamics (Andonova et al., 2021). Multi-stage optimisation frameworks, including segmentation analysis, package design, price optimisation, and empirical validation, help in deriving and validating subscription plans (R. Wang et al., 2019). In the competitive environment, game-theoretic models analyse how firms design subscription packages, including the impact of bundling or freemium strategies on market structure (Caiati et al., 2018; Setterstrom & Michael Pearson, 2019). Optimisation and simulation tools assist in solving

high-dimensional pricing problems under capacity and regulatory constraints (F. Fang et al., 2010).

2.7 Research Gaps

The literature across traditional craft industries, barriers assessment, government policy interventions, and subscription retailing reveals substantial theoretical and empirical contributions while exposing critical knowledge gaps that require in-depth research to fill the gaps and add value to the research in respective domains. First and foremost, the studies on select industries are limited in the Indian context.

The following research gaps are identified from the literature:

- Lack of comprehensive assessment of industry barriers: Existing literature provides fragmented insights into the challenges faced by artisans, with limited studies offering a holistic evaluation of industry barriers across the value chain and lacks a comprehensive evaluation of industry barriers faced by artisans from the stakeholders' viewpoint, particularly covering broader value chain elements.
- Insufficient analysis of interrelationships among barriers: Most of the studies independently examine the existing barriers in isolation. Very few studies systematically examine the interdependent nature of prevalent barriers. The absence of structured analytical frameworks limits the ability to identify the root causes and key leverage points necessary for designing targeted interventions.
- Lack of stakeholder-centric quantitative analysis: Research lacks quantitative studies measuring the prevalent barriers from the artisans' viewpoint. Most of the current research relies on qualitative methods such as interviews, village-level narrative case studies, and focus group discussions. These approaches are insightful but lack a quantitative validation to identify the relative influence or prioritisation of barriers, particularly from the artisans' viewpoint. There remain sparse studies that assess which barriers exert the strongest impact and which are triggered by others, specifically in traditional pottery and textile industries.
- Limited generalisation beyond pilot and community-based studies: Much of the study in handcrafted pottery and handicrafts is based on small-scale pilot initiatives or community-level projects. Thus, systematic research on scaling strategies and broader industry-wide implementation mechanisms is limited, which further limits the transferability of findings.

- Weak exploration of collaboration and ecosystem models: Literature underscores the importance of collaboration models, such as artisan-designer partnerships, that are frequently highlighted in the literature. However, robust comparative assessments or evidence-based evaluations of these models remain largely absent. The literature review highlights a limited focus on human capital development and the absence of structured talent management frameworks for artisans.
- Inadequate ground-level evaluation of government policies: Most of the research evaluates national policies and compares them with international benchmarks rather than examining their alignment with ground-level industry needs. Government schemes are frequently analysed in isolation, without mapping them against the prevalent industry barriers or evaluating how well they address existing barriers with the on-ground implementation challenges.
- Limited research on policy convergence and long-term impact: Very few studies assess how policies converge or diverge from the actual needs of artisans over time or examine temporal changes in scheme effectiveness.
- Scarcity of research on innovative retail and marketing mechanisms: There is a lack of integration between artisan-centric challenges and market-driven solutions, such as subscription-based retailing. There is fragmented literature across sustainability, consumer behaviour, and economic modelling, with minimal interdisciplinary integration. There is almost no empirical research on innovative retail mechanisms for handcrafted products, such as omni-channel mechanisms, subscription-based retailing, or community-supported commerce, despite growing recognition of the importance of e-commerce and digital retail in revitalising the handicraft sector by researchers.
- Minimal exploration of consumer adoption behaviour toward retail models: While online retail has been proposed as a future pathway, studies rarely examine consumer willingness to adopt such retail models to purchase handcrafted products.
- Lack of integrated assessment of consumer purchase behaviour in innovative retail channels: While few studies examine consumers' willingness to purchase traditional handmade items via different retail channels, these investigations largely consider isolated influencing factors. There is a lack of integrated assessment of multi-dimensional factors within a unified assessment. Consequently, there is a paucity of research in explaining how multiple interacting factors shape consumer purchase decisions to innovative retail methods for handcrafted products.

- Absence of an integrated framework linking consumer behaviour and retail strategy: Literature lacks a framework that strategically integrates consumer behaviour into the design of operational retail models for handcrafted products. For instance, research on the optimum design of subscription retail packages based on willingness to pay, consumer value perception, behavioural intention theories, profitability estimation, and other preferences is extremely limited. Most of the subscription adoption assessment studies employ single theoretical perspectives, while integrated models combining value, behavioural, and technology acceptance frameworks remain absent.
- Underexplored cross-demographic and cross-regional behavioural variations: Most studies overlook demographic, cultural, and geographic differences in consumer behaviour, which limits the understanding of how consumer behaviour varies across different population segments.
- Insufficient research on balancing cultural preservation and market competitiveness: There is insufficient research that examines how to balance cultural preservation with market competitiveness strategically.

2.8 Summary

The literature review section provided a comprehensive view of select industries, particularly the pottery and handcrafted textiles industry, including the prevalent barriers covered in the current research. Parallely, the study adopts a scientometric approach using keyword co-occurrence analysis through VOSviewer to identify thematic clusters and interrelationships within the literature. The analysis provides a global mapping of the literature, identifies major thematic domains and research gaps across the domains. The review highlights that existing research outlines multiple barriers throughout the value chain elements. Further, the section discusses the initiatives taken by the government in the form of policies and reforms to improve the business of select industries and enhance the growth of artisans involved in these industries. The focus areas in the schemes and policies are finance, technology, skill development and infrastructure enhancement.

A key insight emerging from the thematic analysis is the role of human capital development, which appears as a distinct yet weakly integrated cluster in the literature. Although aspects such as training, education, empowerment, and entrepreneurship are discussed, they are largely treated within a social development perspective and are not effectively connected with market-

oriented strategies such as innovative retailing, knowing consumer behaviour, and pricing. Furthermore, the literature on subscription-based retailing highlights its potential as an innovative mechanism for generating recurring revenue, with strong emphasis on consumer behaviour, willingness to subscribe, and pricing strategies. However, its application in the context of traditional handicraft industries remains underexplored. Overall, the review identifies critical research gaps, including the lack of an integrated assessment of industry barriers, insufficient alignment between policy interventions and ground-level challenges, limited incorporation of human capital into economic and market frameworks, and the absence of operational strategies for implementing subscription-based retail models in artisan-driven industries.

The bibliometric and thematic re-examination of the literature further reveals novel intersections between human capital development, consumer behaviour, and pricing strategies, which are currently underexplored. These gaps not only guide the present research but also provide strong avenues for future academic contributions, particularly in developing integrated, multidisciplinary frameworks for sustainable livelihood generation.

The subsequent chapters of the thesis aim to address these gaps by developing a comprehensive framework for barrier assessment, policy alignment, consumer behaviour analysis, and optimal subscription package design for enhancing the sustainability of select industries. The following chapter discusses the development of the framework for the identification and assessment of barriers prevalent in the pottery and traditional handicraft textile industry.

CHAPTER 3

Identification of Industry Barriers Impacting the Performance of Handcrafted Textiles and Pottery Industry

Handcrafted textiles and pottery embody rich traditions of artisanal skill and cultural identity, yet both industries face formidable barriers from inadequate capital access and raw material constraints to limited market reach and social marginalization that affects the performance of the business and livelihood sustainability of artisans involved with this industry (Jakhar, 2023; Mohd Tokiran et al., 2022; Naik et al., 2025). This chapter systematically identifies and analyses the principal obstacles confronting these sectors and examines the causal and effect relationships that collectively inhibit artisan performance (Panghal et al., 2023). The mapping of these barriers and understanding their interrelationships establishes the foundation for designing targeted interventions for industry stakeholders that can contribute efficiently to preserving cultural heritage while creating sustainable livelihoods (Jakhar, 2023; Mohd Tokiran et al., 2022).

This chapter consists of six sections, starting from the introduction section that establishes the context of the analysis. The methodology section discusses the research framework, data collection, and detailed steps for conducting the analysis. The section is followed by the outcomes of the chapter, which connect to the section discussing the theoretical and managerial implications derived from the results.

3.1 Introduction

With technological advancement leading to globalisation and industrialisation, market systems have seen evolving growth. Advanced technologies have revolutionised manufacturing systems. Globalisation has facilitated the exchange of techniques, materials, ideas, and technologies. It has expanded product markets across nations and enabled mass production at an unprecedented scale. Improvements in product design and functionality have changed consumer expectations as well. Many foreign brands with sophisticated products have established strong market presence, influencing the demand for indigenous community goods such as handcrafted textiles, pottery, toys, furniture and utensils. This, as a result, is impacting the business of the indigenous traditional manufacturing sector, particularly the handicraft industry (Dalal et al., 2024; Majeed, 2018).

Each of the traditional handicraft items embodies artistry and excellence, shaped by generations of skilled artisans. Rooted in sustainability, they hold deep cultural and heritage value, with craftsmanship passed down from generations through families and communities. The handicraft industries reflect artisans' expertise and contribute to the preservation of traditional heritage and culture. Globalisation and technological advancements in reshaping industries are exposing the traditional handicraft communities to face mounting challenges, risking the continuity of heritage-based craft systems (Iyengar, 2021; Mohd Tokiran et al., 2022).

Competition from machine-made and mass-produced alternatives that offer advantages in quantity, cost, availability, and variety has impacted the business of traditional artisan businesses. Many of these industries are recognised as select industries for their traditional significance to society and cultural heritage. Despite government-backed policies and regulations, the overall business in these conventional sectors is declining continuously and is forcing several artisans to discontinue their traditional family cottage business due to diminishing growth prospects and livelihood challenges, as seen in both the textile and pottery sectors (Jakhar, 2023; S. Kumar et al., 2021; Naik et al., 2025; Silveru & Sankineni, 2024).

This prevalent hardship in traditional handicraft industries motivates a critical examination of prevalent industry barriers from artisans' perspectives. There is limited study in the literature that systematically identifies the barriers affecting business sustainability in these sectors (Dalal et al., 2024; Naik et al., 2025; Silveru & Sankineni, 2024). A comprehensive evaluation will help identify vulnerable areas hindering the growth of such select industries. The chapter identifies and evaluates the barriers faced by artisans, particularly in the pottery and handcrafted textiles industry in the Indian study context.

3.1.1 The Pottery Industry Context

The pottery industry is one of the important select industries that operates predominantly as a cottage, micro, small, and medium-scale industry. It provides employment to numerous artisans contributing to cultural heritage preservation (Jakhar, 2023; Silveru & Sankineni, 2024). Categorised into four segments, namely earthenware, terracotta, stoneware, and porcelain, the industry caters to diverse market segments from affordable household items to premium decorative pieces. Stoneware and porcelain hold significant market presence for dinnerware, cookware and tableware. Then, earthenware and terracotta are majorly popular across home decor, artistic pieces, kitchenware, and construction-related materials (Dahiya et al., 2022). Among these, earthenware and terracotta items are generally more affordable,

having traditional appeal. Accordingly, the focus of this chapter is on the earthenware and terracotta pottery items for their shared characteristics, widespread usage and applications. Despite the significant impact of pottery in employment generation, societal culture, heritage, and environmental sustainability, the market demand for these products has been affected by the rise of mass-produced alternatives that are more fancy, durable, cost-effective, and readily available across consumer markets (Silveru & Sankineni, 2024). Artisanal communities have limited literacy, limited access to basic amenities and bear with poor living standards. These socio-economic limitations hinder technological advancement, restrict production modernisation, and reduce competitiveness within the broader marketplace (Jakhar, 2023). Constrained market conditions and the absence of structured distribution mechanisms compel artisans to rely heavily on intermediaries for marketing and sales, which significantly reduces their profit margins and bargaining power (Pal, 2021). As a result, many potters are compelled to seek alternative sources of primary income and engage in the pottery business only during high-demand periods such as summers, marriages, and festive seasons (Silveru & Sankineni, 2024).

3.1.2 Handcrafted Textile Industry Context

Traditional handcrafted textiles, informally known as the traditional handloom industry, represent one of India's oldest and significant micro, small, and medium enterprises (MSMEs), representing the epitome of craftsmanship, cultural heritage, and artistic expression. These textiles possess unique designs, intricate detailing, and strong cultural identity, which distinguish them from machine-made alternatives and contribute to their longstanding reputation among consumers (Iyengar, 2021). In the present dynamic market environment, this industry faces severe challenges.

The sector experiences intense competition from machine-made textile products that are more affordable and rich in availability and variety. Such industrial competition has weakened the demand for handmade textiles and affected the livelihood prospects of traditional weavers (Naik et al., 2025). National and international brands have infused fast fashion culture that has further transformed consumer preferences, traditional handcrafted textiles, despite the environmental drawbacks associated with mass-produced apparel, including plastic pollution and excessive water and chemical usage (S. Kumar et al., 2021). In contrast, communities that manufacture traditional handmade textiles promote environmentally sustainable products with inherent circular fashion principles. Many environmentally conscious consumers appreciate these textiles for their unique, sustainable qualities (Iyengar, 2021).

Despite these advantages, many weavers continue to abandon the traditional craft due to persistent livelihood challenges, shrinking market opportunities, insufficient income, and limited institutional support. These factors collectively threaten the preservation of indigenous textile skills passed down through generations and contribute to the gradual erosion of cultural craftsmanship (Naik et al., 2025; Pal, 2021). Identifying and eliminating critical barriers impeding this sector is therefore essential for sustaining long-term growth and ensuring the continuity of heritage textile traditions.

3.1.3 Research Motivation and Problem Statement

The persistent problems in both pottery and handcrafted textile sectors, despite the presence of government support initiatives, motivate a critical examination of industry barriers from artisans' own perspectives. Prior studies acknowledge challenges in these sectors but tend to focus on specific issues such as livelihood constraints, disappearing crafts, and socio-economic vulnerabilities rather than developing an integrated barrier assessment framework (Jakhar, 2023; Mohd Tokiran et al., 2022; Silveru & Sankineni, 2024). A systematic analysis of barrier identification, categorisation, and interconnections remains limited in the existing literature, particularly for small-scale pottery and handloom-based enterprises operating within culturally embedded cottage industry structures (Dalal et al., 2024; S. Kumar et al., 2021).

Existing literature typically examines isolated obstacles across different segments of value chain such as raw material procurement issues, limited working capital, outdated tools and technologies, competition from mass-produced alternatives, low literacy levels, skill shortages, market access limitations and more without systematically mapping how these obstacles interrelate or intensify one another within the production-to-market value chain system (Dalal et al., 2024; Iyengar, 2021).

Understanding the barriers systematically from the stakeholders' perspective is essential for designing effective interventions, including targeted policy initiatives and innovative business models that can address root causes rather than symptomatic obstacles. Accordingly, the chapter seeks to answer the following research questions:

RQ1. What are the principal barriers impacting the performance and sustainability of small-scale pottery and handcrafted textile industries from stakeholders' perspectives?

RQ2. What are the interconnections among the identified barriers in terms of cause-and-effect relationships?

To systematically address the research questions, this chapter pursues the following research objectives:

Objective1. To systematically identify, classify, and prioritise the key barriers impacting the small-scale pottery and handcrafted textile industries from stakeholders' perspectives, examining the constraints throughout the value chain.

Objective2. To analyse the relative importance of barriers and identify the cause-and-effect relationship among the identified barriers.

Fulfilling the research objectives contributes to the existing body of literature by:

- Providing a comprehensive overview of barriers through the identification and categorisation of barriers faced by artisans in the pottery and handcrafted textile sectors.
- Providing a quantitative assessment of the relative importance of the barriers and identifying the causal barriers.
- Categorising the barriers according to the intervention priorities identified through the cause-and-effect analysis.
- Establishing an evidence-based foundation for designing targeted policy interventions and business model innovations.

To fulfil the research objectives, this chapter adopts a mixed-methods approach, as shown in Figure 3.1. The chapter combines literature reviews and field visits to systematically identify critical barriers affecting the pottery and handcrafted textile industries. Following the identification of barriers and barrier domains (categories), the barriers are classified into broad domains with the help of expert consultation. Subsequently, experts evaluate the importance of each barrier, after which the Fuzzy Analytical Hierarchy Process (FAHP) is applied to determine the relative weight structure. Finally, the Decision-Making Trial and Evaluation Laboratory (DEMATEL) method is implemented to uncover complex causal relationships among the identified barriers. The following section presents a detailed illustration of the barriers identified from the literature review.

3.2 Identified Barriers for the Analysis

From the literature review (detailed in Chapter 2) and based on the experts' feedback, eight barrier domains are identified for the study. These domains reflect the recurring structural

challenges highlighted extensively in the handicraft, handloom, and pottery literature (Dalal et al., 2024; Naik et al., 2025).

- ***Financial Constraints (F)***: This domain encompasses monetary constraints that hinder operational stability and growth. Barriers such as capital limitations, cash flow mismanagement, and low investment returns restrict artisans' ability to reinvest in their businesses and sustain daily operations, consistently reported across the handloom and handicraft sectors (Alora & Barua, 2019; Kaur et al., 2024).
- ***Resource Availability Constraints (R)***: This category addresses supply chain vulnerabilities affecting production continuity. Challenges like material shortages, inconsistent quality, and high procurement costs directly impact product standards and profitability, often disrupting the manufacturing cycle (Panigrahi & Rao, 2018).
- ***Workforce Issues (H)***: This domain highlights human resource deficits that threaten the industry's future. Pottery and handcrafted textile sectors struggle with a shortage of skilled artisans, scarce skill development opportunities, and low job engagement, leading to a declining and unmotivated workforce (A. I. Ozdemir et al., 2020).
- ***Market Dynamics and Limitations (M)***: These barriers relate to the inability to reach and compete in broader markets effectively. Artisans face intense market competition, suffer from ineffective strategies, and struggle with limited market access, preventing their products from reaching potential customers (Naik et al., 2024).
- ***Institutional and Regulatory Limitations (P)***: This category reflects the disconnect between government frameworks and ground-level realities. Issues such as limited awareness, poor implementation, and unclear compliance requirements dilute the intended impact of institutional support systems (Amrita et al., 2024; S. Mishra et al., 2025).
- ***Logistical and Operational Infrastructure Constraints (L)***: This domain covers physical distribution and storage challenges that inflate operational expenses. High production and logistics costs, warehousing constraints, and freight network disruptions complicate supply chain management and delay product delivery (Alora & Barua, 2019; Ülgen & Forslund, 2015).
- ***Technological Capability Limitations (T)***: This category identifies technological stagnation hampering productivity and modernisation. The industry is held back by limited innovation, insufficient tools, and reliance on obsolete machinery, which reduces efficiency and product quality (Dohale et al., 2023).

- ***Socio-economic Environment Issues (S)***: This domain encapsulates the socio-cultural and systemic issues affecting artisan welfare. Barriers include inequality and exploitation, constrained human development, and limited social support, which marginalise artisans and discourage new generations from continuing the craft practices (Khani et al., 2023).

To ensure the robustness and practical relevance of this study, the barriers initially identified through the literature review were validated through unstructured field visits to artisan communities. This qualitative validation approach is widely recommended in craft-sector research to align theoretical findings with community realities (Dalal et al., 2024; Naik et al., 2025). An open-ended discussion format was adopted to engage directly with artisans, allowing for an unscripted and in-depth exploration of the challenges they encounter across various stages of the value chain. The participation was entirely voluntary, and strict protocols were followed to ensure the privacy and anonymity of the respondents.

This direct engagement confirmed that the literature-derived barriers align closely with the real-world experiences of artisans, thereby reinforcing the accuracy and credibility of the study's foundational data. With the aim of comparing the barriers across the pottery and textile industries, this study took uniform barriers prevalent in both industries with different intensities (Jakhar, 2023; Silveru & Sankineni, 2024). A total of thirty-three barriers were identified, of which twenty-five barriers were taken after discussion with experts and validation by the communities of both product segments.

3.3 Methodology

This section presents the methodology to examine the barriers in the pottery and handicraft textile industries. This study employs a four-stage analysis framework to evaluate the barriers (see Figure 3.1). The first stage focuses on barrier identification through a comprehensive literature review, followed by validation via field visits. In the second stage, expert opinions are solicited to finalise and categorise the identified barriers based on relevance. To ensure the robustness of this classification, the study employs Fleiss's Kappa statistic (Fleiss, 1971) to measure inter-rater agreement. By quantifying consensus beyond random chance, a high Kappa value confirms strong expert agreement, thereby minimising subjective bias and reinforcing the validity of the categorisation.

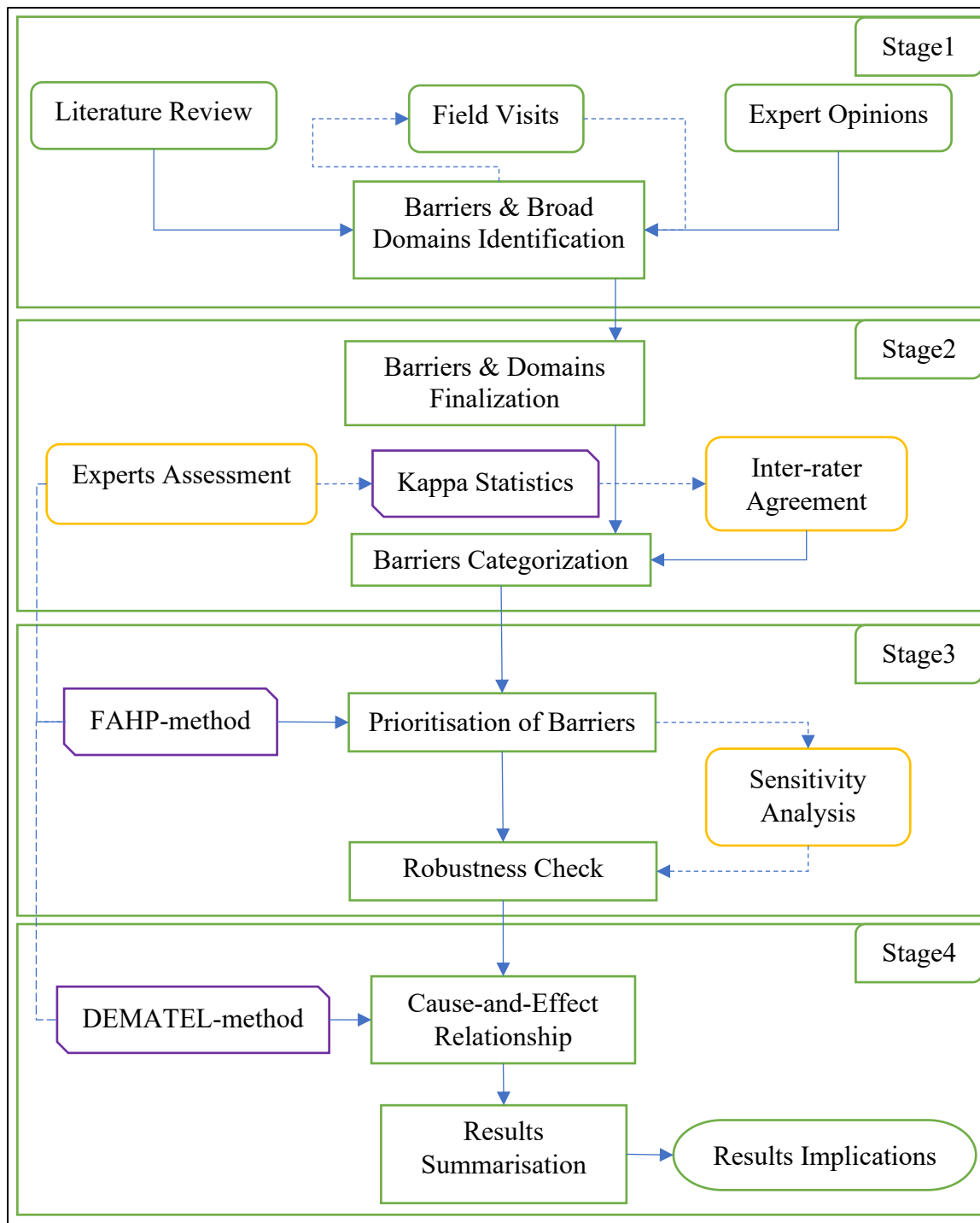


Figure 3. 1 Research Framework for Barriers Identification and Assessment (Source: Author)

The third stage prioritises the identified barriers using the Fuzzy Analytical Hierarchy Process (FAHP) (D.-Y. Chang, 1996). By incorporating fuzzy logic, FAHP effectively manages the uncertainty and imprecision inherent in human judgment. This enables more realistic evaluations, overcoming limitations of rigid pairwise comparisons in classical AHP (Meena et

al., 2023). In the fourth stage, the Decision-Making Trial and Evaluation Laboratory (DEMATEL) method is applied to map the cause-and-effect relationships among barriers (Gabus & Fontela, 1972). This structured approach identifies key causal factors and assesses interdependencies, enabling the prioritisation of barriers based on their systemic influence (Kabra & Mukerjee, 2025). Subsequent sections detail the specific tools and analytical techniques employed in each stage of the analysis.

3.3.1 Kappa Statistics

Kappa statistics is a statistical measure to evaluate inter-rater reliability, which is the degree of agreement among independent raters (experts) when classifying items into categories (Cohen, 1968). In any research, it is misleading to calculate the agreement in the form of a normal percentage, as it does not account for the possibility that experts might agree purely by random chance. Kappa statistics address this by explicitly calculating the agreement that would be expected by chance and subtracting it from the observed agreement (Cohen, 1960). This chapter uses Kappa statistics to validate if the categorisation of industry barriers is consistent, reliable and reflects a genuine consensus among the expert panel, rather than subjective or random choices.

There are two primary forms of Kappa statistics chosen based on the number of experts involved. First is Cohen's Kappa, developed in 1968 by Jacob Cohen, designed to measure the level of agreement between two raters when categorising items, explicitly adjusting for agreement that could occur by random chance (Cohen, 1960). Second is Fleiss' Kappa, developed by Joseph L. Fleiss in 1971, which is a generalisation of Cohen's metric designed for more than two raters (multiple experts) involved in the categorisation process (Fleiss, 1971).

For this study, Fleiss' Kappa was selected as the appropriate validation method as the barrier categorisation process involves a panel of multiple experts. Fleiss' Kappa allows for the robust assessment of consensus across the entire group, ensuring that the final categorisation is statistically valid across all expert judgements (Fleiss, 1971). The detailed steps for calculating Fleiss' Kappa are detailed below:

Step 1. Parameter Definition: The process begins by defining the scope of analysis, where N denotes the total number of barriers being evaluated, M represents the distinct categories under which barriers are to be classified, and E indicates the total number of experts participating in the rating process.

Step 2. Determination of Expert Classification Counts: Based on the classification of barriers under the categories by experts, a classification table is constructed that tabulates how many experts assigned each barrier to each category. For each barrier i and category j , the value n_{ij} Represent the number of experts who assigned the i^{th} barrier to the j^{th} category.

Step 3. Calculation of Proportion of Agreement for Each Barrier (P_i): This step calculates the extent of consensus among experts for each individual barrier. P_i Reflects the agreement level for that specific barrier and is calculated by summing the squared classification counts for a barrier and normalising the number of rater pairs shown below:

$$P_i = \frac{1}{E(E-1)} \sum_{j=1}^M n_{ij}(n_{ij} - 1) \quad (3.1)$$

Step 4. Calculation of the Proportion of Assignment for Each Category (p_j): This step determines the overall proportion of all allocations that fell into each category j . The value p_j is computed to determine the proportion of total assignments falling into category j , representing the likelihood of a barrier being assigned to that category by chance:

$$p_j = \frac{1}{N \cdot E} \sum_{i=1}^N n_{ij} \quad (3.2)$$

Step 5. Calculation of Overall Observed Agreement (P_o): In this step, the average of the individual barrier agreement values (P_i) are computed to determine the overall observed agreement (P_o) across all barriers.

$$P_o = \frac{1}{N} \sum_{i=1}^N P_i \quad (3.3)$$

Step 6. Calculation of the Expected Chance Agreement (P_e): This step counts the combined probability of agreement occurring purely by random chance, assuming expert ratings are independent.

$$P_e = \sum_{j=1}^M p_j^2 \quad (3.4)$$

Step 7. Computation of the Kappa Statistics (k): This step finally computes the kappa coefficient that represents the degree of agreement beyond what would be attributed to chance.

$$k = \frac{P_o - P_e}{1 - P_e} \quad (3.5)$$

The resulting Kappa statistic (k) falls on a scale from -1 to 1. A value of 1 denotes perfect consensus, while a value of 0 indicates agreement no better than random chance. Conversely, negative values imply a level of disagreement worse than what would be expected by chance alone (Gautam & Bolia, 2024). Table 3.1 shows the detailed interpretation of the kappa statistics.

Table 3. 1 Interpretation of Agreement Levels by Kappa Statistics (k)

Kappa statistic (k)	Level of Agreement
Less than 0	Less than chance agreement
0.01 to 0.20	Slight agreement
0.21 to 0.40	Fair agreement
0.41 to 0.60	Moderate agreement
0.61 to 0.80	Substantial agreement
0.81 to 1.00	Perfect agreement

3.3.2 Fuzzy Analytic Hierarchy Process (FAHP)

The Fuzzy Analytical Hierarchy Process (FAHP) extends the traditional AHP framework by integrating fuzzy logic to effectively address the uncertainty and imprecision inherent in complex decision-making (M.-F. Chen et al., 2008). Unlike AHP, which relies on rigid numerical comparisons, FAHP utilises fuzzy numbers to capture subjective judgments, thereby offering a more flexible and realistic representation of human reasoning (A. K. Gupta & Goyal, 2021). By explicitly accounting for vagueness and ambiguity, this approach enhances the reliability and robustness of the resulting criteria weights (M.-F. Chen et al., 2008).

This study adopts Buckley's (1985) methodology (Buckley, 1985) to implement FAHP. The process initiates with the construction of a fuzzy pairwise comparison matrix, where items within each category are evaluated using linguistic terms that are subsequently transformed into Triangular Fuzzy Numbers (TFNs) (Bakir & Atalik, 2021). Judgments from multiple decision-makers are aggregated using the geometric mean of each row to ensure consensus.

These calculated fuzzy weights are then defuzzified by converting fuzzy values into crisp numbers using the Centre of Area (COA) method (Bakir & Atalik, 2021). Finally, the values are normalised to yield definitive crisp criteria weights. The detailed methodological steps are illustrated below (Bakir & Atalik, 2021; Bakır et al., 2021):

Step 1. Definition of hierarchical structure: FAHP begins by structuring the decision problem into a hierarchy. The overall goal is placed at the top, followed by intermediate levels (criteria and sub-criteria) and then the alternatives at the bottom level.

Step 2. Pairwise Linguistic Comparison: In this step, experts evaluate the relative importance of items at the same level using the linguistic terms. The linguistic terms allow expressing subjective judgements more naturally. Table 3.2 shows the nine-point linguistic scale for converting the linguistic judgements to crisp and fuzzy scales.

Table 3. 2 Nine-Point Fuzzy Conversion Scale

Linguistic Terms	Crisp Scale	TFS Scale (l, m, u)	Reciprocal TFS Scale (l, m, u) ⁻¹
Equally Preferred	1	(1,1,1)	1 = (1,1,1)
Equally to moderately preferred	2	(1,2,3)	1/2 = (1/3, 1/2, 1)
Moderately preferred	3	(2,3,4)	1/3 = (1/4, 1/3, 1/2)
Moderately to strongly preferred	4	(3,4,5)	1/4 = (1/5, 1/4, 1/3)
Strongly preferred	5	(4,5,6)	1/5 = (1/6, 1/5, 1/4)
Strongly to very strongly preferred	6	(5,6,7)	1/6 = (1/7, 1/6, 1/5)
Very strongly preferred	7	(6,7,8)	1/7 = (1/8, 1/7, 1/6)
Very strongly to extremely preferred	8	(7,8,9)	1/8 = (1/9, 1/8, 1/7)
Extremely Preferred	9	(8,9,9)	1/9 = (1/9, 1/9, 1/8)

Step 3. Construction of Fuzzy Pairwise Comparison Matrix: The linguistic evaluations of the relative importance of barriers i and j derived in step 2 are converted into Triangular Fuzzy Numbers (TFNs) (d_{ij}^k) for each decision maker k .

$$d_{ij}^k = (l_{ijk}, m_{ijk}, n_{ijk}) \quad (3.6)$$

Step 4. Aggregation of Matrices: The individual matrices from all experts are combined into a single aggregated fuzzy matrix using the geometric mean method. For P experts, the aggregated value (a_{ij}) for barriers i and j is calculated as:

$$A = (l_{ij}, m_{ij}, u_{ij}) \quad (3.7)$$

Where,

$$l_{ij} = \left\{ \prod_{k=1}^P l_{ijk} \right\}^{1/P}, m_{ij} = \left\{ \prod_{k=1}^P m_{ijk} \right\}^{1/P}, u_{ij} = \left\{ \prod_{k=1}^P u_{ijk} \right\}^{1/P} \quad (3.8)$$

Step 5. Calculation of Fuzzy Weights Matrix (R_i): In this step, for each row in the aggregated matrix, the fuzzy geometric mean (R_i) is computed. This represents the importance of each barrier before normalisation.

$$R_i = \left\{ \left(\prod_{j=1}^n l_{ij} \right)^{1/n}, \left(\prod_{j=1}^n m_{ij} \right)^{1/n}, \left(\prod_{j=1}^n u_{ij} \right)^{1/n} \right\} \quad (3.9)$$

Step 6. Calculation of Fuzzy Weights of Barriers (w_i): The fuzzy geometric means are then normalised to determine the relative fuzzy weight of each criterion. This is completed by multiplying the geometric mean of a row by the inverse sum of geometric means of all rows.

$$w_i = R_i \otimes (R_1 \oplus R_2 \oplus \dots \oplus R_n)^{-1} \quad (3.10)$$

Step 7. Defuzzification of the fuzzy weights (N_i): The fuzzy weights (w_i) are further converted into a single crisp number to be usable. This is performed using the Centre of Area (COA) method.

$$N_i = (lw_i + mw_i + uw_i)/3 \quad (3.11)$$

Step 8. Normalisation of Crisp Weights (N_r): The defuzzified weights (N_i) are then normalised to ensure that the sum of all weights equals 1. This yields the final standardised weight for each criterion.

$$N_r = (N_i) / \sum_{i=1}^n N_i \quad (3.12)$$

Step 9. Priority Ranking: Finally, the normalised crisp weights (N_r) are arranged in descending order, which identifies the decreasing order of critical barriers, establishing the priority for intervention in decision-making.

3.3.3 Decision-Making Trial and Evaluation Laboratory (DEMATEL) Method

The Decision-making Trial and Evaluation Laboratory (DEMATEL) method is a sophisticated multi-criteria decision-making (MCDM) tool designed to visualise and analyse complex systems by transforming interdependent relationships into a cause-and-effect relationship diagram (also known as an influential network diagram) (Gabus & Fontela, 1972). DEMATEL categorises factors into cause (influencers) and effect (receivers). The cause-and-effect explicitly maps how different factors influence one another in a system (A. Gupta et al., 2023). Additionally, identifying the factors that are root causes helps decision-makers to focus on improvements that trigger cascading benefits throughout the entire system (Shieh et al., 2010).

Unlike other decision-making methods like Analytical Hierarchy Process, which assumes independence among criteria and solely focuses on weighting, DEMATEL excels in handling interdependent relationships among multiple factors (Bag et al., 2022; Saroha et al., 2022). DEMATEL identifies a cause-and-effect relationship diagram within the system by converting the data on factor interactions. This quantification of intensity of direct and indirect influences helps in the identification of factors as cause factors (which drive the system) and effect factors (which are resultant of other influences), thereby putting a clear and visual structural representation of the system (Kuo et al., 2022; Vishwakarma et al., 2022). This identification of causals and effects is critical for strategic planning as fixing root causes yields the highest impact (T. Banerjee et al., 2023). Capturing interdependencies helps in identifying the ripple effect, where a change in one factor may indirectly affect a distant factor through intermediate steps. It is preferred over Interpretive Structural Modelling (ISM) as ISM only maps qualitative binary relationships, whereas DEMATEL provides quantitative measurement of the strength of influence with a visual representation of factors influencing or being influenced in the system (Shahedi et al., 2023; Vishwakarma et al., 2022). The detailed steps of DEMATEL for finding the interrelationship of barriers in the system are discussed below, adapted from Shieh et al. (2010):

Step 1. Goal definition and construction of the Initial Direct-Relation Matrix (X^k): As the very first step of DEMATEL, the goal is defined, and barriers (evaluation factors) are identified, say

n barriers. Then, H experts are asked to evaluate the direct influence between barriers using a pairwise comparison scale (see table 3.2). For each expert k (where, $1 \leq k \leq H$), an $n \times n$ non-negative matrix is created, known as the individual initial direct-relation matrix (X^k) where x_{ij}^k represents the influence of barrier i ($1 \leq i \leq n$) on barrier j ($1 \leq j \leq n$) as judged by expert k . The diagonal elements of the initial direct-relation matrix (X^k) are 0 ($x_{ij} = 0 \forall i = j$) as a factor cannot directly influence itself in this context.

$$X^k = [x_{ij}^k] \quad (3.13)$$

Step 2. Development of Average Direct-Relation Matrix (A): After developing the initial direct-relation matrix for each expert k , the judgements of all H experts are aggregated to eliminate individual bias and form a consensus view, forming Average Direct-Relation Matrix A . This averages the score given by all experts for each pair of factors.

$$A = [a_{ij}] \quad (3.14)$$

where,

$$a_{ij} = \frac{1}{H} \sum_{k=1}^H x_{ij}^k \quad (3.15)$$

Step 3. Developing Normalised Initial Direct-Relation Matrix (N): The average direct-relation matrix A contains raw scores that are then normalised to develop Normalised Initial Direct-Relation Matrix N . Normalisation ensures that the values fall between 0 and 1, which is determined by finding the maximum total direct influence exerted or received by any single factor (the maximum of row sum and column sum). This step ensures that the subsequent geometric series converges reliably.

$$N = [n_{ij}] \quad (3.16)$$

Where,

$$n_{ij} = \frac{a_{ij}}{\max(\sum_{i=1}^n a_{ij}, \sum_{j=1}^n a_{ij})} \quad (3.17)$$

Step 4. Developing Total Relation Matrix (T): While matrix N captures only single-step direct influences, it lacks the coverage of chains of indirect influences (for example, barrier A influencing barrier B, which is also influencing barrier C). The total relation matrix T captures both the cumulative effect of all direct and indirect influences a barrier exerts on another. Mathematically, it is calculated as an infinite series convergence formula that is simplified to the following equation (where I is the identity matrix).

$$T = [t_{ij}]_{n \times n} = N(I - N)^{-1} \quad (3.18)$$

Step 5. Calculation of Prominence and Relation Vectors: Using the total relation matrix T , the total influence given by factor i and received by factor j is calculated. In this, r_i is the sum of the i^{th} row that represents the total influence dispatched by factor i to all other factors in the system. Also, c_j is the sum of i^{th} column that represents the total influence received by factor j from all other factors.

$$r_i = \sum_{j=1}^n t_{ij} \quad (3.19)$$

$$c_j = \sum_{i=1}^n t_{ij} \quad (3.20)$$

Step 6. Calculation of Causal Relationships: From the value of total influence given (r_i) and received (c_j), prominence and relation nature of each factor is identified. Prominence ($r_i + c_j$) reflects the total involvement of the factor, where a high prominence score identifies the barrier as highly interactive and central to the system. Relation ($r_i - c_j$) is the value that determines the causal nature of the barrier. Barrier with positive relation ($r_i - c_j \geq 0$) is a net cause that influences the system more than it is influenced and categorised as the drivers of the system. Further, barrier with a negative relation ($r_i - c_j \leq 0$) is a net effect that is influenced by other factors.

Step 7. Visualisation of Causal-Effect Diagram: From the net cause and effect a barrier exerts and receives in the system, the impact-relationship map is plotted. This visualisation allows decision-makers to instantly identify the critical root causes which need to be prioritised for intervention.

3.3.4 Data Collection

To ensure a robust and comprehensive analysis, the study employs a mixed-data framework integrating both primary and secondary data sources. The secondary data covers existing literature that provides the foundational identification of barriers. A questionnaire-based approach for collecting expert assessments constitutes primary data collection that provides the empirical basis for the subsequent prioritisation and cause-and-effect analyses. The data collection phase was administered over a six-month period, from February to October 2024, during which identified industry experts were approached to provide detailed evaluations. Their input in the form of an assessment was incorporated into the assessment. The integrated assessment from the concerned experts reflected ground-level industry realities. The experts voluntarily provided their assessments that were used in the subsequent analysis. Table 3.3 provides brief information on the profile of experts identified for evaluating barriers to pottery.

Table 3. 3 Summary of Experts for Pottery Barrier Assessment

S.N.	Experts	Area	Profile	Experience (years)
1	5	Earthenware Pottery	Potters	15-45
2	6	Earthenware Pottery	Entrepreneurs	20-40
3	2	Government	Commission Officer	07-12
4	4	Terra Cotta Pottery	Business Owners	15-30
5	2	Banking	Manager	10-15
6	3	Academia	Industrial, Rural Development	10-20

Table 3.4 provides brief information on experts' profiles for evaluating barriers to handcrafted textiles.

Table 3. 4 Summary of Experts for Textile Barrier Assessment

S.N.	Number of Experts	Area	Profile	Experience (years)
1	5	Handloom Industry	Cottage Weavers	15-40
2	3	Academia	Professor	12-25
3	2	Government	Commission Officer	10-15
4	3	Handloom Enterprise	Business Owner	15-35
5	2	Banking	Manager	08-15
6	3	Textile Retail	Retailer & Distributor	15-35
7	3	Handloom Industry	Sales & Marketing	20-35

This study investigates a total of twenty-five barriers prevalent in handicraft industries, particularly pottery and textile, identified from literature and experts' discussion across the eight identified categories. For the case of the pottery industry, the barriers identified from the

literature were validated from the field visits done in the earthenware-making communities of Umari (Jalaun, Uttar Pradesh), Jarhan (Sonbhadra, Uttar Pradesh), Uttam Nagar (New Delhi), and Malviya Nagar (New Delhi) in India. The engagement with potters of diverse experience levels provided valuable perspectives on different value chain elements. For the textile sector, field visits were conducted in the handmade weaving communities of Akhorhi (Jalaun, Uttar Pradesh), Ayana (Auraiya, Uttar Pradesh), and Dudhi (Sonbhadra, Uttar Pradesh) in India. Discussions with local weavers revealed specific operational constraints to the handloom value chain, validating the relevance of the identified barriers. The following section evaluates the identified barriers from the literature using the four-stage analysis already discussed in this chapter earlier.

3.4 Categorisation of Identified Barriers

Twenty-five barriers and eight barrier categories were identified from the first stage. In the second stage, identified experts were asked to categorise the identified barriers into eight domains (categories). The categorisation was validated using Kappa statistics, which evaluated the inter-rater reliability among experts. This ensured that the agreement among the experts is statistically significant and has not occurred by chance (Fleiss, 1971).

For the case of the pottery industry, twenty-one experts independently categorised the identified barriers across eight distinct domains. Fleiss Kappa calculation (in section 3.2.1) yielded a Kappa index of 0.66, indicating substantial agreement among raters, thereby reinforcing the reliability and validity of the classification.

Similarly, for the case of the handcrafted textile industry, a separate panel of twenty-one experts independently classified the twenty-one barriers into the same eight domains. The kappa index turned 0.65, demonstrating a comparable level of substantial agreement. This consistency confirms that the categorisation of barriers within the textile segment is robust and statistically reliable. Table 3.5 contains the list of all barriers under the categorised domains.

Table 3. 5 List of Finalised Barriers

Domains	Challenges	Code
Financial Constraints (F)	Capital and Funding Limitations	F1
	Difficulty in Cash Flow Management	F2
	Low Investment Returns	F3
Resource Availability Constraints (R)	Material Shortages	R1
	Material Quality Issues	R2
	High Material Costs	R3
Workforce Issues (H)	Skilled Artisan Shortage	H1
	Skill Development Scarcity	H2
	Low Job Engagement	H3
Market Dynamics and Limitations (M)	Market Competition and Domination	M1
	Ineffective Marketing Strategies	M2
	Limited Market Access	M3
Institutional and Regulatory Limitations (P)	Regulatory and Policy Implementation Issues	P1
	Ineffective Government Initiatives	P2
	Lack of Scheme Awareness and Accessibility	P3
	Regulatory Uncertainty and Compliance Issues	P4
Logistics and Operational Infrastructure Constraints (L)	High Production and Logistics Cost	L1
	Warehousing Constraints	L2
	Freight Network Disruptions	L3
Technology Capability Limitations (T)	Limited Technology and Innovation	T1
	Insufficient Tools and Equipment	T2
	Obsolete Machinery and Production Methods	T3
Socio-economic Environment Issues (S)	Limited Social Support and Well-being	S1
	Artisan Inequality and Exploitation	S2
	Constrained Human Development Opportunities	S3

3.5 Assessment of Barriers in the Pottery Industry

3.5.1 Prioritisation of Barriers based on relative importance

Following stage two, in the third stage, the identified barriers were evaluated and prioritised based on their relative influence using FAHP. By integrating fuzzy logic, FAHP effectively accommodates the inherent uncertainty and vagueness associated with human judgment and offers a more robust and realistic decision-making framework compared to the traditional Analytical Hierarchy Process (AHP) (Bakir & Atalik, 2021). Recent studies within the handicraft and MSME literature have demonstrated the suitability of FAHP for prioritising multi-layered constraints in informal and artisan-driven sectors (Dalal et al., 2024; Naik et al., 2025; Silveru & Sankineni, 2024).

For the FAHP evaluation, primary data in the form of expert judgements was collected from experts through a structured questionnaire, enabling pairwise comparison of both domains and individual barriers. Experts expressed their judgments using linguistic terms, which were

subsequently converted into triangular fuzzy numbers (TFNs) utilising the nine-point conversion scale established by Anagnostopoulos et al. (2007) (see Table 3.2), used in contemporary FAHP studies (D. V. Menon & Vadakepat, 2022). This conversion facilitated the construction of a Fuzzy Pairwise Comparison Matrix (FPCM). To establish consensus, individual expert inputs were aggregated using the geometric mean method, a widely adopted aggregation mechanism in fuzzy MCDM research (Dalal et al., 2024).

Fuzzy weights were then computed, defuzzified, and normalised. This analytical process yielded local weights for both parts (domains and the specific barriers within them). Global weights for all twenty-five barriers were subsequently derived by multiplying the local weights of barriers by their respective domain weights (see Table 3.6). This hierarchical weighing approach ensured a precise, clear, and comprehensive prioritisation of constraints and applied effectively in recent craft-sector prioritisation studies (Silveru & Sankineni, 2024).

Table 3. 6 FAHP and DEMATEL Calculations for the Case of Pottery

Domain	Weight	Barrier	FAHP			DEMATEL				
			Local Weight	Global Weight	Level	r_i	c_i	r_i+c_i	r_i-c_i	Level
F	0.334	F1	0.45	0.150	1	1.43	1.04	2.47	0.38	3
		F2	0.30	0.100	2	1.47	1.09	2.56	0.38	3
		F3	0.25	0.083	2	1.33	1.98	3.31	-0.65	2
R	0.136	R1	0.41	0.056	3	1.07	1.21	2.29	-0.14	4
		R2	0.30	0.041	4	1.00	1.62	2.61	-0.62	4
		R3	0.29	0.039	4	1.04	1.43	2.47	-0.38	4
H	0.12	H1	0.37	0.044	4	1.37	1.22	2.59	0.16	3
		H2	0.28	0.033	4	1.48	1.38	2.86	0.10	1
		H3	0.35	0.042	4	0.83	2.29	3.11	-1.46	2
M	0.128	M1	0.42	0.054	3	1.73	1.83	3.56	-0.09	2
		M2	0.30	0.038	4	1.16	1.95	3.11	-0.79	2
		M3	0.28	0.036	4	1.93	1.33	3.26	0.60	1
P	0.101	P1	0.30	0.030	4	2.01	0.59	2.60	1.43	3
		P2	0.24	0.024	4	1.97	0.53	2.50	1.44	3
		P3	0.20	0.020	4	1.46	0.76	2.22	0.71	3
		P4	0.26	0.026	4	1.91	0.43	2.34	1.48	3
L	0.058	L1	0.36	0.021	4	1.11	1.74	2.85	-0.63	2
		L2	0.31	0.018	4	0.77	0.93	1.70	-0.16	4
		L3	0.33	0.019	4	1.22	1.08	2.30	0.13	3
T	0.069	T1	0.34	0.023	4	0.94	1.70	2.64	-0.76	4
		T2	0.30	0.021	4	0.92	1.12	2.04	-0.21	4
		T3	0.36	0.025	4	0.97	1.38	2.35	-0.41	4
S	0.053	S1	0.23	0.012	4	1.66	1.42	3.08	0.23	1
		S2	0.47	0.025	4	1.69	2.25	3.94	-0.55	2

S3	0.30	0.016	4	0.71	0.89	1.60	-0.18	4
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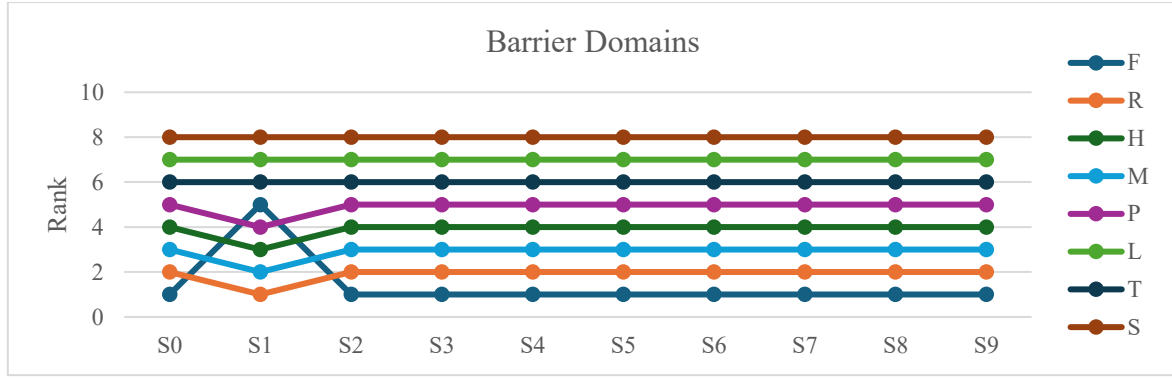
Note: Priority Level 1 > 2 > 3 > 4

Based on the calculated global weights, the barriers were categorised into four distinct priority levels, ranging from Level 1 (highest priority) to Level 4 (lowest priority), as detailed in Table 3.6. The reliability of the expert judgments was validated by calculating the consistency ratios for all comparison matrices, all of which fell below the established threshold of 0.10 (Bakir & Atalik, 2021). The analytical results identify financial constraints, material procurement challenges, marketing limitations, and workforce challenges as the most critical concerns for cottage potters. Specifically, limitations in funding, persistent cash flow constraints, low returns on investment, intense market competition, shortages of raw materials, and a scarcity of skilled labour emerged as the critical constraints undermining the sector's viability. The findings strongly align with earlier literature indicating similar constraints across related handicraft sectors, particularly Dalal et al. (2024), Silveru & Sankineni (2024), and D. V. Menon & Vadakepat (2022).

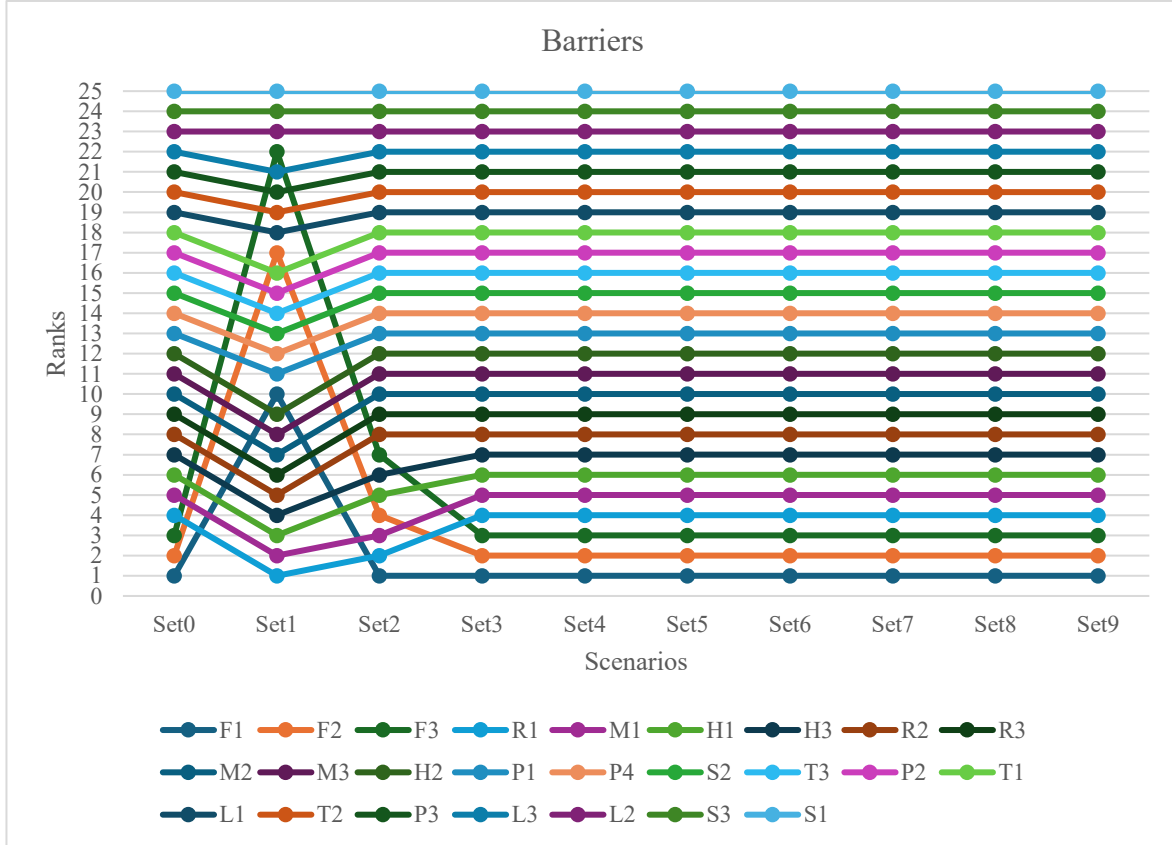
3.5.2 Sensitivity Analysis

To verify the robustness of the FAHP results, a sensitivity analysis was conducted (Bhatnagar et al., 2022). Given that the financial constraints (F) emerged with the highest relative weight at level 1, it possesses the potential to influence the prioritisation of other barrier domains significantly. Consequently, the weight of the financial constraints (F) was systematically varied across a range from 0.1 to 0.9 to observe the resulting shifts in other categories (see Figure 3.2 (A)). Furthermore, the implications of these variations on the ranking of individual barriers at Level 2 were analysed (see Figure 3.2 (B)).

The analysis demonstrated a high degree of stability in the rankings across different scenarios, thereby validating the findings derived from the FAHP model. The results indicate that financial constraints (F) remain a dominant and resilient domain, while material procurement issues (R) and marketing obstacles (M) gain prominence as the influence of financial constraints (F) decreases. This highlights the contextual criticality of procurement and market-related factors when financial constraints are less acute. Conversely, barriers related to socio-economic issues (S), logistics (L), and technology infrastructure (T) consistently retain a low priority, demonstrating limited sensitivity to fluctuations in the weight of the financial domain.



A. Weightage Change in Domains



B. Changes in Global Weights for Different Domain Local Weights (Source: Author)

Figure 3. 2 Sensitivity Analysis (Pottery Barriers)

3.5.3 Cause-and-effect relationship

Following stage three, stage four applied the DEMATEL technique that facilitated the mapping of complex structural relationships, revealing the causal interdependencies and mutual influences existing among the barriers (Shieh et al., 2010). Experts participated in a structured questionnaire where they assessed the degree of influence exerted by one barrier upon another using a predefined scale ranging from 0 (no influence) to 3 (high influence) (Shieh et al., 2010), thereby establishing the initial direct-relation matrix (X^k). Strict quality control measures were implemented to ensure the accuracy and completeness of expert responses. Individual inputs

were aggregated to form a unified Direct-Relation Matrix A , which was subsequently transformed into the Total Relation Matrix T .

Based on the Total Relation Matrix T , prominence ($r_i + c_i$) and net effect ($r_i - c_i$) scores were computed (see Table 3.6). To isolate significant interactions, a threshold value of 0.54 was applied to filter out negligible relationships that were derived from the average of all elements in matrix T . Figure 3.3 visualises the classification of barriers into cause-and-effect groups based on net effect values, while Figure 3.4 maps the directional causal relationships, illustrating the influence dynamics between barriers. To enhance clarity, the barriers were clustered according to their interdependency levels.

The analysis revealed that barriers such as regulatory inefficiencies (P1–P4), limited market access (M3), financial constraints (F1–F2), social support limitations (S1), human capital issues (H1–H2), and warehousing constraints (L2) emerged as strong causal factors. This classification indicates that these foundational issues drive broader systemic challenges within the industry. Conversely, barriers particularly workforce engagement issues (H3), market competition (M1–M2), low investment returns (F3), high logistics costs (L1), limited social well-being (S2–S3), technological barriers (T1–T3), and material procurement issues (R1–R3) were identified as effect barriers, signifying that they are largely symptomatic outcomes influenced by other structural obstacles.

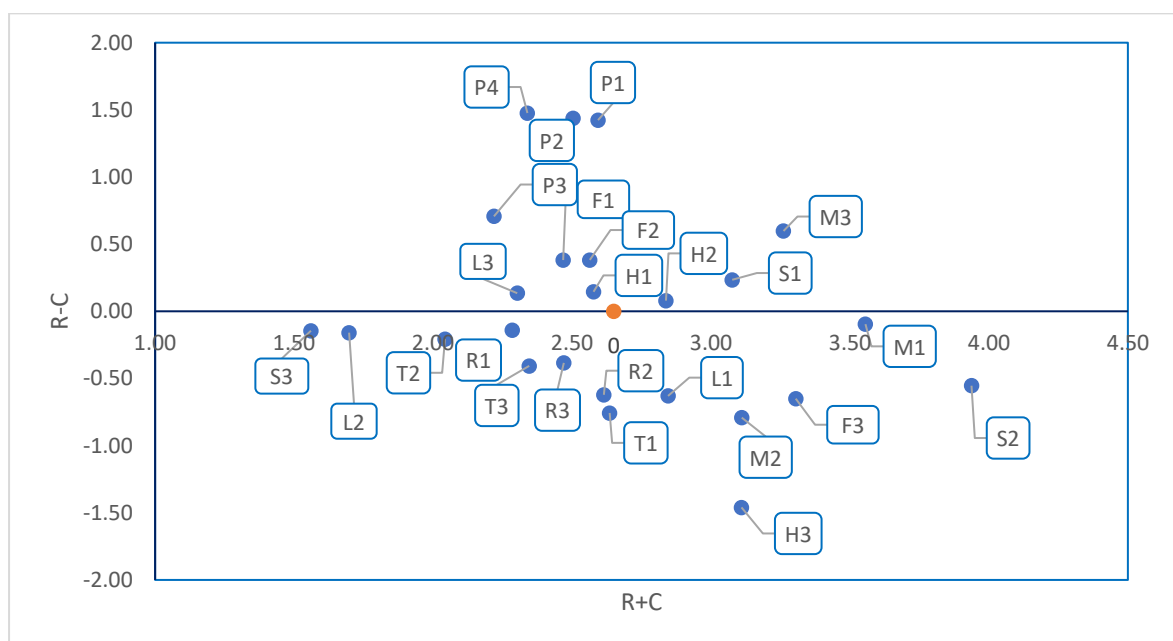
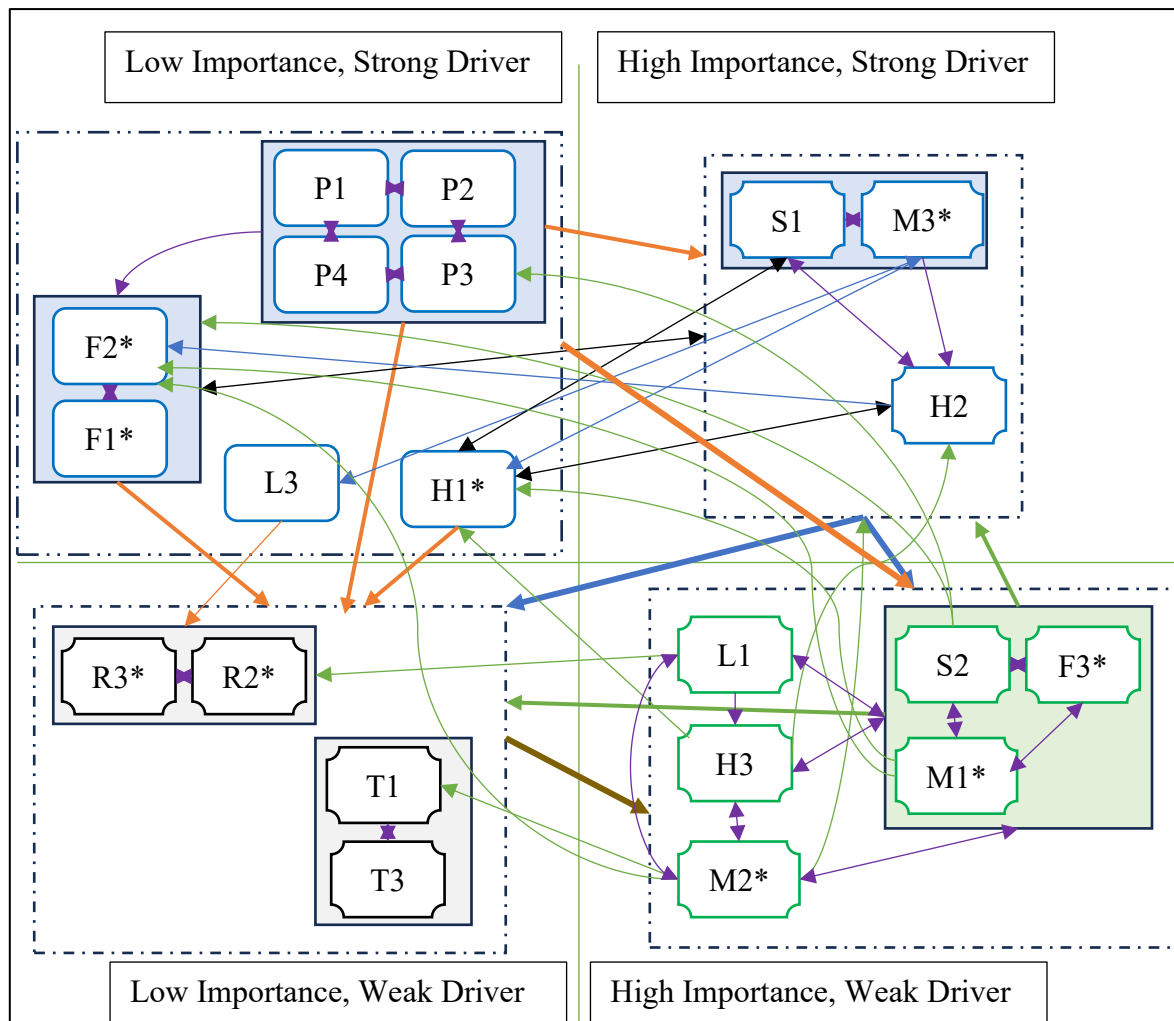


Figure 3. 3 Cause and effect diagram of Pottery Industry Barriers



* High Priority

Figure 3. 4 Causal Relations and Interdependencies among Pottery Industry Barriers

These findings suggest that strategic interventions targeting the identified root causes, particularly regulatory frameworks, market access, and financial liquidity, can generate a positive ripple effect. Effectively addressing these drivers is likely to yield cascading improvements in workforce engagement, marketing effectiveness, investment efficiency, logistics optimisation, technological modernisation, and the availability of quality resources.

3.6 Assessment of Barriers in the Textile Industry

3.6.1 Prioritisation of Barriers based on Relative Importance

Consistent with the methodology applied to the pottery sector, the identified barriers were ranked based on their relative importance in the handcrafted textile industry. This prioritisation provided a hierarchical understanding of the constraints affecting the sector. Table 3.7 lists local and global weights identified from FAHP analysis and the degree of prominence and net

effect from DEMATEL analysis. The findings identify financial constraints, marketing barriers, material procurement issues, and technology barriers as the most critical barrier domains impacting cottage weavers, validating the results of Naik et al. (2025). In contrast, barriers related to workforce availability and socio-cultural conditions exhibited lower significance, consistent with prior research indicating that many handloom challenges stem from structural, financial, and market-related issues rather than solely workforce-driven limitations Naik et al. (2025). Conversely, regulatory challenges displayed moderate significance, echoing literature reporting inconsistencies between policy frameworks and ground-level implementation in the textile and craft sectors (Mohd Tokiran et al., 2022).

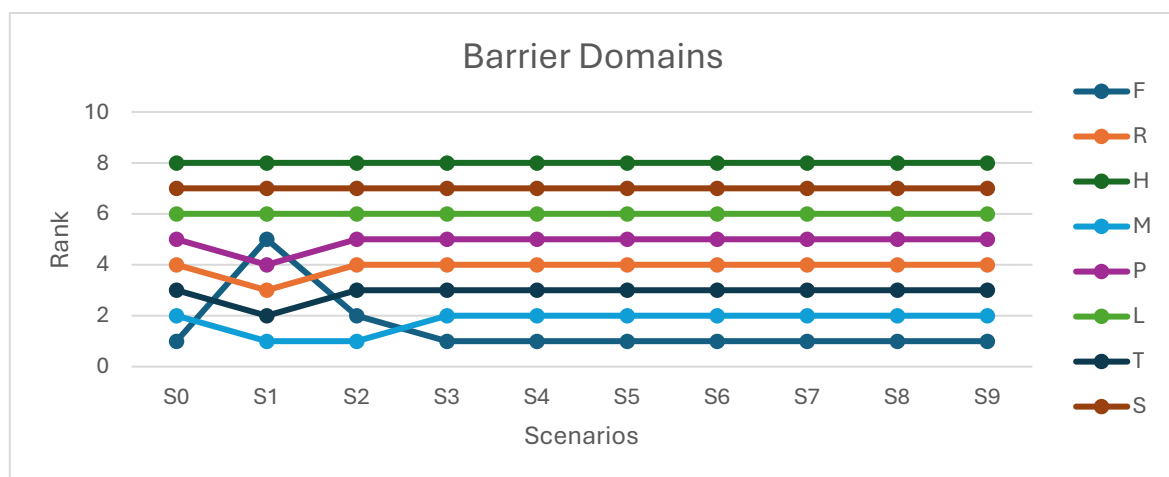
Table 3. 7 FAHP and DEMATEL Calculations for the Case of Textile

Domain	Weight	Barrier	FAHP			DEMATEL				
			Local Weight	Global Weight	Level	r_i	c_i	r_i+c_i	r_i-c_i	Level
F	0.313	F1	0.474	0.149	1	1.21	0.96	2.18	0.25	3
		F2	0.322	0.101	2	1.19	1.02	2.21	0.17	3
		F3	0.204	0.064	3	1.10	1.70	2.8	-0.6	2
R	0.114	R1	0.410	0.047	3	0.84	0.76	1.6	0.09	4
		R2	0.250	0.039	3	0.66	1.33	1.99	-0.66	4
		R3	0.340	0.029	4	0.99	1.07	2.06	-0.09	4
H	0.032	H1	0.460	0.015	4	1.12	1.07	2.19	0.05	3
		H2	0.300	0.010	4	1.02	0.96	1.99	0.06	3
		H3	0.240	0.008	4	0.49	2.08	2.57	-1.59	2
M	0.225	M1	0.460	0.103	2	1.52	1.72	3.24	-0.2	2
		M2	0.300	0.067	3	1.05	1.75	2.8	-0.7	2
		M3	0.240	0.054	3	1.64	0.67	2.32	0.97	1
P	0.094	P1	0.180	0.017	4	1.82	0.68	2.5	1.13	1
		P2	0.280	0.026	4	2.02	0.48	2.5	1.53	1
		P3	0.210	0.020	4	1.63	0.62	2.26	1.01	1
		P4	0.330	0.031	4	1.96	0.37	2.33	1.59	1
L	0.063	L1	0.420	0.026	4	0.67	1.60	2.27	-0.92	2
		L2	0.300	0.019	4	0.61	0.82	1.43	-0.21	4
		L3	0.280	0.018	4	0.95	0.79	1.75	0.16	4
T	0.122	T1	0.190	0.023	4	0.65	1.59	2.24	-0.94	4
		T2	0.350	0.043	3	0.70	1.18	1.88	-0.48	4
		T3	0.460	0.056	3	0.72	1.31	2.03	-0.58	4
S	0.036	S1	0.245	0.009	4	1.41	1.16	2.56	0.25	1
		S2	0.395	0.014	4	1.55	1.74	3.29	-0.18	2
		S3	0.359	0.013	4	0.57	0.69	1.25	-0.12	4

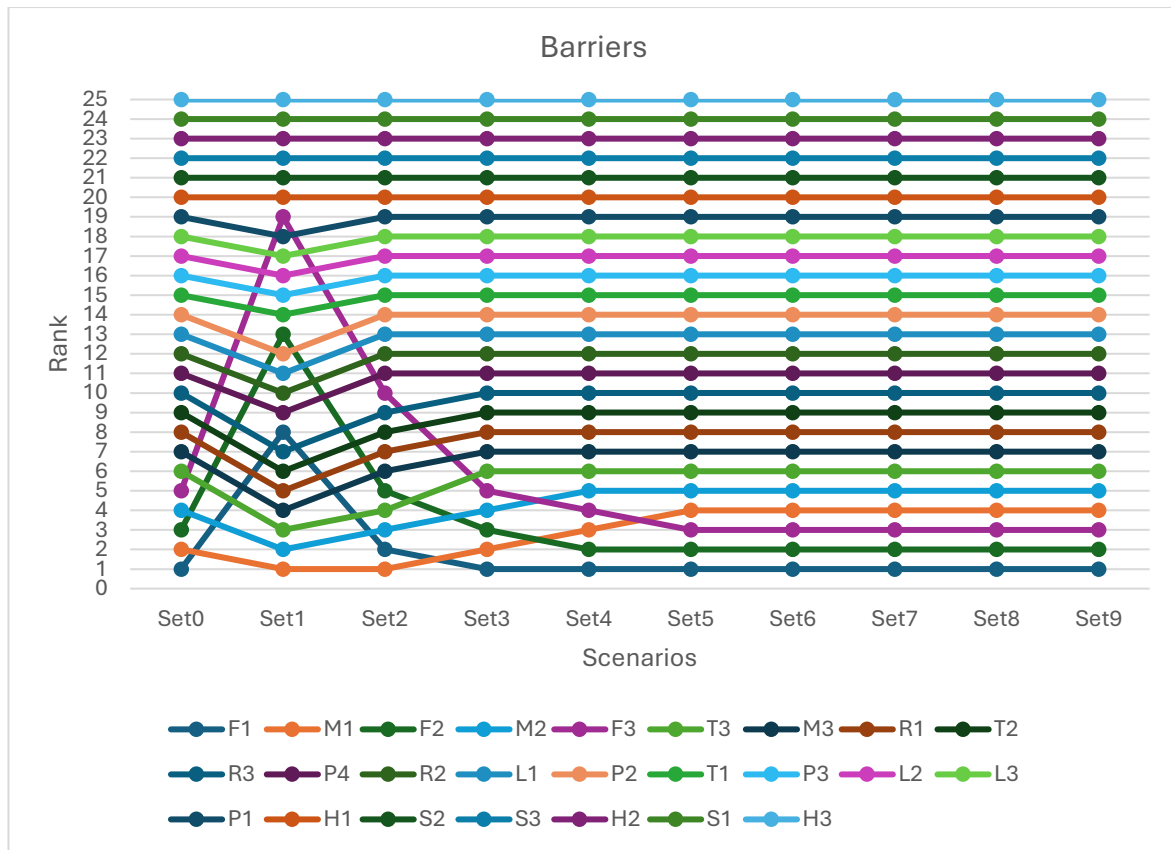
3.6.2 Sensitivity Analysis

Following FAHP, a sensitivity analysis was performed to assess the robustness and stability of the FAHP results. Given that the finance domain (F) initially carried the highest relative weight, its influence was systematically tested by varying its weight from 0.1 to 0.9 to observe the consequential impact on other barrier domains. Subsequently, the rankings of individual barriers based on their global weights were recalculated across these scenarios.

Across all scenarios, the analysis demonstrated a high degree of stability in the rankings, thereby validating the reliability of the initial FAHP findings. Figure 3.5 illustrates these variations, with Part A depicting scenarios at the domain level and Part B at the barrier level. The results confirm that financial issues remain the dominant barriers across most scenarios. However, marketing issues (M) emerged as a significant inhibitor, particularly when the weight of financial constraints was reduced. Similarly, technology (T) and material procurement (R) barriers displayed moderate significance, gaining prominence when the overriding influence of capital-centric constraints (F) was diluted. In contrast, barriers related to workforce (H), logistics (L), and social (S) obstacles consistently ranked low across all tested scenarios, suggesting that although relevant, their influence is comparatively weaker. This persistent lower ranking reflects prior empirical insights that many socio-economic and logistical issues manifest as effects of deeper systemic constraints such as market access, regulatory inefficiencies, and financial shortages (Jakhar, 2023; Prusty & Mallick, 2022).



A. Weightage Change in Domains



B. Changes in Global Weights for Different Domain Local Weights

Figure 3. 5 Sensitivity Analysis (Textile Industry)

3.6.3 Cause-and-effect Analysis

After ranking the barriers based on the relative importance in stage three, stage four applied the DEMATEL technique to systematically uncover causal relationships and structural interdependencies among the barriers, thereby identifying the root causes and effect dynamics within the handloom textile industry ecosystem. To investigate the structural interdependencies within the system, each participating expert completed a structured questionnaire, assessing the direct influence between pairs of barriers using a scale ranging from 0 (no influence) to 3 (high influence) (Shieh et al., 2010). A total of twenty-one individual direct influence matrices X were generated and subsequently averaged to form a unified initial direct-relation matrix A thereby consolidating the collective expert judgments.

Following the methodological steps, this matrix A was normalised and transformed into the Total Relation Matrix T . Based on this matrix, prominence ($r_i + c_i$) and net effect ($r_i - c_i$) values were computed (see Table 3.7) to quantify both the overall importance and the causal nature of each barrier. To isolate meaningful interactions, a threshold value of 0.05 that was

derived from the average of all elements in matrix T was established to filter out insignificant relationships.

The resulting Cause-and-Effect Digraph (Figure 3.6) plots the barriers based on their $(r_i + c_i, r_i - c_i)$ coordinates. Additionally, the Causal Relationship Diagram (Figure 3.7) visualises the directional influence of one barrier upon another, providing a clear schematic of the system's dynamics. The results identify barriers, particularly capital and cash-flow issues (F1–F2), workforce unavailability issues (H1–H2), limited market access (M3), regulatory issues (P1–P4), and limited social support (S1) as substantial cause barriers. These factors exert a significant influence, driving multiple interconnected challenges across the value chain.

These findings are strongly supported by literature indicating that sector-wide constraints in finance, regulation, workforce scarcity, and limited market channels underpin systemic challenges in Indian handloom communities (S. Kumar et al., 2021; Mohd Tokiran et al., 2022; Naik et al., 2025).

Conversely, barriers related to technology barriers (T1–T3), logistics obstacles (L1–L3), material procurement issues (R1–R3), workforce engagement limitations (H3), poor investment returns (F3), marketing inefficiencies (M1–M2), and social inequality (S2–S3) emerged as effect barriers. These factors exhibit low to moderate systemic influence and are largely symptomatic, responding to the pressures exerted by the stronger root causes. The findings suggest that strategically addressing these high-impact causal barriers can trigger systemic positive ripple effects that alleviate several downstream challenges across the textile value chain.

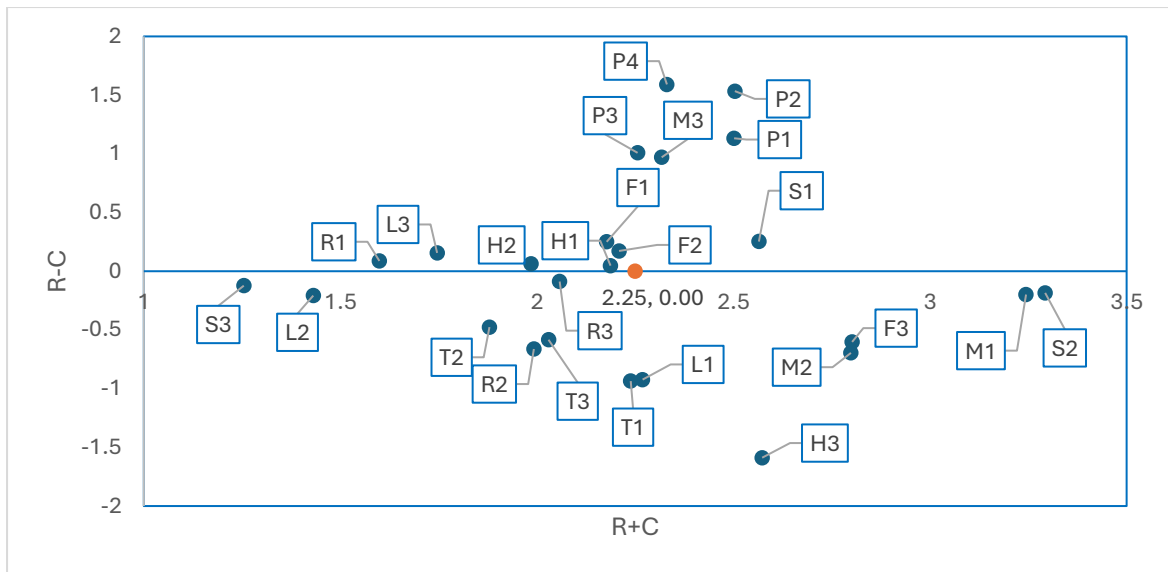
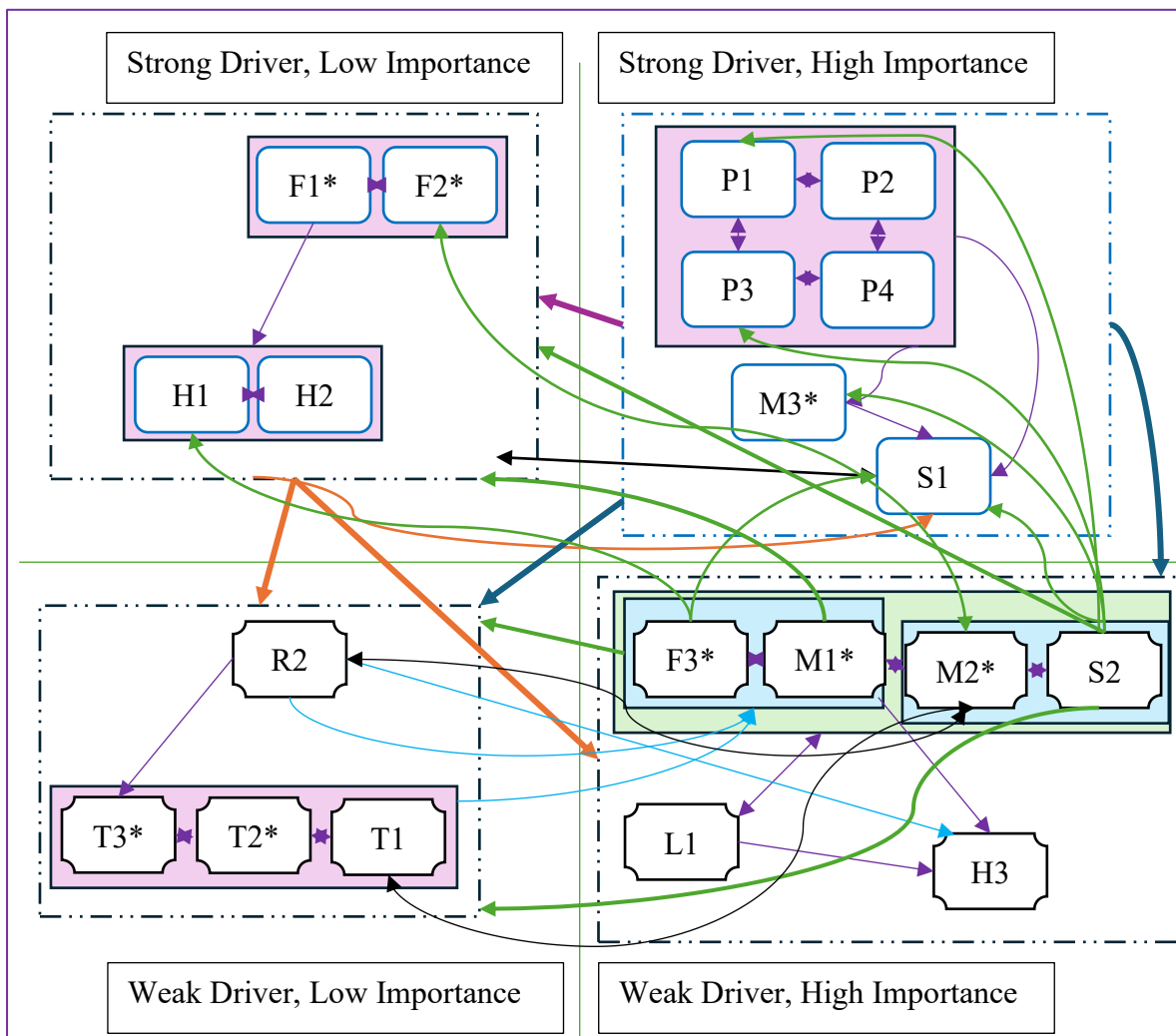


Figure 3. 6 Cause and effect diagram of Pottery Industry Barriers



**High Priority*

Figure 3. 7 Causal Relations and Interdependencies among Pottery Industry Barriers

The subsequent section synthesises the integrated insights derived from both the FAHP prioritisation and the DEMATEL causal analysis. Building on these empirical findings, the discussion elaborates on the broader theoretical contributions, as well as the strategic managerial and policy implications essential for addressing the identified industry challenges.

3.7 Discussion of Outcomes

Recognising the critical need to assess industry barriers directly from the perspective of artisans, this study employs a hybrid analytical framework combining the Fuzzy Analytical Hierarchy Process (FAHP) and the Decision-Making Trial and Evaluation Laboratory (DEMATEL) method. This dual-method approach is applied to both the earthenware and handmade textile sectors to benchmark and prioritise key influencing factors systematically. While FAHP calculates relative weights based on expert judgments under conditions of uncertainty, DEMATEL maps the structural cause-and-effect relationships to reveal underlying drivers and dependencies (Chandra et al., 2023; D. V. Menon & Vadakepat, 2022; Saroha et al., 2022).

By integrating quantitative prioritisation from FAHP with the causal insights from DEMATEL, this assessment identifies the most pressing barriers, their mutual interdependencies, and their net involvement within the system. This holistic evaluation facilitates the development of targeted, system-wide interventions. The following discussion synthesises insights derived from the combined analysis of relative weights, degree of prominence ($r_i + c_i$) and net influence ($r_i - c_i$), offering a comprehensive roadmap for industry improvement.

3.7.1 Financial Constraints

Financial barriers exhibited distinct characteristics across both sectors. Funding limitations (F1) and cash flow management (F2) were identified as high-priority influential drivers in both the pottery and textile industries. Despite having moderate systemic importance in some contexts, their high driving potential suggests that targeted financial injections can catalyse significant change within specific scopes for both artisan groups. Similar patterns of financial dominance have been documented in handicraft and MSME barrier analyses, where liquidity shortages and unstable working capital repeatedly appear as foundational obstacles (Dalal et al., 2024; Naik et al., 2025; Prusty & Mallick, 2022).

In contrast, low investment returns (F3) functioned as a high-weight but reactive barrier for both sectors, shaped by other upstream inefficiencies such as market access and operational efficiency, implying that profitability issues will naturally improve as root causes like market

access and operational costs are resolved. This aligns with the observation that profitability challenges in cottage industries often stem from structural market and logistical constraints rather than internal financial mismanagement (D. V. Menon & Vadakepat, 2022).

3.7.2 Resource Availability

Procurement barriers (R1–R3) showed sector-specific variations. In the pottery sector, these issues presented a unique dynamic. Despite high weight and visibility, they exhibited low systemic influence, classifying them as "Perpetually Significant but Passive" challenges covering acute daily operational issues that do not shape the rest of the system (Silveru & Sankineni, 2024). In the textile sector, these barriers similarly exhibited low systemic influence. This implies that improvements must originate from broader reforms in financing, logistics, and market stability rather than isolated procurement interventions.

3.7.3 Human Capital

Human capital challenges display a dichotomy in influence between the two sectors. In pottery, skill development scarcity (H2) was uniquely identified as a high-leverage causal driver, reinforcing earlier findings highlighting the critical role of training and capability-building in sustaining craft-based livelihoods. Conversely, in the textile sector, shortage of skilled artisans and skill development scarcity (H1, H2) showed lower weight but significant influencing power, indicating a need for targeted, segment-specific interventions rather than broad systemic overhaul. However, low job engagement (H3) consistently appeared as a reactive barrier across both sectors, important but largely influenced by other systemic constraints. This suggests that engagement issues for all artisans are best addressed through secondary-level interventions once primary constraints are mitigated.

3.7.4 Institutional and Regulatory Framework

Regulatory hurdles (P1–P4) consistently acted as "Silent Catalysts" across both pottery and textile sectors. In both industries, these barriers carried low to moderate priority weights but exerted high causal influence and systemic importance. This structural position highlights their critical role in shaping the entire ecosystem regardless of the product type. Improvements in policy frameworks, implementation, and governance are essential for both sectors to enable downstream operational efficiency, as they have the capacity to unlock wide-ranging benefits across marketing, finance, and operational domains. This aligns with research demonstrating that policy implementation gaps and administrative bottlenecks significantly constrain the growth of MSMEs and artisan clusters (Mohd Tokiran et al., 2022).

3.7.5 Market Dynamics

In both the pottery and textile sectors, limited market access (M3) emerged as a critical constraint, exhibiting high global weight, prominence, and strong causal influence. This underscores its role as a shared "Central Leverage Point," demanding immediate prioritisation in strategic action plans to drive systematic transformation. Similarly, market competition (M1) and ineffective strategies (M2) were classified as key "Reactive Barriers" for both industries. While they hold high weight and importance, their low causality suggests they are largely symptomatic of deeper issues, requiring second-tier actions following the resolution of upstream root causes.

3.7.6 Technological Capability

Technological barriers (T1–T3) consistently ranked as low-leverage barriers across all metrics in both industries. They exhibited low weight, low importance, and minimal systemic impact for both potters and weavers. This suggests that while technology is necessary for modernisation, immediate high-cost technological interventions may yield diminishing returns for either sector unless foundational issues like market access or finance are not resolved first. Technological upgrades should therefore be integrated into broader, long-term reform strategies rather than treated as standalone priorities.

3.7.7 Logistical and Operational Infrastructure

Logistics barriers displayed varied roles depending on the sector. High production costs (L1) were identified to be essential but reactive for both sectors and heavily influenced by upstream inefficiencies. Warehousing constraints (L2) consistently ranked as a low-leverage barrier across both industries, suitable for low-cost or long-term interventions. However, a specific distinction was found in pottery, where freight network disruptions (L3) showed high influence despite moderate weight, indicating a unique relevance for segment-specific interventions to prevent supply chain bottlenecks in the earthenware trade.

3.7.8 Socio-Economic Environment

Social barriers showed notable divergence. Limited social support (S1) emerged as a "Silent Catalyst" specifically in the pottery sector, with low ranking in initial priority but high in causal influence, indicating strong hidden potential to drive systemic shifts despite its moderate priority weight. In contrast, for the textile sector, social support barriers showed weaker causal influence, consistent with findings that textile artisans rely more heavily on institutional and financial mechanisms than community-driven support structures (Naik et al., 2025). Other

social barriers, such as artisan inequality (S2) and constrained human development (S3), were ranked low in priority and influence across both industries. This categorised them as low-leverage barriers that absorb improvements from upstream changes without independently driving systemic impact. This observation matches the consensus that social challenges manifest primarily as outcomes of system-wide structural deficits rather than independent catalysts (Jakhar, 2023).

3.8 Implications of the Study

This section synthesises the integrated findings from the FAHP and DEMATEL analyses to present broad inferences for academic researchers, industry practitioners, and policy stakeholders. This study offers a holistic view of the structural dynamics across the pottery and handcrafted textile industry. The implications drawn from the study bridge the gap between empirical evidence and strategic applications, providing a roadmap for data-driven decision-making in complex, unorganised business environments.

3.8.1 Theoretical Implications

This study makes several significant contributions to the literature on artisanal industries and supply chain barriers. By shifting the analytical lens from a linear listing of constraints to a causal-structural mapping, the research advances theoretical understanding of how barriers interact within the informal economy.

Implications for the Pottery Industry

The application of the hybrid FAHP-DEMATEL framework to the pottery sector contributes to the literature by validating the use of Multi-Criteria Decision Making (MCDM) tools in highly informal, unorganised settings. Theoretically, this study challenges the traditional "siloed" view of industry barriers, where obstacles are typically viewed in isolation. Instead, it establishes a systems-thinking approach, demonstrating that barriers in this sector behave dynamically, some act as "drivers" while others are merely "recipients". Similar applications of MCDM in handicraft and MSME environments have demonstrated the value of structured prioritisation for understanding systemic constraints (Dalal et al., 2024; Prusty & Mallick, 2022).

Specifically, the identification of limited social support (S1) as a "Silent Catalyst" expands the Resource-Based View (RBV) of the firm in artisan sectors, demonstrating that intangible social

capital can act as a strategic resource influencing operational resilience, parallel to findings in community-driven handicraft ecosystems where social embeddedness determines production stability (Silveru & Sankineni, 2024).

Furthermore, the distinction that high-prominence barriers (like F1, F2) are different from high-influence barriers (like H2) aligns with empirical evidence showing that frequently visible operational barriers are often symptoms rather than structural causes (D. V. Menon & Vadakepat, 2022). This observation attempts to refine existing theories on barrier prioritisation, proving that "most visible" does not always mean "most critical." This creates a theoretical precedent to differentiate between symptomatic relief (addressing reactive barriers like F3) and structural cure (addressing causal barriers like H2), a concept increasingly emphasised in contemporary MSME constraint-management literature (Dalal et al., 2024).

Implications for the handcrafted textile industry

In the context of the textile industry, the study enriches the theoretical understanding of supply chain vulnerability by mapping the hierarchy of constraints. The research provides empirical validation for Institutional Theory, as the strong causal influence of regulatory inhibitors (P1-P4), despite their lower perceived weight, demonstrates that institutional gaps and policy implementation failures served as the invisible architects of operational failure in the handloom sector.

The study also contributes to the Theory of Constraint Management in MSMEs. By categorising technological barriers (T1-T3) as "overvalued bottlenecks" with limited systemic impact, the research challenges the prevalent techno-centric development paradigms often promoted in development policy that assume technology is the primary solution for artisan industries. Accordingly, the study posits a Causal Hierarchy Theory in artisanal supply chains, arguing that lower-level operational upgrades (like technology, logistics) are theoretically incapable of generating systemic improvement unless upstream structural drivers (like market and finance) are resolved first. This multidimensional assessment framework provides future researchers with a validated model for dissecting complex barriers in other labour-intensive craft industries. This aligns with contemporary evidence demonstrating that structural constraints, particularly finance and market access, shape operational outcomes far more strongly than isolated technological enhancements (Silveru & Sankineni, 2024).

3.8.2 Managerial Implications

This section translates the analytical findings into actionable strategies for business owners, entrepreneurs, cooperative leaders, and industry managers. The results underscore that resource allocation in resource-constrained sectors must be strategic, targeting root causes rather than symptoms to maximise systemic impact.

Implications for the pottery industry

For managers and entrepreneurs in the pottery sector, the study suggests a restructuring of operational priorities:

- **Target Central Leverage Points:** Management must prioritise addressing skill scarcity issues (H2) and limited market access issues (M3) above all else. Unlike typical strategies that focus heavily on upgrading machinery, this study shows that investing in workforce training and securing retail partnerships yields the highest systemic returns. Managers should therefore focus on product diversification, branding, and retail partnerships to break market access deadlocks before investing in production expansion.
- **Address "Silent Catalysts" via Community Engagement:** The identification of inefficient social support (S1) as a hidden driver implies that businesses cannot operate in isolation. Entrepreneurs should foster community-led initiatives and peer-support collectives to improve the social perception of the craft. Research shows that social cohesion, artisan networks, and collective identity significantly improve motivation, output consistency, and business continuity. This "soft" investment is a prerequisite for solving "hard" operational problems like workforce retention. Thus, community-led initiatives and peer-support mechanisms become foundational strategic investments.
- **Adopt Sequential Intervention Strategies:** Managers should avoid reacting to downstream issues like low investment returns (F3) or high logistics costs (L1). These appear repeatedly in literature as outcomes of upstream failures rather than standalone problems (Prusty & Mallick, 2022). A phased strategy that first resolves upstream market barriers, financial liquidity, and skill shortages ensures that cost efficiencies and profitability follow naturally through scale effects.
- **Strategic Resource Conservation:** Technology barriers (T1-T3) and warehousing bottlenecks (L2) were found to be low-leverage. Managers should therefore avoid heavy capital investment in advanced machinery or large storage facilities in the early stages.

Instead, these needs should be met through shared-resource models (like shared facility centres, community resource centres, and cluster-based infrastructure), which yield higher returns once foundational issues are addressed. Only after foundational stability is achieved they can be integrated into broader and long-term modernisation plans.

Implications for the handcrafted textile industry:

For the textile sector, the findings provide a clear blueprint for navigating a complex value chain:

- **Prioritise Financial & Institutional Navigation:** Since Finance (F1-F2) and regulatory barriers (P1-P4) emerged as pivotal levers, management focus must shift from purely production-centric concerns to financial and institutional literacy. Entrepreneurs should prioritise formalising their businesses to leverage government credit schemes (like MUDRA) and streamline compliance, as these are the "keys" that unlock downstream operational efficiency.
- **Strategic Partnerships for Market Access:** With limited market access (M3) being identified as a critical driving barrier, independent weavers and small cooperatives should not attempt to compete in isolation. The implication is to pursue "Strategic Collaborations", tying up with established market leaders in sustainable fashion. These partnerships can act as a bypass for the significant barriers of marketing and logistics, allowing artisans to piggyback on established supply chains.
- **Caution Against Over-Digitisation:** Although digital platforms are often promoted as solutions, research confirms that technology barriers (T1-T3) have low systemic impact unless supply-chain basics are stable. This implies that managers should adopt digital tools only after securing steady procurement, liquidity, and market channels. Digital adoption should be treated as a modular, secondary strategy and implemented in a phased manner.
- **Integrated Procurement Models:** Since procurement issues (R1-R3) are low-priority/low-effect but essential operationally, managers should move away from individual sourcing. Establishing Cooperative-led Procurement Models allows cottage units to aggregate demand, enforcing quality standards and negotiating better rates without requiring significant individual management bandwidth. Literature strongly

supports cooperative-led procurement systems for improving bargaining power, quality consistency, and cost-efficiency (D. V. Menon & Vadakepat, 2022; Naik et al., 2025).

3.8.3 Policy Implications

This section outlines strategic recommendations for policymakers, government agencies, and development institutions. The findings underscore that effective governance in the artisan sector requires moving beyond subsidy-driven models to creating enabling ecosystems that align with the Sustainable Development Goals (SDGs).

Implications for the Pottery Industry

The chapter brings the following implications for policymakers for the pottery industry:

- **Institutionalising Support at the Grassroots:** The analysis demonstrates that regulatory implementation gaps and weak institutional outreach act as systemic bottlenecks. To counter this, the government should decentralise support by establishing localised "Artisan Facilitation Centres" (modelled on the Anganwadi system). These centres can serve as single-window operational hubs for scheme enrollment, grievance redressal, and compliance assistance, directly addressing regulatory hurdles (P1–P4).
- **Geo-Spatial Cluster Development:** To address limited market access (M3), policies should pivot towards creating "Geographical Indication (GI) Parks." Instead of generic industrial estates, these dedicated zones for GI-tagged pottery clusters would provide specialised infrastructure, collective branding, and direct export channels, effectively bypassing exploitative intermediaries.
- **Social Infrastructure as Economic Policy:** Recognising limited social support (S1) as a critical "hidden lever," policy must treat artisan welfare as an economic input. Integrating artisans into national social security nets (healthcare, insurance, pension) aligns directly with SDG 1 (No Poverty) and SDG 10 (Reduced Inequalities), reducing the vulnerability that forces artisans to abandon the craft.
- **Financial Monitoring Ecosystems:** Addressing persistent capital limitations (F1-F3) requires more than just launching schemes; instead, it requires monitoring and accountability in credit disbursement. A robust monitoring mechanism should be institutionalised to audit the performance of lending institutions in disbursing loans to cottage industries.

The implications of the study, along with the contribution of different SDGs, are summarised in Table 3.8.

Table 3. 8 Potential Interventions and SDG Alignments for the Case of Pottery

Barrier	Level	Managerial Interventions	Political Interventions	SDG Alignment
F1	3	Cooperative financing, Lean budgeting	Low-Interest Loans, Streamlined credit access	8
F2	3	Digital bookkeeping, Staggered payment cycles	Prompt payment mandates, financial literacy programs	8, 9
F3	2	Optimised supply chain, Skill enhancement, Artisan cooperatives	Tax relaxations, Minimum support price-like initiatives	1, 9
H1	3	Skill-building initiatives, Socioeconomic incentives	Establishing craft schools, Rural skilling missions	5, 8
H2	1	Peer mentoring, modular training	Training infrastructure support	8, 10
H3	2	Performance incentives, Recognition programs, and providing basic facilities	Welfare-linked incentives, Recognition and promotion platforms	3, 4, 8
M1	2	Niche branding, Storytelling advertising	GI tagging, Fair trade shops, Promotion campaigns	9, 10, 16, 17
M2	2	Digital Campaigns, Influencer collaborations	Mass promotion, Fair trade shops	9
M3	1	E-commerce outreach	Forming marketing clusters	9
P1	3	Scheme integration and monitoring	One-stop facilitation centres	16
P2	3	Self-reliant business models	Consulting artisans for scheme development	16, 17
P3	3	Awareness campaigns, volunteer engagement	Vernacular campaigns, multi-channel advertising	10, 16
P4	3	Rights protection, Adaptive planning	Long-term policy frameworks	10, 16, 17
L1	2	Shared logistics, Cost optimisation	Clustered logistics support, Subsidies	9, 12
L3	3	Multi-modal transport systems	Road infrastructure development	8, 9
S1	1	Community engagement programs	Cultural events, Exhibitions and Fairs	5, 8, 10
S2	2	Fair wage systems, transparent pricing	Minimum support price, trade equity legislation	1, 5, 10

Implications for the handcrafted textile industry:

- **Harmonising Trade and Regulatory Frameworks:** The causality of regulatory barriers (P4) highlights the need for stable, transparent trade policies. The government should streamline licensing for small exporters and negotiate inclusive trade agreements that lower non-tariff barriers for handmade textiles. This macro-level support is essential for making Indian handicrafts globally competitive.
- **Enforcing Artisan Rights:** To combat inequality and exploitation (S2), states must act as a regulator of fair labour practices. The study recommends establishing sector-specific grievance mechanisms and regulatory bodies to enforce timely payments and fair labour practices, directly supporting SDG 8 (Decent Work and Economic Growth).
- **Infrastructure as a Public Good:** Recognizing that logistics and technology barriers (L2-L3, T1-T3) are essential but have low systemic influence for individual artisans, public provisioning of infrastructure, such as shared warehousing, subsidized transport corridors, and common technology centers, can improve cluster-level performance. Investing in common warehousing facilities, subsidized freight corridors for handicrafts, and shared technology parks can be some good initiatives. Such public investment lowers the barrier to entry for all players, fostering SDG 9 (Industry, Innovation, and Infrastructure).
- **Strategic SDG Alignment:** The revitalisation of the textile sector should be framed within global sustainability goals. By explicitly linking textile promotion policies to SDG 5 (Gender Equality), given the high female participation in weaving, and SDG 12 (Responsible Consumption and Production), policymakers can attract global developmental funding and conscious consumer markets that value sustainability over mass production. The SDG realisation is tabulated briefly in Table 3.9.

Table 3. 9 Potential Interventions and SDG Alignments for the Case of Textile

Barrier	Level	Managerial Interventions	Political Interventions	SDG Realisation
F1	3	Cooperative financing, Lean budgeting	Subsidised credit schemes	8
F2	3	Digital bookkeeping, Industry 4.0	Prompt payment mandates, finance literacy programs, and credit policies	8, 9
F3	2	Efficient management and supply chain, Skill	Tax relaxations, Minimum support price, Subsidies	1, 9

		improvement, Leverage government schemes		
H1	3	Skill-building initiatives, Socioeconomic inducements	Handloom schools, Textile fellowships	5, 8
H2	3	Integrated training, Skill improvement programs	Training infrastructure support	8, 10
H3	2	Performance incentives, Amenities and recognition programs, Strengthening stakeholder relationships	Welfare-linked incentives, Recognitions and promotions	3, 4, 8
M1	2	Strong regional identity branding, Storytelling advertising, investing in intricate designs	GI tagging, Fair trade shops, Trade fairs	9, 10, 16, 17
M2	2	Digital marketing campaigns, Influencer collaborations, Competitive pricing models, Branding	Brand promotion and undertaking, multi-channel marketing promotion	9
M3	1	Online retailing, WhatsApp and Instagram advertising	Forming marketing clusters, e-market provisions	9
P1	1	Scheme integration and monitoring	One-stop facilitation centres	16
P2	1	Local and self-managed governance	Weaver's input in policy design	16, 17
P3	1	Ground outreach, volunteer-led handloom drives	Multi-channel campaigns	10, 16
P4	1	Adaptive planning, rights protection of weavers	Long-term textile policy frameworks	10, 16, 17
L1	2	Shared logistics, supply chain optimisation	Subsidised logistics support, Transport clusters	9, 12
T1	3	Tie-ups with NIFT, NID, IITs for loom innovation, Industry collaborations	Textile innovation grants, Craft-tech incubators	8, 9
T2	3	Sharing-based models, Common facility centres	Subsidisation, Equipment leasing schemes	9
T3	3	Power loom and other infrastructure upgradation	Tax benefits and subsidies for tech upgrades	8, 9
S1	1	Community engagement programs	Cross-cultural fairs, Textile exhibitions and festivals	5, 8, 10
S2	2	Wage parity systems, transparent pricing	Textile welfare boards	1, 5, 10

Adding to the context, while the operational challenges differ between the pottery and textile sectors, both align closely with global development agendas. Studies increasingly argue that traditional craft sectors, if supported through structural reforms rather than piecemeal subsidies,

can significantly contribute to poverty alleviation, gender empowerment, and sustainable production systems (Dalal et al., 2024; Silveru & Sankineni, 2024). This study advocates for a paradigm shift where sectoral interventions are viewed as vehicles for achieving the United Nations Sustainable Development Goals (SDGs), particularly those focused on poverty alleviation, gender equality, and responsible production. Table 3.9 presents a consolidated list of targeted managerial and political interventions against each barrier for both sectors.

3.9 Summary

The traditional handicraft industries, particularly pottery and handmade textiles, occupy a pivotal space in the national development. Beyond their tangible economic contribution through employment generation, these sectors serve as custodians of cultural heritage and champions of eco-friendly production (Dalal et al., 2024). By offering sustainable alternatives to plastics and synthetic fabrics, they align indigenous manufacturing practices with modern environmental goals. However, despite this immense potential, both sectors remain constrained by systemic inefficiencies that hinder their scalability and resilience.

This study aimed to bridge the gap between potential and performance by systematically investigating the barriers hindering these industries. Utilising a robust four-stage analytical framework combining FAHP and DEMATEL, the research moved beyond generic observations to provide a quantified, causal assessment of industry challenges. Uniquely, this assessment was grounded in the perspectives of the artisans themselves, the primary stakeholders, ensuring that the findings reflect the gritty, ground-level reality rather than a top-down administrative view.

The empirical results reveal that while the products differ, the structural impediments facing Indian cottage industries are remarkably convergent. In both sectors, limited market access (M3) and financial constraints (F1-F2) emerged as the dominant "Central Leverage Points," driving a cascade of downstream operational issues. The analysis debunked the notion that technology is the primary bottleneck; instead, it identified regulatory hurdles (P1-P4) and limited social support (S1) as "Silent Catalysts", invisible yet powerful forces that shape the industry's trajectory. By distinguishing between root causes (drivers) and symptoms (receivers), the study provides a scientifically validated roadmap for policymakers to transition from reactive subsidies to proactive structural reforms.

In conclusion, revitalising the pottery and textile sectors requires a paradigm shift from viewing them as outdated and backwards to recognising them as vital pillars of a sustainable, creative economy. By addressing the identified root causes through targeted, evidence-based interventions, stakeholders can unlock a resilient future where traditional craftsmanship thrives alongside modern economic imperatives. The next chapter connects the policy convergence to the identified domains in this chapter.

CHAPTER 4

Policy Evaluation and Framework Formulation for Sustainable Development of Traditional Industries

This chapter evaluates how effectively current government schemes and their policy convergence support the sustainable development of traditional industries, with a focus on handcrafted textiles and pottery. Using thematic content analysis, it maps the objectives and design of key central schemes of the last six years (2019–2025) against the eight critical barrier domains identified in the previous chapter. A comparative gap and convergence analysis is then employed to assess the extent of coverage of existing schemes with ground-level constraints and evaluate if there exists misalignment between policy objectives and the actual critical barriers faced by artisans in the pottery and handcrafted textile sectors. This analysis helps identify areas where multiple schemes overlap and reinforce each other (policy convergence) as well as domains where key challenges remain insufficiently addressed or neglected, thereby informing more integrated and effective policy design. Based on the thematic evaluation, the chapter proposes a Handcraft Cluster Park framework, adapted from the PM MITRA model, as an integrated policy instrument encompassing finance, workforce and skills, raw materials, infrastructure and technology, marketing, and social welfare domains of the industry value chain. Additionally, a conceptual facility location framework is outlined to guide the optimal location of such cluster parks.

4.1 Introduction

Traditional Select Industries are predominantly composed of micro, small, and medium enterprises (MSMEs) that occupy a vital position in the national economy (Panda et al., 2019). Pottery and handmade textiles are such select industries that play a vital role in sustaining cultural heritage, generate rural employment and promote environmentally responsible manufacturing practices. By offering sustainable alternatives to plastic and synthetic materials, these industries contribute meaningfully to environmental sustainability and local economic resilience (Khan, 2022; Kurup, 2008). Recognising this dual potential, the Government of India has introduced and periodically revised numerous schemes and policies over the last decade to support these traditional select industries (Kashyap & Shukla, 2023; Upendar & Ramulu, 2016). These schemes target critical dimensions such as finance, infrastructure, skill

enhancement, and market access, with the overarching aim of improving artisans' productivity, competitiveness, and livelihoods (M. Jain et al., 2021).

The rationale behind launching these government schemes stems from the acknowledgement that handcrafted MSMEs face distinct challenges arising from informality, fragmented supply chains, and systemic inefficiencies (Paul, 2018). Artisans often struggle with restricted access to affordable credit, lack of modern technology, inadequate infrastructure, and limited market connectivity (S. Mishra et al., 2025). The multiplicity of government schemes reflects a concentrated effort to address these manifold barriers through initiatives such as financial support, cluster development, capacity building, and market facilitation (Sahu et al., 2022; Yadav et al., 2023). At a policy level, these interventions attempt to foster inclusive economic growth while safeguarding India's rich craft heritage in a rapidly globalising environment.

However, despite the rise of such schemes, there are growing concerns over their effectiveness, efficiency, and equity. Many interventions suffer from limited reach, bureaucratic complexity, and overlapping mandates across ministries and agencies (Samadhiya et al., 2023). The uneven distribution of benefits often marginalises vulnerable artisans, particularly those operating in informal or home-based settings (Pegu, 2019). Furthermore, persistent sector-specific issues such as raw material shortages in pottery and fragmented value chains in handloom weaving persist, suggesting gaps in policy focus or execution (Dalal et al., 2024; Pegu, 2019). These limitations highlight the pressing need to systematically evaluate existing schemes, assessing not only in terms of their stated objectives but also their alignment with empirically identified industry barriers. Such evaluation ensures that public resources are optimally utilised to deliver sustainable impact.

Evaluating government schemes is, therefore, a critical exercise that supports evidence-based policymaking. It enables identification of thematic areas that are well covered by current policies while revealing blind spots where vital industry constraints remain insufficiently addressed (Naik et al., 2025). The traditional evaluation approaches range from qualitative case studies to quantitative assessments such as multi-criteria policy evaluation involving expert scoring, and stakeholder surveys that assess scheme relevance, efficiency, and outcome quality, typically involving stakeholder consultations and empirical data collection (S. Gupta & Kushwaha, 2025).

In this chapter, the Thematic Content Analysis approach is used for the scheme evaluation. This method involves systematically coding the objectives and design features of major government schemes launched or active within a time frame and mapping them against referenced domains (Oyebode et al., 2020). Thematic Content Analysis permits a nuanced understanding of the specific focus areas of each policy instrument and their breadth in addressing industry constraints (Oyebode et al., 2020). The decision to use thematic analysis rests on its suitability for document-based studies where direct consultation with stakeholders is unavailable. It also aligns well with the comparative policy analysis tradition in public policy research (M. Jain et al., 2021). By focusing on policy content and explicit objectives rather than solely on implementation outcomes, thematic analysis provides a necessary first step in determining whether foundational policy design addresses the critical constraints experienced by artisans. This methodological choice complements the quantitative rigour of the prior barrier assessment and ensures that the study remains grounded in available documentary evidence.

This study analyses the government-launched policies from 2019-2025 and maps their objectives against eight empirically validated domains identified in the previous chapter. Complementing this, a Comparative Gap and Convergence Analysis is employed to compare the thematic scheme focus with the barrier domains, enabling assessment of both alignment and misalignment. This comparative approach allows identification of domains where multiple schemes converge to provide reinforced support, as well as domains suffering from dispersion, fragmentation, or policy neglect. Rather than a mere inventory of schemes, this method reveals systemic coherence, or the lack thereof, across the policy landscape. Figure 4.1 outlines the research framework of the chapter.

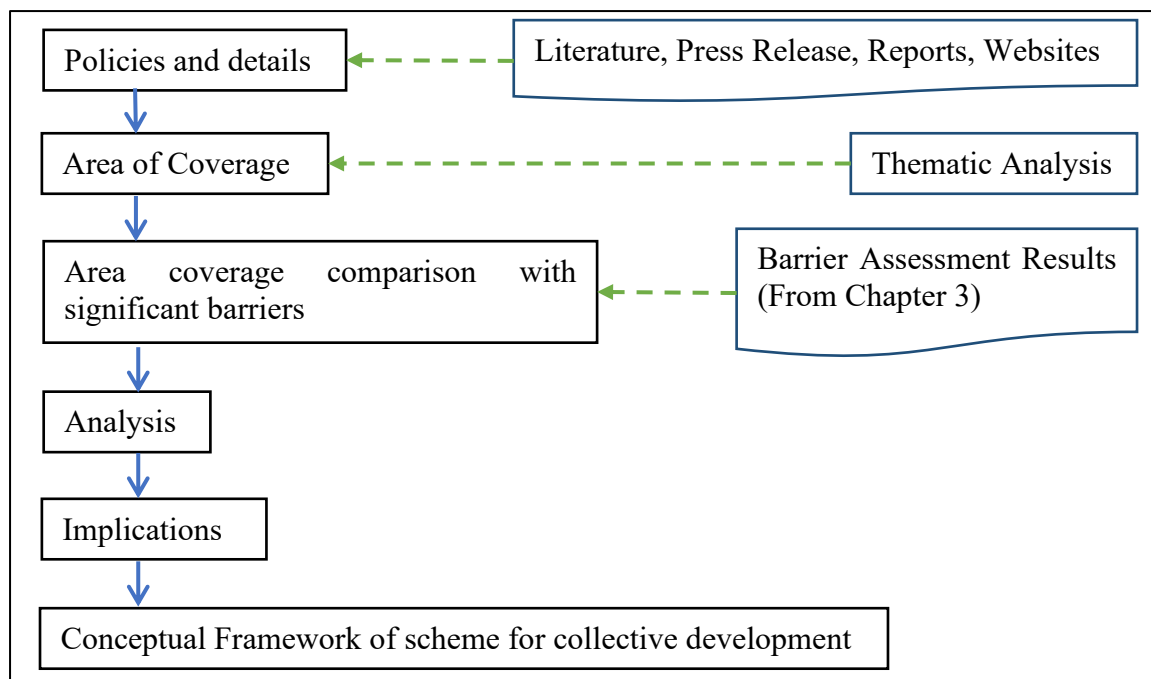


Figure 4. 1 Research Framework (Source: Author)

As an outcome, the chapter proceeds beyond critique to offer constructive solutions. Building upon the findings of policy-barrier convergence and divergence, it proposes a ‘Cluster-based Development Parks for Select Products (CB-DPSP)’ framework, inspired by the Indian government’s PM MITRA textile park model (Ministry of Textiles, 2024). This cluster park concept seeks to integrate finance, skills development, raw material security, infrastructure, marketing, and social welfare into spatially coherent, craft-specialised hubs. By pooling resources and aligning interventions, these parks aim to overcome the fragmented support typical of current schemes and create sustainable ecosystems tailored to unique artisanal needs (Ministry of Textiles, 2024). To operationalise this vision, a conceptual facility location framework is outlined. This framework prioritises optimal siting of cluster parks based on artisan density, geospatial resource availability, existing production clusters (aligned with One District One Product and Geographical Indications), and logistical accessibility. Such a strategic approach ensures that investments in cluster infrastructure yield maximum developmental impact and foster regional economic balances.

This chapter is organised as follows. The next section provides a brief overview of prevailing schemes, followed by the thematic mapping of these schemes against identified barriers. Subsequent sections discuss policy convergence and gaps, leading to the discussion of a

conceptual facility location framework for the effective utilisation of the proposed handicraft cluster framework.

4.2 Prevalent Schemes for Handcrafted MSMEs

The Indian central and state governments have implemented a range of schemes over the past decade aimed at supporting micro, small, and medium enterprises (MSMEs), including traditional select industries (MoMSME, n.d.). These policies collectively aim to alleviate crucial challenges such as limited access to finance, inadequate infrastructure, fragmented markets, skill gaps, and other institutional challenges (Deshmukh & Chavan, 2024). Their combined objective is to enhance artisan productivity, promote market integration, and ensure sustainable livelihoods across rural and semi-urban areas (A. R. Singh & Pangarkar, 2024). This section presents a systematic overview of major schemes launched by the central and state governments of India related to the pottery and handcrafted textiles industry.

4.3.1 Cross-Sectoral Central Government Schemes for Pottery and Textiles

At the central level, the Prime Minister's Employment Generation Programme (PMEGP), launched in 2008 and administered by the Ministry of Micro, Small and Medium Enterprises (MoMSME), through Khadi and Village Industries Commission (KVIC) and other agencies, remains a flagship scheme facilitating microenterprise formation in the non-farm sector (MoMSME, n.d.). The scheme provides subsidised credit support for establishing new microenterprise units, thereby encouraging entrepreneurship. This scheme specifically benefits women and other disadvantaged groups by offering higher subsidy rates and promoting inclusive entrepreneurship. With a budget allocation of approximately ₹2450 crore for FY 2025-26, PMEGP remains a flagship scheme facilitating microenterprise growth (Press Release: Press Information Bureau, n.d.).

Complementing this is the Scheme for Fund for Regeneration of Traditional Industries (SFURTI), revitalised in 2014 under MoMSME, which focuses explicitly on cluster development for traditional and rural crafts. Allocated ₹425 crore for 2025-26, SFURTI fosters financial and technical support for the creation of common facility centres, design innovation, marketing assistance, and social security, encouraging collective empowerment among artisans (M. Jain et al., 2021; Thomas et al., 2024).

Targeting cluster infrastructure more broadly, the Micro & Small Enterprises – Cluster Development Programme (MSE-CDP) supports cluster-level common infrastructural improvements, focusing on technology, skills, product quality, and market connectivity for small enterprises broadly, including handicraft manufacturers. The emphasis on common facility centres benefits dispersed artisan groups lacking individual capacity to modernise (Press Release:Press Information Bureau, n.d.).

In recent years, the PM Vishwakarma Yojana, launched in 2023 by the MoMSME, has specifically recognised traditional artisans by providing biometric identification, skill development opportunities, toolkits worth up to ₹15,000, and concessional credit access. Budgeted at ₹13,000 crore until 2028, this scheme is designed to uplift informal sector artisans nationwide, including potters and handloom weavers (Press Release:Press Information Bureau, n.d.).

For marketing enhancement, the Procurement and Marketing Support (PMS) scheme (2019–2026) encourages artisan communities to participate in domestic and international exhibitions, while facilitating integration with e-commerce platforms, with an approximate budgetary support of ₹100 crore (Ministry of Textiles, n.d.).

Branding and product specialisation programs such as One District One Product (ODOP), initiated in 2018 under the Ministry of Commerce, leverage geographical indications (GI) to promote district-specific traditional products, including various handicrafts and pottery specialisations (M. Jain et al., 2021). ODOP supports regional identities with cluster recognition, market expansion, capacity building, infrastructure development support, and fostering targeted growth of traditional industries. Furthermore, the Digital India Initiative broadly supports digital literacy and enables artisans' expansion into online marketplaces, complemented by targeted marketing and branding initiatives by the Ministry of Textiles (Schemes of the Office of Development Commissioner (Handicrafts), n.d.).

4.3.2 Government Schemes for the Pottery Segment

Pottery-specific schemes are comparatively focused within the realm of skill and technology upgradation. The Gramodyog Vikas Yojana – Kumbhar Sashaktikaran Programme (GVYKSP), launched in 2020 by the Khadi and Village Industries Commission (KVIC) under MoMSME, emphasises training potters, providing modern equipment such as electric wheels

and pug mills, alongside marketing support (NITI Aayog, 2022). The scheme's budget allocation stood at approximately ₹70 crore for 2023–24 and continues to address workforce and technological challenges unique to pottery artisans (NITI Aayog, 2022).

While a dedicated raw material supply scheme for potters remains absent, challenges related to clay procurement, exacerbated by environmental and regulatory hurdles, are recognised but persist without explicit centralised subsidy support.

Pottery artisans additionally benefit indirectly from broader schemes such as PMEGP, SFURTI, PM Vishwakarma, and MSE-CDP, through access to credit, common facility centres designed for traditional industries and other cluster-level support (MoMSME, n.d.).

4.3.3 Textile-Specific Government Schemes

For the handicraft segment, the National Handicraft Development Programme (NHDP), led by the Office of the Development Commissioner (Handicrafts), revamped in 2021 under the Ministry of Textiles, allocates ₹200 crore (2023–24) toward infrastructure development, market development, social welfare initiatives, and workforce skill building (Press Release:Press Information Bureau, n.d.). Establishment of Urban Haats, national and international exhibitions and e-commerce portals for digital presence are a few initiatives of NHDP. Running through 2026, NHDP plays an essential role in supporting existing weavers and cooperatives with improvements in production and market access.

Furthermore, the Raw Material Supply Scheme for Handloom, launched by the Ministry of Textiles and budgeted at ₹160 crore in 2023-24, provides subsidies on yarn costs and transport support, ensuring affordability and price stability in raw materials procurement for artisan weavers (Press Release:Press Information Bureau, n.d.). This significantly mitigates one of the supply-side constraints identified in the sector.

Closely related is the Comprehensive Handicrafts Cluster Development Scheme (CHCDS), initiated in 2021, concentrating on cluster-based interventions such as design hub creation, technology upgradation, and infrastructure enhancement. With an annual budget of approximately ₹120 crore, CHCDS seeks to bolster market competitiveness for handicraft artisans through coordinated support (Schemes of the Office of Development Commissioner (Handicrafts), n.d.).

A major transformative initiative, the Mega Investment Textile Region and Apparel (PM MITRA) scheme, launched in 2021, under the Ministry of Textiles, spearheads the development of fully integrated textile and apparel parks across India, designed to create a seamless value chain spanning from raw material processing to finished product marketing, including exports. With an investment commitment of nearly ₹4,445 crore for seven parks up to 2027-28, PM MITRA focuses on value chain completeness, leveraging plug-and-play infrastructure and advanced facilities to connect raw materials to export markets effectively (Ministry of Textiles, 2024).

Recognising the importance of digital inclusion, programs such as the Digital India initiative and allied e-commerce integration efforts have been instrumental in enhancing artisans' market reach through web platforms and online sales channels (Deshmukh & Chavan, 2024). While not fully scheme-based for crafts, these programs provide critical infrastructure to overcome marketing and information irregularities.

State governments like those of Rajasthan, West Bengal, and Tamil Nadu supplement central programs with region-specific schemes focused on artisan welfare, cooperative strengthening, and infrastructure development, though these state-level policies vary widely in scale and success (M. Jain et al., 2021). The prominent schemes are tabulated briefly in Table 4.1.

Table 4. 1 Details of Related Schemes

Schemes, Year	Ministry	Brief Objective	Budget (₹ Cr)	Focus Area
PM Employment Generation Programme (PMEGP) (Ongoing, revised 2020)	Ministry of Micro, Small and Medium Enterprises (MoMSME)	Subsidised loans for micro-enterprises	2450 (2025-26)	Finance, Entrepreneurship
Scheme of Fund for Regeneration of Traditional Industries (SFURTI) (Ongoing, revamped 2014)	MoMSME	Cluster organisation of traditional and rural crafts	425 (2025-26)	Technology, Marketing, Workforce, Socioeconomic
Gramodyog Vikas Yojana – Kumbhar Sashaktikaran (Pottery, 2020)	Khadi and Village Industries Commission (KVIC)	Skill/train potters, modern equipment, marketing support	70 (2023-24)	Workforce, Technology
Procurement and Marketing Support (PMS) for MSMEs (2019–26)	MoMSME	Enhance market access, exhibitions, e-commerce integration	100	Marketing
Raw Material Supply Scheme (Handloom) (2021–26)	Ministry of Textiles (MoT)	Price subsidy, transport support	160 (2023-24)	Raw material, finance
National Handloom/handicraft Development Programme (NHDP) (2021-26)	MoT	Infrastructure, market development, social security	200 (2023-24)	Infrastructure, Workforce, Marketing
Comprehensive Handicraft Cluster Development Scheme (CHCDS) (2021-2026)	MoT	Design hub, technology, and infrastructure upgradation	120 per year	Workforce, Finance
PM Vishwakarma Yojana (2023)	MoMSME	Skilling, recognition, toolkit, credit for traditional artisans	13000 (2023-28)	Workforce, Finance
One District One Product (ODOP, 2018–ongoing)	Ministry of Commerce	Identify, brand, support district craft specialisations	Not specified	Marketing
Digital India Initiative	MoT	Direct marketing, online presence	Not specified	Technology, Marketing
Mega Investment Textile Region and Apparel (MITRA) (2021)	MoT	Create world-class, integrated textile and apparel parks	4,445 (7 parks upto 2027-28)	Infrastructure, Technology, Marketing, Raw material, workforce

4.3 Thematic Evaluation of Schemes

The thematic evaluation of government schemes supporting traditional industries, specifically in pottery and handcrafted textiles, reflects a focused convergence on a few critical domains that directly respond to the primary barriers affecting artisan livelihoods. These schemes demonstrate a concerted effort by the central and state governments to alleviate persistent bottlenecks around finance, infrastructure, workforce, and market. However, the evaluation also reveals a few areas where scheme convergence is less pronounced, exposing gaps that limit the full potential of policy impact.

The barriers analysed in the traditional pottery and textile industry using the FAHP-DEMATEL technique can be categorised into four broad categories based on their causal influence and relative importance:

- *High-Leverage Drivers (Critical Causes)*: These are barriers with high weight and strong causal influence that drive systemic challenges. Key examples include Funding Limitations (F1), Cash Flow Management (F2), Skill Development Scarcity (H2 in pottery), and Limited Market Access (M3). These represent root causes that require primary strategic focus to stimulate systemic improvements.
- *Perpetually Significant but Passive Barriers*: Barriers with high weight and visibility but relatively low systemic influence, such as Procurement Issues in pottery and textiles (R1–R3), which cause acute operational challenges but do not shape the overall ecosystem dynamics.
- *Silent Catalysts (Regulatory and Social Barriers)*: Barriers with moderate or low direct priority but strong systemic influence, like Regulatory Hurdles (P1–P4) and Limited Social Support (S1), that subtly influence multiple other constraints across the ecosystem.
- *Reactive or Secondary Barriers*: Barriers such as Low Investment Returns (F3), Market Competition (M1), Ineffective Strategies (M2), and High Production Costs (L1) that often respond to primary constraints and improve once root causes are addressed.

Against these barrier categories, government policies and schemes are mapped for all eight domains to assess convergence and coverage, as discussed below:

- **Financial Constraints (High-Leverage Driver)**: A dominant theme across schemes, particularly the Prime Minister's Employment Generation Programme (PMEGP), PM

Vishwakarma Yojana, and the Weavers' Mudra Scheme, is the provision of subsidised loans, credit subsidies, and easy access to finance for artisans. These financial instruments have been prioritised to directly counteract pressing financial constraints like limited funding and cash flow management challenges, which the FAHP-DEMATEL study highlighted as high-leverage barriers severely restricting microenterprise growth. The focus on disadvantaged groups, especially women artisans, within these schemes enhances inclusion, underscoring the commitment to equitable economic development.

Despite strong policy intent, access bottlenecks persist due to collateral requirements, procedural complexity, and low financial literacy among micro and informal artisans. Enhanced awareness programs and simplified credit access mechanisms remain necessary.

- **Human Capital (High-Leverage Driver):** Schemes like the Gramodyog Vikas Yojana – Kumbhar Sashaktikaran Programme (GVYKSP) and NHDP recognise human capital as a crucial lever. These focus on specialised artisan training, digital literacy, and design innovation, emphasising sector-specific skill development, especially in potters and weavers.

Although skills development receives attention, programs need strengthening to focus on deeper engagement, continuous learning, and upskilling in emerging technologies. Lower job engagement among artisans also calls for more motivational and retention strategies.

- **Market Dynamics (High-Leverage Driver):** Limited market access emerges as a pivotal barrier in both pottery and textile sectors, and government schemes reflect this through dedicated efforts like the Procurement and Marketing Support (PMS) scheme, One District One Product (ODOP) initiative, NHDP marketing components and the Digital India campaigns. These programs facilitate linkages to domestic and international markets, enhance product branding leveraging geographical indications, and open online commerce platforms to artisans. This facilitates better pricing for products and broadens consumer reach. The focus on branding and regional identity through GI tags further complements these market interventions.

However, implementation gaps arise from digital illiteracy, weak rural logistics, and entrenched intermediary networks that limit scheme effectiveness. Greater capacity-building at the grassroots and improved last-mile connectivity would enhance outreach.

• **Logistical Infrastructure (Reactive or Secondary Barrier):** These barriers are mostly addressed with a cluster development approach. Schemes aim to create common facility centres, improve production infrastructure, upgrade technology, and streamline market linkages through collective empowerment, thereby tackling high production costs and supply chain bottlenecks. This cluster focus targets the systemic barriers related to fragmented markets and logistical inefficiencies experienced by dispersed artisan groups who individually lack the capacity to improve logistics and marketing efforts. The Scheme of Fund for Regeneration of Traditional Industries (SFURTI), Micro & Small Enterprises – Cluster Development Programme (MSE-CDP), National Handicraft Development Programme (NHDP), and Comprehensive Handicrafts Cluster Development Scheme (CHCDS) exemplify the convergence toward cluster-based approaches.

However, these improvements mainly benefit organised clusters and larger parks. Scattered and rural artisan groups remain underserved, necessitating proper clustering of communities at different levels to extend the infrastructure benefits beyond core clusters.

• **Raw Material Supply Constraints (Perpetually Significant but Passive):** The area of resource procurement, particularly raw material availability, is partially addressed. Cluster schemes indirectly support resource accessibility. Further, the textile sector, the Raw Material Supply Scheme aids the affordability and reliability of yarn procurement.

However, a major gap exists for pottery artisans who lack dedicated schemes addressing raw material shortages, especially clay sourcing, which is impacted by environmental and regulatory challenges. This omission leaves a critical operational gap unaddressed, extending procurement difficulties that do not conveniently resolve through financial or cluster programs alone.

• **Technological and Innovation Hurdles (Reactive or Secondary Barrier):** Technological challenges are currently ranked as low-leverage barriers having relatively low systemic importance. This is also reflected in schemes that treat technology upgradation as supplementary rather than transformative. Few schemes, such as SFURTI, CHCDS, NHDP, and GVIKSP, focus primarily on these areas with shared objectives. An incremental emphasis on technology adoption is visible, mostly framed within broader cluster and training initiatives rather than as standalone priorities.

In the overall development across the value chain with foundational improvements in core areas like finance and market access, there should be proper investment in technology in prior for maximum efficacy and utilisation.

• **Institutional and Regulatory Framework (Silent Catalyst):** Barriers associated with regulatory frameworks act as “Silent Catalysts” with systemic influence but lower immediate visibility in scheme design. These barriers are addressed indirectly without robust mechanisms through scheme guidelines and welfare initiatives like NHDP and PM Vishwakarma.

Fragmented ministerial governance, overlapping compliance burdens, and policy ambiguity hinder systemic reform. Stronger inter-ministerial coordination and dedicated regulatory reform programs are essential for meaningful impact.

• **Socio-Economic Environment (Silent Catalyst):** Welfare components within NHDP, PM Vishwakarma, and other schemes provide partial social support through health, childcare, and community facilities. Socio-economic challenges such as limited social support and artisan inequality receive minimal direct scheme attention, even though these factors critically affect artisan motivation, equity, and long-term sustainability.

Structural integration of socio-economic upliftment, including education, housing, and social protection within artisan development schemes, remains weak. Addressing socio-economic marginalisation in a holistic manner is vital for sustainable livelihoods.

• **Regional Disparities and State-Level Implementation Variability:** While central schemes provide broad coverage, state government programs vary widely in scale, effectiveness, and focus, leading to uneven benefits across regions. This inconsistency impacts the holistic growth of artisanal sectors and calls for harmonised policy frameworks that integrate central priorities with region-specific needs through better coordination.

The thematic mapping of schemes with identified barrier domains is summarised in Table 4.2.

Table 4. 2 Thematic Mapping of Schemes

Categories → Policies ↓		F	R	H	M	L	T	S
Comprehensive Handicrafts Cluster Development Scheme (CHCDS)		✓	✓		✓	✓	✓	✓
National Handloom Development Programme (NHDP)			✓		✓	✓	✓	

Raw Material Supply Scheme (RMSS)	✓	✓					
Weaver Micro Units Development and Refinance Agency - Pradhan Mantri Mudra Yojna (MUDRA)	✓				✓	✓	
Amended Technology Upgradation Fund Scheme (ATUFS)	✓				✓	✓	
Mega Investment Textile Region & Apparel (MITRA)	✓	✓	✓	✓	✓	✓	✓
Integrated Skill Development Scheme for Textiles and Apparel Sector			✓			✓	
Integrated Processing Development Scheme				✓	✓	✓	
Textile Cluster Development Scheme	✓		✓	✓	✓		
Scheme for capacity building in textile sector (SAMARTH)			✓		✓	✓	✓
Comprehensive Handloom Cluster Development Scheme	✓	✓	✓	✓	✓	✓	
Raw Material Supply Scheme	✓	✓					
Khadi Vikas Yojana		✓		✓			
PM Vishwakarma Yojana	✓		✓			✓	✓
PM Employment Generation Programme (PMEGP)	✓		✓				
SFURTI (Scheme of Fund for Regeneration of Traditional Industries)	✓			✓	✓	✓	
Gramodyog Vikas Yojana – Kumbhar Sashaktikaran			✓			✓	✓
Procurement & Marketing Support (PMS)	✓	✓		✓			
National SC-ST Hub Scheme	✓						✓

This structured thematic evaluation confirms that government schemes ideally converge around the identified critical target areas of finance, skills, and market access, which are the root causes hindering artisan sector development. Secondary and passive issues, such as procurement and infrastructure, receive moderate attention, whereas silent catalytic barriers like regulatory simplification and social support remain under-addressed. Addressing these gaps through integrated, multi-dimensional policy frameworks will be essential for the sustainable and inclusive growth of traditional industries.

Based on the thematic mapping, the coverage is highlighted in Figure 4.2 in terms of the number of schemes targeting the particular domain. Same schemes targeting different domains are also considered.

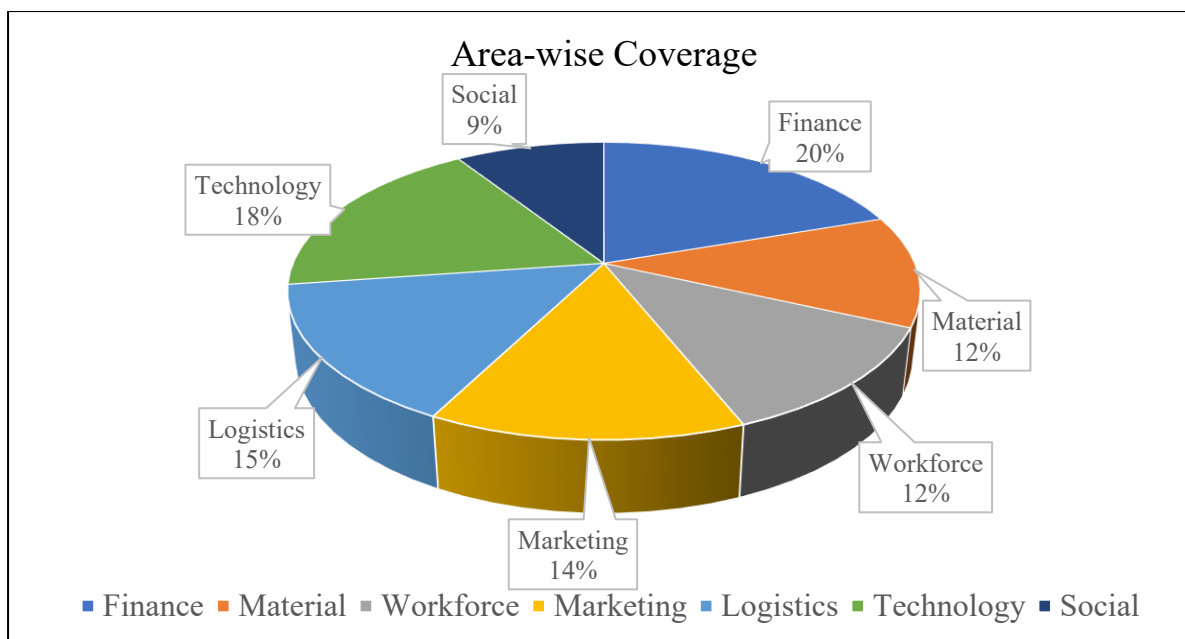


Figure 4. 2 Area-wise Coverage of Schemes (Source: Author’s Own Work)

The following section proposes a ‘Cluster-based Development Parks for Select Products (CB-DPSP)’ policy framework for effective addressal of prevalent barriers with broader coverage across barrier domains.

4.4 Proposed Framework: Cluster-based Development Parks for Select Products (CB-DPSP)

Building on the scheme-barrier mapping and the analysis of convergence gaps, the proposed framework of CB-DPSP offers a comprehensive, integrated solution that directly targets systemic issues and addresses existing mismatches in scheme coverage. Drawing inspiration from the PM MITRA scheme for textiles, which exemplifies an integrated, value-chain park model, CB-DPSP are conceptualised as multifunctional, regionally specialised hubs that provide an integrated approach to production spaces, skill development, raw material availability, access to technology and testing facilities, marketing platforms, logistics, and social welfare infrastructure. This cluster-based model is designed to transcend fragmented interventions, addressing high-impact barrier domains together within a cohesive governance framework.

By aligning craft specialisation with regional cultural identities through ODOP and GI tags and fostering barrier-aligned functional modules such as single-window capital facilitation, dedicated raw material depots, continuous skill and design innovation centres, and embedded

social supports, CB-DPSP targets root causes across barrier domains. Governance through Special Purpose Vehicles (SPVs), comprising state agencies, industry representatives, financial institutions, and artisans themselves, ensures enhanced coordination, accountability, and responsiveness. Overall, CB-DPSP can tackle critical high-leverage barriers by embedding tailored solutions within a consolidated park ecosystem, as explained below.

- **Finance Facilitation:** Each development park provides a one-stop credit facilitation centre, linking artisans with Microfinance Institutions (MFIs), Self-Help Groups (SHGs), and banks. This directly mitigates the prevalent bottlenecks to subsidised credit and working capital faced by micro and informal artisans, overcoming fragmentation and procedural complexities evident in existing schemes.
- **Skill Development and Design Innovation:** Development parks, through the skill and design centre, can serve as a continuous learning hub offering hands-on training, artisan upskilling, digital literacy, and product design innovation. This specialised focus can mitigate the identified scarcity of skilled artisans and the need for sector-specific interventions, particularly in pottery and handloom weaving.
- **Improvement in Market Access:** The development parks incorporating access to market hubs can hold offline showrooms, business-to-business buyer zones, and e-commerce support platforms, along with region-identified branding. These can facilitate direct market linkages, explore new channels, and reduce dependency on intermediaries, addressing the persistent barrier of limited market access with an integrated approach.
- **Raw Material Security:** The availability of raw material banks established within the parks can provide ready access to quality raw materials at an appropriate price. This addresses the critical gap in raw material availability for pottery artisans, which conventional schemes fail to target sufficiently.
- **Shared Technological Infrastructure:** Through common facility centres that encompass shared machinery, testing labs, kilns, looms, and IT facilities, improve production process, improving efficiency and lowering individual investment costs. This addresses operational bottlenecks and underprioritised technological upgrades.
- **Institutional Support:** Each park operating under a Special Purpose Vehicle (SPV) governance model incorporates state agencies, industry bodies, financial institutions, and artisan representatives. This improves accountability, enhances policy coordination across

ministries, and integrates fragmented governance regimes into a singular responsive unit, effectively mitigating weak policy convergence.

- **Social and Welfare Integration:** The social and welfare nucleus within the parks provides community infrastructure such as health centres, childcare facilities, women's hostels, and community spaces. The embedded availability of social support directly addresses socio-economic barriers and artisan marginalisation that is weakly integrated into existing schemes, thereby promoting holistic wellbeing and sustained livelihoods.
- **Overcoming Spatial and Scale Bias:** Unlike dispersed and fragmented artisan communities that often fall outside cluster-based interventions, CB-DPSPs promote craft specialisation following regional branding grounded in ODOP and GI tag alignments. This ensures cultural coherence with the scaling of economies and operational synergies. The institutionalised framework effectively integrates scattered artisans into formalised cluster environments, improving network linkages and domain expertise.
- **Sustainability and Value Chain Completeness:** Through integrated waste management, renewable energy systems, water conservation and a circular economy framework, CB-DPSPs enhance sustainability, aligning with global sustainable development goals (SDGs). The development parks can offer a complete value chain solution, connecting production, skill building, raw material supplies, technological innovation, marketing, logistics, and social welfare under a unified spatial and operational framework, overcoming the isolated and fragmented approaches prevalent in existing policies.

Thus, cluster-based development parks can systematically resolve key convergence gaps and enhance scheme effectiveness by:

- Concentrating fragmented financial and technical support into accessible, locally anchored hubs.
- Securing raw material supply chains, especially for pottery artisans.
- Bridging regulatory and institutional fragmentation through consolidated governance models.
- Embedding socio-economic support systems within the production ecosystem.
- Facilitating integrated market access, design innovation, and technology sharing.
- Aligning policy with spatial and craft-specific realities to expand inclusivity and scale.

By addressing the multi-dimensional barriers jointly rather than through isolated scheme components, Cluster-Based Development Parks offer a forward-looking platform for sustainable, equitable growth and empowerment of traditional industries that complements and extends current government initiatives.

Figure 4.3 reflects the integrated CB-DPSP framework, showing how clustered developmental parks for select products can address critical barriers across domains, creating a sustainable ecosystem for artisans. The model positions the cluster parks at the centre, with each segment detailing the support structures that together form a holistic policy and development strategy. This CB-DPSP framework hence represents a strategic evolution in policy design for handcrafted sectors, transitioning from fragmented subsidy-driven schemes to systemic cluster-based development, facilitating long-term resilience and competitiveness. Overall, these cluster parks offer a scalable, integrated ecosystem that mitigates critical policy gaps uncovered in the thematic evaluation, driving sustainable artisan empowerment, operational efficiencies, market competitiveness, and social inclusion across traditional industry sectors. This framework thus marks a strategic evolution from dispersed scheme-based support to systemic cluster-driven development, holding promise for the comprehensive revitalisation of India’s handicraft heritage and livelihoods.



Figure 4. 3 Conceptual Framework of CB-DPSP Scheme (Source: Author’s Own Work)

Thus, given the integrated benefits associated with cluster-based development parks for traditional industries, it becomes essential to adopt a systematic approach to identify and spatially situate relevant clusters within a single park, while accounting for other geographical, political, and demographic constraints. Facility location modelling for such cluster-based development parks, especially those organised around ODOP and GI-tag products, demands the integration of geospatial, operational, and contextual data layers. It requires essential latitude and longitude coordinates for the intended district, city, and potential park sites. It also needs a distance matrix to quantify the transport distance between different production and demand locations. Then, detailed geographic information on the locations of raw materials abundance, as well as the distribution and density of artisans, adds to further requirements.

To further enhance the analytical precision, a cluster similarity index should be developed, grouping products and their respective locations according to material type, production techniques, and usage patterns. This multi-factorial methodology ensures that facility location decisions optimise logistical efficiency, resource accessibility, workforce allocation, and market linkage, thereby supporting the holistic development of cluster parks aligned with the strategic objectives of sustainable traditional industry growth.

4.5 Summary

Effective policies are critical for traditional industries because they shape access to finance, skills, infrastructure, and markets, all of which determine whether artisan livelihoods remain viable and competitive in a changing economy. For sectors like pottery and handcrafted textiles, policy design and implementation largely decide if these crafts can transition from vulnerable, informal activities into sustainable, value-added enterprises.

This chapter provides a comprehensive evaluation of India's policies and schemes aimed at driving sustainable growth in traditional select industries, focusing on pottery and handcrafted textiles as representative sectors. Based on the results from the previous chapter, the barrier domains were grouped into four categories: high-leverage drivers, perpetually significant but passive barriers, silent catalysts, and reactive or secondary barriers. The assessment then maps existing government schemes against these barrier types, revealing both domains of strong policy convergence and critical gaps.

While financial access, skill development, and market integration receive robust policy support, the chapter identifies persistent gaps in raw material supply (notably for pottery), regulatory reform, technological innovation, and holistic social support. Regional disparities in scheme execution further impede uniform progress across artisanal sectors. Responding to these findings, the chapter introduces the Cluster-based Development Parks for Select Products (CB-DPSP) framework as an integrated ecosystem model that reimagines artisan clusters as integrated parks. Drawing inspiration from large-scale sectoral parks like PM MITRA, CB-DPSP proposes multifunctional clusters tailored to select products and regions. CB-DPSP parks, if properly designed, can bring integrated development to the traditional handicraft manufacturing communities.

This chapter thus advances sectoral policy from a fragmented scheme-based support towards a systemic model that combines barrier-sensitive evaluation, strategic planning, and inclusive development for long-term artisanal empowerment and industry competitiveness. The next chapter elaborates on the innovative marketing for handicraft products for effective revenue and livelihood sustainability.

CHAPTER 5

Analysis of Factors Influencing Subscription Adoption Intention and Behavioural Variations Across Demographic Traits

This chapter examines multi-dimensional factors influencing consumer intention to adopt subscription-based retail models for handcrafted textiles and pottery products. It builds upon the preceding barrier assessment analysis, which identified marketing innovation as a crucial lever in strengthening the retail ecosystem of micro and traditional industries. Subscription retailing, in this context, is explored as a sustainable marketing and distribution mechanism that stabilises revenue flows, strengthens consumer-artisan linkages, and advances ethical consumption.

5.1 Introduction

Micro and small-scale industries, especially handicraft sectors like pottery and traditional textiles, are vital to cultural heritage and rural livelihoods (John, 2023). However, they face substantial marketing and retail challenges that jeopardise their sustainability. Many artisans lack access to modern marketing tools and skills, compelling them to depend on intermediaries (Upendar & Ramulu, 2016). This reduces their profitability and limits consumer reach. Additionally, these handcrafted items face intense competition from cheaper, mass-produced goods and dominant retail brands that undermine their market presence and consumer trust (Khamba & Nanda, 2018b). This is compounded by the inconsistent demand, irregular incomes, and fragmented traditional retail channels, making it difficult to foster customer loyalty or scale operations (S. Mishra et al., 2025). Such barriers hinder the innovation and preservation of these environmentally conscious and culturally rich crafts in an increasingly globalised market (Vasani & Abdulkareem, 2024).

Subscription retailing offers a strategic solution to these issues by providing artisans with predictable and recurring revenue streams, which facilitate better financial planning and production planning (Woo & Ramkumar, 2018). Unlike conventional retail, subscription retailing fosters ongoing relationships between artisans and consumers, reducing demand uncertainty and the risks of overproduction. Subscriptions allow artisans to directly connect with customers who appreciate authentic craftsmanship and sustainable consumption, simultaneously expanding market reach and improving profitability (Lindström et al., 2024).

Moreover, Subscription-based services offer personalised experiences, such as curated product selections and timely replenishments, which boost customer engagement and loyalty (Wilczek et al., 2023). Implementing subscription retail can also streamline marketing efforts, utilising data insights to target diverse demographic segments effectively while promoting sustainable, culturally significant products (Sung & Chattaraman, 2022).

At its core, subscription retailing involves customers paying a recurring fee to receive goods or services at regular intervals, typically weekly, monthly, or annually, through both online and offline platforms (Tao & Xu, 2018). Subscription retailing has grown across various industries by delivering curated products and services to customers at regular intervals, providing convenience, personalised experiences, and predictable revenue for businesses. It encompasses various forms: access-based subscriptions that offer exclusive member benefits; curated subscriptions featuring personalised product assortments; and replenishment subscriptions focused on automating routine item delivery. Across industries such as beauty, fashion, food, entertainment, software, and healthcare, subscription models have transformed one-time transactions into sustained consumer relationships, encouraging customer retention, strengthening brand loyalty, improving inventory control, and supporting sustainable business growth (Bray et al., 2021; Jeong et al., 2024; Rese & Baier, 2025; Tao & Xu, 2020). This model leverages technology and digital platforms to enhance convenience, predictability, and personalisation for both sellers and buyers.

In contrast, subscription retailing in handicraft industries, such as pottery and traditional textiles, offers unique and innovative advantages tailored to the sector's specific challenges (Johnson et al., 2021). These artisans produce culturally significant, eco-friendly products that often suffer from demand uncertainties, market unpredictability, limited marketing reach, and irregular income streams (Naik et al., 2024). Subscription commerce enables artisans to gauge demand through subscription metrics accurately, reducing inventory risks and overproduction while establishing steady revenue flows critical for sustaining livelihoods in these communities (Woo & Ramkumar, 2018). Beyond product delivery, subscription packages can include value-added services such as craft-making workshops, product maintenance, and customised offerings that deepen consumer engagement and build a sense of community around traditional crafts. Furthermore, artisans can foster circular economic practices by reclaiming used items for refurbishment, recycling, or resale, thus promoting environmental sustainability and prolonging product life cycles. For micro and artisanal industries, subscription retailing not

only addresses financial and marketing challenges but also elevates the perceived value of indigenous handcrafted goods, harmonising traditional craftsmanship with contemporary consumer expectations centred on ethical and sustainable choices. Figure 5.1 shows the collage of pottery products, and Figure 5.2 shows the collage of handcrafted textiles and apparel that can be marketed via subscription.



Figure 5. 1 Collage of Earthenware Products for Subscription Retail (Source: Author)

Studying factors influencing subscription adoption intention in the handicraft sector is essential because consumer willingness to subscribe is influenced by a complex interplay of product utility, subscription benefits, perceived risks, social norms, and demographic traits (Bray et al., 2021). Understanding these factors helps design more effective, inclusive, and scalable subscription offerings that not only support economic sustainability for artisans but also foster ethical and sustainable consumer behaviour (Gal-Or & Shi, 2022). Given the intricacies of traditional craft markets, tailoring subscription models and marketing strategies to demographic and psychographic variations can drive higher adoption, strengthen relationships, and amplify the socioeconomic impact of these industries (Jeong et al., 2024; Saenger & Thomas, 2021). Thus, subscription retailing stands out as an innovative and effective approach to overcoming the persistent barriers faced by traditional craft industries, supporting their economic viability, market expansion, and sustainable cultural preservation (S. Bischof & Rudolph, 2021). Moreover, recognising differences in adoption behaviour across age, income,

environmental consciousness, and ethical values enables tailored marketing strategies that improve uptake and foster sustained engagement (Lian & Yen, 2014; Tao & Xu, 2020). Such insights are critical to maximising the social and economic impacts of subscription retailing by bridging the gap between artisans' needs and consumer expectations (Dahiya et al., 2022). Thus, subscription retailing stands as a transformative, innovative solution to address the marketing and livelihood challenges faced by handicraft industries, enabling them to thrive sustainably in a modern retail environment while honouring their cultural and environmental values (Day et al., 2020).

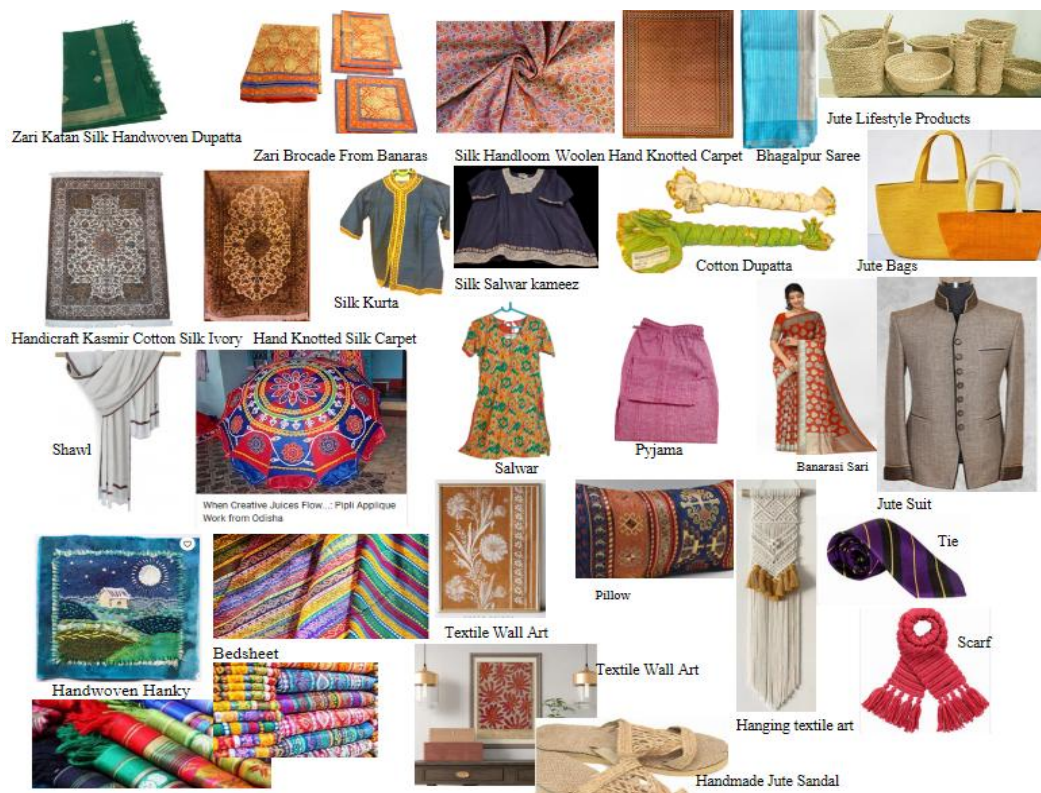


Figure 5. 2 Collage of Handcrafted Textiles and Apparel for Subscription Retail
(Source: Author)

This chapter addresses the following research questions (RQs) to systematically examine consumer subscription adoption in handicraft sectors, particularly pottery and textiles:

- RQ1. What are the key factors (drivers and inhibitors) influencing consumers' intention to subscribe to handcrafted pottery and textile products?
- RQ2. How do barriers (such as perceived risks, product inhibitors, and market limitations) moderate the relationship between motives (product utility, social norms, and subscription benefits) and subscription intention?

RQ3. Do the influences of these factors on subscription intention differ significantly across demographic and psychographic traits?

Through solving the above-mentioned research questions, this chapter fulfils the following research objectives:

Objective1. To identify and evaluate the primary drivers and inhibitors affecting consumers' subscription intention using integrated behavioural theories like the Theory of Reasoned Action and Innovation Resistance Theory.

Objective2. To assess the moderating effects of barriers on the strength and direction of relationships between subscription motives and adoption intention.

Objective3. To analyse how factors influencing subscription intention vary across demographic and psychographic segments, providing insights for tailored marketing strategies in traditional industries.

Addressing these questions advances a comprehensive framework for understanding subscription retail dynamics in artisanal sectors and supports the design of sustainable retail innovations that improve the marketing and retail of artisan communities.

The chapter is outlined as follows. Section 5.2 describes consumer behaviour theories that give foundation to the formation of the research model. Then the chapter provides briefs about different factors that affect subscription intention. The methodology section describes the research model, method and tool used to examine the factors. This is followed by the results section that outlines the outcomes from the analysis. This section is followed by the theoretical and managerial implications of the results.

5.2 Consumer Behavioural Theories

This study integrates key principles from established consumer behaviour theories to identify suitable factors influencing subscription adoption for handcrafted pottery and textiles. These theories form the conceptual grounding for understanding the psychological and evaluative processes that shape consumers' evaluation of subscription offerings and decide their engagement with subscription retailing. First is the Technology Acceptance Model (TAM), which posits that perceived usefulness and ease of use are primary determinants of technology adoption intentions (Davis, 1989). In subscription contexts, TAM explains how practical

utilities such as convenience, cost-effectiveness, and customised delivery shape positive attitudes toward recurring artisanal product services.

Complementing TAM, the Diffusion of Innovation Theory (DOI) explains adoption through innovation attributes like relative advantage, compatibility, complexity, trialability, and observability (Rogers, 2003). DOI is significant in the subscription retailing context as it represents an innovative retail model whose perceived superiority over traditional channels and alignment with consumer values (e.g., sustainability) influence uptake in niche handicraft markets.

The Social Cognitive Theory (SCT) elucidates behaviour through reciprocal interactions among personal factors, environmental influences, and behavioural patterns (Bandura, 1986). SCT underpins subjective norms and personal norms by highlighting how observational learning, self-efficacy, and internalised values drive ethical consumption behaviours, such as supporting artisans via subscriptions.

Furthermore, the Unified Theory of Acceptance and Use of Technology (UTAUT) synthesises performance expectancy, effort expectancy, social influence, and facilitating conditions, moderated by demographics like age and experience (Venkatesh et al., 2003). UTAUT accounts for variations in factor influences across consumer segments, informing tailored strategies for handicraft subscriptions.

Addressing adoption resistance, the Innovation Resistance Theory (IRT) categorises barriers into functional (usage, value, risk) and psychological (tradition, image) dimensions (Ram & Sheth, 1989). IRT is central to modelling inhibitors like perceived subscription risks, product utility impediments, and market barriers that hinder intention despite motivational drivers. Additionally, Prospect Theory (Kahneman & Tversky, 1979) enriches this theoretical foundation by highlighting how consumers' decision-making under risk and uncertainty is influenced by the asymmetric evaluation of potential gains versus losses. This theory suggests that loss aversion and the framing of subscription offers impact consumers' willingness to take subscription-related risks, particularly relevant in artisanal markets where product quality uncertainty and commitment to recurring payments pose perceived risks.

An important consumer behaviour assessment theory is the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), along with its extension, the Theory of Planned Behaviour (TPB)

(Ajzen, 1991), which posits that an individual's behavioural intention is primarily influenced by their attitude toward the behaviour and perceived social norms. TPB further includes perceived behavioural control, reflecting the ease or difficulty of performing the behaviour. Both theories emphasise that intentions shaped by beliefs about behavioural outcomes and social expectations are immediate precursors to actual adoption decisions. In the context of subscription retailing, these models explain how positive attitudes toward subscription benefits and supportive social norms increase consumers' willingness to subscribe.

Together, these theories form a robust framework that helps in the selection of key constructs such as utility perceptions, social and personal norms, hedonic motivations, perceived risks, and barriers that shape subscription adoption intentions. This integrated theoretical approach enables a nuanced analysis of consumer behaviour in the unique context of handcrafted pottery and textile subscription retailing.

5.3 Factors Affecting Subscription Intention

Subscription adoption is shaped by different barriers categorised broadly as motives (drivers) and barriers (deterrents). Motives span practical subscription benefits (utilitarian and hedonic, such as convenience, variety, value, and enjoyment), personal psychological traits (attitudes, lifestyle, self-efficacy, fashion orientation), and social factors (subjective norms, social and environmental values) (Baek & Kim, 2022; Bray et al., 2021; Woo & Ramkumar, 2018). Conversely, barriers comprise anticipated risks (privacy, product quality, trust, cost), product-specific usage obstacles, and external market constraints (Day et al., 2020; Nagaraj et al., 2021). While existing research addresses these factors in general consumer contexts, with most of the factors studied in isolation, except for a few. Traditional handcrafted products bring additional cultural, functional, and market considerations that further complicate consumer decision-making (Ghazinoory et al., 2020). The following sections specify how these factors operate within the pottery and textile subscription domains, referencing specific consumer behaviour theory components from the previous theoretical discussion.

5.3.1 Factors Affecting Subscription Intention for Pottery

For pottery subscription, the study adopts and integrates insights from the Theory of Reasoned Action (Ajzen, 1991) and Innovation Resistance Theory (Ram & Sheth, 1989). The Theory of Reasoned Action emphasises that consumers' intention to subscribe is shaped by their attitudes

toward the behaviour, the influence of social norms, and perceived behavioural control. These components affect how positively or negatively consumers view the benefits of subscribing, how much social pressure or approval they perceive from their environment, and their confidence in their ability to engage in the subscription (Sardanelli et al., 2019). Complementing this, Innovation Resistance Theory provides a lens to understand the barriers that impede adoption, which include functional and psychological resistance. Functional resistance encompasses perceived difficulties in product usability, such as fragility or cleaning issues common in pottery, while psychological resistance covers deeper barriers like tradition and norms that may conflict with adopting new retail models (Talwar et al., 2024). Together, these theories give a comprehensive view of both the motivating factors and obstacles affecting subscription intention for pottery. The following factors are considered for assessing subscription intention for pottery items and services.

- **Subscription Utilitarian Values (SUV):** Subscription Utilitarian Values (SUV) refer to the practical benefits that consumers seek when subscribing to pottery products. These include saving time and effort, receiving personalised deliveries, and making cost-effective purchases, which together make subscription services efficient and convenient (Bray et al., 2021; Woo & Ramkumar, 2018). This factor aligns with the attitude component of the Theory of Reasoned Action (TRA), where positive beliefs about these practical advantages foster favourable subscription intentions.
- **Product Usage Values (PUV):** PUV captures the intrinsic benefits of pottery items such as environmental sustainability, aesthetic appeal, and cultural and traditional significance (Chakraborty et al., 2023). Quality, ease of use, and product information also influence subscription intention (Day et al., 2020). These values relate to TRA's attitude construct, as consumers' positive evaluations of the product's inherent utility encourage subscription adoption.
- **Normative Influence (NI):** Normative influence encompasses the ethical and social influences that motivate consumers to subscribe (Leong et al., 2023). These norms, stemming from family, friends, and community expectations, reinforce behaviour aligned with supporting artisans and preserving cultural heritage (Woo & Ramkumar, 2018). Normative influence reflects the social pressure and approval elements of TRA, strengthening subscription intention through normative influence (Ajzen, 1991).

- Perceived Subscription Risks (PSR): PSR include concerns about privacy, trust, long-term commitment, product quality, and complexities with returns or refunds. These risks act as the ‘image’ component of barriers under Innovation Resistance Theory (IRT), capturing psychological apprehensions that reduce consumers’ willingness to engage with subscriptions (S. F. Bischof et al., 2020; Nagaraj et al., 2021).
- Product Utility Impediments (PUI): PUI represent functional difficulties such as the fragility of pottery, difficulties in cleaning, and preferences for more durable alternatives. These inhibit subscription adoption by creating mismatches between consumer expectations and product performance, consistent with IRT’s ‘usage’ barrier (Dahiya et al., 2022).
- Perceived Access Constraints (PAC): PAC refer to external constraints like limited product variety, inadequate promotion, reduced visibility, and poor local availability that makes the intention to adopt a behaviour difficult. These factors lower the perceived value and convenience of subscriptions ultimately hindering adoption (Nath & Agrawal, 2023).

The above discussion leads to the following hypotheses about the factors influencing subscription intention:

H1: Subscription Utilitarian Values (SUV) positively motivate pottery subscription intention.

H2: Product Usage Values (PUV) positively motivate pottery subscription intention.

H3: Normative Influence (NI) positively motivate pottery subscription intention.

H4: Perceived Subscription Risks (PSR) negatively affect pottery subscription intention.

H5: Product Utility Impediments (PUI) negatively affect pottery subscription intention.

H6: Perceived Access Constraints (PAC) negatively affect pottery subscription intention.

The study also investigates the moderating role of demographic and experiential factors on adoption intentions. Moderation analysis explores whether variables such as age, gender, relationship status, education, income, location, and subscription experience influence the strength or direction of the relationships between motives, barriers, and subscription intention (Byrne, 2016). Drawing on prospect theory, which posits that consumers weigh perceived

losses more heavily than gains, the study examines whether barriers (PSR, PUI, PAC) moderate the influence of motives (SUV, PUV, NI).

The related hypotheses for moderation are:

H7a-f: Age moderates the effects of (a) SUV, (b) PUV, (c) NI, (d) PSR, (e) PUI, and (f) PAC on pottery subscription intention.

H8a-f: Income moderates the effects of (a) SUV, (b) PUV, (c) NI, (d) PSR, (e) PUI, and (f) PAC on pottery subscription intention.

H9a-f: Education moderates the effects of (a) SUV, (b) PUV, (c) NI, (d) PSR, (e) PUI, and (f) PAC on pottery subscription intention.

H10a-f: Gender moderates the effects of (a) SUV, (b) PUV, (c) NI, (d) PSR, (e) PUI, and (f) PAC on pottery subscription intention.

H11a-f: Relationship status moderates the effects of (a) SUV, (b) PUV, (c) NI, (d) PSR, (e) PUI, and (f) PAC on pottery subscription intention.

H12a-f: Subscription experience moderates the effects of (a) SUV, (b) PUV, (c) NI, (d) PSR, (e) PUI, and (f) PAC on pottery subscription intention.

Additionally,

H4a-c: Perceived subscription risks weaken the relationships between (a) SUV, (b) PUV, and (c) NI with pottery subscription intention.

H5a-c: Product utility impediments weaken the relationships between (a) SUV, (b) PUV, and (c) NI with pottery subscription intention.

H6a-c: Perceived access constraints weaken the relationships between (a) SUV, (b) PUV, and (c) NI with pottery subscription intention.

The hypotheses formulated are illustrated visually in Figure 5.3.

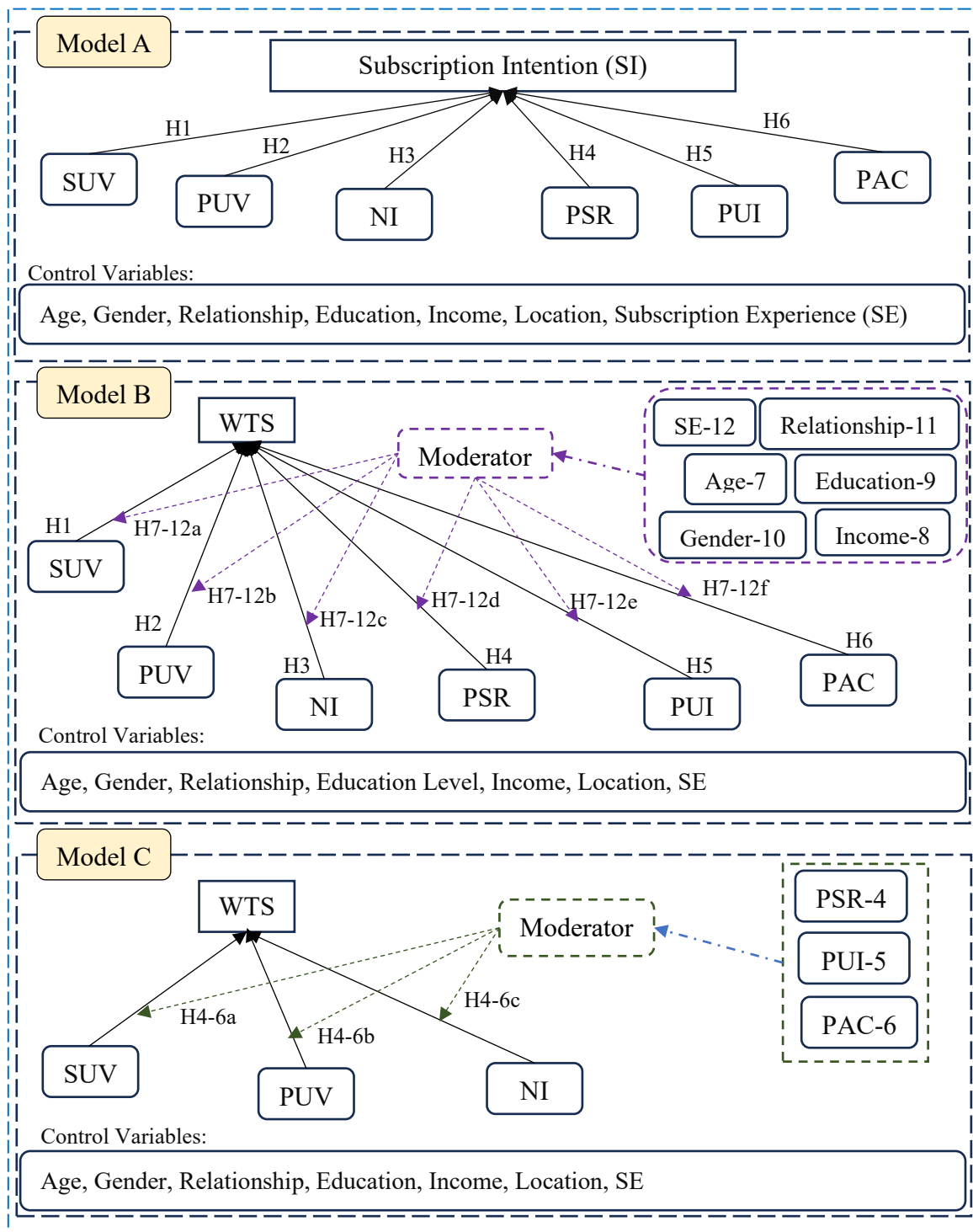


Figure 5. 3 Integrated Research Model for Subscription Adoption Intention (Source: Author)

5.3.2 Factors Affecting Subscription Intention for Textiles

In the case of textile subscriptions, the study combines and applies the principles of the Theory of Planned Behaviour (Ajzen, 1991) and Innovation Resistance Theory (Ram & Sheth, 1989). The Theory of Planned Behaviour suggests that consumers' subscription intentions are influenced by their attitudes towards the behaviour, social norms, and perceived behavioural

control, reflecting the influence of personal beliefs, societal expectations, and perceived ease or difficulty of subscribing. This helps explain how positive attitudes, social endorsement, and confidence in their ability to subscribe encourage adoption. In parallel, Innovation Resistance Theory outlines the inhibitors that diminish subscription intention, including functional barriers like product maintenance challenges and psychological barriers such as conflicts with tradition, cultural image, and norms. This approach considers both the underlying drivers that promote subscription behaviour and the barriers that create resistance, providing a balanced understanding of consumer decision-making in the textile sector. The following factors are considered to assess subscription intention for handcrafted textiles and services.

- **Subscription Utilitarian Values (SUV):** SUV represents the practical benefits of subscription services that encourage adoption, including ease of use, cost-effectiveness, comfort, variety, and time and effort savings. These utilitarian values foster a positive attitude toward subscriptions by highlighting their convenience and functional advantage, consistent with the attitude component of the Theory of Planned Behaviour (K. Bhatt, 2022).
- **Subscription Utility Risks (SUR):** SUR refers to anticipated negative outcomes such as financial loss, poor product value, and dissatisfaction. This barrier comprises performance risk, which involves concerns about product quality, fit, and value failing to meet expectations, and utility risk, related to challenges in the subscription process, like the inability to inspect items, losing the social shopping experience physically, and commitment constraints (Kwon & Noh, 2010). These risks create functional resistance to adoption, aligning with the ‘risk’ barrier dimension of Innovation Resistance Theory. This study models SRB as a second-order construct reflected by Performance Risk (PR) and Process Risk (UR) as first-order constructs, both denoting the risk barrier dimension of IRT. PR captures the risk of receiving poor-performing products via subscription boxes in terms of quality, value and fit, resulting in disenchantment with the functional benefits. UR represents risk associated with the subscription process and consumption experience, such as inability to physically inspect items, missing social shopping experience, commitment constraints, and mismatch with personal needs.
- **Subscription Hedonic Values (SHV):** SHV captures the emotional and experiential appeal of subscription services, such as excitement, surprise, trendiness, and enjoyment. These

intrinsic motivations enhance positive attitudes toward subscribing by fulfilling consumers' desires for novel and pleasurable experiences (D. Bhatt et al., 2021; Tao & Xu, 2020).

- Normative Influence (NI): NI represents the influence of social expectations, cultural values, and peer pressure on subscription intention. These norms bring a sense of social approval and responsibility in consumers, encouraging sustainable and ethical consumption patterns (Chakraborty et al., 2023; Patwary et al., 2023; Stibe & Cugelman, 2019).
- Intrinsic Fashion Motivation (IFM): IFM reflects personal beliefs, cultural identity, and values that drive subscription adoption in fashion (Bandura, 1986). It includes self-expression through fashion identity, a desire for novelty and creativity, and the pursuit of enjoyment and uniqueness, reflecting deeper, intrinsic motivators aligning with Self-Determination Theory (Pappas, 2018; Sung & Chattaraman, 2022). In this study, IFM is conceptualised as a second-order construct reflected through Fashion Identity Orientation (FIO), Innovative Fashion Orientation (IFO), and Enjoyment and Uniqueness Orientation (EUO). FIO captures self-identity expression through fashion. IFO reflects intrinsic motivation for novelty and creativity in fashion choices. EUO emphasises individuality experienced through fashion.
- Product Value Barrier (PVB): PVB highlights perceived practical value challenges to product usage that hinder subscription adoption, reflecting the 'value' barrier dimension of IRT. PVB highlights perceptions of practical challenges related to product quality, design, appearance, and innovation that may deter consumers from subscribing. These barriers reduce perceived value and satisfaction with the subscription offering (Ram & Sheth, 1989).
- Perceived Access Risks (PAR): PAR captures structural obstacles that limit consumers' ease of subscribing, such as poor product availability, inadequate promotion, and low market visibility. When consumers perceive limited access to handcrafted textile products, their perceived behavioural control decreases, reducing their likelihood of adoption (Huynh, 2022).

Based on the above discussion, the study posits the following hypotheses:

H1. Subscription Utilitarian Values positively drive handcrafted-textiles subscription intention.

H2. Subscription Utility Risks negatively influence handcrafted-textiles subscription intention.

H3. Subscription Hedonic Values motivate handcrafted-textiles subscription intention.

H4. Normative Influence motivate handcrafted-textiles subscription intention.

H5. Intrinsic Fashion Motivation favours handcrafted-textiles subscription intention.

H6. Product Value Barriers negatively impact handcrafted-textiles subscription intention.

H7. Perceived Access Risks negatively influence handcrafted-textiles subscription intention.

The hypotheses are summarised visually in Figure 5.4.

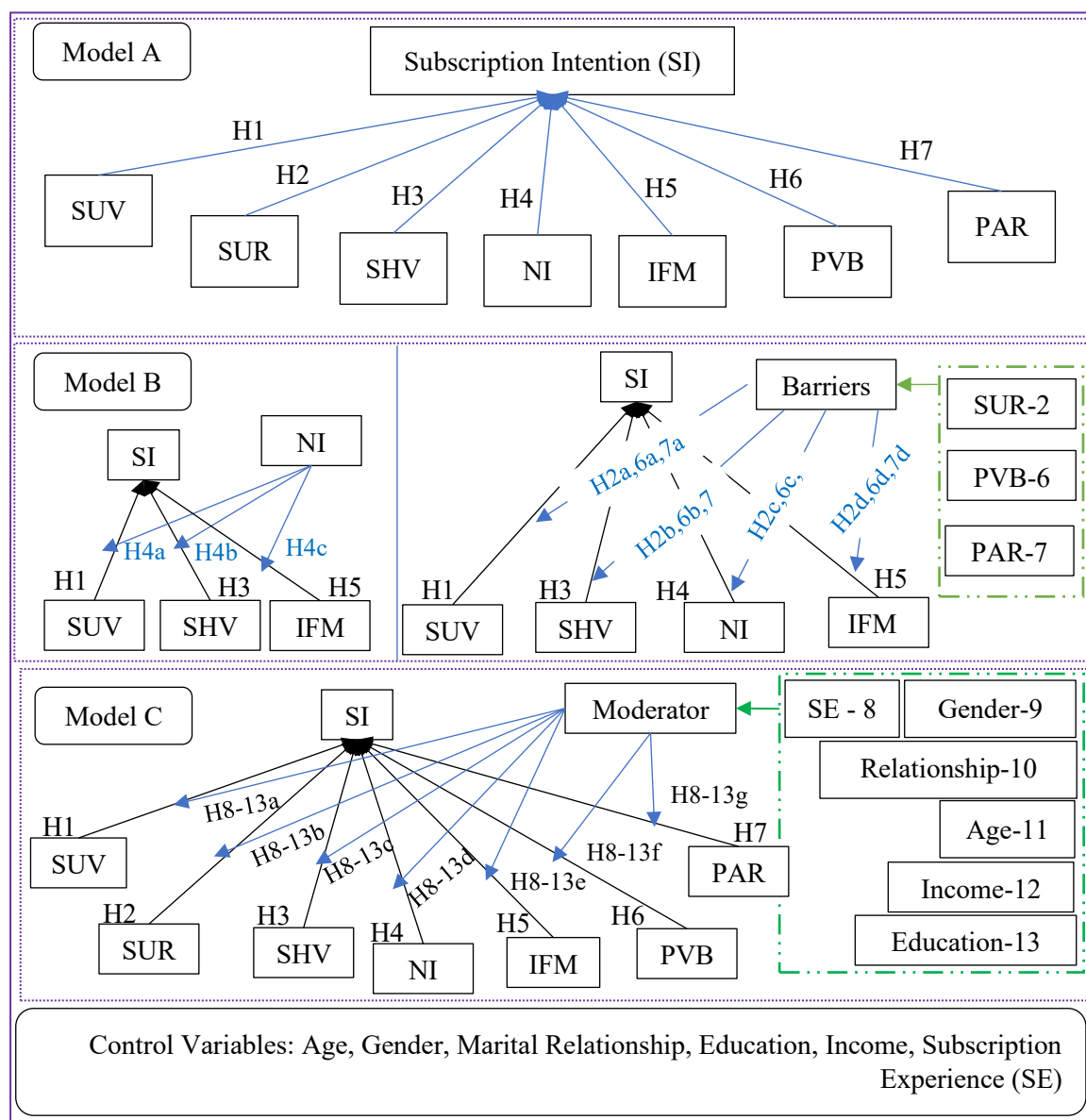


Figure 5. 4 Research Model for Subscription Intention Behaviour Analysis (Source: Author)

The literature also highlights the importance of studying the moderating effects of various factors on adoption intentions. For example, Chakraborty et al. (2023) analysed how demographics such as age, gender, and household size moderate relationships between different value types and repurchase intention. Similarly, S. Gupta et al. (2023) examined the moderating role of reviews and recommendations on willingness to pay, while Jo (2024) found that perceived risk negatively moderates the relationship between perceived usefulness and willingness to pay. Research by Woo & Ramkumar (2018) and Nath & Agrawal (2023) further emphasises the importance of demographic and other moderators in understanding the strength of relationships between adoption factors and intentions.

Building on these insights, this study examines whether social norms moderate the relationship between motivational factors and subscription intention. Subjective norms might strengthen the effects of drivers on subscription adoption behaviour, as demonstrated by Benita et al. (2023). Empirical evidence from Jo (2024) also supports that perceived risks weaken the influence of perceived usefulness and willingness to pay; accordingly, this study investigates whether subscription risk barrier, product value barrier, and perceived access risk similarly moderate the influence of motivation factors on subscription intention. In addition, demographic variables, including gender, age, income, relationship status, education, and subscription experience (SE), are examined as moderators affecting the relationships between all identified factors and subscription adoption.

The specific moderation hypotheses are:

H2a-d: Subscription Utility Risks weaken the relationship between Subscription Usefulness (H2a), Hedonic Values (H2b), Social Norms (H2c), and Intrinsic Fashion Motivation (H2d) with handcrafted textile and apparel subscription intention.

H4a-c: Normative Influence strengthen the relationship between Subscription Usefulness (H4a), Subscription Hedonic Values (H4b) and Intrinsic Fashion Motivation (H4c) with handcrafted textile and apparel subscription intention.

H6a-c: Product Value Barriers weaken the relationship between Subscription Usefulness (H6a), Subscription Hedonic Values (H6b), Social Norms (H6b), and Intrinsic Fashion Motivation (H6c) with handcrafted textile and apparel subscription intention.

H7a-c: Perceived Access Risks weaken the relationship between Subscription Usefulness (H7a), Subscription Hedonic Values (H7b), Social Norms (H7c), and Intrinsic Fashion Motivation (H7d) with handcrafted textile and apparel subscription intention.

H8a-g: Subscription Experience moderates the relationship between Subscription Usefulness (H8a), Subscription Risk Barrier (H8b), Hedonic Values (H8c), Social Norms (H8d), Intrinsic Fashion Motivation (H8e), Product Value Barrier (H8f), and Perceived Access Risk (H8g) with handcrafted textile and apparel subscription intention.

H9a-g: Gender moderates the relationship among all the factors above (H9a-g) with handcrafted textile and apparel subscription intention.

H10a-g: Relationship status moderates the relationship among all factors (H10a-g) with handcrafted textile and apparel subscription intention.

H11a-g: Age moderates the relationship among all factors (H11a-g) with handcrafted textile and apparel subscription intention.

H12a-g: Income moderates the relationship among all factors (H12a-g) with handcrafted textile and apparel subscription intention.

H13a-g: Education moderates the relationship among all factors (H13a-g) with handcrafted textile and apparel subscription intention.

5.3.3 Measurement Development

To measure the underlying constructs discussed above, the measurement development of constructs followed a systematic inductive approach, adapting established scales from prior literature to the specific contexts of pottery and textile subscription commerce. This involved identifying latent constructs, generating contextually relevant items through literature review and expert input, and ensuring content validity before pilot testing. Constructs were operationalised as reflective indicators measured via Likert scales, with final items refined for clarity and relevance.

Measurement development of constructs influencing pottery subscription adoption intention: The latent variables (constructs) and their measures were adapted from the existing scales and modified to the study context. SUV indicators are based on Bray et al. (2021). PUV are inferred from Chakraborty et al. (2023). Ramkumar & Woo (2018) form the basis for NI. The indicators of PSR are adapted from Bray et al. (2021). The studies of Nath & Agrawal (2023) and Ram & Sheth (1989) form the basis for PUI and PAC. Subscription intention indicators are drawn from Bray et al. (2021) and Woo & Ramkumar (2018). Final constructs and measurement items were validated through expert consultation to ensure the instrument's content validity.

Similarly, for the analysis of factors affecting handcrafted textile and apparel subscription intention, in the present study, the indicators reflecting research model constructs are adapted from the literature and modified to the study context. Items of SUV and SHV are inferred from Tao & Xu (2020) and Ramkumar & Woo (2018). Items from Ram & Sheth (1989) and Day et al. (2020) are referred to for constructing SUR items. Ahn et al. (2020) and Ramkumar & Woo (2018) became the starting point of NI. Sung & Chattaraman (2022) and Ramkumar & Woo (2018) are referred to for IFM. Nath & Agrawal (2023) and Ram & Sheth (1989) form the basis for PVB. PAR items are motivated by Patwary et al. (2023) and Nath & Agrawal (2023). Table 5.4 lists the research model constructs and their measurement items used in this study. The following section illustrates the methodology for hypothesis testing.

5.4 Methodology

The study employed Structural Equation Modelling (SEM) using IBM SPSS AMOS 28 Graphics Software to test the proposed hypotheses. Figure 5.5 presents the methodological framework used to assess subscription intention, which can also be applied to other product and service categories. The framework involves key steps: developing hypotheses, collecting data through a survey instrument, cleaning the data, testing the measurement model for fit, and evaluating the structural model to test hypotheses. The next section details the method and tool used for the analysis.

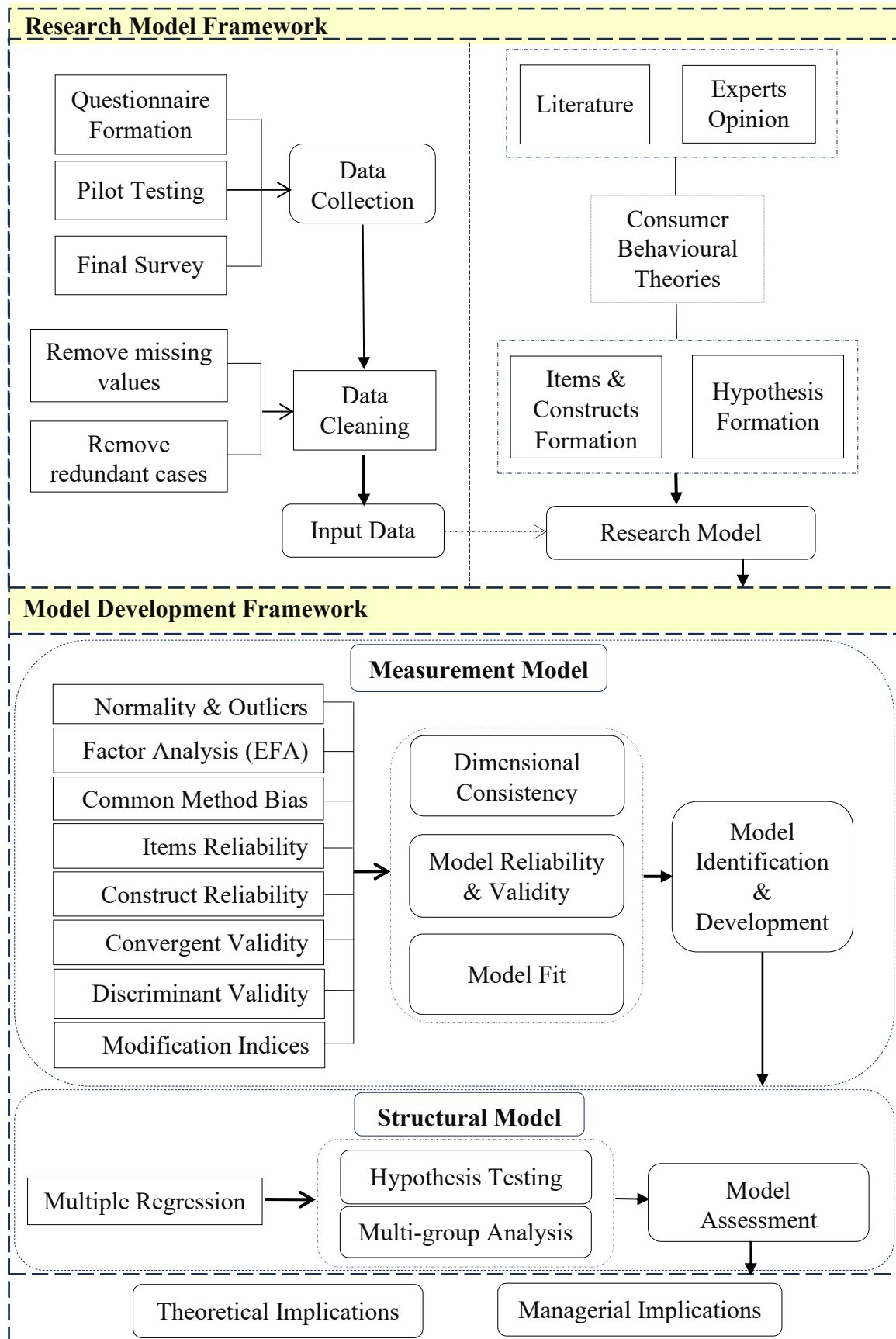


Figure 5. 5 Research Methodological Framework (Source: Author)

5.4.1 Structural Equation Modelling

Structural Equation Modelling (SEM) is a comprehensive statistical approach that allows researchers to examine and estimate complex causal relationships between observed and latent variables within a single analytical framework (Dogra & Kaushal, 2023; Ramesh et al., 2020). Unlike methods such as multiple regression and path analysis, SEM can simultaneously assess multiple interrelated dependencies and incorporate latent constructs, unobserved variables inferred from measured indicators, which are often essential in studying complex behavioural constructs like subscription intention (Devakumar & Barani, 2016). SEM integrates two key components: the measurement model, which assesses the validity and reliability of latent constructs through Confirmatory Factor Analysis (CFA), and the structural model, which examines hypothesised causal paths among these constructs.

This study utilised SEM through the IBM SPSS AMOS 28 Graphics Software, which implements covariance-based SEM (CB-SEM). CB-SEM was preferred over variance-based methods like Partial Least Squares SEM (PLS-SEM) because CB-SEM provides more precise parameter estimates by accounting for the shared covariance structure among variables, making it particularly suited for theory testing and confirmation with large sample sizes (Byrne, 2016; Cheah et al., 2020). CB-SEM rigorously evaluates model fit through indices that indicate how well the theoretical model represents the observed data, a critical advantage for validating complex models.

This study uses AMOS for its user-friendly graphical interface that facilitates model specification and interpretation, and its strong capabilities in performing CB-SEM analyses (D. Singh et al., 2017). It enables detailed examination of measurement validity, reliability, and structural relationships within one platform. This approach ensures robust testing of hypotheses concerning subscription intention by accommodating the multi-dimensional influences of motives, barriers, and subjective factors captured as latent variables (Byrne, 2016). Overall, SEM with AMOS and CB-SEM offers a powerful and reliable methodological framework suitable for investigating and confirming complex behavioural models in social science research.

5.4.2 Data Collection

Data collection employed a quantitative survey-based approach using structured online questionnaires to gather primary data on subscription intention for traditional industries.

5.4.2.1 Survey Instrument Development

The study used bilingual online surveys (English and Hindi) developed using Google Forms, where each section comprised each construct and an additional section incorporating demographic questions. The survey explained the study's purpose, key concepts used in the survey, and assured data confidentiality to foster respondent trust and clarity.

For the subscription adoption assessment of pottery subscription, Latent constructs were measured using a five-point Likert agreement scale ranging from 1 (strongly disagree) to 5 (strongly agree), enabling a nuanced capture of attitudes toward factors influencing subscription behaviour. Subscription intention specifically employed a simplified three-point likelihood scale from 1 (not likely) to 3 (extremely likely), justified by research demonstrating that shorter scales reduce respondent cognitive load, enhance response reliability, and eliminate middle-category ambiguity for more decisive and interpretable data, as evidenced by Jacoby & Matell (1971) and Kutscher & Eid (2020).

For the textile subscription adoption intention, all survey items utilised a consistent five-point Likert agreement scale from 1 (strongly disagree) to 5 (strongly agree) to quantify attitudes across constructs, with key terminologies clearly defined within the instrument. The design underwent academic expert review to optimise clarity, flow, and comprehension, ensuring accessibility for diverse respondents while maintaining psychometric robustness.

5.4.2.2 Pilot Survey

Pilot surveys served as essential pre-tests to validate the survey instruments, identify comprehension issues, refine question wording, assess flow and timing, and ensure overall reliability before full-scale deployment. This step minimised errors in the main data collection, enhanced respondent experience, and confirmed internal consistency of constructs, following standard practices in survey methodology.

For the assessment of factors influencing pottery subscription intention, the pilot involved 53 academic researchers from diverse departments who completed the bilingual Google Forms questionnaire under realistic conditions. Feedback focused on language clarity, structural organisation, and logical flow, leading to targeted revisions that improved conciseness, eliminated ambiguities, and enhanced overall comprehension without altering core measurement items. Completion times were recorded to verify feasibility, and preliminary

checks confirmed adequate internal consistency, preparing the instrument for broader distribution.

For the handcrafted textile and apparel subscription case study, 47 pilot responses were received, which provided detailed input on the questionnaire. They suggested shortening lengthy sentences, removing repetitive phrases across sections, and improving readability, resulting in a streamlined version. Respondents also verified internal consistency of construct items through reliability analysis and noted respondent engagement levels, ensuring the instrument's psychometric robustness prior to final rollout.

5.4.2.3 Final Survey Administration and Distribution

The final surveys were administered through online Google Forms. Accessibility and ethical compliance were ensured by providing respondents with comprehensive briefings on research objectives, voluntary participation, data confidentiality, and response anonymity prior to filling out the survey. This approach adhered to established standards for informed consent in survey research, fostering respondent trust while facilitating efficient data capture across both studies.

For the pottery subscription case study, the online survey commenced on March 1, 2023, and concluded in June 2023, yielding 709 valid responses from individuals possessing pottery usage experience and awareness of subscription commerce across various Indian states. Distribution occurred through multiple digital channels, including WhatsApp, Instagram, Facebook, LinkedIn, and email, utilising diverse personal and professional accounts and pages to target relevant audiences and achieve generalizability beyond Fornell & Larcker (1981), as recommended by Cochran (1977).

For the handcrafted textile subscription case study, the data collection was done from July 2023 to May 2024, resulting in 970 usable responses. The instrument was disseminated via LinkedIn, Facebook, webmail, X (formerly Twitter), and WhatsApp through an array of accounts and pages, securing broad demographic representation consistent with Hair et al.'s (2019) guideline of ten observations per item for structural equation modelling with 50-55 constructs.

5.4.3 Data Analysis

Following data collection, preliminary screening was conducted for both pottery and textile datasets to ensure quality and suitability for structural equation modelling. In the pottery study, 13 redundant responses were identified and removed, while normality assessments confirmed

skewness and kurtosis values within the acceptable ± 2 range (Chakraborty et al., 2023). Subsequently, 10 potential outliers were detected using Mahalanobis distance and excluded to improve model fit (Hair et al., 2019). Similarly, the textile dataset involved removal of 7 redundant responses and five outliers via Mahalanobis distance, with item normality verified through skewness and kurtosis falling between acceptable thresholds (Chakraborty et al., 2023; Hair et al., 2019). To enhance parameter, estimate accuracy and stability, particularly under non-normal conditions, bootstrapping with 2000 resamples was applied across both analyses as an assumption-free resampling technique that generates multiple subsamples from the original data (Byrne, 2016; Hair et al., 2019). These procedures prepared the cleaned datasets for subsequent measurement and structural model evaluations, with detailed outcomes presented in the following sections.

5.5 Analysis of Factors Affecting Pottery Subscription Intention

5.5.1 Descriptive Statistics and Preliminary Analysis

Table 5.1 presents the demographic profile of the final sample, consisting of 686 respondents. Among these, 74% were male, and 26% were female, while 59% fell within the age range of 25 to 44 years. Educational qualifications among respondents came predominantly high, with 40% holding graduate degrees and 47% possessing postgraduate degrees. In terms of marital status, 33% were married. Notably, 47% of respondents reported prior experience with subscription services. Residence patterns of respondents indicated that 49% lived in urban areas, with the remaining participants equally distributed across rural and suburban regions.

Table 5. 1 Demographic and Psychographic Characteristics of Respondents of Pottery Survey

Measure	Categories	Frequency	Percentage
Age	Less than 25	197	28.7
	25-44	406	59.2
	45 and above	83	12.1
Gender	Male	510	74.3
	Female	176	25.7
Relationship	Single	458	66.8
	Married	228	33.2
Education	Below Intermediate	36	5.2
	Intermediate	55	8.0
	Graduate	275	40.1
	Postgraduate & above	320	46.7
Annual Income	₹1,99,999 or less	184	26.8
	₹2,00,000 to ₹5,99,999	194	28.3

	₹6,00,000 to ₹9,99,999	164	23.9
	₹10,00,000 or above	144	21
Location	Rural	176	25.7
	Sub-Urban	174	25.3
	Urban	336	49
Availed Subscription	Yes	322	46.9
	Never	364	53.1

Further, Exploratory Factor Analysis (EFA) was performed to validate the construct items and reduce dimensionality. For doing the EFA, principal component analysis was employed with varimax rotation. This technique identifies clusters of correlated items while eliminating those exhibiting weak loadings on their respective factors, thereby enhancing the reliability of the subsequent measurement model. Sampling adequacy was established through a Kaiser-Meyer-Olkin measure of 0.82 (exceeding the 0.7 threshold) and a significant Bartlett's test of sphericity ($\chi^2 = 10082.16$, $df = 325$, $p < 0.001$). Factor loadings for all items surpassed 0.5, with communalities above 0.4, confirming that constructs adequately accounted for variance in the indicators (Hair et al., 2019) (see Table 5.4). Eigenvalues, representing variance explained by each principal component, revealed seven retained factors (eigenvalue > 1), yielding a cumulative eigenvalue of 17.36 and total variance explained of 66.75% (both exceeding recommended criteria of >1 and $>50\%$, respectively) (Hair et al., 2019; Z.-H. Li et al., 2023). Following EFA, Common Method Bias (CMB) was evaluated via Harman's single-factor test, which extracts a single factor to assess if it captures the majority of variance, indicating potential bias from shared method effects. The resulting single-factor model accounted for only 14.47% of total variance (well below the 50% threshold), confirming the absence of CMB (Nath & Agrawal, 2023). After this preliminary analysis, a measurement model was created and checked for validity and reliability using Confirmatory Factor Analysis (CFA).

5.5.2 Confirmatory Factor Analysis

Following the completion of Exploratory Factor Analysis (EFA) and Common Method Bias (CMB) assessments, Confirmatory Factor Analysis (CFA) was conducted to rigorously test the hypothesised measurement model using Maximum Likelihood Estimation (MLE). The model demonstrated acceptable fit to the data, as evidenced by key indices: $\chi^2 = 629.44$, $df = 278$, $\chi^2/df = 2.26$ (< 3), and $p < 0.001$, aligning with established thresholds for model adequacy (Byrne, 2016) (see Table 5.2 for comprehensive fit statistics).

Table 5. 2 Model Fit Indices of Measurement Model (Pottery Subscription)

	Model Fit Indices	Threshold Fit Indices	Sources
<i>Badness of fit</i>			(Byrne, 2016)
CMIN/DF	2.26	< 3	
SRMR	0.04	< 0.09	
RMSEA	0.04	< 0.08	
<i>Goodness of fit</i>			(Byrne, 2016)
GFI	0.92	> 0.90	
NFI	0.94	> 0.80	
IFI	0.96	> 0.9	
CFI	0.96	> 0.9 and < 1	
PCFI	0.83	> 0.5	
PNFI	0.80	> 0.5	

Standardised factor loadings (β) for all indicators exceeded the conservative threshold of 0.5, confirming that each observed variable adequately represented its underlying latent construct (see Table 5.4). Model reliability and validity were systematically evaluated to ensure measurement consistency and accuracy. Construct reliability was measured via Cronbach's Alpha ($\alpha > 0.7$), while the Gaskin AMOS plugin facilitated computation of composite reliability (CR), average variance extracted (AVE) for convergent validity, and discriminant validity metrics (Gaskin, 2016; Hair et al., 2019).

Content and face validity were established during the initial item generation phase through expert review (Ravi et al., 2022). All constructs satisfied stringent criteria: $CR > 0.7$, $AVE > 0.4$, $CR > AVE$, and $\alpha > 0.7$, thereby verifying internal consistency and convergent validity per Fornell & Larcker (1981). Discriminant validity was affirmed as the square root of each construct's AVE surpassed its correlations with all other constructs (see Table 5.3). Additionally, heterotrait-monotrait (HTMT) ratios remained below the 0.85 threshold across all pairs, providing further robust confirmation of distinctiveness among constructs (Henseler et al., 2015).

Table 5. 3 Discriminant Validity: Fornell-Larcker Criterion (Pottery Subscription)

Constructs	SUV	PUV	NI	PSR	PUI	MI	SI
SUV	0.67						
PUV	0.15**	0.68					
NI	0.32***	0.34***	0.68				
PSR	0.23***	0.14**	0.19***	0.74			
PUI	-0.09	0.001	0.25***	0.24***	0.66		
MI	0.06	0.08	0.28***	0.08	0.26***	0.67	
SI	0.42***	0.19***	0.13**	-0.12**	-0.41***	-0.23***	0.94

***p < 0.001; **p < 0.01; *p < 0.05

5.5.3 Structural Model Analysis

Following validation of the measurement model through Confirmatory Factor Analysis (CFA), the structural model was estimated using Maximum Likelihood Estimation (MLE) to test the hypothesised relationships among latent constructs and subscription intention. The model exhibited strong overall fit to the data, as indicated by comprehensive goodness-of-fit indices: $\chi^2 = 821.54$, $df = 411$, $\chi^2/df = 1.99 (< 3)$, $p < 0.001$, SRMR = 0.04 (< 0.08), RMSEA = 0.04 (< 0.06), CFI = 0.96 (> 0.95), TLI = 0.95 (> 0.95), IFI = 0.96 (> 0.95), and NFI = 0.92 (> 0.90), all meeting established benchmarks for acceptable model fit (Byrne, 2016; Hair et al., 2019) (see Table 5.5 for detailed path coefficients).

Table 5. 4 Standard Factor Loadings, Construct Validity and Reliability (Pottery Subscription)

Constructs and Indicators	Factor Loading (λ)	Std. Reg. Weight (β)	Cronbach's Alpha (α)	CR	AVE
Subscription Utilitarian Values (SUV)			0.77	0.77	0.45
<i>"Through the purchase of pottery subscription, I can..."</i>					
1) Save my time and effort	0.71	0.57			
2) Reduce bargaining strain as in physical purchase	0.79	0.68			
3) Get customised boxes at convenient frequency	0.77	0.74			
4) Get cost-effective items	0.69	0.69			
Perceived Usage Values (PUV)			0.77	0.77	0.46
The following values can motivate me to choose pottery subscription:					
1) Environmental sustainability of pottery items	0.78	0.75			
2) Creative and aesthetic attributes of pottery items	0.77	0.70			
3) Cultural and traditional significance of pottery items	0.71	0.61			
4) Practical Functionality (Health, Purity and Taste) of pottery utensils	0.78	0.66			
Normative Influence (NI)			0.76	0.77	0.46
1) The concerns about well-being of artisans reflect my social concern that influences my pottery subscription intention.	0.69	0.69			
2) Social consciousness towards pottery skills and community heritage preservation motivates me to adopt pottery subscriptions.	0.72	0.74			
3) Family and friends using and promoting pottery for numerous reasons influence my intention to adopt pottery subscriptions.	0.81	0.68			
4) Pottery subscription can support pottery artisans and promote sustainable pottery products.	0.76	0.59			
Perceived Subscription Risks (PSR)			0.83	0.83	0.55
<i>"Traditional Pottery Subscription can create a risk of ..."</i>					
1) receiving damaged products.	0.81	0.76			
2) receiving products of inadequate value	0.83	0.75			
3) receiving unwanted products	0.77	0.73			
4) receiving products of compromised quality	0.80	0.72			

Product Utility Impediments (PUI)			0.71	0.71	0.44
<i>“My pottery subscription intention may get influenced due to ...”</i>					
1) difficulty in cleaning earthen products I may encounter	0.75	0.61			
2) my inclination towards more durable products over earthen items	0.75	0.68			
3) the breakability nature of earthen products	0.77	0.69			
Perceived Access Constraints (PAC)			0.71	0.71	0.45
The following reasons may affect my pottery subscription intention.					
1) limited choice of pottery items in the market	0.81	0.72			
2) lack of business promotion of earthen items	0.81	0.71			
3) difficulty in finding earthen products in the local market	0.71	0.57			
Subscription Intention (SI)			0.97	0.97	0.88
1) I want to purchase pottery items and services through subscription	0.82	0.77			
2) I want to enhance my pottery consumption through subscription	0.93	0.99			
3) I intend to use pottery products and services through subscription soon	0.94	0.98			
4) I am interested in traditional pottery purchases through its subscription	0.95	0.99			

The model's explanatory power for the endogenous variable, subscription intention, was substantial, with a squared multiple correlation (R^2) of 0.41, indicating that the predictors collectively accounted for 41% of the variance in subscription intention. Direct path analysis provided empirical support for hypotheses H1 through H6 at $p < 0.05$ significance levels. Specifically, positive predictors included subscription utilities (H1: $\beta = 0.37$, $p < 0.001$), product usage values (H2: $\beta = 0.13$, $p < 0.01$), and normative influence (H3: $\beta = 0.14$, $p < 0.01$), all enhancing adoption intention. In contrast, negative relationships were confirmed for perceived subscription risk (H4: $\beta = -0.15$, $p < 0.001$), product inhibitors (H5: $\beta = -0.32$, $p < 0.001$), and access constraints (H6: $\beta = -0.20$, $p < 0.001$), demonstrating their inhibitory effects on subscription behaviour. These results align with prior findings on subscription dynamics (Bray et al., 2021; Nagaraj et al., 2021).

Table 5. 5 Structure Model Estimates (Pottery Subscription)

Path	Hypothesis	Standardised Path Coefficient (β)	Effect	t	p
SUV→SI	H1	0.37	+	8.05	***
PUV→SI	H2	0.13	+	2.98	**
NI→SI	H3	0.14	+	2.94	**
PSR→SI	H4	-0.15	-	-3.85	***
PUI→SI	H5	-0.32	-	-6.36	***
PAC→SI	H6	-0.20	-	-4.61	***

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Among control variables, only education exerted a significant positive influence on subscription intention ($\beta = 0.07$, $p < 0.05$), suggesting greater receptivity among higher-educated consumers. Moderation analyses revealed nuanced boundary conditions, with age emerging as the sole significant demographic moderator. Age amplified the positive effect of product usage values on intention (H7b: $\beta = 0.08$, $p < 0.05$), indicating stronger subscription affinity among older adults valuing pottery utilities, while simultaneously intensifying the negative impact of product utility impediments (H7e: $\beta = -0.08$, $p < 0.05$). This pattern corroborates Lian & Yen (2014), attributing older consumers' heightened sensitivity to barriers relative to younger cohorts' greater risk tolerance.

Further moderation by barriers yielded critical insights: product utility impediments strengthened the influence of normative influence (H5c: $\beta = 0.16$, $p < 0.001$), underscoring social pressures' role in overcoming usability concerns; product usage values retained significance despite perceived access constraints (H6b: $\beta = 0.08$, $p < 0.05$); perceived access

constraints, however, attenuated subscription utilities' effect (H6a: $\beta = -0.07$, $p < 0.05$); and subscription risks enhanced the normative influence–intention linkage (H4c: $\beta = 0.14$, $p < 0.001$), affirming peer influence's resilience under risk perceptions.

5.5.4 Key Outcomes

The SEM analysis resulted in the following results:

- Subscription utilities positively influenced subscription intention, supporting H1 ($\beta = 0.37$, $p < 0.001$) and implying that subscription services must emphasise convenience and value propositions to drive adoption.
- Product usage values positively affected subscription intention, supporting H2 ($\beta = 0.13$, $p < 0.01$) and highlighting the role of practical benefits of traditional products in encouraging subscription uptake.
- Normative influence positively influenced subscription intention, supporting H3 ($\beta = 0.14$, $p < 0.01$) and signifying that social influence from peers and family significantly boosts subscription willingness.
- Perceived subscription risk negatively impacted subscription intention, supporting H4 ($\beta = -0.15$, $p < 0.001$). Results imply that addressing risk perceptions through guarantees is essential for adoption.
- Product inhibitors negatively affected subscription intention, supporting H5 ($\beta = -0.32$, $p < 0.001$) and indicating that product quality and usability issues represent the strongest barrier to subscriptions.
- Perceived access constraints negatively influenced subscription intention, supporting H6 ($\beta = -0.20$, $p < 0.001$) and suggesting that external market challenges like availability must be mitigated for success.
- Education positively influenced subscription intention ($\beta = 0.07$, $p < 0.05$). This states that higher-educated consumers show greater openness to innovative subscription models.
- Age strengthened product usage values' effect on intention, supporting H7b ($\beta = 0.08$, $p < 0.05$) and witnessing that older consumers who value product utility respond more favourably to subscriptions.
- Age intensified product impediments' negative effect on intention, supporting H7e ($\beta = -0.08$, $p < 0.05$), signifying that older adults are particularly sensitive to product quality barriers.

- Product impediments amplified subjective norms' influence, supporting H5c ($\beta = 0.16$, $p < 0.001$) and reflecting that social pressure overcomes usability concerns in subscription decisions.
- Product usage values remained significant despite perceived access constraints supporting H6b ($\beta = 0.08$, $p < 0.05$). This shows that intrinsic product value sustains intention amid external challenges.
- Perceived access constraints weakened subscription utilities' effect, supporting H6a ($\beta = -0.07$, $p < 0.05$) and highlighting that market barriers diminish perceived subscription convenience.
- Subscription risks enhanced subjective norms and subscription intention relationship supporting H4c ($\beta = 0.14$, $p < 0.001$). This remark suggests that peer influence persists even under high risk perceptions.

5.6 Analysis of Factors Affecting Handcrafted Textile and Apparel Subscription Intention

5.6.1 Descriptive Statistics and Preliminary Analysis

Table 5.6 presents the comprehensive demographic profile of the textile dataset, providing essential respondent characteristics for contextualising subsequent analyses. Consistent with the established research framework, Exploratory Factor Analysis (EFA) was systematically conducted employing principal component analysis with varimax rotation to empirically validate the underlying structure of measurement items prior to measurement model specification (Hair et al., 2019). This analytical approach identifies clusters of highly correlated items that coalesce into distinct factors, thereby confirming the theoretical dimensions of latent constructs and establishing a robust foundation for Confirmatory Factor Analysis (CFA).

Table 5. 6 Demographic and Psychographic Characteristics of Respondents of Textile Survey

Measure	Categories	Frequency	Percentage
Age	Less than 25	218	22.8
	25-44	582	60.8
	45 and above	158	16.4
Gender	Male	700	73.1
	Female	258	26.9
Relationship	Single	619	64.6
	Married	339	35.4
Education	Below Intermediate	71	7.4

	Intermediate	114	11.9
	Graduate	290	30.3
	Postgraduate & above	483	50.4
Annual Income	₹1,99,999 or less	251	26.2
	₹2,00,000 to ₹5,99,999	311	32.5
	₹6,00,000 to ₹9,99,999	193	20.1
	₹10,00,000 or above	203	21.2
Location	Rural	200	20.9
	Sub-Urban	239	24.9
	Urban	519	54.2
Availed Subscription	No	576	60.1
	Yes	382	39.9

EFA serves the critical function of scale purification by systematically eliminating problematic items, those exhibiting poor loadings on primary factors (<0.5), cross-loadings across multiple factors, or inadequate communalities, thus enhancing the reliability, validity, and theoretical coherence of the subsequent CFA measurement model (Ahn et al., 2020). Sampling adequacy for factorisation was robustly confirmed through a Kaiser-Meyer-Olkin (KMO) measure of 0.92, substantially exceeding the recommended threshold of 0.7, complemented by a highly significant Bartlett's test of sphericity ($\chi^2 = 23640.08$, $df = 1176$, $p < 0.001$), rejecting the null hypothesis of an identity matrix and affirming substantial inter-item correlations suitable for factor extraction.

To achieve optimal discriminant validity, one item from the Performance Risk (PR) construct was deliberately removed due to unacceptable cross-loading patterns (Nath & Agrawal, 2023). Post-refinement, all retained items demonstrated communalities exceeding 0.4, indicating that the extracted factors collectively explained a substantial proportion of variance in each indicator, meeting established acceptability criteria (Hair et al., 2019). Factor retention criteria based on eigenvalues greater than 1 (Kaiser criterion) yielded eleven distinct components, collectively accounting for 65.48% of total variance, well above the conventional 50% threshold for practical significance (Hair et al., 2019). Factor loadings for all indicators on their respective primary constructs surpassed the conservative 0.5 threshold, providing strong empirical validation of construct reliability (see Table 5.9). Correlation analysis further substantiated discriminant validity, revealing substantially stronger correlations among items belonging to the same component compared to inter-component correlations, confirming the distinctiveness of each factor structure.

To rule out methodological artefacts, Common Method Bias (CMB) was rigorously assessed using the Common Latent Factor (CLF) approach (Ahn et al., 2020), supplemented by Harman's single-factor test. The single-factor solution accounted for only 11.25% of total variance, well below the 50% threshold, conclusively demonstrating the absence of CMB and ensuring substantive relationships drive the observed effects (Chakraborty et al., 2023).

5.6.2 Confirmatory Factor Analysis

The measurement model was systematically constructed and estimated using Maximum Likelihood Estimation (MLE), a robust covariance-based approach that yielded excellent overall fit to the observed data, as evidenced by comprehensive goodness-of-fit indices: $\chi^2 = 2942.56$, $df = 1142$, $\chi^2/df = 2.58 (< 3)$, $p < 0.001$, SRMR = 0.043 (< 0.08), RMSEA = 0.04 (< 0.06), and CFI = 0.92 (> 0.90), all satisfying established benchmarks for model adequacy (Byrne, 2013) see Table 5.7 for complete fit statistics).

Table 5. 7 Model Fit Indices of Measurement Model (Textile Subscription)

	Model fit indices	Threshold fit indices	Sources
<i>Badness of fit</i>			Byrne (2016)
Absolute Fit Indices			
CMIN/DF	2.58	< 3	
SRMR	0.04	< 0.09	
RMSEA	0.04	< 0.08	
<i>Goodness of fit Indices</i>			Byrne (2016)
GFI	0.92	> 0.90	
AGFI	0.91	> 0.80	
IFI	0.92	> 0.9	
CFI	0.92	$> 0.9 \text{ and } < 1$	
PCFI	0.86	> 0.5	
PNFI	0.82	> 0.5	

All standardised path coefficients (factor loadings) exceeded the conservative threshold of 0.5 with $p < 0.001$ significance, confirming that each observed indicator reliably represented its underlying latent construct (see Table 5.9). Confirmatory Factor Analysis (CFA) comprehensively evaluates both reliability, through construct reliability (CR) and composite reliability (CR), and multiple dimensions of validity, including content validity, face validity, convergent validity, and discriminant validity, thereby verifying the measurement model's consistency and accuracy in operationalising theoretical constructs (Hair et al., 2019).

Content and face validity were established during the initial item generation and expert review phases, ensuring theoretical alignment and respondent comprehension (Hair et al., 2019). Internal consistency reliability was robustly confirmed with Cronbach's Alpha (α) values exceeding 0.7 for all constructs, meeting the standard threshold for acceptable reliability (Byrne, 2016). The Gaskin AMOS plugin provided automated computation of advanced reliability and validity metrics, including composite reliability (CR), average variance extracted (AVE) for convergent validity, and discriminant validity assessments (Gaskin, 2016).

All constructs demonstrated strong composite reliability with CR values surpassing 0.75, while AVE ranged from 0.46 to 0.64, satisfying the minimum threshold of 0.4 for convergent validity. Critically, CR exceeded AVE for every construct, fulfilling dual criteria for internal consistency and convergent validity of Fornell & Larcker (1981) (see Table 5.8) (Malhotra & Dash, 2011). Discriminant validity was affirmed through multiple stringent tests: Maximum Shared Variance (MSV) for each construct remained below its corresponding AVE, and the square root of AVE exceeded correlations with all other constructs, confirming factor distinctiveness (Fornell & Larcker, 1981).

Table 5. 8 Discriminant Validity: Fornell-Larcker Criterion (Pottery Subscription)

Construct	SI	SUV	SUR	SHV	NI	IFM	PVB	PAR
SI	0.76							
SUV	0.67***	0.68						
SUR	-0.50***	-0.53***	0.78					
SHV	0.32***	0.34***	-0.22***	0.77				
NI	0.51***	0.57***	-0.41***	0.33***	0.76			
IFM	0.63***	0.58***	-0.54***	0.28***	0.49***	0.80		
PVB	-0.05	-0.04	0.01	-0.06	0.02	-0.04	0.70	
PAR	0.29***	0.44***	-0.43***	0.23***	0.43***	0.30***	-0.09*	0.71

***p < 0.001, **p < 0.01, *p < 0.05

Additionally, heterotrait-monotrait (HTMT) ratios for all construct pairs fell below the conservative 0.85 threshold, providing contemporary confirmation of discriminant validity through correlation ratio analysis (Henseler et al., 2015).

5.6.3 Structural Model Analysis

Structural Equation Modelling (SEM) was executed using Maximum Likelihood Estimation (MLE) to comprehensively test the hypothesized theoretical framework, yielding a well-fitted structural model as evidenced by robust goodness-of-fit indices: $\chi^2 = 3414.201$, $df = 1437$, χ^2/df

= 2.38 (< 3), $p < 0.001$, SRMR = 0.042 (< 0.08), RMSEA = 0.04 (< 0.06), CFI = 0.92 (> 0.90), TLI = 0.91 (> 0.90), and IFI = 0.92 (> 0.90), all satisfying established criteria for model adequacy and theoretical confirmation.

Table 5. 9 Standard Factor Loadings, Construct Validity and Reliability (Textile Subscription)

Construct and Items	Factor Loading (λ)	Standardised Regression Weight (β)	Cronbach's Alpha (α)	CR	AVE
Subscription Utilitarian Values (SUV)			.77	.77	.46
<i>"Through the purchase of traditional textiles via subscription, I can"</i>					
1) save my time and effort	.71	.69			
2) explore a variety of items sitting at home	.75	.74			
3) avoid stress of offline purchase	.57	.67			
4) get home delivery of items at a convenient frequency	.58	.60			
Subscription Utility Risks			.87	.75	.61
A. Performance Risks (PR)					
B. Process Risks (UR)					
A. Performance Risks			.73		
<i>"Traditional Handmade Apparel Subscription can create a risk of ..."</i>					
1) getting products not meeting my standards of style and quality	.59	.64			
2) receiving products that may be damaged, dirty and in poor condition	.79	.80			
3) receiving products that are of low value and poor fit	.77	.65			
B. Process Risks			.73		
<i>"If I subscribe to apparel subscription, I ..."</i>					
1) cannot physically inspect the items before I receive them	.66	.68			
2) can have commitment issues to continue to the subscription plan	.64	.71			
3) miss social shopping with friends and family.	.64	.62			
4) may face delays in receiving current-season items.	.71	.63			
5) may struggle customizing/returning unwanted deliveries.	.68	.55			
Subscription Hedonic Values (SHV)			.85	.85	.59
<i>Following features motivate me to traditional handmade textile subscriptions:</i>					
1) Return and replacement of undesired and defective items	.81	.75			
2) Sending surprise boxes	.82	.79			
3) Sending customised items tailored to customer preferences	.81	.75			

Construct and Items	Factor Loading (λ)	Standardised Regression Weight (β)	Cronbach's Alpha (α)	CR	AVE
4) Give premium services like sending surprise coupons, vouchers passes to craft fairs and exhibitions, and more.	.79	.76			
Normative Influence (NI)			.89	.89	.58
1) My friends and family would think purchasing traditional apparel through subscription is a good idea.	.79	.78			
2) People using traditional apparel inspire me to use traditional apparel subscriptions.	.77	.78			
3) Sustainable nature of handmade textiles inspires me to opt for its subscription.	.73	.72			
4) The labour practices involved in making traditional textiles inspire me ethically to choose traditional apparel subscription.	.76	.74			
5) By adopting handmade textiles subscription, I can support textile artisans.	.71	.75			
6) Traditional apparel subscriptions can promote cultural significance of traditional and regional wear.	.74	.78			
Intrinsic Fashion Motivation (IFM)			.87	.84	.64
A. Fashion Identity Orientation (FIO)					
B. Innovative Fashion Orientation (IFO)					
C. Enjoyment and Uniqueness Orientation (EUO)					
A. Fashion Identity Orientation (FIO)			.88		
1) I am particular about my fashion and attire	.66	.64			
2) I am involved with the clothes I wear	.71	.74			
3) I like to look well-dressed in public places	.66	.69			
4) I love shopping for new clothes for various occasions	.53	.51			
5) I don't like to wear same outfit at multiple events	.72	.74			
6) I am conscious about my attire in celebrations and festivals	.73	.74			
7) I love wearing new and trending clothes	.73	.77			
8) I emphasise my personality through the fashion I wear	.63	.75			
B. Innovative Fashion Orientation (IFO)			.91		
1) I like to experiment with my fashion and style	.83	.83			
2) I like to bring innovative designs into my fashion attire	.77	.90			

Construct and Items	Factor Loading (λ)	Standardised Regression Weight (β)	Cronbach's Alpha (α)	CR	AVE
3) I like to try apparel types different to my taste of fashion	.77	.89			
C. Enjoyment and Uniqueness Orientation (EUO)			.90		
1) I enjoy dressing in apparel that is unique and close to my culture	.79	.82			
2) Wearing sustainable and Indigenous clothes boosts my self-esteem	.75	.89			
3) Wearing clothes of my personality gives a sense of accomplishment	.77	.88			
Product Value Barriers (PVB)			.83	.83	.50
<i>"My purchase behaviour towards traditional apparel is affected as"</i>					
1) there are limited designs in traditional handmade apparel.	.79	.77			
2) there is a lack of innovation in the design and material of such apparel	.82	.81			
3) the quality of traditional handmade apparel is not good	.67	.55			
4) traditional apparel is of low value and aesthetics	.82	.74			
5) the traditional clothes are old-fashioned	.72	.61			
Perceived Access Risks (PAR)			.83	.84	.51
<i>"My affinity for traditional handmade apparel is affected as ..."</i>					
1) machine-made apparels are easily available in the nearby market.	.74	.68			
2) these products are scarcely available in the nearby market.	.73	.67			
3) there is lack of consumer awareness of traditional apparel.	.82	.79			
4) there is lack of business promotion of traditional textiles.	.78	.78			
Subscription Intention			.85	.85	.58
1) I want to purchase traditional handmade textiles through subscription.	.66	.75			
2) I want to enhance my traditional textile consumption through subscriptions.	.73	.80			
3) I intend to use traditional handmade apparel subscription services in near future.	.75	.77			
4) I am likely interested in purchasing traditional apparel through its subscription.	.72	.72			

Measurement model diagnostics confirmed strong reflective relationships within higher-order constructs. Subscription Utility Risks (SUR) explained substantial variance in its sub-dimensions, 52% of Performance Risk (PR) and 66% of Process Risk (UR), with highly significant path coefficients (SUR → PR: $\beta = 0.75$, $p < 0.001$; SUR → UR: $\beta = 0.79$, $p < 0.001$), validating PR and UR as robust indicators of the overarching SUR construct. Similarly, IFM demonstrated exceptional explanatory power for its fashion consciousness dimensions: 87% of Fashion Identity Orientation (FIO), 51% of Innovative Fashion Orientation (IFO), and 55% of Enjoyment and Uniqueness Orientation (EUO), supported by strong path coefficients (IFM → FIO: $\beta = 0.93$; IFM → IFO: $\beta = 0.71$; IFM → EUO: $\beta = 0.74$; all $p < 0.001$), confirming these as reliable manifestations of IFM.

The structural model's predictive capability for the endogenous variable, Subscription Intention (SI), was impressive, achieving a squared multiple correlation (R^2) of 0.57, indicating that the exogenous predictors collectively accounted for 57% of the variance in SI, demonstrating substantial explanatory power (see Table 5.10 for comprehensive path results). Direct effects analysis revealed clear patterns: Subscription Utilitarian Values (H1), Normative Influence (H4), and Intrinsic Fashion Motivation (H5) exerted significant positive influences on SI, while Subscription Utility Risks (H2) and Perceived Access Risks (H7) demonstrated significant negative effects.

Table 5. 10 Structure Model Estimates (Pottery Subscription)

Path	Hypothesis	Standardised Path Coefficient (β)	p	Effect
SUV→SI	H1	0.36	***	+
SUR→SI	H2	-0.16	**	-
SHV→SI	H3	0.06	0.08	
NI→SI	H4	0.12	**	+
IFM→SI	H5	0.28	***	+
PVB→SI	H6	-0.03	0.26	
PAR→SI	H7	-0.08	*	-

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Subscription Hedonic Values exhibited a positive but insignificant relationship with SI, and Product Value Barriers showed a negative but non-significant impact, suggesting these factors play secondary roles in textile subscription dynamics. Control variables exerted negligible direct effects on SI, affirming the robustness and generalizability of primary relationships unconfounded by demographic variations.

Consistent with SEM best practices, moderation analysis was conducted only for relationships that were statistically significant in the baseline structural model, ensuring model parsimony and interpretability (Byrne, 2016; Day et al., 2020). Accordingly, the moderating effects were examined only on the statistically significant relationships with SI.

Multi-group moderation analyses systematically examined boundary conditions for hypotheses H1-H7 through demographic moderators: prior Subscription Experience (SE; H8), gender (H9), relationship status (H10), age (H11), income (H12), and education (H13). SE significantly moderated three key relationships (H8a, H8e, H8g): Subscription Utilitarian Values (SUV) more strongly predicted SI among non-experienced consumers ($\beta = 0.51$, $p < 0.001$) versus experienced ones ($\beta = 0.39$, $p < 0.001$; $z = -2.13$, $p < 0.001$); Intrinsic Fashion Motivation (IFM) exerted greater influence among experienced subscribers ($\beta = 0.39$, $p < 0.001$) than novices ($\beta = 0.29$, $p < 0.001$; $z = 2.04$, $p < 0.001$); and Perceived Access Risks (PAR) more severely deterred SI among experienced users ($\beta = -0.17$, $p < 0.001$) compared to novices ($\beta = -0.06$, $p < 0.05$; $z = -1.96$, $p < 0.05$).

Income amplified negative effects (H12b, H12g), intensifying both Subscription Utility Risks (SUR; $\beta = -0.06$, $p < 0.05$) and Perceived Access Risks (PAR; $\beta = -0.07$, $p < 0.05$) on SI. Education served as a positive buffer (H13a, H13b), strengthening SUV $\rightarrow$ SI ($\beta = 0.12$, $p < 0.001$) while attenuating SUR $\rightarrow$ SI ($\beta = 0.09$, $p < 0.001$). No significant moderation emerged from gender, age, or relationship status, attributable to handmade apparel's universal appeal, consistent with Woo & Ramkumar (2018).

Construct-specific moderation effects yielded nuanced insights: Subscription Utility Risks (SUR) enhanced IFM $\rightarrow$ SI (H2d: $\beta = 0.12$, $p < 0.05$), demonstrating fashion attitudes' resilience against risk perceptions; Product Value Barriers (PVB) and Perceived Access Risks (PAR) exhibited no significant moderation on SUV, NI, or IFM $\rightarrow$ SI; Normative Influence (NI) amplified SUV $\rightarrow$ SI (H4a: $\beta = 0.11$, $p < 0.05$) but attenuated IFM $\rightarrow$ SI (H4c: $\beta = -0.10$,

$p < 0.05$), revealing complex interplay between external pressures and internal motivations. Table 5.9 details construct loadings, weights, reliability, and validity metrics, while subsequent sections elaborate on theoretical and managerial implications.

5.6.4 Key Outcomes

The SEM analysis resulted in the following results:

- Subscription utilitarian values positively influenced subscription intention, supporting H1. This emphasises that functional benefits drive apparel subscription adoption.
- Subscription risks negatively impacted subscription intention, supporting H2 and signifying that risk mitigation strategies are critical for textile subscription success.
- Social norms positively influenced subscription intention, supporting H4. This suggests that leveraging peer recommendations accelerates sustainable fashion subscriptions.
- Intrinsic fashion motivation positively affected subscription intention, supporting H5 and implying that consumers' fashion consciousness strongly predicts subscription willingness.
- Hedonic values positively influenced subscription intention but are not insignificant, stating that experiential appeal shows potential but requires stronger marketing emphasis.
- Perceived access risks negatively affected subscription intention, supporting H7. This remark suggests that improving market accessibility is essential for broader adoption.
- Product value barriers negatively impacted subscription intention, which is not insignificant and signifies that quality concerns exist but are not primary adoption barriers.
- Prior subscription experience strengthened the subscription usefulness effect, supporting H8a. This highlights that experienced users value functionality more highly.
- Prior subscription experience enhanced personal norms supporting H8e and signifying that experienced subscribers respond more to fashion attitudes.
- Prior subscription experience intensified market barriers, supporting H8g and highlighting that experienced users are more sensitive to market challenges.
- Income amplified subscription risks' negative effect, supporting H12b. This signifies that higher-income consumers are more risk-averse toward subscriptions.
- Income strengthened the market barriers' negative effect, supporting H12g. This highlights that affluent consumers face greater external adoption hurdles.
- Education enhanced subscription usefulness, supporting H13a and signifying that educated consumers better appreciate subscription convenience.

- Education weakened subscription risks' negative effect of subscription risks, supporting H13b. This highlights that higher education buffers risk perceptions in subscriptions.
- Subscription risks strengthened personal fashion motivation effect, supporting H2d and signifying that positive fashion attitudes overcome risk concerns.
- Social norms amplified the subscription usefulness effect, supporting H4a and showing that peer influence boosts functional value perception.
- Social norms weakened personal fashion motivation, supporting H4c. This result implies that external pressure reduces reliance on internal fashion motivations.

5.7 Implications of the Study

This study advances subscription commerce research by empirically validating multi-dimensional drivers of adoption intention for traditional handicraft products, bridging the Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA), and Innovation Resistance Theory (IRT) within integrated frameworks. By examining simultaneous motives, barriers, demographic moderations, and inhibitor interactions across pottery and textile sectors, the findings offer novel theoretical extensions and actionable strategies for concerned stakeholders, including social enterprises seeking sustainable revenue through subscription models, addressing critical gaps in handicraft retailing literature (Osabohien et al., 2023; Woo & Ramkumar, 2018).

5.7.1 Theoretical Implications

Academically, the study advances consumer behaviour research by focusing on subscription intention for handicraft products that employ subscription as a retailing and marketing strategy. For stakeholders, including social enterprises, this study serves as a starting point for quantitative studies assessing consumer adoption intentions towards innovative retail strategies such as subscription services, applicable to diverse product segments, including handicrafts. The study demonstrated an empirical attempt to integrate consumer behaviour theories such as TRA, TPB, IRT, and SCT to examine motives and barriers towards subscription intention. The three-fold assessment model enriches the literature by analysing consumer behaviour across demographic traits and under perceived impediments. The study also integrates product and market-oriented factors with subscription dynamics, offering a more holistic view of adoption behaviour.

The results validate several key theories in technology and innovation adoption, particularly in the context of subscription purchase adoption for such niche products. Specifically, the Technology Acceptance Model (Davis, 1989) is supported as utilitarian and usage values drive subscription intention, demonstrating that perceived usefulness increases adoption. The significant role of normative influence, especially in the presence of inhibitors, affirms that social expectations and peer pressure boost behavioural intention, validating TRA's component of subjective norms, which asserts that normative influence shapes an individual's intention to perform a behaviour. Innovation Resistance Theory is validated as product, market, and risk barriers clearly hinder subscription adoption intention. Notably, product and market impediments exert a more substantial deterrent effect than usage motives and social norms, aligning with prospect theory's assertion that consumers, being irrational, tend to overweigh losses relative to potential gains.

5.7.2 Managerial Implications for Pottery Subscription

Subscription retailing expands product diversity within accessible retail formats, enabling social enterprises to sustain artisan livelihoods through predictable revenue streams (Baxter, 2015). The empirical findings provide targeted strategies for pottery marketers to overcome dominant inhibitors and leverage key adoption drivers.

- **Leverage Social and Cultural Storytelling:** Social norms significantly enhance subscription intention even amidst risks and inhibitors (H3, H5c, H4c), underscoring peer influence's resilience. Marketers should deploy influencer partnerships, celebrity artisan collaborations, culturally resonant social media campaigns, word-of-mouth referral incentives, and educational content showcasing pottery's artisanal traditions to amplify societal endorsement and community belonging.
- **Emphasise Dual Utilities:** Subscription utilities (H1: $\beta = 0.37$) and product usage values (H2: $\beta = 0.13$) drive adoption. This suggests that managers must highlight cost savings, delivery convenience, craftsmanship authenticity, and cultural-aesthetic benefits through curated boxes featuring innovative designs, limited editions, and usage tutorials to maximise perceived value.
- **Systematically Mitigate Barriers:** Product inhibitors (H5: $\beta = -0.32$), market barriers (H6: $\beta = -0.20$), and subscription risks (H4: $\beta = -0.15$) represent primary adoption hurdles. This signifies the need to implement quality assurance certifications, safe packaging with

insurance, flexible pause/cancel options, complimentary maintenance kits, 30-day returns, and 24/7 multilingual support to build trust and reduce perceived obstacles.

- **Age-Segmented Strategies:** Older consumers amplify utility values (H7b) but suffer intensified inhibitor effects (H7e). Marketers should provide premium subscriptions with expert guidance, repair services, and personalised curation for this segment, while targeting youth through experiential pop-up workshops and social media challenges, emphasising pottery's modern lifestyle integration.
- **Prioritise Educated Segments:** Higher education positively influences intention ($\beta = 0.07$). Marketers should launch targeted LinkedIn campaigns, webinar series on pottery's sustainability benefits, and premium tiers for urban professionals, complemented by broad awareness initiatives across demographics to cultivate universal appreciation for subscription-enabled artisan support.

5.7.3 Managerial Implications for Handcrafted Textile Subscription

The analysis brings the following suggestions for managers and marketers involved with the handmade clothing industry.

- **Leverage Social Norms and Intrinsic Motivation:** Marketers should integrate ethical, social and personal values into handcrafted textiles and apparel subscription campaigns through strategies such as testimonials, storytelling, influencer endorsements, and community-based promotions. Emphasising cultural preservation and sustainability can significantly enhance subscription engagement, particularly among consumers with prior subscription experience.
- **Mitigate Subscription Risks:** To strengthen consumer trust and confidence, companies should implement measures like flexible returns and replacement policies, free-trial periods, personalised sizing and style recommendations, flexible subscription plans, and clear product descriptions with transparent pricing. These measures are especially crucial for high-income customers, who are more sensitive to perceived risks.
- **Overcoming Access Risk Barriers:** Streamlining operations in key areas such as timely delivery, inventory optimisation, data security, privacy protection, flexible shipping options, and easy cancellations can reduce perceived barriers and strengthen consumer trust.

- **Utilitarian Messaging:** Marketing efforts should emphasise the functional benefits of sustainable apparel subscriptions, such as convenience, cost-effectiveness, and variety, to attract consumers, especially those without prior subscription experience.
- **Enhancing Hedonic Appeal:** Although hedonic values did not significantly influence subscription intention, highlighting the uniqueness and exclusivity of handmade textiles remains crucial. Offering curated and exclusive collections can attract consumers who appreciate craftsmanship and cultural authenticity. Moreover, providing additional service features can enhance hedonic satisfaction. For instance, service providers can offer easy return and replacement options for defective items and discounted maintenance services like refurbishing, resizing, and bleaching, thereby enriching the overall consumer experience.
- **Educational and Social Awareness Campaigns:** Results show that highly educated consumers value subscription utilities more and show resilience to subscription risks in deciding on handcrafted textiles and apparel subscription intention. Companies should emphasise sustainable handmade fashion's ethical, environmental and cultural benefits to appeal to highly educated consumers. Campaigns emphasising sustainability and responsible consumption can further encourage adoption.
- **Risk mitigation for high-income groups:** Study finds that high-income groups are more sensitive to subscription risk and access risk barriers, suggesting risk-mitigating strategies essential for their engagement.
- **Tailored Strategies for Experienced Subscribers:** Consumers with prior subscription experience are more strongly influenced by intrinsic motivation and access barriers. Meanwhile, first-time subscribers place a higher value on subscription utilities. Therefore, for subscribers with prior experience, businesses should prioritise offering hard-to-find and exclusive products and services to improve their satisfaction and delight level while mitigating access risk. Reinforcing utilitarian benefits, ethical values, and personal norms will strengthen customer loyalty and long-term engagement.
- **Leveraging Government Initiatives:** Marketers should utilise various schemes launched by different ministries like 'Digital India' and 'National E-commerce Policy' by the Ministry of Electronics and Information Technology, 'Startup India', 'Foreign Trade Policy' and

‘Market Access Initiative Scheme’ by Ministry of Commerce and Industry, ‘Skill India’ by Ministry of Skill Development and Entrepreneurship, ‘Digital MSME’ scheme by Ministry of Micro, Small and Medium Enterprises and more to facilitate the development of subscription commerce infrastructure.

5.8 Summary

This study comprehensively analyses handmade textile, clothing, and pottery subscription adoption behaviour through an integrated research framework that simultaneously evaluates multi-dimensional drivers, including social norms, personal motivations, subscription usefulness, perceived risks, hedonic values, product inhibitors, and market access barriers. By validating these factors via Structural Equation Modelling, the research establishes subscription retailing as a sustainable marketing strategy for unique handicrafts, creating predictable demand and revenue streams for artisans while accommodating seasonal/occasional Indian consumption patterns distinct from consumable or rental models (Bray et al., 2021; Woo & Ramkumar, 2018). The distinctive three-fold assessment, direct effects, demographic moderations, and barrier interactions, reveals nuanced patterns: subjective norms and intrinsic motivations drive intention, usefulness amplifies under social influence, while risks and market barriers inhibit, with education/income/experience shaping responses.

Findings offer actionable guidance for marketers and artisans: pottery requires age-segmented strategies emphasising utility for older consumers while mitigating intensified barriers, whereas textiles demand experience-based tailoring prioritising usefulness for novices and norms for veterans. This enables demographic-specific packages balancing consumer choice with profitability, extendable to GI-tagged handicrafts via flexible curation, avoiding rigid monthly impositions. Marketers should leverage government schemes like Gramodaya Vikas Yojna, Self-Reliant India Fund, and Credit Guarantee Fund for infrastructure, aligning with SDGs 1 (poverty alleviation via artisan income), 8 (decent work through demand creation), 9 (innovation/infrastructure), and 12 (sustainable consumption via circular trade-ins and reduced impulse buying).

The subscription model advances three sustainability pillars: economic stability through recurring revenue; social preservation via indigenous craft promotion; and environmental gains from recycling/exchange features, curbing waste. Theoretically, it integrates TAM (usefulness

drives adoption), TPB (norms overcome risks), and IRT (barriers deter), extending macro marketing theory to cottage industry challenges like visibility and competition.

Future research should incorporate brand loyalty, surprise elements, environmental consciousness, shopping orientation, hedonic motives, and pricing optimisation. Comparative physical vs subscription analyses, longitudinal churn studies, and AI/blockchain personalisation represent key extensions. This foundational work equips marketers/artisans with consumer-centric strategies to scale handicraft subscriptions, preserving cultural traditions while ensuring economic viability. The following chapter discusses the operational part of designing subscription packages for handicraft items.

CHAPTER 6

Developing Feasible Subscription Packages for Handcrafted Textile and Pottery Products

This chapter focuses on developing feasible subscription packages and pricing structures for handcrafted textile and pottery products within the sustainable framework of Micro, Small, and Medium Enterprises (MSMEs).

6.1 Introduction

Traditional select industries, particularly handcrafted textile and pottery producers, face unpredictable sales cycles, seasonal demand fluctuations, and limited market reach beyond local clusters (Silveru & Sankineni, 2024). Unlike sectors with steady consumption patterns, these artisanal industries often struggle with volatile cash flows and irregular customer engagement (Dalal et al., 2024). Subscription retailing introduces an innovative mechanism to cultivate recurring demand, boost retention across dispersed markets, and secure revenue stability (S. Bischof & Rudolph, 2021). This study proposed subscription retailing as an innovative retail mechanism to improve customer engagement and sustainable revenue. Basically, this improves customer retention and reduces the difficulty of identifying customers across the market, especially outside the local market (Rese & Baier, 2025). Subscription package development fosters sustained customer relationships and predictable income, reduces acquisition costs in fragmented artisanal supply chains (Schuh et al., 2020). In this context, developing subscription packages becomes essential as a strategic mechanism to generate recurring demand, stabilise revenue, and ensure consistent customer interaction (Belavina et al., 2017; Yao et al., 2012). Like restaurant and service-based businesses that rely on predictable subscription models to mitigate sales fluctuations, artisanal MSMEs can benefit from structured subscription offerings that foster financial stability and ongoing customer relationships (Jeong et al., 2024; Tyagi & Bolia, 2024).

The development of a subscription package and its pricing is quite critical. The pricing decision must balance consumer willingness-to-pay with the high variability in artisan production costs, such as fluctuating material prices, labour-intensive processes, and product-level heterogeneity. Without a thoughtful pricing mechanism, subscriptions risk underpricing that can erode margins in craft-based sectors or can risk overpricing, which suppresses adoption

(K. Sharma & Lulandala, 2023; Tyagi & Bolia, 2024). Therefore, a systematic pricing approach is needed to maintain profitability while ensuring affordability and fairness.

The broader subscription commerce ecosystem encompasses diverse package types: freemium (free basic tier monetizing upgrades), tiered (basic/standard/premium with progressive features), usage-based (charges scaled to consumption volume), flat-rate (fixed fee for unlimited access), per-seat/per-user (scaled by subscribers), and modular/per-add-on (core plus optional enhancements); bundling variants include pure (exclusive packages), mixed (bundled with à la carte), and hybrid (fixed fee plus usage overages) (Freedman & King, 2016; Jo, 2024; R. Sharma & Kakkar, 2019; Syahrivar et al., 2022). Additionally, corresponding pricing strategies mirror these variations in package designs, such as cost-plus (costs plus markup) pricing, value-based (anchored in perceived utility) pricing, competitive (benchmarking rivals) pricing, dynamic (time/usage-responsive) pricing, penetration (low initial to build volume), skimming (high initial tapering down), and psychological (e.g., charm pricing) pricing (Asghari et al., 2019; Cao et al., 2015; H. Li et al., 2020). Modern pricing literature further highlights advanced models that employ consumer utility maximisation, self-selection, incentive-compatibility constraints, often optimised using linear/dynamic programming models for surplus optimisation amid flat-rate bias and heterogeneity (Aminah et al., 2021; Miao et al., 2022; Tyagi & Bolia, 2024; Umashankar et al., 2023).

However, these conventional models, broadly and traditionally studied in literature, find limitations in application directly to handcrafted textiles and pottery subscription package design. Most textile subscription packages are box subscription packages that cater to regularly consumed items such as socks, sanitary pads, or undergarments, which naturally suit monthly replenishment cycles (Rese & Baier, 2025; Woo & Ramkumar, 2018). Rental-based subscriptions are also common in fashion sectors, which are culturally less feasible in India because ownership preferences across Indian demographics (A. Banerjee et al., 2023; R. Jain et al., 2023). Pottery products, similarly, are not needed monthly but seasonally or occasionally. Imposing fixed monthly selections or rigid tiers leads to consumer inconvenience, reduced perceived relevance, and lower subscription intention. Additionally, artisanal products carry high marginal production costs, significant variability in design and quality, and uncertain usage frequency, which makes flat-rate and bundled models less effective than in scalable service industries (Dalal et al., 2024).

Given these challenges, subscription package development for artisanal crafts must be consumer-centric, flexible, and context-sensitive. Therefore, for the effective subscription design, the following approaches should be incorporated:

- Understanding consumer preferences through surveys, ranking exercises, and segmentation techniques, such as the K-means clustering technique.
- Provision of customisation and choice in the subscription package, avoiding imposed product assortments that do not align with individual needs.
- Provision of bundling products by rating similarity or demand compatibility, enabling self-selection while maintaining operational feasibility.
- Incorporating insights of behavioural drivers like flat-rate bias, risk aversion, variety seeking, quality sensitivity, and utility of features that shape subscription decisions.

The subscription package pricing should ensure rigour based on reservation prices, marginal costs from artisans, and optimisation models that ensure prices exceed costs while maximising consumer surplus and feasibility across segments (Y. Fang et al., 2018). Considering these aspects, this study adopts a three-stage framework for subscription package selection and pricing designed specifically for handcrafted textiles and pottery. The goal is to develop packages that are both desirable for consumers and profitable for producers, thereby supporting sustainable deployment of subscription models in India's handcrafted MSME sector.

Based on the above discussion, the chapter tries to address how consumer-centric subscription packages and optimal pricing models can be systematically designed for handcrafted textiles and pottery to improve customer adoption and ensure profitability for artisanal MSMEs in India. Thus, the chapter tries to address the following research questions:

RQ1: What are the key behavioural drivers and attribute utilities that influence subscription package selection for handcrafted textiles and pottery?

RQ2: Which subscription package combinations are most desirable and feasible when evaluated through the consumer utility lens?

RQ3: How can part-worth utilities and cost structures be integrated into a profit-maximising optimisation model to determine optimal subscription pricing for artisanal MSMEs?

RQ4: Which subscription packages yield the highest expected profit while maintaining affordability, operational feasibility, and consumer acceptance?

Thus, the chapter tries to attain the following objectives:

Objective 1: To develop a data-driven framework for designing consumer-centric and financially viable subscription packages for handcrafted textiles and pottery.

Objective 2: To identify attributes and their importance level in deciding the subscription package.

Objective 3: To determine integrated subscription package selection and pricing model integrating package utilities, choice probabilities, costs and pricing to maximise expected profit.

Objective 4: To identify optimal subscription packages that balance consumer desirability, affordability, and profitability for handcrafted textile and pottery artisans.

To attain the following objectives, the study employs an integrated framework combining Choice-Based Conjoint analysis and Mixed Integer Linear Programming to align consumer preferences with profit-optimised subscription package design. The chapter is constructed as follows. The next section describes the methodology, followed by the results and implications of the study.

6.2 Methodology

This section presents the methodological framework adopted for developing consumer-centric and profit-feasible subscription packages for handcrafted textiles and pottery products. The methodology integrates Choice-Based Conjoint (CBC) analysis (Oztas & Erdem, 2021) and Mixed Integer Linear Programming (MILP) (Y. Fang et al., 2018) into a unified analytical system to capture consumer preferences, estimate willingness-to-pay, and identify optimal package subsets capable of generating sustainable recurring revenue for artisanal MSMEs. The approach was designed deliberately to address the fundamental limitations of traditional subscription models when applied to handcrafted products, particularly their seasonal usage, heterogeneous characteristics, and the cultural unsuitability of replenishment- or rental-based subscriptions in the Indian context (Rese & Baier, 2025). The integrated methodology ensures

that subscription packages remain operationally feasible, aligned with consumer expectations, and financially viable for producers (Meyer et al., 2017).

6.2.1 Integrated Framework for Subscription Package Development

The study develops a three-stage, data-driven framework that aligns consumer behaviour insights with quantitative optimisation. In the first stage, subscription attributes and levels are identified based on literature, pilot discussions, and contextual relevance to artisanal products (Gensler et al., 2012). Unlike replenishable goods such as food or personal care items, handcrafted textiles and pottery do not exhibit fixed consumption cycles, making conventional monthly boxes or rigid tier-based subscriptions inappropriate (Sardanelli et al., 2019; Tyagi & Bolia, 2024). Consequently, subscription design must originate from consumer preferences rather than provider-imposed assortments (Caiati et al., 2020).

The second stage employs Choice-Based Conjoint (CBC) analysis, which captures consumer valuations of different attribute levels by simulating real-world choice scenarios (M. A. Ozdemir, 2022; Popovic et al., 2018). CBC provides the part-worth utilities required to evaluate all feasible package combinations, including the computation of total utility, reservation prices, and willingness-to-pay values (Jedidi & Zhang, 2002). The third stage integrates these utilities into a Mixed Integer Linear Programming (MILP) model that selects the optimal subset of packages while maximising expected profit (Raja & Sharda, 2020; Tyagi & Bolia, 2024). This ensures that packages with high desirability but low profit margins, or those profitable but unattractive to consumers, are appropriately filtered out. The combination of behavioural data (via CBC) and operational optimisation (via MILP) enables the development of subscription packages that are not only desirable and affordable for consumers but also profitable and feasible for producers, thereby supporting sustainable adoption in handcrafted MSMEs.

6.2.2 Conjoint Analysis

Conjoint analysis is a quantitative technique used extensively in marketing research to determine how customers value the attributes of a product or service (Mehta & Kapoor, 2020). The fundamental premise of conjoint analysis is that products can be decomposed into a set of attributes, each with multiple levels, and that consumer preference for a product can be expressed as the sum of their preferences for each attribute level (H. S. Shin et al., 2015). Conjoint analysis compels respondents to make trade-offs, thereby mimicking real marketplace decision-making more effectively than rating or ranking tasks. For handcrafted textiles and

pottery subscriptions, where consumption patterns vary widely and rigid subscription structures are unsuitable, conjoint analysis offers the capability to measure nuanced preferences for configurable attributes such as number of items, delivery frequency, share of handmade items, and value-added services. Unlike traditional surveys, where respondents may overstate preferences or fail to consider trade-offs, conjoint analysis quantifies true preference structures, making it ideally suited for designing consumer-driven subscription packages.

Several alternative techniques, such as Likert-scale surveys, ranking exercises, cluster analysis, and expert-driven assessments (AHP, Delphi), are commonly used in product development. However, these methods lack the ability to simulate consumer trade-offs under constrained choice environments, which is essential for subscription design. Likert scales capture attitudinal data but cannot reveal how consumers prioritise attributes when forced to choose between competing options. Ranking tasks impose heavy cognitive burdens and often result in inconsistent preference patterns. Expert-based techniques capture practitioner perspectives but fail to represent consumer behaviour, which is critical for subscription adoption. Revealed preference methods cannot be used because subscription models for handcrafted products are not yet prevalent in the Indian market. In contrast, conjoint analysis provides respondents with realistic choice sets and uses their choices to infer the underlying utility structure. Conjoint methods are particularly well-suited to subscription package contexts where attributes interact to influence perceived value, and where pricing needs to be grounded in consumer willingness-to-pay rather than provider assumptions (Fraginière et al., 2011).

Among the various forms of conjoint, full-profile conjoint, rating-based conjoint, Adaptive Conjoint Analysis (ACA), Adaptive Choice-Based Conjoint (ACBC), and Choice-Based Conjoint (CBC) (Green et al., 1991; H. S. Shin et al., 2015). CBC is considered the most realistic and robust method for modelling purchase behaviour, as it replicates actual choice processes where consumers select one option from a set of alternative packages (H. S. Shin et al., 2015). CBC is particularly useful when price is a critical attribute, as it allows estimation of the marginal utility of money and thereby supports the derivation of willingness-to-pay metrics (Gensler et al., 2012). Further, CBC accommodates complex attribute structures and multiple levels without overwhelming the respondent, as only a limited number of choice sets need to be evaluated (Schlereth et al., 2011). This aligns with the study's objective of capturing realistic consumer decision-making for subscription plans involving handcrafted products with varied usage cycles and diverse attribute combinations. Thus, this study uses CBC for

systematically quantifying consumer preferences, computing package-level utilities and choice probabilities, and generating the demand-driven inputs required for the MILP model to select feasible and profit-maximising subscription packages. The following section describes the process for conjoint design and utility calculation.

Conjoint Design and Estimation Procedure

The implementation of Choice-Based Conjoint (CBC) analysis follows a systematic multi-stage procedure that transforms consumer choice data into part-worth utilities, package-level utilities, and monetary preference metrics such as willingness-to-pay (WTP) and reservation prices (Caiati et al., 2020; Gensler et al., 2012; Jedidi & Zhang, 2002). The overall process consists of (i) defining attributes and levels, (ii) generating experimental design, (iii) administering choice tasks, (iv) estimating part-worth utilities through multinomial logit modelling, and (v) computing utility-based monetary measures for pricing and package evaluation. The Choice-Based Conjoint (CBC) methodology in this study follows a structured sequence starting from attribute design and concluding with the computation of package-level utilities, willingness-to-pay, reservation prices, and choice probabilities for optimisation (Gensler et al., 2012). The steps of CBC analysis are described below:

Step 1. Identification of Attributes and Levels:

The CBC process begins with identifying the key attributes of the product or service and involves specifying mutually exclusive, collectively exhaustive levels for each attribute. These attributes define the subscription package. Attributes should represent the primary drivers of consumer preference, while the number of levels of each attribute balances the need for realistic variation with respect to respondent cognitive comfort. These attributes and levels form the basis of CBC cards, where each card represents one hypothetical subscription combination.

Let,

k = index of an attribute level

X_{ik} = dummy variable taking value 1 if card i contains attribute level k , else 0

Step 2. Experimental Design and Construction of Choice Sets

Once attributes and levels are finalised, an experimental design is constructed, typically using an orthogonal design to ensure statistical independence across attribute levels and balanced representation of each level in the choice sets. The design results in a set of cards ($i = 1, 2, \dots, I$), which are grouped into multiple-choice tasks, where respondents choose one option from a set of available cards. Only a subset of the total possible profiles is shown to each respondent to minimise fatigue, while maintaining statistical efficiency.

Let,

C = the set of cards shown in a particular choice task

r = index of respondent

Step 3. Administration of Choice Tasks

Each respondent r selects exactly one card i from each choice set C . Respondents complete the CBC questionnaire by selecting their preferred option in each choice set. The collected responses form the discrete choice dataset needed to estimate part-worth utilities. This choice-based format simulates real-world decision-making because respondents are required to make trade-offs across attributes.

Step 4. Utility Specification for each CBC Card

The utility of each card is assumed to be a linear combination of its attribute levels. The latent utility that respondent r associates with card i is expressed as:

$$U_{ri} = \beta_0 + \sum_k \beta_k X_{ik} \quad (6.1)$$

Where

U_{ri} = utility of card i for respondent n

β_0 = intercept

β_k = part-worth utility of attribute level k representing the relative desirability at each level

X_{ik} is the indicator variable taking the value 1 if card i , has level k else 0

Step 5. The probability of choosing a card by the respondent

CBC data are commonly analysed using a multinomial logit model (MNL), where the probability of respondent r choosing card i from choice set C is expressed as:

$$P_{ri} = \frac{e^{(U_{ri})}}{\sum_{h \in C} e^{(U_{rh})}} \quad (6.2)$$

Where,

$\sum_{h \in C} e^{(U_{rh})}$ sums exponential utilities for all cards i in the same choice task C .

Step 6. Estimation of Part-Worth Utilities

The multinomial logit model (MNL) determines the β -values that maximise the likelihood of predicting the observed choices. β_0 and β_k are obtained through maximum likelihood estimation (MLE). These coefficients represent the part-worth utilities of each attribute level.

Step 7. Part-Worth Utility Contribution of Each Attribute Level for Each Package

After calculating β_0 and β_k , any package j can be calculated. For any package j , the utility contribution of attribute level k to package j (U_{jk}) is calculated as:

$$U_{jk} = \beta_k X_{jk} \quad (6.3)$$

Where

$j = 1, 2, \dots, J$ = index of subscription package

$X_{jk} = 1$ if package j contains level k , else 0

Step 8. Computation of Total Utility of Package j

For any feasible package j , the overall utility of package j (V_j) is the sum of all part-worth utilities:

$$V_j = \sum_k U_{jk} = \beta_0 + \sum_k \beta_k X_{jk} \quad (6.4)$$

Where,

β_0 = intercept

V_j = total deterministic utility of package j

This score represents the perceived attractiveness of the package relative to competing alternatives. It is to note that U_{ri} is the card-level utility and V_j is the package-level utility.

This V_j is further used for calculating pricing, willingness to pay, reservation price and optimisation.

Step 9. Willingness to Pay (WTP)

For packages with positive total utility ($V_j > 0$), the WTP is calculated as:

$$WTP_j = P_{baseline} + \left(\frac{V_j}{-\beta_{price}} \right) \quad (6.5)$$

Where,

$P_{baseline}$ = reference price

$-\beta_{price}$ = price coefficient (marginal disutility of price)

The price coefficient ($-\beta_{price}$) captures how strongly an increase in price lowers consumer utility. Because price has a negative effect on preference, $-\beta_{price}$ is usually negative. Its magnitude reflects the sensitivity of consumers to price changes and forms the basis for translating total utility into monetary values such as willingness to pay.

Step 10. Reservation Price

For the packages with negative utility ($V_j < 0$), the reservation price is the price at which the utility becomes zero which is calculated as:

$$ReservationPrice_j = P_j - \left(\frac{V_j}{-\beta_{price}} \right) \quad (6.6)$$

Where,

P_j is the initially proposed price for package j

This gives the price reduction required to make the package acceptable. Packages with reservation prices significantly lower than their proposed prices may be unsuitable for market introduction.

Step 11. Computing Choice Probabilities

This study uses the choice probability for package j to compute choice probabilities using the following equation 6.7. Although CBC provides part-worth utilities, choice probabilities are not generated directly by CBC and must be computed separately when integrating conjoint results into an optimisation model such as MILP. Using the total utility V_j for each package, the choice probability (q_j) is calculated using the multinomial logit formula:

$$q_j = \frac{e^{(V_j)}}{\sum_{m=1}^J e^{(V_m)}} \quad (6.7)$$

Where

q_j = probability that consumers choose package j

m = index of all feasible packages

V_j = total package utility

These probabilities represent the likelihood that a consumer will choose package j when presented among all feasible alternatives. In this study, these probabilities are used as weighting factors in the expected profit function. This way, CBC results are integrated into the MILP formulation for package pricing calculation.

6.2.3 Mixed Integer Linear Programming for Package Optimisation

Mixed Integer Linear Programming (MILP) is a powerful operations research methodology for optimising decisions under constraints (Hillier & Lieberman, 2021). It is suited to problems where decisions involve discrete selections, such as choosing which subscription packages to offer, and where the objective is to maximise or minimise a linear function subject to linear constraints (Hillier & Lieberman, 2021; Tyagi & Bolia, 2024). In the context of handcrafted

textiles and pottery subscriptions, MILP provides an analytically robust mechanism to determine which package combinations should be offered to maximise expected profit while simultaneously satisfying operational and consumer-centered constraints.

Subscription package selection is inherently a binary decision problem: each package is either offered (1) or not offered (0). MILP accommodates such binary decision variables while also allowing integration of continuous parameters such as costs, expected revenues, and choice probabilities (Nemhauser & Wolsey, 1988). Furthermore, the handcrafted nature of products imposes constraints related to production variability, cost structures, and logistics. MILP is capable of incorporating these constraints into the optimisation process, ensuring that selected packages remain operationally feasible. The integration of choice probabilities ensures that the optimisation is demand-driven rather than purely cost-driven, enabling a balanced evaluation of packages that may be highly profitable but have low adoption potential, and vice versa.

6.2.4 Research Framework and Stepwise Execution

The integrated methodology unfolds across three sequential stages. In Stage 1, attributes and levels for subscription packages were identified through field insights, consumer interviews, and literature review, ensuring that attribute selection reflected the consumption realities of handcrafted products. In Stage 2, the CBC survey was conducted, utilities were estimated, and WTP and reservation prices were calculated to filter the universe of possible packages into a feasible set. The utilities were then converted into choice probabilities. In Stage 3, the MILP model used these probabilities along with cost data to select an optimal subset of packages that maximised expected profit. This multi-stage approach ensures a seamless flow from understanding consumer preferences to operational decision-making in subscription design.

6.2.5 Study Area

The study focuses on the Indian market for handcrafted textiles and pottery, targeting urban and semi-urban consumers familiar with subscription-based retailing and artisanal products. The context reflects the increasing digital exposure of consumers, growing interest in culturally grounded goods, and the need for innovative retail mechanisms to support artisanal MSMEs facing irregular demand cycles.

6.2.6 Data Collection

The primary data for the subscription package selection and pricing optimisation was taken from the online survey administered using Google Forms. The questionnaire was designed to capture respondents' preferences across a set of experimentally generated subscription package alternatives.

6.2.6.1 Survey Design and Instrument Development

The survey instrument was designed using Google Forms and included CBC choice tasks based on the orthogonal experimental design. Each respondent was shown choice tasks, each consisting of three alternative subscription packages (CBC cards), from which they were required to select the most preferred option. The questionnaire included screening questions to ensure respondent familiarity with handcrafted products and subscription-based retailing. Attribute descriptions were carefully worded to ensure clarity and reduce misinterpretation, particularly for features related to handmade share or circular-economy options. Pictorial cards were used for convenience and clarity. Randomisation of card order within the survey minimised potential order effects, and the orthogonal design ensured that attribute levels appeared in statistically balanced proportions across respondents.

6.2.6.2 Pilot Survey

Before the main data collection, a pilot survey was conducted to evaluate the clarity of attribute descriptions, verify the suitability of attribute levels, and ensure that respondents could complete choice tasks without cognitive overload. Feedback from the pilot phase led to refinements in attribute phrasing and adjustments to the number of items and features included in the final design. The pilot also helped determine that seven choice tasks per respondent struck an optimal balance between statistical rigour and respondent fatigue.

A total of 21 CBC cards were initially generated using an orthogonal design matrix developed in IBM SPSS, ensuring statistical independence and balanced representation of attribute levels across the cards. To reduce respondent fatigue and maintain cognitive clarity, each participant was shown a randomised subset of seven cards, following a Sawtooth-style CBC design approach commonly used in choice modelling studies.

6.2.6.3 Survey Distribution

The online Google form survey was floated via multiple digital platforms, including social media groups, community forums, and personal networks, enabling broad and diverse participation. Data collection was conducted between July and August 2025, yielding 220 valid responses after screening for completeness, redundancy, and inconsistent answering patterns. The resulting dataset provided the choice information necessary for estimating part-worth utilities through Choice-Based Conjoint analysis and subsequently computing package utilities, willingness-to-pay values, reservation prices, and package-level choice probabilities. These outputs served as critical inputs for the pricing and package selection optimisation models developed through Mixed Integer Linear Programming. The following section discusses the development of optimal packages and their pricing for the two case studies, pottery and handcrafted textiles.

6.3 Mathematical Model for Optimal Package Selection

Following the estimation of consumer preferences using Choice-Based Conjoint (CBC) analysis, the next stage of the framework integrates these behavioural outputs into a profit-maximising package selection and pricing model. The CBC procedure generates three key quantitative measures for every feasible subscription package:

- Total attribute utility V_j , computed from the part-worth utilities of included attribute levels
- Choice probability q_j , obtained from the logit transformation of V_j , representing the likelihood of market adoption
- Willingness-to-pay WTP_j , which converts utility into a monetary valuation based on the marginal utility of price.
- Each candidate package j ($j \in J$) additionally has a predetermined base price (p_j^{base}) (from conjoint design) and a corresponding variable cost constructed from feature-related and item-related cost components.

These parameters form the behavioural and economic inputs to a Mixed Integer Linear Programming (MILP) model that simultaneously identifies the subset of packages to offer and the optimal selling price for each selected package. The model ensures that chosen packages are profitable, non-duplicative, and representative across subscription tiers while adhering to affordability limits dictated by the WTP estimates and the price levels tested in the CBC survey.

The following section presents the formal mathematical formulation of the optimisation model, detailing the sets, parameters, decision variables, objective function, and constraints used to determine the optimal portfolio of handcrafted textile and pottery subscription packages.

The following notations are used in the model:

Sets and Indices

- J denotes the set of all candidate subscription packages, indexed by j
- T denotes the set of subscription tiers (Basic, Gold, Premium) indexed by t
- $J_t \in J$ denotes the subset of packages belonging to tier t
- $G_k \in J$ denotes a group of packages that share the same combination of attribute levels within the same tier but appear at different package prices, indexed by group k . Only one package from each such group should be selected to eliminate within-tier duplicates
- $H_r \in J$ denotes group of packages that are cross-tier duplicates indexed by group r

Parameters

For each package $j \in J$,

- q_j : choice probability of package j obtained from CBC (probability of being chosen among all candidate packages)
- V_j : total attribute utility of package j from CBC (used indirectly via q_j and WTP_j)
- WTP_j : willingness to pay for package j
- p_j^{base} : base price of package j used in the conjoint design
- $k_j^{feat} \in \{1,2,3\}$: denotes number of features (1 for basic, 2 for gold, 3 for premium tier)
- $FeatureCost_j = 0.10 \times p_j^{base} \times k_j^{feat}$: computed feature cost
- $ItemCost_j = 0.60 \times p_j^{base}$: computed item cost
- $c_j = FeatureCost_j + ItemCost_j$: total variable cost per subscription of package j
- N : market scaling factor (taken as 1 in this study representing a single customer)
- ε : denotes a small positive constant to ensure that price strictly exceeds cost (taken as 0.01)
- P_{max} : maximum allowed subscription package price (upper bound); typically the highest price level of price attribute of package j

The following are the assumptions taken before carrying out the analysis.

- Linear variable cost structure: For each package j , variable cost (c_j) is assumed to be $c_j = 0.10 \times p_j^{base} \times k_j^{feat} + 0.60 \times p_j^{base}$, where feature cost and item cost are proportional to base price and number of features according to tier.
- Fixed costs, overheads, and capacity costs are not explicitly modelled.
- No stockouts or capacity constraints: The model assumes that artisan clusters can supply quantities consistent with the chosen packages and prices; capacity or inventory limits are not binding.
- Single Customer Profit: Market scaling factor N is set to 1. Expected profit is therefore interpreted per customer and can be scaled up proportionally for a larger market.
- Choice probabilities are exogenous in the MILP: q_j values derived from CBC are treated as fixed parameters in the optimisation.
- WTP and price bounds: The optimised price p_j is constrained to be no higher than WTP_j and P_{max} used in the conjoint design. WTP is interpreted as an upper bound of the acceptable price under the current attribute configuration.
- Tier coverage requirement: The model assumes each tier must have at least one active package to preserve meaningful tier structure.
- Removal of duplicate packages: The model ensures that all the optimised packages are distinct within and across the tier. Packages that differ only trivially (e.g. same attributes but different base price) are treated as duplicates for selection purposes.
- Category-specific assumptions: Since pottery usage is seasonal and occasional, so no monthly replenishment of pottery boxes is considered in the package. Delivery is purely curated as per the customer requirement in the pottery subscription. In textile subscription, demand is occasional for some product segments, and some products are near a replenishment cycle. So, based on expert discussion, there is consideration of number of deliveries per month.
- The features are added based on discussion with artisans.
- The package has not restricted to few selected items. Any item matching the quantity and price constraints is available for purchase in any subscription tier package.

Decision Variables

For each package $j \in J$,

- $x_j \in \{0,1\}$: binary decision variable (1 if package j is selected for offering, else 0)
- $p_j \geq 0$: optimised offered price for package j

Objective Function

The objective is to maximise expected profit across all selected packages:

$$\max_{x,p} \sum_{j \in J} N \cdot q_j \cdot (p_j - c_j) x_j \quad (6.8)$$

Where, $N = 1$ (in this case study)

Subject to the following constraints

- Price lower bound (Price must exceed cost): For each package j , if selected ($x_j = 1$), its price must at least cover cost plus a small margin:

$$p_j \geq (c_j + \varepsilon) x_j \quad \forall j \in J \quad (6.9)$$

- Price upper bound (constrained by WTP and design limits): The optimised price cannot exceed the WTP for that package and the maximum allowable price used in the CBC design:

$$p_j \leq WTP_j \times x_j \quad \forall j \in J \quad (6.10)$$

$$p_j \leq P_{max} \times x_j \quad \forall j \in J \quad (6.11)$$

- Tier coverage: At least one package must be offered in each tier $t \in T$:

$$\sum_{j \in J_t} x_j \geq 1 \quad \forall t \in T \quad (6.12)$$

This ensures that the final solution includes coverage across all subscription tiers.

- Non-negativity of prices

$$p_j \geq 0 \quad \forall j \in J \quad (6.13)$$

- Duplicate Elimination within tiers: To prevent offering multiple packages that are effectively identical within a tier (same tier, delivery frequency, items per box, and feature structure), at most one package may be selected from each within-tier group G_k :

$$\sum_{j \in G_k} x_j \leq 1 \quad \forall G_k \quad (6.14)$$

- Cross-tier duplicate elimination: To avoid cross-tier duplicates that share the same non-tier attributes and base price (e.g. same delivery, items, features, and predetermined base price (p_j^{base})), at most one package is selected from each cross-tier group H_r :

$$\sum_{j \in H_r} x_j \leq 1 \quad \forall H_r \quad (6.15)$$

In this price optimisation model, the objective function is linear in x_j and p_j along with all constraints. Also, binary variable x_j and continuous variables p_j are present. This makes the above formulation a mixed integer linear programming (MILP) model. The following section analyses the package development and price optimisation for pottery products.

6.4 Subscription package development for pottery products

The subscription package development for handcrafted pottery follows the three-stage, data-driven framework established in this study. This process integrates consumer preference modelling through Choice-Based Conjoint (CBC) analysis with quantitative package selection and pricing optimisation via Mixed Integer Linear Programming (MILP). The objective is to design subscription packages that are aligned with consumer needs, feasible for artisanal production constraints, and financially viable for MSME sellers.

6.4.1 Identification of Attributes and Levels

The first step involves defining the attributes and levels relevant for pottery subscription design. These attributes were identified through a combination of literature review, expert consultations, pilot discussions with artisans, and an assessment of consumer usage patterns. Unlike replenishable or fast-moving categories such as food, grooming, or household consumables, handcrafted pottery items do not follow predictable monthly consumption cycles. Purchases typically occur seasonally, occasionally, or for specific aesthetic or functional purposes. Hence, subscription structures commonly observed in commercial box services, such as fixed monthly assortments or rigid tier-based offerings, are poorly suited to pottery products.

Based on contextual relevance and consumer feasibility, the final set of attributes and levels is presented in Table 6.1. These attributes capture several components of consumer value: the product value (handmade versus machine-made pottery), quantity expectations (items per box), and service add-ons such as replacement discounts (F1), maintenance support (F2), and customisation options including colour and name embossing (F3). The tier structure (Basic,

Gold, Platinum) reflects scalable levels of service and assortment, enabling consumers to self-select based on perceived value. Finally, the price range (₹499–₹1599) was chosen based on affordability assessments from pilot respondents and represents realistic willingness-to-pay brackets for handcrafted pottery subscriptions.

Table 6. 1 Attributes and Levels for Pottery Subscription Package Design

Attribute	Levels
Price	₹ 499
	₹799
	₹1199
	₹1599
Items per Box	One to three (1-3)
	Four to six (4-6)
	Seven to ten (7-10)
Product Type	Handmade
	Machine-made
Feature	F1: Discount on replacement
	F2: Maintenance
	F3: Customisation (colour, embossing, naming)
Tier	Basic
	Gold
	Platinum

6.4.2 Estimation of Consumer Utilities Using CBC

In the second stage, CBC analysis is performed to quantify consumer preferences across the attribute levels. Respondents were presented with multiple-choice tasks where they selected their preferred subscription plan from a set of alternative combinations. Using multinomial logit estimation, part-worth utilities (β -values) were derived for each attribute level. All attributes except price are categorical, and price is taken as a continuous variable. So, the aggregated utility for a feasible package j is calculated as:

$$V_j = \sum_k U_{jk} = \beta_0 + \beta_{price} \times Price_j + \sum_k \beta_k X_{jk} \quad (6.16)$$

Following the steps and calculations mentioned above, Table 6.2 contains the estimated part-worth utilities for pottery products.

Table 6. 2 Part-worth Utilities for Pottery Attribute Levels

Attribute	Level	Utility (β)
Intercept	-	-0.0618
Tier	Gold	0.2607
Tier	Platinum	0.1153
Items per Box	One to Three	-0.0873
Items per Box	Four to Six	0.0395
Product Type	Machine-made	-0.3341
Feature	F2	0.1426
Feature	F3	0.1130
Price	Per ₹1 (continuous)	-0.0007

Since Price was modelled as a continuous attribute, the part-worth table reports a single price coefficient ($\beta_{price} = -0.000721$), representing the marginal change in utility per ₹1 increase in price. For interpretation, the implied utility contributions for each discrete price level used in the conjoint design (₹499, ₹799, ₹1199, ₹1599) are presented separately in Table 6.3.

Table 6. 3 Implied Utilities for Discrete Price Levels (From Continuous Price Coefficient for Pottery Subscription)

Price	Utility Contribution from Price ($\beta_{price} \times price_j$)
₹499	-0.36
₹799	-0.58
₹1199	-0.86
₹1599	-1.15

Attribute importance score further indicates that Tier (48.17%) and Items per box (42.03%) are the strongest determinants of consumer decisions, followed by package feature (9.80%).

Using these utilities, the total utility of each feasible subscription package V_j was computed as the sum of the part-worths of its included attribute levels. The utility of a package j is the sum

of the utilities of all attribute levels included in that package. This aggregated utility score V_j , forms the foundation for calculating willingness-to-pay (WTP), reservation prices, and choice probabilities derived for each package, enabling a complete desirability profile. These values are later integrated into the optimisation model. The utility score for each attribute level (tabulated in Table 6.2), leads to the following equation 6.17 to estimate V_j for any package j . In this conjoint modelling, price is treated as a continuous variable.

$$V_j = -0.0618 + 0.2607X_{jGold} + 0.1153X_{jPlatinum} + (-0.0873)X_{jOne\ to\ Three} + 0.0395X_{jFour\ to\ Six} + (-0.3341)X_{jMachine-made} + 0.1426X_{jF2} + 0.1130X_{jF3} + (-0.0007)X_{jPrice_j} \quad (6.17)$$

6.4.3 Package Selection and Pricing Optimisation via MILP

The final stage integrates CBC-derived utilities into an MILP model that selects the optimal subset of pottery subscription packages and determines their profit-maximising prices. Each package was assigned a variable cost computed from its base price through a feature cost component ($FeatureCost_j = 0.10 \times p_j^{base} \times k_j^{feat}$) and an item cost component ($ItemCost_j = 0.60 \times p_j^{base}$). The CBC-derived choice probability q_j , was used to represent expected market adoption for each package.

The MILP model maximises expected profit by selecting only those packages with favourable trade-offs between consumer desirability (high utility and probability) and financial viability (positive margins). The model also includes constraints related to price bounds, tier coverage, and elimination of duplicates to ensure product differentiation.

Table 6.4 presents the output of the MILP model for pottery subscription packages. The model evaluates all feasible combinations generated from the CBC analysis and selects the profit-maximising subset while determining the optimal offering price for each package. For each package j , the table reports:

- Package Utility
- WTP and Reservation Price
- Choice Probability
- Final Optimised Price
- Profit per package

The optimisation identifies 16 feasible packages that offer the best trade-off between consumer desirability (high utility and choice probability) and operational profitability (positive margin after cost). From the supplier's perspective, the most profitable package is Package 5 (Gold tier, 4-6 items, handmade, Feature F2), yielding profit of ₹635.43 per subscription. This is driven by high consumer utility, strong WTP, and moderate input cost. From the consumer end also, Package 5 also exhibits the highest choice probability (0.53), indicating strong alignment between consumer desirability and supplier profitability. Packages containing machine-made products (e.g., Package 10 and 11) show substantially lower utility and profit contributions compared to handmade variants, confirming that consumers strongly prefer handcrafted pottery in subscription formats.

Applying the optimisation model yielded an expected maximum profit of ₹6034.85 for the pottery subscription case. This confirms that integrating consumer-driven utilities with operational optimisation results in subscription packages that are both attractive and sustainable for artisanal MSMEs.

Table 6. 4 MILP-Based List of Optimal Pottery Subscription Packages and Pricing

IDs	Tier	ItemsPerBox	Product Type	Feature	Base Price	WTP	Reservation Price	Choice Probability	Package Utility	Optimised Price	Profit Per Package
1	basic	1-3	handmade	F2	499	453.11	45.89	0.46	-0.15	453.11	48.00
2	gold	1-3	handmade	F2	799	1447.92	0.00	0.50	0.01	1447.92	406.37
3	gold	1-3	handmade	F3	499	1359.10	0.00	0.52	0.08	1359.10	499.19
4	gold	4-6	handmade	F1	499	1400.59	0.00	0.52	0.09	1400.59	524.23
5	gold	4-6	handmade	F2	799	1828.84	0.00	0.53	0.14	1828.84	635.43
6	gold	4-6	handmade	F3	799	1740.02	0.00	0.53	0.11	1740.02	579.88
7	gold	7-10	handmade	F1	499	1281.91	0.00	0.51	0.05	1281.91	453.39
8	gold	7-10	handmade	F2	799	1710.16	0.00	0.52	0.10	1710.16	561.50
9	gold	7-10	handmade	F3	799	1621.34	0.00	0.52	0.07	1621.34	507.68
10	gold	7-10	machinemade	F2	499	411.13	87.87	0.47	-0.14	411.13	5.56
11	gold	7-10	machinemade	F3	499	499.95	-0.95	0.46	-0.17	499.95	46.19
12	platinum	1-3	handmade	F1	499	534.99	-35.99	0.46	-0.18	534.99	39.13
13	platinum	4-6	handmade	F2	499	1392.30	0.00	0.52	0.09	1392.30	493.11
14	platinum	4-6	handmade	F3	499	1303.48	0.00	0.52	0.06	1303.48	440.37
15	platinum	7-10	handmade	F2	499	1273.62	0.00	0.51	0.05	1273.62	422.93
16	platinum	7-10	handmade	F3	499	1184.80	0.00	0.51	0.02	1184.80	371.93

6.5 Subscription package development for handcrafted textile products

The subscription package development for handcrafted textile products follows the same three-stage, data-driven framework used for pottery. This framework integrates consumer preference estimation through CBC with quantitative optimisation using MILP to design subscription packages that reflect consumer expectations, artisanal production capabilities, and financial viability. Since handcrafted textiles, similar to pottery, do not exhibit standardised consumption cycles, subscription structures must be developed directly from consumer preferences rather than borrowing formats from FMCG-based subscription models.

6.5.1 Identification of Attributes and Levels

The first step in designing subscription packages for handcrafted textiles is to identify the attributes and levels most relevant to consumer behaviour in this category. This set of attributes was derived through an extensive review of literature on textile consumption, field discussions with weavers, cooperative units, and designers, and a pilot study evaluating preferences among potential subscribers. Similar to pottery, handcrafted textile products, such as stoles, scarves, table linens, cushion covers, and apparel accessories, are purchased occasionally, often for festivals, seasonal wardrobes, gifting, or aesthetic renewal. As a result, rigid monthly replenishment cycles are impractical, reinforcing the need for a flexible, consumer-centric subscription design.

Table 6.5 presents the finalised attributes and levels for handcrafted textiles. These attributes represent different dimensions of consumer value: functional utility (number of items per box and delivery frequency), artisanal authenticity (percentage of handmade or GI-linked textiles), and risk-mitigation services such as return/replacement (F1), maintenance (F2), and circular economy-oriented exchange options (F3). The inclusion of subscription tiers (Basic, Gold, Platinum) provides differentiated levels of service, while the price range (₹1250–₹2000) aligns with the spending patterns identified during pilot testing for handcrafted apparel and home décor textiles. Together, these attributes ensure that the subscription design effectively reflects consumer needs, artisanal production constraints, and contemporary sustainability considerations.

Table 6. 5 Attributes and Levels for Pottery Subscription Package Design

Attribute	Levels
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Price	₹ 1250
	₹1500
	₹1750
	₹2000
Items per Box	One to Three (1-3)
	Four to Six (4-6)
	Seven to Ten (7-10)
Percentage of Handcrafted Textiles	0%
	25%
	50%
Feature	F1: Return/Replacement/Compensation
	F2: Maintenance
	F3: Exchange for new (circular economy)
Tier	Basic
	Gold
	Platinum
Delivery Frequency	One per month (1/month)
	Two per month (2/month)
	Three per month (3/month)

6.5.2 Estimation of Consumer Utilities Using CBC

CBC analysis was used to estimate consumer preferences for textile subscription attributes. Respondents were presented with multiple-choice tasks and selected one plan from each set. Parameter estimation was performed using a multinomial logit model, and price was treated as a continuous variable (refer equation 6.18). The estimated part-worth utilities are shown in Table 6.6.

Table 6. 6 Part-worth Utilities for Pottery Attribute Levels

Attribute	Level	Utility (β)
Intercept	-	-0.1481
Tier	Gold	0.1030
Tier	Platinum	-0.2007
Items per Box	1-3	-0.1889

Items per Box	4-6	-0.2163
Handcrafted Item share	25%	0.14922
Handcrafted Item share	50%	0.47702
Feature	F2	-0.1551
Feature	F3	-0.3064
Delivery Frequency	2/month	0.2822
Delivery Frequency	3/month	0.1302

Since price is modelled as continuous, the price coefficient $\beta_{price} = -0.0003$ reflects the marginal decrease in utility per ₹1 increase in subscription price. To aid interpretation, implied utilities for the discrete price levels used in the design are shown separately in Table 6.7.

Table 6. 7 Implied Utilities for Discrete Price Levels (From Continuous Price Coefficient)

Price	Utility Contribution from Price ($\beta_{price} \times price_j$)
₹1250	-0.4144
₹1500	-0.4973
₹1750	-0.5801
₹2000	-0.6631

Attribute importance values indicate that Handcrafted Item share (34.06%) and Tier (31.56%) are the strongest determinants of choice, followed by Delivery Frequency (15.79%) and Feature (15.72%).

Using the part-worth estimates, the aggregated utility V_j for any package j can be computed using the following regression equation:

$$\begin{aligned}
V_j = & -0.1481 + 0.1030X_{jGold} + (-0.2007)X_{jPlatinum} + 0.2822X_{j2DeliveryPerMonth} + \\
& 0.1302X_{j3DeliveryPerMonth} + (-0.1888)X_{j1-3ItemsPerBox} + (-0.2163)X_{j4-6ItemsPerBox} + \\
& (0.1492)X_{j25\%GI-Items} + 0.4770X_{j50\%GI-Items} + (-0.1551)X_{jF2} + (-0.3061)X_{jF3} + \\
& (-0.0003)X_{jPrice_j}
\end{aligned} \tag{6.18}$$

This package-level utility score forms the basis for computing WTP, reservation price, and choice probabilities for all textile subscription packages.

6.5.3 Package Selection and Pricing Optimisation via MILP

The final stage integrates utility values into the MILP model to determine the optimal portfolio of textile subscription packages and their profit-maximizing prices. As in pottery, each package is assigned a variable cost calculated using base price, a feature cost component ($FeatureCost_j = 0.10 \times p_j^{base} \times k_j^{feat}$), and an item cost component ($ItemCost_j = 0.60 \times p_j^{base}$). The choice probability q_j , derived from the logit model is used to estimate the expected adoption likelihood of each package.

The MILP model maximises expected profit by selecting only those packages with strong demand potential and positive margins. Constraints for price feasibility, elimination of duplicates, and tier-wise coverage ensure meaningful product differentiation. Table 6.8 shows the top packages based on the integrated effect of choice probability and profit per package.

Table 6. 8 MILP-Based List of Optimal Textile Subscription Packages and Pricing

IDs	Tier	Delivery Per Month	Items Box	Per Item Share	Handcrafted Base Price	WTP	Reservation Price	Choice Probability	Package Utility	Optimised Price	Profit Per Package
1	basic	2	3	50%	1250	3540.20	0	0.549	0.197	2000	617.647
2	basic	2	10	50%	1250	3540.20	0	0.549	0.197	2000	617.647
3	basic	3	3	50%	1250	3081.75	0	0.511	0.045	2000	575.078
4	basic	3	10	50%	1250	3081.75	0	0.511	0.045	2000	575.078
5	basic	2	3	50%	1250	3072.34	0	0.510	0.042	2000	574.201
6	basic	2	10	50%	1250	3072.34	0	0.510	0.042	2000	574.201
7	gold	2	6	50%	1250	3198.43	0	0.521	0.083	2000	520.841
8	gold	1	3	50%	1250	2999.81	0	0.504	0.018	2000	504.391
9	gold	1	10	50%	1250	2999.81	0	0.504	0.018	2000	504.391
10	gold	2	3	50%	1500	3851.04	0	0.554	0.217	2000	443.206
11	gold	2	10	50%	1500	3851.04	0	0.554	0.217	2000	443.206
12	gold	3	3	50%	1500	3392.59	0	0.516	0.065	2000	412.975
13	gold	3	10	50%	1500	3392.59	0	0.516	0.065	2000	412.975
14	gold	2	3	50%	1500	3383.17	0	0.515	0.062	2000	412.351
15	gold	2	10	50%	1500	3383.17	0	0.515	0.062	2000	412.351
16	gold	3	6	25%	1250	1663.55	-413.55	0.366	-0.551	1664	242.544

6.6 Discussion

6.6.1 Handcrafted Pottery Subscription Package Optimisation

The development of the handcrafted pottery subscription proceeded through three stages of analysis, attribute formulation, conjoint-based consumer preference modelling, and mixed-integer linear optimisation.

In Stage 1, the design stage, the final set of attributes included price, number of items per box, product type (handmade or machine-made), feature type (replacement discount, maintenance, customisation), and subscription tier (Basic, Gold, Platinum). A feasible price range was identified at ₹499–₹1599, suitable for urban and semi-urban customer segments. The proposed design moved away from rigid monthly box formats to accommodate flexible combinations of item counts and tier-based differentiation.

Stage 2 involved the conjoint-based choice (CBC) analysis of consumer preference and utility outcomes. The estimated price coefficient was negative ($\beta_{price} = -0.0007$ per ₹1), confirming high price sensitivity among consumers. Part-worth utilities revealed clear preferences for handmade pottery, with machine-made items carrying strong disutility, affirming the centrality of craftsmanship to perceived value. The Gold tier emerged as the most preferred, followed by Platinum, while Basic attracted less interest. In terms of attribute importance, service tier contributed 48.17%, items per box accounted for 42.03%, and the special features together represented 9.8%. Thus, the subscription structure and quantity of items were shown to dominate consumer decision-making. Derived from the part-worth values, package utilities (V_j), willingness-to-pay (WTP) levels, reservation prices, and choice probabilities (q_j) were computed for all feasible combinations. Packages showing negative or marginal net desirability, especially high-priced machine-made variants, were deemed weak candidates before optimisation.

Stage 3, the optimisation model, applied a mixed-integer linear program (MILP) to evaluate feasible combinations under profitability and demand constraints. Sixteen optimal packages were identified that met both cost and preference criteria, ensuring price exceeded cost plus a small margin (ϵ), remained below WTP, included representation across all tier categories, and avoided duplication. The most profitable and preferred configuration was Package 5: a gold tier combination containing 4 – 6 handmade items per box and featuring the maintenance

option (Feature F2), priced at ₹799. This package yielded the highest choice probability (~ 0.53) and the largest profit per package ($\sim ₹635.43$). While two machine-made packages were technically feasible (IDs 10 and 11), their expected returns remained substantially lower ($\sim ₹5.56$ and $₹46.19$), reaffirming the limited appeal of mechanised pottery. Across all selected packages, the model produced an expected maximum profit of ₹6034.85 per representative customer, reflecting cumulative weighted returns across feasible choices. Collectively, the results highlight that mid-tier, handmade subscriptions combining moderate quantity (4–6 items) with maintenance or discount features yield the most balanced performance between perceived value and profitability.

6.6.2 Handcrafted Textile Subscription Package Optimisation

The handcrafted textile subscription followed a parallel framework of development encompassing the same three analytical stages.

During Stage 1, the attribute and design phase incorporated price, items per box, delivery frequency, Handcrafted Item or GI-tag (Geographical Indication) share or percentage of handmade textiles, feature type (return/replacement, maintenance, or exchange for new), and tier level (Basic, Gold, Platinum). The price band of ₹1250–₹2000 was established as realistic, given consumer expectations within the apparel and home textile segments. Importantly, this design explicitly captured authenticity and sustainability dimensions through the inclusion of the GI share variable and circular economy-oriented features.

Stage 2 examined consumer utilities via CBC estimation. As with pottery, the price coefficient was negative ($\beta_{\text{price}} \approx -0.0003$ per ₹1), validating linear price disutility. The part-worth utilities showed a strong preference for Gold tier subscriptions, while Platinum tiers received negative utility, suggesting that additional cost was not matched by perceived benefit. Authenticity through handcrafted item share emerged as a key determinant; a 50% handmade composition attracted high positive utility, whereas 25% handcrafted item share was moderately valued. Maintenance (F2) and exchange (F3) features reflected negative utilities, and higher delivery frequencies (two or three times per month) were favoured over monthly deliveries, indicating consumer enthusiasm for steady engagement. The attribute importance scores quantified these results: handcrafted item share contributed 34.06%, tier structure 31.56%, delivery frequency 15.79%, and features 15.72%, while items per box had a minor effect (2.86%). Collectively, authenticity and service tier dominated consumer preference, with

logistical and experiential attributes exerting secondary but meaningful influence. The derived utilities (V_j), WTP, reservation prices, and choice probabilities (q_j) provided a comprehensive preference map for optimisation.

Stage 3's MILP optimisation identified 79 feasible textile subscription packages that met profitability and demand requirements. For interpretive clarity, only the top 10–16 high-performing combinations were highlighted in the main analysis. The dominant trend among optimal packages included high-authenticity subscriptions (50% handcrafted-item share), Basic or Gold tier, and moderate delivery frequency (two deliveries per month). These options consistently achieved choice probabilities between 0.50 and 0.55 and delivered attractive per-package profits, typically between ₹443 and ₹618. Many handcrafted items supplied packages remained profitable even at the upper price point (₹2000), suggesting consumers' willingness to pay a premium for authentic and sustainable textile assortments. Representative examples include the Basic tier package with 3–10 handmade items, 2 deliveries per month, 50% handcrafted selection (GI) share, optimised at ₹2000 with profit around ₹618 and adoption likelihood near 0.55. Similarly, the gold tier variant under the same conditions yielded a profit of approximately ₹443 per package with equivalent choice probability.

Lower handcrafted selection share combinations (25%) or those featuring maintenance and exchange attributes displayed weaker outcomes both in utility and profit, implying restricted consumer appeal due to perceived lower authenticity or unnecessary complexity. Overall, results underscore that textile subscription success hinges on authenticity-driven differentiation (through GI share), mid-frequency delivery, and price-value clarity, conditions best met in 50% handcrafted items share, Basic or Gold-tier packages priced at the upper boundary of the feasible range.

6.7 Implications of the study

6.7.1 Theoretical Implications

This study provides a significant conceptual extension of subscription commerce by applying it to non-replenishable and culturally embedded handcrafted products such as pottery and textiles. Traditionally, subscription models have catered to replenishable goods or digital services with predictable consumption cycles. By successfully optimising subscription packages for artisanal, non-repetitive products, the study demonstrates that the subscription

paradigm can be meaningfully extended to creative sectors where consumer value is rooted in uniqueness, cultural expression, and craftsmanship rather than functional replenishment.

A key theoretical contribution lies in the integrated Conjoint-Based Choice (CBC) and Mixed-Integer Linear Programming (MILP) framework established for subscription design. This model links consumer preference estimation and operational optimisation through a unified pipeline: from estimated utilities to willingness-to-pay (WTP) computations, and onward to expected profit maximisation. This methodological bridge demonstrates how behavioural insights can directly inform operational decision-making, especially in contexts with limited market data availability. Beyond craft industries, this hybrid framework offers a transferable approach for data-driven subscription planning in niche product categories characterised by demand uncertainty.

Moreover, the study advances the theory of utility-based pricing anchored in WTP rather than conventional cost-plus estimations. By embedding WTP and reservation price constraints within the optimisation model, pricing decisions become endogenous to perceived consumer value. This reflects a shift towards adaptive, preference-led pricing logic that aligns with contemporary behavioural economics and value-based marketing theories.

Another theoretical insight concerns the role of authenticity and service tiering in consumer adoption of artisanal subscriptions. The relative importance of handcrafted identity in pottery (handmade vs. machine-made) and of the involvement of handcrafted items share in textiles underscores authenticity as a central construct in the emerging theory of craft subscription behaviour. Similarly, tier structures (Basic, Gold, Platinum) function as symbolic cues for exclusivity and value, aligning with literature on perceived quality and hierarchical service differentiation.

The observed negative utilities for certain features, such as maintenance in pottery or exchange and compensation in textiles, highlight the limits of feature proliferation. These results enrich the theoretical discourse on “feature fatigue,” suggesting that consumers may interpret complex add-ons not as benefits but as latent costs, particularly in emotionally resonant product categories. Consequently, simplicity and transparency in service configuration are reaffirmed as key determinants of perceived value in subscription-based consumption.

Finally, the study strengthens the theoretical link between sustainable and circular consumption and economic optimisation. By embedding features related to exchange, maintenance, and handcrafted origin into a formal utility–profit framework, the research illustrates how sustainability-oriented attributes can be quantitatively valued relative to price and convenience. This integration contributes to the literature on data-driven sustainability by offering measurable evidence of how authenticity and circular practices influence adoption probabilities and profitability.

6.7.2 Managerial Implications

The study brings effective insights for stakeholders working in traditional select industries towards improvement in the retail business of these industries. The following are the implications specifically for pottery stakeholders:

- Identifying high-performing subscription configurations: The study finds that the gold tier with four to six items per delivery, along with maintenance like practical features, offers the strongest balance of desirability and profitability. Thus, making packages around these themes can be a useful strategy.
- Reconsidering premium tier package attributes and machine-crafted items in the package: Offering machine-made pottery under the premium tier brings low utility and reduced profit margins. So, such combinations should be positioned sparingly, only for niche customer segments.
- Pricing opportunities anchored in consumer valuation: Optimised prices frequently align with the upper bound of estimated WTP, indicating that artisans may currently underprice their handcrafted offerings. Subscription pricing should therefore be built on value rather than cost, with clear messaging on craftsmanship and features.
- Streamlining of the packages: Rather than offering numerous arbitrary product mixes, select industries can curate identified well-performing packages centred on handmade pottery items and mid-tier selections. It will enhance the clarity from both the consumer end and the marketing end.

The study brings the following implications for handcrafted textile package optimisation:

- Leveraging handcrafted share: The strong preference for handcrafted items in the package indicates that authenticity remains the strongest selling point. Textile select industries

should foreground GI certification, artisan stories and origin transparency in all subscription marketing.

- Effective delivery and quantity strategies: Subscriptions offering 2 deliveries per month with moderate to high quantity (3–10 items) are consistently preferred. Overly rigid (1/month) or overly frequent cycles dilute perceived value, suggesting that moderate frequency should be the standard design choice.
- Designing features with simplicity and clarity: Negative utilities for maintenance and circular exchange features signal the need for careful communication. While these services are desirable in principle, they should be positioned and transparently, avoiding perceptions of additional cost or complexity.
- Strategic pricing and upsell pathways: Consumers show comfort with subscription prices up to ₹2000 when paired with authenticity-rich content. Managers can therefore design tiered pricing ladders, Basic to Gold, with value-added components linked to indigenous handcrafted shares and curated assortments.

A few further insights applicable to the subscription package of both products are as follows, which can bring in general implications for marketers:

- Adopting data-driven subscription design: The integrated approach of the CBC-MILP methodological framework offers artisans, MSMEs, cooperatives, and other stakeholders a systematic quantitative tool for developing, updating and refining subscription offerings. This is particularly valuable in markets with limited sales history.
- Risk reduction and smooth income plans for artisans: By converting irregular purchases into structured subscription revenue, artisans gain predictable demand patterns and improved cash-flow stability, addressing a chronic weakness in craft-sector business models.
- Flexible and easy adaptive framework for platforms, incubators and policymakers: Additionally, e-commerce platforms and cooperatives can embed such optimisation frameworks within their digital ecosystems to algorithmically design profitable bundles that balance cultural authenticity with consumer convenience. At a policy level, these insights support public interventions aimed at digitalisation, capacity building, and market inclusion of traditional artists, demonstrating how advanced analytics can serve as a bridge between craft livelihoods and modern market systems.

6.8 Summary

This chapter examined how subscription-based business models can be adapted for India's handcrafted pottery and textile sectors, both of which face irregular demand, limited access to wider markets, and profitability challenges. Traditional subscription formats, common in fast-moving or digital industries, do not naturally align with the artisanal context, where products are culturally rooted, non-replenishable, and produced in small batches. The study, therefore, set out to address both a practical and conceptual gap: to design and test an evidence-based subscription framework tailored to handcrafted goods, offering sustainable income pathways for micro and small enterprises (MSMEs).

To achieve this, the chapter employed an integrated Conjoint-Based Choice (CBC)–Mixed Integer Linear Programming (MILP) framework. This three-stage process combined consumer preference analysis with operational optimisation. First, subscription attributes relevant to pottery and textile products were identified through field insights and design evaluation. Second, consumer preferences and willingness-to-pay were measured using CBC analysis to generate utility-based insights. Third, these behavioural results were fed into an optimisation model that selected and priced subscription packages capable of maximising both demand and profit within realistic business constraints.

The findings provided clear, actionable directions for artisanal sectors. For pottery, results indicated that mid-tier, handmade, and moderately priced subscription packages offer the best balance of consumer appeal and business viability. For textiles, authenticity, measured through the proportion of GI-certified or handmade content, and delivery frequency emerged as the strongest drivers of choice. Across both categories, handcrafted identity, moderate subscription variety, and transparent value propositions proved far more influential than complex feature bundles or excessive premium tiers.

From an industry perspective, the study offers a decision-support tool for MSMEs, cooperatives, and online platforms seeking to design data-informed subscription portfolios. It demonstrates how subscription commerce can convert irregular sales into steady cash flow while maintaining product authenticity and craftsmanship. For policymakers and developmental institutions, the results highlight how digital tools and analytics-based planning can support artisans' market inclusion, improve price realisation, and encourage

entrepreneurship in craft clusters. The framework can guide public programs promoting creative industry resilience and local enterprise digitalisation.

At the broader level, the research connects directly to the United Nations Sustainable Development Goals (SDGs). It contributes to SDG 8 (Decent Work and Economic Growth) by stabilizing artisan incomes, SDG 9 (Industry, Innovation and Infrastructure) by enabling data-driven business innovation in traditional sectors, SDG 12 (Responsible Consumption and Production) by promoting sustainable and authentic goods, and SDG 11 (Sustainable Cities and Communities) through the preservation and modernisation of cultural industries.

In essence, the chapter demonstrates that when grounded in measurable consumer utility and optimized through systematic modelling, subscription systems can be reimaged for craft-based industries. The proposed CBC–MILP framework provides both a theoretical and practical blueprint for sustainable subscription commerce that respects cultural authenticity while advancing economic inclusion and digital transformation within India’s artisan ecosystem. The next chapter concludes the thesis.

CHAPTER 7

Conclusion

This chapter concludes the thesis and summarises the work done to solve the research questions and attain the identified research objectives. The chapter discusses the practical implications of the work and major contributions across literature, policy, and managerial frameworks. Then the chapter also acknowledges its limitations and suggests directions for future research.

7.1 Summary

The thesis focused on addressing the critical challenges faced by select traditional handcrafted industries in India, specifically in pottery and textiles, which are integral to sustaining cultural heritage and artisan livelihoods. These industries face systemic barriers such as fragmented supply chains, inadequate access to markets, limited financial support, and evolving consumer preferences that threaten their sustainability. The research aimed to develop a comprehensive, multidisciplinary framework that integrates diagnostics of industry barriers, evaluation of government policies, consumer adoption behaviour analysis, and innovative operational retail models to enhance livelihood sustainability for these artisanal sectors.

The study began by identifying and prioritising the key barriers through expert assessments and advanced decision-making tools, revealing finance, marketing, workforce skills, and policy implementation as primary drivers constraining growth. This barrier analysis set the foundation for evaluating existing government schemes, uncovering gaps in addressing critical issues like raw material availability, socioeconomic upliftment, and cohesive policy support. To bridge this gap, a conceptual model for cluster-based development parks was proposed to facilitate shared infrastructure, skill development, and integrated market access tailored to geographic indicators and district-specific crafts.

Following policy evaluation, the thesis examined consumer behaviour related to subscription-based retailing for handcrafted products, employing structural equation modelling to understand motives and barriers affecting subscription intentions. Key insights highlighted the importance of utilitarian values, social influences, and authenticity, with notable demographic variations informing targeted marketing strategies. Finally, the research developed feasible

subscription package designs using conjoint analysis and optimisation techniques to maximise profitability while aligning with consumer preferences and business constraints.

Overall, the thesis provided an end-to-end approach that linked sectoral diagnostics with practical policy and business solutions. Through the integrated methodology spanning barrier assessment, scheme realignment, demand stimulation, and operational optimisation, it offered a replicable blueprint for empowering artisans and enhancing market responsiveness in traditional industries. This holistic framework strengthens cultural preservation, promotes sustainable economic growth, and supports inclusive development in the face of modernisation and market challenges. Overall, the thesis is summarised chapter-wise below for a concise understanding of the work done to attain the thesis research objectives.

Chapter 1 introduced the research context and motivation for studying sustainable livelihood generation in India's select handcrafted industries, focusing on pottery and textiles as culturally significant yet challenged sectors. It outlined systemic issues like supply chain fragmentation, market access limitations, skill erosion, and policy disconnects, threatening artisan livelihoods. The chapter defined the research problem, articulated research objectives, and presented the integrated framework linking these elements. Finally, it provided a thesis outline previewing the contribution of the subsequent chapters to the broader research objectives.

Chapter 2 conducted a comprehensive literature review to establish the theoretical foundation for sustainable development in select handicraft industries. It systematically surveyed production ecosystem barriers, government policy interventions studied in literature, consumer behaviour modelling for subscription retailing, and operational retail optimisation techniques. The chapter traced the evolution of challenges from supply fragmentation to market marginalisation, critiqued scheme implementation gaps, and examined behavioural drivers and barriers to subscription retail, followed by reviewing subscription package development strategies. Flowing from global trends to India-specific gaps, it identified critical research gaps that the thesis addresses through an integrated assessment framework.

Chapter 3 focused on identifying and analysing the multifaceted barriers impacting the performance and sustainability of select handcrafted industries, specifically pottery and textiles, through a structured diagnostic lens. The objective was to systematically assess these obstacles from stakeholders' perspectives, prioritise them, and uncover the causal relationships

underlying their effects across the artisan value chain. This chapter laid the groundwork for designing effective, evidence-based interventions by highlighting the most critical constraints that inhibit the growth and livelihood security of artisans.

The chapter began with extensive data collection comprising field visits, expert interviews, and literature synthesis to identify an exhaustive list of barriers. These barriers were broadly categorised into eight domains: finance, workforce, raw materials, marketing, policy and regulations, logistics, technology infrastructure, and social factors. The methodological framework combined fuzzy analytical hierarchy process (FAHP) and Decision-Making Trial and Evaluation Laboratory (DEMATEL) techniques to rank barriers by severity and elucidate their interdependencies. FAHP accommodated expert judgment uncertainty while producing a prioritised weighting scheme, and DEMATEL enabled the mapping of causal pathways and feedback loops among barriers.

The analysis revealed that financial constraints, including lack of working capital, low investment returns, and procurement difficulties, emerged as the most impactful causal drivers within the system. Marketing barriers, such as ineffective strategies, poor market access, and dominance of substitutes, were closely intertwined and exerted significant influence on other domains. Workforce challenges, including skilled artisan shortages, skill development scarcity, and low job engagement, further eroded operational efficiency, particularly in pottery. Regulatory and policy implementation barriers, characterised by fragmented schemes, weak enforcement, and accessibility issues, compounded systemic inefficiencies. Social barriers involving exclusion and inequality also surfaced, highlighting the need for inclusive policy frameworks.

The chapter's outcomes underscored the systemic, multi-layered nature of the challenges faced by select industries. Root barriers in finance and marketing triggered destabilising effects across linked domains, suggesting that targeted interventions in these areas could yield broad systemic improvements. Workforce and technology constraints, while important, appeared as secondary or dependent issues requiring integrated long-term strategies. The distinct patterns observed in pottery and textiles called for sector-specific prioritisation within these overall domains.

Implications from this diagnostic chapter for policymakers emphasised the urgency of reorienting financial support mechanisms toward enhanced accessibility and customisation for decentralised MSMEs, avoiding one-size-fits-all subsidy models. Marketing infrastructure investments should focus on digital literacy, branding toolkits, and online market integration, especially for rural artisans. Policy reforms need to prioritise inter-ministerial coordination and streamlined governance to reduce implementation delays and confusion. Social inclusion policies addressing caste, gender, and access disparities are vital to lift marginalised artisan groups equitably.

For researchers, the chapter highlighted the utility of combining FAHP and DEMATEL as a robust methodology to uncover barrier hierarchies and causal influences within complex, multi-domain systems in artisanal enterprises. This approach facilitates actionable insights for informed, integrated, and context-appropriate interventions. Marketers gained insights into the importance of demand stimulation strategies addressing authentic brand positioning, storytelling, and consumer engagement tailored to acknowledge artisan socioeconomic realities. Emphasising authenticity and value while reducing operational complexity can improve consumer adoption and loyalty.

Overall, the chapter progressed from barrier identification to ranking and causal mapping, followed by a focused discussion on domain-wise implications, sectoral nuances, and strategic priorities. This diagnostic evaluation establishes the foundational knowledge enabling subsequent thesis chapters to formulate convergent policy frameworks and innovative retail models for enhanced artisan livelihoods.

The chapter brings foundational context for the subsequent analyses. The barrier analysis from this chapter guides in mapping the convergence of existing policies to uncover the convergence gaps and implementation shortcomings. The marketing gaps from this chapter motivate the subscription behavioural analysis and design of pottery and handcrafted textile subscription packages in chapters 5 and 6.

Chapter 4 examined the alignment between prevalent government schemes and the critical barriers identified in Chapter 3, aiming to assess policy effectiveness and propose a cohesive framework for the sustainable development of select handcrafted industries. The chapter critically reviewed recent central government initiatives targeting pottery and textiles,

measuring their thematic coverage against priority intervention zones to uncover convergence gaps and implementation shortcomings. This policy diagnostic was built directly on the barrier hierarchy, translating systemic insights into actionable recommendations for enhanced scheme utility.

The chapter contained a comprehensive compilation of schemes launched between 2019-2025, categorised by ministries (MoMSME, MoT, KVIC) and target domains, including finance (PMEGP, Weaver MUDRA), workforce skilling (SFURTI, PM Vishwakarma), marketing (ODOP, PMS), infrastructure (PM-MITRA parks), and raw materials (RMSS). Thematic analysis compared scheme objectives against identified barrier domains from Chapter 3. Analysis revealed strong coverage in financial credit and skill programs but persistent deficiencies in raw material security, socioeconomic upliftment, decentralised technology access, and integrated demand stimulation.

Methodologically, the chapter employed qualitative thematic coding of scheme documents, press releases, and performance reports alongside quantitative coverage mapping against FAHP-DEMATEL priorities. This dual approach helped in quantifying the coverage and contextualising implementation barriers like bureaucratic delays and rural outreach failures.

Broad outcomes highlighted fragmented policy design favouring medium-scale clusters over cottage industries, with SFURTI and ODOP showing promise but constrained by isolated execution. The chapter focused on proposing the Cluster-based Development Parks for Select Products (CB-DPSP) framework, adapting PM-MITRA's mega-park model for artisanal mini-clusters.

Implications for policymakers from this chapter underscore the need to integrate high-density craft clusters like Khurja pottery and Banarasi textiles within the CB-DPSP framework. The chapter recommends piloting the framework in high-density clusters, instituting inter-ministerial convergence dashboards, and prioritising targeted interventions such as raw-material subsidies for pottery and mandatory digital-literacy initiatives. For researchers, the chapter offers a replicable scheme–barrier benchmarking approach that can be extended to other craft sectors, including bamboo and metal crafts, while emphasising the importance of longitudinal assessment of policy impacts. For marketers, the findings underscore the role of policy-enabled infrastructure, such as trade facilitation centres and branding support, in

strengthening authentic storytelling, enhancing market visibility, and enabling e-commerce integration essential for scaling retail methods.

The policy-barrier convergence analysis presented in this chapter builds upon the systemic constraints identified in Chapter 3 and highlights areas where existing schemes fall short in addressing core industry challenges.

Chapter 5 investigated the factors influencing consumer adoption intention for subscription-based retailing of handcrafted pottery and textiles, analysing the presence of behavioural variations across demographic traits to understand demand dynamics for subscription of select products. Building on earlier analyses of supply-side constraints and policy shortcomings, this chapter transitions to the consumer perspective, examining the motivations and barriers that shape subscription willingness as a mechanism for stabilising demand and income for artisan producers.

The chapter contained a comprehensive behavioural framework grounded in theories like the Theory of Planned Behaviour, Self-Determination Theory, and Innovation Resistance Theory. It examined key motives and barriers, particularly utilitarian values, product usage values, normative influence, subscription risks, product inhibitors, market impediments, hedonic services, and personal norms. The influence of factors on subscription intention was evaluated under different demographic traits of age, gender, income, education, location, and subscription experience. Primary data from 1644 respondents (686 pottery, 958 textiles) provided robust empirical grounding.

Methodologically, the chapter employed Structural Equation Modelling (SEM) via AMOS, progressing through hypotheses development, measurement model validation (reliability, convergent/discriminant validity), structural path analysis, and multi-group moderation testing. Model fit indices confirmed robustness, enabling quantification of direct effects and interactions.

Broad outcomes revealed utilitarian values and social norms as dominant positive drivers of subscription intention, overpowering risks and impediments. Pottery consumers prioritised product utility and cultural authenticity, while textiles emphasised hedonic and personal aspects. Barriers like perceived access constraints proved significant deterrents, particularly for novice subscribers.

The behavioural analysis in this chapter is supported by the policy insights from Chapter 4 and the barrier analysis from Chapter 3. The findings of this chapter form critical input for Chapter 6 to guide subscription package design for handcrafted pottery and textiles.

Implications for policymakers emphasise incorporating behavioural insights into marketing strategies, including subsidised authenticity certification and targeted digital outreach to strengthen subscription uptake. This chapter provides a validated multi-theory SEM framework applicable to niche product subscriptions, with a moderation approach that can be extended to other rural craft contexts. For marketers, the study provides practical consumer profiles to support more focused marketing campaigns for subscription retailing of select products and improving customer engagement.

Chapter 6 focused on developing feasible subscription packages for handcrafted pottery and textile products, operationalising the consumer insights from Chapter 5 into profit-maximising retail configurations. This chapter addressed the critical gap between behavioural willingness and practical implementation by designing consumer-centric bundles that balance desirability, affordability, and artisan profitability for non-replenishable artisanal goods.

The chapter contained a three-stage integrated framework: attribute identification through pilot discussions and literature, consumer preference modelling via Choice-Based Conjoint (CBC) analysis, and package optimisation using Mixed Integer Linear Programming (MILP). The methodology generated experimental choice sets from surveys, estimated part-worth utilities via multinomial logit, computed willingness-to-pay/reservation prices, and integrated these into MILP constraints ensuring profitability, tier representation, and non-duplication.

The analysis generated feasible subscription package designs. For pottery, the findings indicate that consumers prefer mid-tier packages with moderate item quantities and practical features, which produced high choice probabilities and strong per-package profitability. Variants using machine-made items were generally unviable, reinforcing the importance of handcrafted products. For textiles, the optimised packages showed strong preference for handcrafted items, bi-monthly delivery, and streamlined features at higher price points. Overall, the optimisation reduced thousands of potential package combinations into a small set of options that maximise expected revenue while accounting for realistic cost and demand constraints.

This chapter takes the insights of Chapter 5 to operationalise the subscription plans based on the consumer subscription intention behaviour. From this study, researchers gained a novel hybrid CBC-MILP methodology for non-consumable subscription packages development. Future validation requires field pilots tracking adoption and churn.

7.2 Utility of the Research Work

The present research offers substantial academic, managerial, and societal utility by addressing critical issues in the sustainable livelihood generation of select industries. The research provided a thorough assessment across the industry instead of taking an isolated approach. The research provided operational methodologies and a framework to help in the implementation of the reforms based on the outcomes of the research. To elaborate further, the research holds the following utilities for concerned industry stakeholders and policymakers:

- The research provided a thorough assessment of the prevalent industry barriers faced by artisans that clarifies the on-ground realities that aid concerned stakeholders and policymakers to identify the critical areas for contribution for maximum output and benefit to the entire artisanal community.
- The research provides the methodological frameworks that can be applied to similar products and industries that face livelihood sustainability challenges and are striving hard for their existence in the market.
- The policy convergence analysis helps in identifying that most of the schemes align with the required welfare initiatives for artisans, with some limitations. The analysis helps in arguing that the major issues are with the implementation of the schemes rather than the design of appropriate schemes.
- For the effective utilisation by local entrepreneurs and social enterprises, this study proposes a strategised process for designing subscription packages that are customer-oriented and curated to offer value to customers, improve the demand for traditional sustainable items and bring appreciable profit to artisans.
- By integrating behavioural modelling through Choice-Based Conjoint (CBC) analysis with operational optimisation via Mixed Integer Linear Programming (MILP), the study provides a robust, data-driven framework capable of translating consumer preferences into feasible and profitable subscription packages. This hybrid methodological contribution expands the methodological toolkit for subscription commerce research and can be adapted

to other niche, low-volume, or culturally embedded product categories where conventional replenishment-based subscription methods are unsuitable.

- From a managerial standpoint, the research equips artisanal MSMEs, cooperatives, and digital craft platforms with actionable insights for structuring subscription offerings to improve the revenue sustainability that aligns with consumer expectations while enhancing revenue predictability.
- The findings highlight how authenticity parameters (e.g., GI share, handmade content) and value-added service features influence consumer adoption, providing a foundation for designing supportive policies around certification, digital branding, and artisan-focused subscription platforms.
- The research further aligns with national objectives related to handicraft promotion, digital commerce expansion, and sustainable consumption, reflecting the potential for strategic integration into government programs.

Overall, the research offers contributions that directly target and mitigate the prevailing issues in the traditional handicraft select industries, taking the case of pottery and textile, bringing a systematic operational framework for barrier assessment, policy alignment assessment, subscription retailing assessment for effective marketing and design subscription packages for easy and effective implementation of subscription retailing strategies.

7.3 Research Contributions and Novelty

The research in this thesis makes several contributions towards uplifting the business of select industries, improving their livelihood sustainability through qualitative and quantitative evidence-based assessments.

- A structured, multi-domain barrier framework for select industries: The research establishes one of the most comprehensive barrier classifications for handcrafted sectors, categorising constraints into finance, workforce, raw materials, marketing, policy/regulation, logistics, technology, and social dimensions. This fills a gap in existing literature, where barriers are often examined in isolation rather than as interconnected subsystems. By coupling Fuzzy AHP (for prioritisation under uncertainty) with DEMATEL (for causal mapping), the study introduces a hybrid analytical framework well-suited to artisanal sectors where expert knowledge is imprecise, and interactions between

barriers are complex. This integration is novel in the context of pottery and textiles and provides a replicable approach for other craft industries.

- Development of a scheme-barrier benchmarking framework: The study introduces a systematic method to evaluate how government schemes cover (or fail to cover) the barriers identified in Chapter 3. This is a new analytical contribution to artisanal policy research, enabling measurable convergence analysis. The Cluster-Based Development Parks for Select Products model, adapted from PM-MITRA is conceptualised for small craft clusters and holds a unique theoretical contribution. It provides an implementable, convergence-oriented solution for related select product clusters.
- Development of a multi-theory subscription adoption framework: The willingness to subscribe integrates different consumer behaviour theories to construct a comprehensive behavioural model for subscription to handcrafted traditional products and services. The assessment of factors among different demographic levels brings useful contributions for marketers and entrepreneurs to design effective subscription retail strategies for such sustainable products. The integrated approach assessing motives and barriers simultaneously rather than in isolation helped in identifying the performance of one factor in the presence of another, bringing useful managerial implications to design appropriate subscription retail strategies.
- Developing a customer-integrated framework for subscription package development: The research pioneers the integration of Choice-Based Conjoint analysis with Mixed Integer Linear Programming to design effective subscription packages and optimise the package price, operationally applicable to the handcrafted pottery and textile segment. The study advances utility-based pricing by using WTP and reservation price as binding optimisation constraints, enabling pricing grounded in consumer marginal utility rather than cost-plus heuristics.
- Contribution to literature: Research has resulted in several peer-reviewed journal publications originating from chapters 3, 5 and 6, among which five are under peer review stage and two at the submission stage. Additionally, the research of this thesis is presented in four international conferences, contributing to the literature on select industries.

7.4 Contributions to Sustainable Development Goals (SDGs)

This research makes targeted contributions to multiple United Nations Sustainable Development Goals (SDGs) through its integrated framework addressing systemic challenges

in select handcrafted industries. Each chapter delivers specific advancements aligning with global sustainability priorities.

Chapter 3 directly supports SDG 8 (Decent Work) by identifying workforce skill erosion and financial exclusion as causal barriers, SDG 10 (Reduced Inequalities) through social exclusion mapping, and SDG 9 (Industry Innovation) by highlighting technology adoption gaps constraining MSME competitiveness.

Chapter 4 advances SDG 9 via CB-DPSP infrastructure innovation, SDG 17 (Partnerships) through inter-ministerial scheme convergence, SDG 11 (Sustainable Communities) by strengthening cultural industry resilience, and SDG 8 by enabling scalable livelihood ecosystems.

Chapter 5 contributes to SDG 12 (Responsible Consumption) by promoting subscription models for sustainable artisanal goods, SDG 8 via demand stabilisation, creating decent employment, and SDG 10 through demographic-inclusive marketing strategies reaching underserved segments.

Chapter 6 operationalises SDG 12 with optimised circular consumption packages, SDG 8 through profit-maximising artisan revenue models, SDG 9 via CBC-MILP methodological innovation, and SDG 11 by preserving cultural production systems through market viability.

7.5 Limitations of the Study

This research provided a multi-dimensional contribution to improving business sustainability in select industries. However, the study addresses the following limitations, indicating the areas that, in operation, may strengthen the contributions and findings:

- Chapter 3 does not include broader factors apart from the twenty-five included factors due to the length of the questionnaire and analysis limitations. Broader factors such as the education of artisans, the effect of intermediaries, and urban-rural dynamics can be included to examine how these factors affect other domains of the barrier system.
- In chapter 4, scheme evaluation drew from central government documents and secondary reports, lacking primary implementation feedback from beneficiary artisans across diverse geographies. The conceptualisation of cluster-based development parks policy for select products does not include operational dynamics such as cost modelling for land acquisition,

facility location of clusters, and multi-state comparative analysis, which, if properly taken ahead, would strengthen deployment feasibility assessments.

- Chapter 5 is constrained to incorporate broad factors such as subjective norms, utilitarian values, product usage values, perceived access risks and does not consider specific item-wise assessment, which would be a formative assessment instead of a reflective assessment. Specific factors such as the role of brand, delivery, money, household size and many more can be taken up as a modified theoretical framework as one level above the foundational assessment done in this thesis. The assessment also lacked longitudinal studies validating the change in the dynamics of consumer behaviour over time.
- In chapter 6, the conjoint analysis took the subscription package attribute and levels based on the limitation on the length of the survey. Also, the study took responses across the states and does not limit area-specific analysis, which makes the results prone to vary region to region. However, for a specific area, the framework can be repeated to analyse the factors based on the customers of that region only. Moreover, the region-specific studies can include more attributes and levels based on the operational capacity.

7.6 Suggested Directions for Future Research

Building upon the comprehensive findings and limitations outlined in this thesis, several promising directions emerge for future research to strengthen and expand sustainable livelihood generation in select handcrafted industries:

- Future studies should perform longitudinal studies tracking the evolution of identified barriers and consumer subscription behaviours. This would help in capturing dynamic insights into changing patterns due to market shifts, policy adjustments, or technological advances. Incorporating time-series data collection and real-time monitoring within artisan clusters can enhance understanding of causal relationships and intervention effectiveness beyond the static cross-sectional approach used here.
- Expanding geographic coverage to include remote rural areas and diverse artisan communities across India would improve the generalizability of diagnostic results and retail strategies across regions and capture broader heterogeneity. This inclusiveness may unveil unique barriers, motivators, and operational challenges that are currently underrepresented.
- Further assessments can be done to narrow down key barriers across earthenware and similar industries nationwide. Stakeholder-specific comparative analyses can help reveal barrier patterns and criticality from different viewpoints. Given the government's difficulty

in tailoring policies to individual product segments amongst extensive product catalogues, a comparative study of similar products can highlight shared obstacles that can help with better policy amendments. Similarity can be accounted for based on product use, production methods, economic contribution, workforce size, or operational framework.

- For effective applicability of the Cluster-based Development Parks for Select Products (CB-DPSP) framework, primary field evaluations of the framework proposed at pilot scales are essential to validate architectural feasibility, costs, and socio-economic impact in live environments. Mixed-method research integrating GIS spatial analysis, participatory rural appraisals, and economic impact assessments would inform scalable deployment plans. Multi-state comparative studies could identify contextual adaptations across different cultural and policy regimes.
- Enhancing behavioural modelling through integration of psychographic, cultural, and sustainability value dimensions, as well as employing machine learning techniques on large consumer datasets, would refine consumer segmentation and personalised subscription offerings. Longitudinal panel designs capturing subscription retention, churn, and satisfaction would improve demand prediction accuracy and marketing effectiveness.
- Moreover, a comparative analysis of physical shopping and subscription box retailing can determine demographic and psychographic variations between the two shopping modes and identify the factors that drive/resist box retailing compared to physical shopping.
- Further developing dynamic CBC-MILP frameworks that incorporate stochastic demand, production seasonality, and inventory management would align subscription package optimisation closer to artisanal realities. Simulation-optimisation hybrid methods and reinforcement learning could enable adaptive package recalibration based on real-time sales and supply fluctuations. Application to other GI-tagged sectors like bamboo crafts, metalwork, or home decor could demonstrate methodology scalability across diverse artisanal products.
- Additionally, interdisciplinary research bridging traditional artisan knowledge systems with digital innovations such as blockchain-enabled GI traceability, augmented reality market experiences, and e-commerce platform integration can bring rich insights, adding transparency and consumer engagement. Exploring policy frameworks facilitating such technology adoption and entrepreneurship training would further empower artisan communities.

Overall, future research should adopt multi-level, participatory, and technology-enabled approaches that build on this thesis's diagnostic, policy, behavioural, and operational contributions. Advancing work in these directions can help strengthen India's artisanal traditions while supporting broader goals of inclusive growth and sustainable development.

7.7 Concluding Remarks

Overall, this thesis presents a comprehensive analysis of the structural, policy, behavioural, and operational aspects shaping the livelihood sustainability of select industries, with a focus on pottery and textiles. Using a combination of advanced statistical, behavioural, and optimisation tools, including FAHP, DEMATEL, SEM, CBC, and MILP, the research provides an integrated decision-support framework for stakeholders. The findings reveal significant opportunities for improving artisan livelihoods through interventions that directly address systemic barriers, align government schemes with ground realities, and design consumer-centric subscription models capable of generating stable demand and revenue.

Given the scope of a Ph.D. thesis, the work concentrates on developing contextual, evidence-based frameworks for understanding value-chain bottlenecks, assessing policy convergence, modelling consumer adoption behaviour, and constructing operationally feasible subscription packages. The thesis demonstrates the importance of combining diagnostic insights with behavioural modelling and optimisation-based package design to create viable livelihood pathways.

Future research directions identified include deeper supply-chain cost modelling, longitudinal assessment of subscription adoption, and real-world piloting of proposed interventions. Beyond its specific results, this thesis contributes a foundational, integrated methodology framework that can guide policymakers, marketers, and artisan organisations in formulating targeted strategies, thereby supporting the broader goal of sustainable and scalable livelihood generation in handcrafted micro, small, and medium industries.

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LIST OF PUBLICATIONS BASED ON PRESENT RESEARCH WORK

Journals:

Singh, S., Bolia, N.B. Analysis of Subscription Intention for Select Products. (Under 2nd Review in Social Enterprise Journal)

S Singh, S., Bolia, N.B. Moderating Factors Influencing Subscription in Small-Scale Industries: A Recurring Revenue Retail Model. (Submitted in Journal of Strategic Marketing)

Singh, S., Bolia, N.B. Consumer Purchase Behaviour in Subscription Retail: A Composite Theory Approach to Retail Engagement. (Under Review in Journal of Consumer Marketing)

Singh, S., Bolia, N.B. Assessment of barriers at the manufacturing end of the pottery industry: A cause-and-effect analysis of value chain factors. (Submitted in Business and Society)

Singh, S., Bolia, N.B. Barriers of handloom textiles sector: An assessment from the manufacturing end. (Submitted in Business Strategy and Development)

Conferences:

Singh, S., Bolia, N.B. (2023). "Factors Influencing Willingness to Subscribe to Cottage Products: Study on Pottery Subscription Using SEM", 26th Annual International Conference of the Society of Operations Management (SOM 2023), December 2023, IIM Shillong, India

Singh, S., Bolia, N.B. (2024). "Exploring subscription-based online services (SOS) for sustainable businesses of indigenous cottage products: a behavioural study on cottage textile subscription via SEM", 33rd European Conference on Operational Research (EURO 2024), July 2024, Denmark Technical University, Copenhagen, Denmark

Singh, S., Bolia, N.B. (2024). "Examining Cottage Industry Value Chain Barriers from Manufacturer Perspective: A Cause-and-effect Analysis on Handmade Textile and Apparel Value Chain", POMS India International Conference 2024", December 04-06, 2024, IIM Ranchi, India

Singh, S., Bolia, N.B. (2025). "Cottage Industry Value Chain Barriers from Entrepreneur Perspective: A Cause-and-effect Analysis on Pottery Industry Value Chain", 15th International Conference on Industrial Engineering and Operations Management Singapore, February 18-20, 2024, Singapore University of Social Science, Singapore

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