Application of Bi-Directional ICT Channels to Increase Livelihoods for Artisans in Rural India

By

Sriram Emani

B.Tech Civil Engineering
Indian Institute of Technology, Bombay, 2007

SUBMITTED TO THE MIT SLOAN SCHOOL OF MANAGEMENT IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF BUSINESS ADMINISTRATION AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

JUNE 2014

© 2013 Sriram Emani. All Rights Reserved.

The author hereby grants to MIT permission to reproduce and to distribute publicly paper and electronic copies of this thesis document in whole or in part in any medium now known or hereafter created.

Signature redacted

Signature of Author:

MIT Sloan School of Management
May 10, 2013

Signature redacted

Certified By:

Charles Fine
Chrysler Leaders for Global Operations Professor of Management
Thesis Supervisor

Signature redacted

Accepted By:

Maura Herson
Director, MBA Program
MIT Sloan School of Management
Application of Bi-Directional ICT Channels to Increase Livelihoods for Artisans in Rural India

By

Sriram Emani

Submitted to the MIT Sloan School of Management on May 10, 2013 in partial fulfillment of the requirements for the degree of Master of Business Administration

ABSTRACT

The handicraft industry is the second largest employer in rural India after agriculture, and has been the fastest-growing export growth sector since India’s liberalization in 1991. Today, however, millions of artisans face a lack of infrastructure, stagnation and mis-alignment with a rapidly changing market, intense competition, decline of the natural materials on which they depend, and the lack of the information and skills needed to benefit from new market opportunities. Artisans are confronted by new challenges that include those associated with technology, communication and intellectual property. My research will focus on identifying steps in the handicraft value chain where ICT intervention can create better communication and bi-directional feedback channels between artisans and buyers. The study includes an analysis of the most common handicraft value chains today and the major needs and challenges identified by groups of artisans and retailers surveyed across four different locations in India. The study also includes interviews and perspectives of the stakeholders of the handicraft value chain.

Thesis Supervisor: Charles Fine
Title: Chrysler Leaders for Global Operations Professor of Management
Table of Contents

1. Background.............................................................................................................................. 6
   1.1 Indian Handicrafts Industry.............................................................................................6
   1.2 Opportunities and Challenges in Global Handicraft Industry Landscape....................... 8
   1.3 Research Visit in January 2013.....................................................................................9
   1.4 Problem Areas Identified..............................................................................................10
   1.5 Case Studies and Current Approaches to Addressing Challenges in Handicrafts Sector..12
      1.5.1. Brands and Boutiques in Handicraft Sector.........................................................12
      1.5.2. Online Marketing Platforms..................................................................................12
      1.5.3. NGOs providing education and infrastructural support........................................12

2. Research Plan...........................................................................................................................14
   2.1 Motivation..........................................................................................................................14
   2.2 Research Objectives.........................................................................................................14
   2.3 Proposed Method.............................................................................................................15
   2.4 Data Collection and Analysis..........................................................................................25
      2.4.1 Analysis Methodology.............................................................................................26
      2.4.2 Impact Analysis.........................................................................................................26
      2.4.3 Risks..........................................................................................................................28

3. References................................................................................................................................29
1. Background

1.1 Indian Handicrafts Industry

The handicraft sector is the second largest source of employment in India after agriculture, with official estimates indicating 7 million artisans\(^1\), and unofficial ones indicating 200 million people employed in this sector\(^2\). This sector has also been the fastest-growing export growth sector since India’s liberalization in 1991.

Handicrafts are classified into two categories:

1. Articles of everyday use
2. Decorative items

The craftsmen use different media to express their originality. The diversity of the handicrafts is expressed on textiles, metals – precious and semi-precious, wood, precious and semi-precious stones, ceramic and glass.

Textile based handicrafts:
Hand printed textiles including block and screen printing, batik, kalamkari (hand printing by pen) and bandhani (tie and die) are used in products ranging from bed-covers to sheets, dress material to upholstery and tapestry. The famous embroidered articles of silk and cotton, often embellished with mirrors, shells, beads, and metallic pieces are also found in India. Embroidery is done too on leather, felt and velvet etc. This segment of the industry accounts for almost half a million strong employment in addition to a large number of designers, block makers, weavers and packers involved in the trade.

Clay, Metal and Jewellery:
Brass, copper, bronze, bell metal are used for a variety of wares and in a variety of finishes. Scintillating ornaments are available in a wide range of patterns, styles and compositions. Made from precious metals, base metals, precious and semi-precious stones; these ornaments have traditional as well as modern styles.

Woodwork:
Wooden articles in India range from the ornately carved to the absolutely simple. One can find toys, furniture, decorative articles, etc. bearing the art and individuality of the craftsman. India is known particularly for its lacquered wood articles.
Stone Craft:
The intricately carved stoneware made of marble, alabaster or soapstone, etc., inlaid with semiprecious stones carry on the heritage of Indian stone crafts.

Glass and Ceramic:
Glass and ceramic products are a fast upcoming segment in the handicrafts from India. The age-old production process of mouth-blowing the glass instills a nostalgic feeling. The varied shapes of ceramic and glass in a number of colours, would appeal to Western aesthetics while retaining the Indian touch.

This sector today faces significant challenges in the face of industrialization. With the concept of modernity being increasingly framed as an adoption of ideas and ways of living from the West, artisanal products are often branded as ‘local’ or ‘primitive’ that can denote inferior quality compared to machine-made, mass-produced objects. This brand of being from a pre-industrial past has led to a neglect and ignorance of the value of artisanal production, its scale and potential with a rapidly changing market. This directly impacts the millions of people directly dependent upon this sector for livelihoods.

As a result of Mahatma Gandhi’s Swadeshi movement, free India included handicrafts within the framework of national planning. However, official support schemes, often indifferently designed and reluctantly implemented, today touch only a fraction of possibly 200 million or more engaged in craft activity. For instance, Cauvery Handicrafts, the state emporium of Karnataka, has only 5000 registered artisans in its fold, with over 30,000 artisans indirectly depending upon them\(^3\). The unofficial estimate of number of artisans can be significantly higher given that the countrywide estimates vary between 7 million and 200 million.

As a result, millions of artisans face a lack of infrastructure, stagnation and mis-alignment with a rapidly changing market, intense competition, decline of the natural materials on which they depend, and the lack of the information and skills needed to benefit from new market opportunities. Artisans are confronted by new challenges that include those associated with technology, communication and intellectual property\(^2\).

The liberalization of India’s economy during the 1990’s has ushered in an era of globalization into the Indian subcontinent. This has especially been a boon, on one hand, to the Indian handicrafts industry which saw its exports rise to about $2.3B during 2011-2012 according to the Export Promotion Council of India – a Government of India organization (Export Promotion Council of India). Among countries exported to the United States of America is, by far, the biggest importer of such handicrafts\(^4\).
The open market reforms that have helped the Indian handicraft industry on one hand have also created issues on the other hand. Propelled by loss of markets, declining skills and difficulty catering to new markets, a large number of artisans have moved to urban centres in search of low, unskilled employment. According to the United Nations, over the past 30 years the number of artisans has decreased by 30 per cent, indicating the need to re-invest in artisans to safeguard history, culture and an important source of livelihood.

As per the Dasra report on ‘Crafting a Livelihood’, the four main challenges facing artisans in creating sustainable livelihoods in today’s economy are low productivity, inadequate inputs, fragmented value chain and lack of enabling environment by way of official neglect. “Investing in the crafts sector today presents tremendous opportunity...including stable employment and income generation opportunities, the ability to capture a greater share of a significant global market and preservation of unique cultural assets,” the report says.

1.2 Opportunities and Challenges in Global Handicraft Industry Landscape

The global market for handicrafts is estimated at $4 Billion of which India’s share is below 2%. There is an interesting shift in the nature of industrialization and also definitions and attitudes regarding mass production globally. In the area of handmade goods, both crafts and textiles, even as countries like India are learning to convert their weaknesses into strengths, in China mechanization is efficiently organizing itself to imitate the hand work of India to encroach upon the market for India’s special skills.

This competition reflects a strong unmet demand in the world. Post-industrialization, as products become increasingly similar and standardized wherever they may be sold, the non-standardized and multi-cultural nature of handicrafts can provide a welcome contrast and unique value proposition.

Opportunities within the phenomenal rise of the retail industry include the growing consumer demand for green production, expanding tourism (domestic as well as foreign visitors), growth in fashion and luxury markets, the potential of e-commerce and increasing space for cultural goods in markets at home as well as overseas. Another added advantage is the low energy requirement since production processes used in crafts typically have a low carbon footprint and promote use of locally available materials as well as natural and organic materials where possible, as per the Dasra report. Crafts production provides a source of earning and employment for otherwise low skilled, home-based women, improving their status within the household.
According to the 12th Five-Year Plan, handicrafts production is expected to double between 2012 and 2017 and exports are projected to grow at the compounded annual rate of 18 per cent per year during the same period. As a result, the craft sector will employ an additional 10 per cent of individuals per year. The crafts value chain encompasses the full range of activities required to bring a handicraft product from conception through production to delivery to consumers, the Dasra report suggests.

Stringent competition in home and export markets underlines the importance of new marketing and distribution challenges which Indian artisans must be assisted to overcome. These include better access to market trends, to urban markets, to R&D (including design) resources that can help lift quality, and better terms of trade.

1.3 Research Visit in January 2013
The author visited several organizations along the handicrafts supply chain to conduct primary research and observations in January 2013.

Project Visits Completed in India during IAP 2013:

1. Artisanal Groups and NGOs
   - Sandur Kushala Kala Kendra, Sandur, Karnataka
   - Bamboo artisans from Benu Tripura, Katlamara, Tripura
   - Bamboo artisans from Nalchar village, Tripura
   - Dishari, Nalchar, Tripura
   - Khamir, Anjar, Gujarat
   - Kala Raksha, Bhuj, Gujarat
   - Kadam India, Kolkata, West Bengal

2. State Emporiums and Government Agencies
   - Cauvery Crafts, Karnataka State Emporium, Bengaluru, Karnataka
   - Tripura Bamboo Mission, Agartala, Tripura

3. Retailers/Buyers of artisanal products
   - Deccan Crafts, Bengaluru, Karnataka
   - Crafts Heritage, Agartala, Tripura
   - Setu Fair Trade, Jaipur, Rajasthan
4. Academic Institutions and Experts

- Prof M P Ranjan, National Institute of Design, Ahmedabad, Gujarat
- Prof Bhardwaj, Director of Indian Institute of Crafts and Design (IICD), Jaipur, Rajasthan
- Trustee Council of IICD, Jaipur, Rajasthan
- Mahesh Patel, Core Member, National Innovation Foundation, Ahmedabad, Gujarat

1.4 Problem Areas Identified

Based on the research conducted in January 2013, the following key problem areas were identified:

![Hierarchy of Challenges on the Demand and Supply Side in Indian Handicraft Industry](image)

The areas of Artisan Discovery and Project Management can be addressed through use of ICT, and can also provide Market Linkages to the clusters. Within this, the author proposes to conduct a preliminary needs analysis in conjunction with buyers and artisanal clusters to prioritize the areas that will be addressed in the current research. For example, designer Jolijn of Netherlands in her interview with the
author suggested that the need for project management and communication tools is critical for her work with rural artisans in India. Addressing Infrastructure related challenges would be out of the scope of the current research.

- **Need for direct market linkages and feedback loops**
  - The value chain linking the supply side (artisans) to the demand side (individuals and businesses requiring the products) is eroding the profit of Indian artisans due to the middlemen and high input costs.
  - The non-profit groups working with artisans do not have the resources to perform proper market outreach opportunities to increase the demand for products.
  - While there are online retailers who sell artisanal products there are far too many non-profit groups who do not have access to such retailers.
  - Lot of artisans export, or seek to export, products to foreign organizations who require a lot of design customization.
  - The interaction process is very rudimentary – involves excel spreadsheets and pictures.

- **Need for skills training**
  - The number of master artisans is dwindling leaving a void in the master craftsmen/craftswomen pool.
  - Loss of quality artisans is resulting in low quality products and places a stress on the remaining artisans and organizations.
  - Low quality could result in decreased revenues and loss of livelihood for the artisans.
  - The Indian government does support training for artisans but the opportunities are too few and the artisans requiring the training are too many.

- **Poor project management and logistics infrastructure**
  - Organizations procuring the handicrafts get frustrated sometime over inability to get accurate and real time project status feedback.
  - Problems not identified early due to lack of interim updates, leading to significant loss of time, materials and efforts.
  - Lack of trust between collaborators – unwillingness amongst artisans to produce or ship goods without receiving advance or part payment, inability to accompany every shipment to final destination to collect payment.
  - High costs of shipping.
1.5 Case Studies and Current Approaches to Addressing Challenges in Handicrafts Sector

Based on the problem areas identified, there can be several ways to create impact, and indeed there have been several attempts made in India and internationally to address challenges faced by artisans. We shall review a few of these attempts to understand key learnings and insights, and propose an argument for the chosen vision for the current research and approach.

1.5.1 Brands and Boutiques in Handicraft Sector

Companies such as Anokhee, Jaypore.com, and Matsya are amongst several brands and boutiques that source products from artisans and act as intermediaries or shop fronts to domestic and international buyers. These companies have both retail and online presence. The value they bring is to create a brand identity for a group of products and target specific customer segments who may be interested.

1.5.2 Online marketing platforms

Websites such as MyMela.com provide an online marketplace for handicrafts, targeting customers in domestic and international cities. They are also starting to offer money-lending services to artisans to create a funding mechanism. The website can be an additional marketing channel for current artisanal products, in addition to the various websites being set up by NGOs and artisanal clusters themselves in some cases. None of the NGOs or artisans that the author met with in January 2013 had heard of or were working with MyMela.com or any such website as yet, so there would need to be more research done to determine the impact of such platforms. From the experience of analogous sites like Etsy.com in USA, another question that comes to mind is about how the discovery of artisans can be facilitated when there are a lot of them trying to sell their wares on such a platform.

1.5.3 NGOs providing education and infrastructural support

NGOs such as Khamir in Gujarat, Dishari in Tripura, and Sandur Kushala Kala Kendra in Karnataka are located close to artisanal clusters in rural India with a view to providing infrastructural and educational support to artisans. These organizations try to provide design workshops, training and work space to artisans. During the visits to these NGOs and conversations with their staff in January 2013, it was observed that while they have been successful at providing some means of income to a limited number of artisans, they are struggling to find efficient marketing and sales mechanisms for the products. The need for better communication mechanisms with retailers and buyers was repeatedly mentioned. For instance, Mr Ramesh Verma of Sandur Kushala Kala Kendra expressed the need for a software that provides design-feedback channels and project management tools for their interaction with buyers in Netherlands.
and Japan. The author’s discussion with the buyers in Netherlands indicated problems of large turnaround
times for the design process, lack of clarity of requirements, inefficiencies in supply chain, and the need
to educate artisans about global standards and expectations.

Based on the above, it seems unclear whether current interventions have enabled a fundamental change in
the handicraft production value chain from what it has been traditionally. The introduction of new sales
channels definitely provides a means to more revenue and orders for existing products, but it is unsure if
they enable alignment with market needs. Mr Verma from Sandur points out that the product they sell at
Rs 100 ($2) is sold at Rs 400 ($8) by wholesalers and buyers, and they are unable to capture this value
because of inefficient supply chains, dependency on a few buyers, and lack of market linkages with
buyers and end customers. There is a shortage of clients and work that can enable livelihoods to all the
artisans at Sandur. He expresses the need for a strong channel that can enable discovery of their group,
ensure continued orders, and transparency and greater control in pricing.

The key question then is whether there is a possibility for low-cost technology intervention that can
reduce the dependency of artisans on intermediaries, and develop strong working relationships with
buyers. Rather than a uni-directional, one-time sales relationship with buyers, is there a way for artisans
and artisanal clusters to align with specific needs of buyers and have bi-directional communication with
them that empowers the artisans and helps them capture more value. An important consideration here is
the reason for the emphasis on disintermediation. While intermediaries often play an important role in the
value chain, the majority of the value is captured by them as is evident from Sandur’s case and others,
which results in extremely low wages (Significantly less than minimum wages) for artisans. Sandur
artisans make Rs 600 a month on average ($12) which is about a sixth of what they would make if they
earned the minimum wage of Rs 115/day for 30 days.

We can argue that if artisans can increase the value they capture as well as establish strong client
relationships for continued business, their earnings can be higher than the minimum wage and potentially
make this a viable livelihood. Another hypothesis is that the earnings can increase if artisans can increase
the value of their work by adhering to global standards and design requirements by understanding what
their customers want. Rudimentary channels such as email and phone conversations are a time-consuming
process to communicate design requirements, and there is no easy way for buyers to discover groups that
are able to adhere to their standards and requirements from amongst the millions of artisans in India.
2. Research Plan

2.1 Motivation
During the last couple of years there has, once again, been an increase in demand for traditional handicrafts, with a dip in the demand being caused by the global economic crisis. Emerging markets such as India have seen an uptick in exports of traditional, hand-made artisanal products to foreign shores riding on improving global economic conditions and rise in disposable income levels. The National Skills Development Corporation (NSDC) has identified the handicraft sector amongst 20 high-growth sectors for India where skill gaps need to be bridged to provide skilled workforce. On the other hand, millions of highly skilled artisans are leaving their trade to go into unskilled agricultural labor due to lack of infrastructure and revenue generation opportunities for their skills. India is projected to have a skills training requirement of over 15 million people annually in the next decade, but it is not being able to find markets and livelihoods for those who are already well trained.

Internet penetration in emerging markets, particularly India, is growing at a robust rate, connecting millions of rural communities with global markets. New products can now be marketed beyond local communities, and long chains of middlemen can be dis-intermediated to provide more value to grassroots producers. The motivation for this project is hence to identify potential low-cost technology solutions and assess their impact on increasing the efficiency of handicraft production to provide livelihoods to artisans.

2.2 Research Objectives

In order to achieve the above, the following are the key research questions we seek to answer:

1. How can technology intervention create better communication and bi-directional feedback channels between artisans and buyers? What impact can this have on efficiency of the handicraft production value chain, and number of work orders and livelihoods for artisans?

Based on the above, the proposed thesis attempts to assess the impact of ICT-based technology interventions on the efficiency of the handicraft production value chain, and its impact on livelihood provision for artisans in rural India.
2.3 Proposed Method

For purposes of this research, the author proposes to study two common methods currently used to engage artisans – the Boutique Model, and the Online model. Based on preliminary research, we have broken these processes down step-by-step, and attempted to identify steps where ICT can impact parameters of time, cost and quality. An ICT-based prototype shall be built to validate these hypotheses by engaging artisanal clusters in India to engage with buyers with and without the prototype, to examine the impact of the ICT intervention. The step-by-step models, and the hypothesis regarding impact of ICT intervention are outlined below:

2.3.1 The Boutique Model

In the Boutique model, the boutique commissions artisans based on their estimate of market and consumer preferences. Artisans send samples of their work to the boutiques for approval. In this model, the boutique takes the risk of marketing and sales of the product.

2.3.1.1 Sample Creation and Approval Process

Exhibit A1: Sample Review and Approval Process: Boutique Model
Exhibit A2: How ICT Can Impact the Sample Creation Process

In this first part of the process, our hypothesis on ICT-intervention is as follows:

a) ICT can provide customer needs and a more reliable estimate of demand. In the current process, the customer is not involved in the product approval process. ICT can enable user-inspired design, customer co-creation, or other feedback-gathering approaches from customers to identify preferences and provide a more accurate estimate of demand to the boutique. This can reduce costs by lowering inventory risk and marketing expenditure.

b) The sample review and approval process currently relies on physical transport of samples back and forth, which increases costs as well as time. ICT can facilitate online review and approval, thus reduce time and costs. However, it needs to be established whether all sample review steps can be replaced by ICT because the buyer may still prefer ‘touching and feeling’ the product at least once before placing an order. Similarly, the impact of this intervention on quality is yet to be established.

c) A major concern raised by artisans in rural India to the author was the lack of trust or guarantee on payment by buyers in the traditional model. Cash flow can be a concern for artisans, and the time taken to follow up on payments needs additional resource investment. ICT can streamline the process on mutually agreeable terms by implementing payment gateways, and recording
transactions and payment terms in case of disputes. This step can improve willingness of artisans to engage with buyers, and indirectly increase quality due to the lower risks involved.

2.3.1.2 Handicraft Product Process

![Handicraft Production Process: Boutique Model](image)

1. In many cases, material sourcing is from a different artisanal cluster or group, and coordinating with them is key.

Exhibit B1: Handicraft Production Process: Boutique Model
Exhibit B2: How ICT Can Impact the Handicraft Production Process

In the second part of the process, our hypothesis on ICT-intervention is as follows:

d) Once the order has been placed, boutiques seek visibility into the process at interim stages to check if everything is as per their understanding in terms of design, quality, and other factors. Often at this level the samples are sent back and forth between artisans and buyers to confirm specifications. ICT can provide a channel to reduce time and cost in this step. As with Step (b), we may need to evaluate if there are some steps where physical transport is required, but the hypothesis is that the ICT intervention can improve project management overall.
2.3.1.3 Quality Control and Sales Process

Exhibit C1: Quality Control and Sales Process: Boutique Model

Exhibit C2: How ICT Can Impact the Quality Control and Sales Process
In the last part of the process that concerns the artisan-boutique relationship, we envision the impact of ICT intervention to have the following impact:

e) Potential to streamline order fulfillment across stores. ICT can enable the order fulfillment process for large orders across multiple stores, and reduce time and cost

f) Customers often do not have visibility into the product value chain, and what proportion of the value is actually reaching the artisan. As fair trade sourcing becomes an important factor to consumers across the world, ICT can provide multiple options to ensure this information reaches the end consumer. In addition, this can also be a channel to improve the ‘buying experience’ by telling the story of the product through QR code tags, story-tags, or other means that can build a connection between the consumer and the artisan. This step can reduce cost by facilitating the purchase, and improve quality by incentivizing the artisan to highlight their brand to the end consumer

g) In addition the customer, often artisans are not able to predict what proportion of the value they are able to capture. The lack of visibility into final MRP places them at a disadvantage when negotiating prices with boutiques. ICT can enable the channeling of this information back to artisans. It can also help them optimize their production strategy by focusing on geographical locations, buyers, type of product and quality parameters that can maximize returns.

2.3.2 The Online Model

In this model, we refer to two-sided platforms that bring together artisans on one side, and buyers on the other. The website by itself does not usually commission work, or provide market requirements and hence does not take on any risk related to sales of products. The process is outlined below, along with our hypotheses on how ICT can improve this process.
2.3.2.1 Catalog Upload and Discovery Process

Exhibit D1: Catalog Upload and Discovery Process: Online Model

Exhibit D2: How ICT Can Impact the Catalog Upload and Discovery Process
In this part of the process, we envision the impact of ICT intervention to be:

a) Current platforms do not provide market preferences to artisans. The advantage of reaching out directly to buyers and customers through online channels can be further supported by ICT intervention to provide requirements upfront before artisans start production. By facilitating demand-driven production, it can minimize inventory risk, and improve quality based on the target customers and price point catered to.

b) ICT can enable web stores to become curators or to commission products based on the rich data that they have from customer transactions and browsing trends. This may be especially relevant in case of artisans in emerging markets who may not be able to process this information by themselves to generate insights that can determine their strategy.

c) With too much information now available online, the ability to connect artisans with their specific target customers is critical to ensure conversion and sales. ICT can enable this through algorithms that can match user preferences with ratings/reviews of current customers and aid the discovery process. This can reduce marketing costs, and increase number of customers and orders for artisans.

2.3.2.2 Handicraft Selection and Purchase Process

Exhibit E1: Handicraft Selection and Purchase Process: Online Model
Exhibit E2: How ICT Can Impact the Handicraft Selection and Purchase Process

d) ICT can enable customers to understand capabilities of artisans, and facilitate bespoke orders. These orders offer higher margins and lower risk than regular ones, and enable relationship building with clients for repeat purchases.

e) Artisans can determine their catalog strategy based on data from online purchases and browsing. This can be a bi-directional feedback channel to help them cater their production to what the market wants, and educate themselves.

f) ICT can provide feedback to artisans on pricing, customer reviews and other parameters that can help them invest in training, quality improvement, catalog strategy and other areas.

g) Artisans can use ICT to connect with clients and build relationships that go beyond one-time sales. This can be through direct communication, bespoke manufacturing or alterations, invitations to live events in their cities, or other ways that can enhance the customer experience.

2.3.3 Prototype Strategy

Based on the above, an ability to clearly communicate design requirements impacts the efficiency and longevity of the artisan-buyer relationship. The versatility and subjectivity of the design process pose a
unique challenge in communication, quality control and turnaround time in the handicraft industry. Buyers can communicate design requirements in three ways:

1. Refer to current artisan design catalog and indicate modifications or additions to existing designs

2. Create an entirely new design and communicate the same to artisans

3. Invert the design process based on knowledge of artisan capabilities and design attributes (Design product based on the elements that the artisans are familiar with to increase familiarity with design)

By facilitating easy design collaboration and communication, we seek to observe the factors that determine if a client relationship has been successful and the impact it has on the artisanal cluster’s revenue and number of work orders.

At its very roots the system that can be developed is a design collaboration tool that will help the customers visually depict customizations and design requirements for the artists. This would require giving the customers the ability to import pre-composed images into the design tool onto a canvas and providing annotation elements so the customer can add/edit annotations. The customer should have the ability to create multiple such “projects”. Furthermore from a project management perspective the customer should be able to create “folders” that can house multiple projects. The intent is to have each “folder” correlate to individual artisan organizations as a customer can have multiple projects with multiple organizations.

The ability to share projects is vital because it enables the artisans, residing remotely, to view and understand the customer requirements. The artisan and the customer should be able to create a project and invite each other to contribute to the project. If a project is created by an artisan organization the artisan should be able to upload their current products and customizations available. The system should automatically add all these elements to a palette and make the palette accessible in the design tool. This way the customer can add existing elements from the palette onto the canvas.

If a project is create by a customer group the system should allow the artisan group to upload elements to the palette after a share invitation has been received from the customer group.

More specifically,

- The primary pain points that the product will address initially are:
  - Product design collaboration
Project related information (status, logistic information etc)

The platform, which will be web based (accessible via browser) will compose of the following components:

- Plugin where the potential customers can customize the product based on product attributes (defined by the artisans). Additionally it would allow notes for custom modification
- A dashboard system to track, on a per customer basis information such as below but not limited to (more interviews are needed to identify the various types of information required to be displayed):
  - Project status
  - Shipping status
- A SMS based system which would integrate the remote artisans into the system to get the latest information

Over time the intent is to start addressing the market reach problem by building a portal customized and for each non-profit where they can highlight the handicrafts they produce.

Skills training and production automation are not pain points that the platform will address. There are foundations, such as the American Indian Foundation, that are doing work in this area. Furthermore the web platform will enable delivery of value with minimal effort.

2.4 Data Collection and Analysis

The research method can be a series of 4 case studies across different artisanal clusters in India with a view to studying the economics of artisanal cluster livelihoods before and after the ICT intervention. A more rigorous data analysis for trends and impact could be carried out once the new platform adoption reaches a steady state.

Each case study shall comprise the following:

Data to be gathered before the ICT solution is integrated into the development lifecycle

- Important milestones jointly agreed by the buyer and the artisan (qualitative data)
- Time taken to reach each of those milestones (quantitative data)
- Overall project completion duration (quantitative data)
- Number of man hours from project initiation to completion
- Quality rating
Data to be gathered after the ICT solution is integrated into the development lifecycle

- Important milestones jointly agreed by the buyer and the artisan (qualitative data)
- Time taken to reach each of those milestones (quantitative data)
- Overall project completion duration (quantitative data)
- Number of man hours from project initiation to completion
- Quality rating
  - Subjective analysis - rating on a scale from 1-10 (quantitative data)
  - Defect rate – expressed in terms of defect/100 parts (quantitative)
- Engagement metrics (can be obtained by implementing Google analytics APIs)
  - Frequency – gives an estimate for how often a user uses the solution in a given time period (quantitative data)
  - Session duration – gives an estimate of how much time the user spends on the solution (quantitative data)
  - Number of unique users – gives an estimate of how many unique, distinct users log on to use the website (quantitative)
  - Clickstream data – gives an estimate of the use of particular features (quantitative)
- Overall satisfaction survey (quantitative & qualitative)
- Viral coefficient (TBD since there is no direct implementation of social/share abilities)

2.4.1 Analysis methodology

- The primary approach to analyzing the data would be to employ standard statistical methodologies such as:
  - Averages, moving averages
  - Standard deviation
  - Distribution curves
  - Confidence intervals

2.4.2 Impact Analysis

The actual impact of the tool can be measured both directly and indirectly. It is important to consider multiple dimensions of measurement because there is dependency, to some extent, on factors such as
qualitative aspect of measurement, time duration and so forth. The insights that can be obtained are as follows:

<table>
<thead>
<tr>
<th>DIRECT IMPACT</th>
<th>INDIRECT IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does using ICT technology enable shorter turnaround times? This can be quantified both in terms of cost and time</td>
<td>What is a good estimate for realizable opportunity cost if the tool improves efficiency?</td>
</tr>
<tr>
<td>Will the quality of product improve if the ICT solution is adopted?</td>
<td>What is the size of potential additional revenue for new orders placed due to quality improvements?</td>
</tr>
<tr>
<td>Would the artisan/artisan affiliated organizations use the ICT tool frequently enough to realize the potential benefits?</td>
<td>Will users of this tool recommend it to their friends/colleagues? What is the potential of revenue growth for artisans if more buyers are introduced to the tool?</td>
</tr>
<tr>
<td>Can this tool support viral growth? What is the viral coefficient?</td>
<td></td>
</tr>
</tbody>
</table>

**Benefits of approach**

- The data gathering mechanism includes quantitative and qualitative aspects which lends itself to an easier way to quantify the benefits
- Impact analysis not only captures the direct impact but also the indirect impact, again along quantitative and qualitative dimensions. This ensures that a holistic view of the benefits is captured
- The impact analysis performed can also act as a catalyst for further improvements and new capabilities that can be integrated into the product roadmap
- The engagement metrics along with the satisfaction surveys will ensure proper prioritization of features as well as efficient allocation of resources
- If favorable data is obtained it can be used to demonstrate the effectiveness of technology not only for current projects but also for all future projects. This could play a significant role in the reduction of barriers to adoption
- The metrics are agnostic to variations in external environment therefore enabling the team to use the data to spread the reach of the product irrespective of geographic location. This will ensure widespread product adoption and scale
2.4.3 Risks

There is no project without risks. Therefore an attempt has been made to capture the risks associated with this particular project albeit at a high level so appropriate risk mitigation strategies can be adopted upstream. An additional purpose of this exercise is to create a methodical framework for risk detection and mitigation instead of an ad-hoc approach. This framework is intended to be flexible so that the risks can be appropriately categorized as and when detected and appropriate mitigation strategies prioritized. The high level risks are as follows:

1. The intended product is not complete in time for deployment
2. The ICT tool has inherent instability/quality issues rendering the deployment quite useless
3. The implemented functionality in the ICT tool does not match the requirements of the artisan groups and/or buyers
4. The learning curve to use the tool is relatively high
5. Resistance from stakeholder groups to implement and use the tool
6. Sporadic/irregular use of the tool which may not generate sufficient data points
7. Time period during measurement is done is insufficient to prove/disprove hypothesis
8. Lack of proper communication channel between the stakeholders in the project rendering the entire undertaking ineffective
9. Tendency to keep switching back to traditional approach due to cognitive familiarity
10. Insufficient follow up by MIT project team to ensure smooth operation
11. Inadequate key technological elements such as power, internet
3. References

3. Mr Muniswamy. Head of Cauvery Handicrafts, Karnataka State. Interview with Author. Jan. 2013
10. National Skill Development Corporation. India. 5 Apr. 2013