KNOWNS: A FRAMEWORK FOR THE HOLISTIC UNDERSTANDING OF CRAFT ECOSYSTEMS

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Abstract

This paper introduces the KNOWNS framework as a tool for designers and researchers to acquire a more holistic understanding of craft ecosystems. It takes experience and time to grasp a craft community's nuanced workings and needs before a designer can design products and services that respond to the different tenets of holistic sustainability—including the ecological, social, cultural, and economic (Reubens, 2016). The author, a fashion educator, developed the KNOWNS framework to help designers navigate the complexities of craft ecosystems and identify priorities for responsible, respectful, and sustainable design-craft initiatives. The framework consists of six dimensions. The **Knowledge** dimension covers tacit knowledge, indigenous knowledge, possible theorisation, and mechanisms for knowledge transfer. The **Numbers** dimension involves the analysis of quantitative data to provide insight into such factors as scale and economic health. The **Objects** dimension explores the full range of products that can be produced by the craft and considers the different ways to assess the value of the craft object, including the quality of workmanship and its functional, aesthetic, and cultural utility. The **Work** dimension addresses issues of job scope and the division of labour; potential for upward mobility; working environment conditions; and the existence of any organised private, non-government organisation, or governmental support for the craft. The **Network** dimension recognises the craftsman as part of a larger value chain consisting of buyers, intermediaries, subcontractors, and suppliers. Issues of complementarity and dependencies, as well as communication and transaction modalities, are explored within this dimension. Finally, rich insight from the collective and individual histories of craftspeople are gathered for the **Stories** dimension; revealing their heritage, cross-cultural connections, socio-cultural significance, symbols, and examples of innovation. To illustrate how to use the framework the author will reflect on a cross-culture fashion-craft case study—in which a dress was designed in Singapore and hand-embroidered by artisans in India with motifs inspired by the Manila Shawl—through the six dimensions of KNOWNS. Designers and stakeholders who wish to engage in design with/in/for craft projects are invited to use and build upon this framework for their practice.

Introduction

In the quest to develop more sustainable and culturally-connected fashion offerings, many designers have turned towards craft for possible answers. Craft is one field with highly pluralistic practices (Petiot & Braunstein-Kriegel, 2018). Branzi's (2008) concept of “diffuse craftsmanship” describes the diversity of practices ranging from heritage and vernacular, to highly globalised and cutting-edge, and everything in between. Craftspeople or “artisans” can be found throughout the world—from the savoir-faire Maisons under Chanel's Paraffection to the countless craft villages spread across Southeast Asia.

Through craft, humans shape their environment, rituals and experiences; which in turn ground our heritage and become important pillars of our culture. The industrial revolution and the introduction of mass production have gradually but surely moved us towards globalisation and the dilution/erosion of heritage craft practices. While capitalism has brought an increase in material comfort, we may be paying the price in loss of cultural wealth—becoming increasingly dislocated from our indigenous traditions, practices, and identities.

More recently, designers have been re-engaging with craft in numerous ways and to various extents. In 2022, Loewe (n.d.) drew inspiration from Chinese monochrome ceramics, producing a limited collection of their signature bags and accessories in colours inspired by these heritage craft objects. Since 2000, Carla Fernández (n.d.) has worked closely with craft communities and their indigenous techniques to produce designs that are locally made with global appeal. And since 2012, the founders of Buaisou have been revitalising the craft of indigo farming and dyeing with their ‘farm to closet’ project (The Kindcraft, 2015).

While the aforementioned are positive examples of how designers can successfully and respectfully engage with craft, there are many cases with undesirable outcomes. Besides instances of cultural appropriation, unintended problems in design-craft interactions likely arise from incompatibilities between the worldview, agendas, expectations, understanding, and working behaviours of designers and their artisan counterparts. The development of design products—fashion in particular—is often focused on producing a product outcome in a process that is pressed for time. But it is precisely time and a broader understanding that are required for the development of design-craft products and systems that meet the different tenets of holistic sustainability which include the ecological, social, cultural, and economic (Reubens, 2016).

This paper introduces the KNOWNS framework, developed by the author, as a guide for designers and researchers to acquire a holistic understanding of craft ecosystems and communities. Its conception was in response to the author's encounters with craft communities (in the Philippines, Indonesia, Cambodia, and India) and observing an increasing desire of designers and undergraduate fashion students to work with heritage crafts. The aim is to help designers navigate the complexities of craft ecosystems and identify priorities for respectful, mutually-beneficial, and sustainable design-craft initiatives and innovation.

Literature Review

In this section, the six dimensions of the KNOWNS framework are explicated in relation to the literature, and in connection with the four tenets of holistic sustainability.

Holistic sustainability

Since the 1980s, apparel companies have been introducing environmental practices into their businesses (Assoune, 2020) and the fashion industry has become acquainted with the three ‘Ps’ of sustainability, namely People (social), Planet (ecological), and Profit (economic). However, the fourth, cultural dimension, is sometimes overlooked. This paper adopts Reubens' (2016) pleonastic use of the term holistic alongside sustainability to place emphasis on all four tenets of sustainability. The legend in the Holistic Sustainability Label presented by Reubens (2016, p. 268) provides a succinct purview of each sustainability tenet: ECOLOGICAL – cleaner materials and process, energy efficient; SOCIAL – fair-trade and labour, safe for makers and users; CULTURAL – supports local culture and indigenous knowledge; and ECONOMIC – supports livelihoods and local trade.

Knowledge

The Knowledge dimension covers tacit knowledge; indigenous knowledge; possible theorisation; and mechanisms for knowledge transfer. The knowledge of a craft community is linked to cultural sustainability and could potentially offer approaches for achieving greater ecological sustainability.

Designers from urban value chains often regard craftspeople as potential recipients of know-how from their developed world, particularly in areas such as communication technologies and access to global markets. From the other end, Reubens (2016) found that craftspeople, as keepers of indigenous systems, have much to offer to the nascent field of sustainable design. They possess attributes critical to responding to the sustainability crisis on two fronts. Firstly, craftspeople tend to better grasp the compound picture and systems thinking because they come from backgrounds that are not completely globalized and subject to division of labour. Secondly, having faced the encroachment of globalisation, the information revolution, and unprecedented development in recent history, they have become more adept at internalising and responding to crises in flux. Refer to Appendix 1 for a list of the various types of indigenous knowledge that can potentially be learnt from a craft community.

Numbers

The Numbers dimension involves the analysis of quantitative data that can provide valuable insight into the vitality and (economic, social, and cultural) sustainability of a particular craft community. Having quantitative data can also be useful for the setting and monitoring of measurable goals.

While established quantitative methods such as Life Cycle Assessment (LCA) based on ISO 14040:2006 are already commonly used to measure and communicate fashion's environmental

impact, they have flaws and limitations (Roberts-Islam, 2022). Without expertise, resources, and significant funding, it would not be feasible for designers to conduct this level of research and assessment. Instead, the focus should be on numbers that designers can gather directly from craft communities they engage with and that will help them draw meaningful insight to guide their design decisions.

Reviewing the threats under UNESCO's (2019) Intangible Cultural Heritage themes, some key areas for which pertinent quantitative data can be collected are identified: under weakened practice and transmission: the number of practitioners, age of practitioners, and frequency of practice; under economic pressure: length of training, and remuneration.

Objects

The Objects dimension explores the full range of artifacts that can be produced by the craft and considers the different ways to assess the value of the craft object, including the quality of workmanship and its functional, aesthetic, and cultural utility.

In her work with the Kotwalia community of bamboo crafters, Reubens (2016) introduced a product-library workshop where designers and community mobilizers documented the process of craftspeople crafting their complete range of traditional products using their own tools. This physical library of products and documentation resulted in a cultural repository of the aesthetics, products, techniques and contexts of the craft practice, thereby formalising previously tacit knowledge. She proposes that this repository serves the dual purposes of recording and augmenting indigenous knowledge and cultural capital; and as a resource for collaborative innovation between craftspeople and designers towards revitalising and evolving the craft in sustainable directions.

From this perspective, the craft object is not merely the product of craftspeople, but vessels, signifiers, and evidence of their unique knowledge and cultural capital. Building on this train of thought and referencing actor-network theory (ANT), there are other ‘things’ (beyond the craft object) within the craft ecosystem that could be studied because of their effect on the system (Bencherki, 2017). These could include craft tools, machinery, technology (including smartphones and their apps), materials, and so on.

Work

The Work dimension addresses issues of job scope and the division of labour; potential for upward mobility; working environment conditions; and the existence of any organised private, non-governmental organisation (NGO), or governmental support for the craft.

An artisan's craft is also their work and therefore an integral part of their personal and social identity. For the individual, work is an essential part of life. It provides financial means that in turn gives access to the purchase of essential and non-essential goods, services and activities. A healthy work experience is also critical to a person's physical and mental well-being, providing a sense of self-worth, usefulness and belonging derived from the feeling of contributing to society or the greater good.

For societies, work promotes community cohesion and safety, civic participation, promotes social and economic vitality, and organises social life at a macro level (Inwork European Project, n.d.).

Network

The Network dimension recognises the craftsman (and designer) as part of a larger value chain consisting of buyers, intermediaries, subcontractors, and suppliers. Issues of complementarity and dependencies, as well as communication and transaction modalities, are explored within this dimension. This dimension is closely linked to sustainability on the social front.

Borrowing from actor-network theory (ANT), we recognise the reality that craft ecosystems are not homogeneous organisations but instead made up of the rhizomatic connections between human, non-human and non-individual actors (Latour, 2017). Put another way, craft ecosystems can be seen as networks or assemblages made of unique, complex, and changing populations of people, things, entities, technologies, and processes (Jones, 2009). These networks are unstable, and can break down, fail, or moulder away; therefore require effort to stabilise and maintain.

Based on this recognition, to understand the craft ecosystem, we need to identify its constituent actors or actants and how they are connected. Actor network theory captures the idea that action is always mediated or as Latour (1996, p.237) put it, “when one acts, others proceed to action.” When a designer decides to work with a craft community, that choice and action have ramifications.

Stories

Rich insight from the collective and individual histories of craftspeople are gathered for the Stories dimension; revealing their heritage, cross-cultural connections, socio-cultural significance, symbols, and examples of innovation. The stories of a craft ecosystem can open conversations pertaining to all four tenants of holistic sustainability.

Stories not only help us understand and empathise with others (Hurst, 2020), but they also help us learn from the experience and wisdom of others. One example, highlighted by Fletcher (2014), is the work of Professor Anil Gupta, who walked between rural communities in India, gathering local lore, knowledge and innovations and has posted over 50,000 sustainability ideas from these villages online. Through Stories, the designer-researcher can potentially catch examples of knowledge and innovation that may be thought of as commonplace for the craftspeople.

Apart from the history of the craft, we should also pay attention to the presently unfolding stories within the craft ecosystem. As Le Roux (2018) points out, the ongoing information revolution and the web create the possibility for reworking many of the craft sector's previous weaknesses: including financing, responsiveness, development of partnerships, modern management techniques and standards, the transformation of sales and supplies, automation of

repetitive tasks, and accelerated access to aid, support, networks, training structures, new materials, etc.

Methodology

To illustrate how the KNOWNS framework can be applied, the author will reflect on a cross-culture fashion-craft case study involving a dress that was designed in Singapore and hand-embroidered by artisans in India with motifs inspired by the Manila Shawl.

Instruments and consent

The case study approach is rooted in real-life scenarios and can include the collection and analysis of qualitative and quantitative data collected from multiple sources of information (Creswell, 2013; Yin, 2009). Research tools included observation, interviews, and analysis of relevant data, such as WhatsApp chat proceedings between involved persons. Some of the key people involved in the making of the dress were interviewed, including the client, the designer, and the embroiderers. Participants were informed of the intent and objectives of the research and their permissions were attained prior to the start of interviews and documentation which included the use of photography, audio, and video recording. Information on what data was collected, how it will be used, and what the findings of the research are made available to the participants.

Participants

This case study included interviews with multiple actors involved, including the designer, artisans, and client. While the majority of data and supporting visuals pertaining to the making of the dress were provided by the designer; a field trip to the city in which the embroidery artisans work was made in 2018 to observe the craft ecosystem *in situ*. Time spent with the artisans, speaking to them and observing their work and interactions with other actors in their community was essential for gaining a clearer first-hand understanding of their living and work context. The designer also took the author to visit the various material suppliers linked with the workshop and the dress-making. The details of these are available in Huang (2021).

Approach

Certain concepts from ANT (Latour, 2017) can be adopted when using the KNOWNS framework. Firstly, craft ecosystems are not defined by geographical proximity, but simply by associations between all elements of the network (actors/actants). These actors are not conceived as fixed entities but as flows dependent on other actions and circumstances. No predictions or assumptions are made about how an actor should behave and which associations are allowed *a priori*. No privilege is given to any specific actor (human, non-human or entity). The work is to attribute, impute, and distribute action, competencies, performances and relations within the network but places the burden of theory on the recording. The objective is to open the ‘black box’ of the craft ecosystem to see beyond the utility/output designers might expect of the system (Bencherki, 2017).

Data collection

While we might first encounter a craft ecosystem through its product (Object), the case study will usually begin more naturally from the Stories dimension and build up towards the identification of craft Knowledge. Starting with Stories has the advantage of allowing the designer-researcher to listen and absorb as the craftspeople (and other stakeholders) introduce you to their world. The researcher should actively listen, write notes, and ask questions to expand the conversation around specific themes as they arise. While being respectful and grateful for the time shared, the designer-researcher should not expect to collect all the relevant data in one sitting. It is advised to enjoy the conversations and take time afterwards to reflect upon what was said, shown, and observed in order to identify salient themes in relation to the KNOWNS dimensions and develop more targeted follow-up questions.

Quantitative data collected (Numbers) can and will likely be linked or directly related to qualitative data from the other dimensions. Here are some (non-exhaustive) examples. Formulations and craft techniques under the Knowledge dimension are likely to come with certain measures such as specific counts, volumes, duration and so on. In relation to Objects, we might study factors such as material consumption, daily output, and costs. Under the Work dimension, we can investigate if living wages are paid and hours of work are not excessive. Pertaining to Network, understanding the number of distribution channels and the sales volumes pegged to each might be relevant. With Stories, plotting different numbers against timelines can potentially be used to identify important trends within the craft ecosystem. The task is to reflect upon and identify what data is required to inform decisions within the scope of your particular design-craft initiative.

Findings and Analysis

The findings of the case study are presented backwards along the KNOWNS dimensions, starting with Stories and cumulating with Knowledge. As noted in the previous section, certain numbers will be interspersed across the different dimensions.

Stories

In the re-telling of a design-craft initiative, we identify stages and trace the chain of decision-making. Reflecting on these processes allows us to identify priorities, possible problem areas and opportunities for design innovation.

Intent/Starting point. The story of this case study began when the client (Circe), a fashion curator and educator was planning her outfit for the opening of the exhibition *Frida: Making Herself Up* at the V&A Museum scheduled for June, 13, 2018. Her desire was to commission an alumni of the college where she is employed to create a contemporary outfit with a cultural connection to the exhibition.

Connections/Discussions. Nearing the end of March 2108, Circe consulted with the author (Adrian) about the possibility of commissioning one of their fashion design alumni (Vikas) to make a dress incorporating embroidery inspired by the Manila shawl. Realising that the timeline of three months could be tight for a fully embroidered piece, Adrian arranged the first meeting between the client and designer (Vikas) on March 28, to discuss the design of the dress. He accepted the commission on Adrian's recommendation and because it seems to align with his own schedule.

Busyness/Initial rejection. Amidst preparations for a fashion show, Vikas discussed the work for Circe's dress with his embroiderers. They estimated that the embroidery with all its colours would require at least three months to complete, making it “impossible” to deliver by the end of May 2018. They strongly advised him to drop the project.

Persuasion/Obstacles. On April 22, 2018, Circe followed up with Vikas via WhatsApp. She negotiated with him, suggesting a compromise of making either a top or skirt with the embroidery if the dress could not be completed on time. Vikas decides to produce an embroidery sample (see Figure 1) using machine-aided embroidery.

Figure 1. Machine-aided embroidery sample at different magnifications

While the sample is approved by Circe, Vikas realises that the backing required by machine-embroidery would be too stiff and hand-embroidery would be a better choice. Moreover, because there were 17 colours used in the embroidery, it would be too tedious to use machine-aided embroidery for the entire dress because of the 15-inch hoop limitation and the requirement to constantly change threads (See Figure 2).

Figure 2. The embroidery sewing machine (left) and embroidery hoop (right).

Second rejection. Concerned that his own embroiderers could not finish the work on time, Vikas tried to sub-contract some of the work to two other embroidery workshops. Judging the work to be too tedious and time-consuming, they reject the work even though Vikas offers more than double their usual rate.

This story of the dress that almost failed to materialise served as the catalyst for the author to research the factors that are often taken for granted in design-craft negotiations. Following the field trip and interview with the embroidery artisans, various themes surfaced. These are expanded upon in the following dimensions.

Network

The actor-network of the case study is visually represented in Figure 3. Not prioritising human actors in the research is not meant to diminish their importance or value, but adds recognition to the role and impact that entities and non-human things created by humans have in the ecosystem. Mapping out the network helps us see that the creation of the embroidered dress is made possible by the existence, availability, and direct or indirect agency of other things including templates, materials, machinery, and tools.

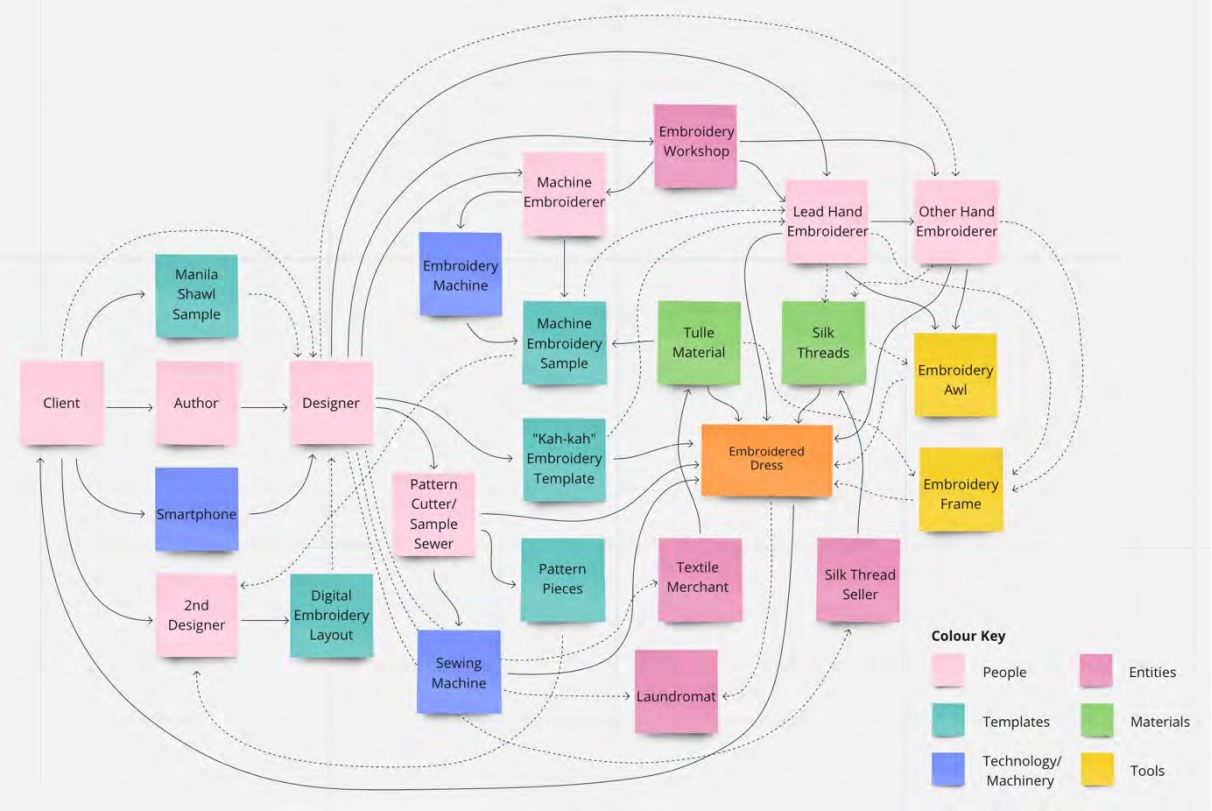

Figure 3. Visual representation of the actor-network of the case study craft ecosystem

Work

Figure 3 was developed from an understanding of the workflow involved in the production of the dress. Table 1 below traces the stages and timeline of the making of the dress.

Day	Date	(Location) Development
1	28 Mar	(Singapore) First meeting between client and designer to discuss the design of the dress. Measurements are taken.
2	29 Mar	(Singapore) Vikas begins work on toile with Chote, his pattern-cutter and sample-sewer.
4	31 Mar	(Singapore) First fitting, followed by alterations.
5	1 Apr	(Singapore) Second fitting. Client passes Manila shawl sample to Vikas as reference for the embroidery.
6	2 Apr	(Delhi) Vikas flies to India, work stalls as he is busy with other work and the embroiders advise against taking up the project.
26	22 Apr	(Messaging between Singapore - Delhi) Circe negotiates with Vikas.

		(Delhi) Vikas buys the silk threads and gets Taufir to produce a machine embroidery sample based on the Manila Shawl's embroidery.
28	24 Apr	(Messaging between Delhi and Singapore) Vikas sends images of the machine embroidered sample to Adrian and Circe. (Singapore) Circe decides to ask another colleague, Dinu, to plan the embroidery layout. Dinu requests for images of the pattern pieces in addition to the embroidery sample.
32	28 Apr	(Messaging between Delhi and Singapore) Vikas sends Dinu images of the dress pattern pieces and the first embroidery sample photographed with measuring tape for scale.
40	6 May	(Messaging between Singapore and Delhi) Dinu shares embroidery placements with Vikas. (Delhi) Vikas starts work on the ‘kah-kah’ (embroidery template)
41	7 May	(Delhi) The tulle is mounted on the embroidery frame and the hand embroidery begins.
58	24 May	(Delhi) Embroidered panels are removed from the frame and brought to the laundromat for cleaning.
59	25 May	(Delhi to Singapore) Vikas flies back to Singapore with the embroidered panels. (Singapore) Chote sews up the dress
60	26 May	(Singapore) Vikas delivers the dress to Circe

Table 1. Timeline and workflow of the making of the dress

In total, the dress took approximately 700 hours to embroider. There were 18 days between the start and completion of the embroidery; working out to an average of more than 38 hours of embroidery each day. This was achieved by assigning up to four hand-embroidery artisans to work on the dress at any one time (see Figure 4). The artisans working on the dress were compensated with more than three times their usual renumeration.

Figure 4. Two artisans embroidering the front of the dress.

Three roles were indispensable for the making of this dress—the designer, pattern cutter/sample sewer, and hand embroiderers. While the machine-aided embroiderer's work played a part in jump-staring the process by providing the first embroidery prototype, it was not applied in the final dress. The machine embroiderer expedited the preparation of the embroidery template by punching the holes along the drawn embroidery lines, but this could have been achieved (more slowly) by hand.

Vikas estimates that embroiders in Dehli earn an average of between USD300 to 400 per month. According to Vikas, the embroidery artisans are compensated according to their skill. The skill of the embroidery artisans varies. Some of them are fast but seem incapable (or unwilling) to produce refined work, but there is a place for that. For his own work, Vikas chooses to work with his favourite embroiderer who produces refined work and understands the quality he demands.

At the onset of the hand embroidery of Circe's dress, Vikas says that his embroiderer produced two beautiful flowers, but calculating the time taken and deadline, Vikas had to tell him to speed up. This reality is addressed by Adamson (2018) on craftsmanship being “an expertly controlled balancing act between doing a job well, and getting it done”.

Objects

The objects within this design-craft case were presented earlier in Figure 3. While designers and buyers are often more interested in the final product of a craft ecosystem, understanding the role of other objects in the network can help us discover new potentialities. Drawing the ‘kah-kah’ (see Figure 5) by hand is tedious work but the slight variations add to the liveness of the final embroidery.

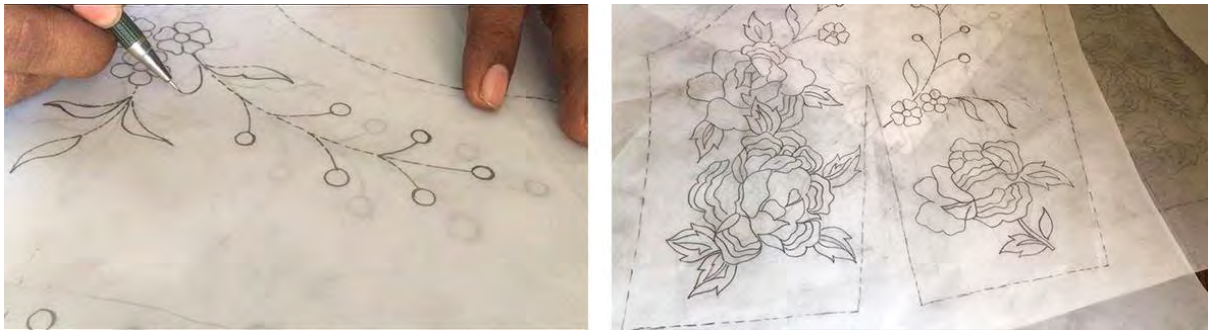

Figure 5. Vikas hand drawing the embroidery template, referred to as ‘kah-kah’ in Delhi.

The digital embroidery layouts prepared by Dinu (Figure 6) provided Circe and Vikas with a preview of how the embroidery sample would look on the dress.

Figure 6. Digital embroidery layout

Figure 7. The final embroidered dress

The craft product in this case study, the embroidered dress (Figure 7), had a special meaning for the client. The style of embroidery for the dress was adapted from the Manila Shawl which was also adapted by Tehuanas from the Isthmus of Tehuantepec Oaxaca—who as icons of Mexican culture, inspired the work and dress of Frida Kahlo. The embroiderers have no connection with the meaning of the type of embroidery, but the resulting work inspired the designer and added to his design repertoire. A sample of a Manila shawl on loan to the designer from the client served as a vessel for possible creative cross-pollination.

Numbers

The number of embroiderers employed by the embroidery factory (as Vikas prefers to call it) has varied over the years since it was established in 2005. Vikas and his partners first established the factory in a rented room with just one embroiderer to produce work for buyers from the United Kingdom and Norway. At its peak, the factory employed up to 20 embroiders and 10 sewers. All the embroidery artisans are male and come from other states, Kolkata and Uttar Pradesh in particular. It is common for the artisans to have learned embroidery since childhood as a family craft, but the factory only employs adults.

The bulk of the work at the factory, between 70–90 per cent, comes from wholesale buyers who order Indian ethnic wear such as lehenga choli and more contemporary wedding and party suits and dresses. Vikas' own work makes up the other 10–30 per cent depending on the season and orders. The wholesale buyers typically order between 200 to 1000 pieces per design but delivery is done in batches as they do not want to hold on to excess inventory. Re-orders closely follow retail performance and market demand.

On average, the artisans take four times the amount of time to complete one of Vikas' pieces as compared to the more commercial pieces they produce for the local market.

Knowledge

From Table 2, we can see that the design-craft ecosystem in this case study resides within a larger commercial system. It consists of embroidery artisans who have come from their own hometowns to work in Delhi for higher wages.

No.	Type of Indigenous Knowledge	Observations
1	Information	The artisans do not seem to be aware of the heritage of their craft.
2	Practices and technologies	Machine-aided embroidery is used alongside hand embroidery. Embroiders do not always do embroidery and beadwork. It is common for them to work on orders that utilise glued-on crystals.
3	Beliefs	Many festivals that are celebrated throughout the year.
4	Tools	Hand embroidery: wooden frame, awls/embroidery needles of varying sizes. Embroidery needle sellers come directly to the factory to sell their wares every few months. Machine-aided embroidery: embroidery hoop, single-needle embroidery machine (electric powered).
5	Materials	Tulle and silk embroidery threads used in the dress were procured and made in India. Locally produced tulle tends to be stronger and more suitable for embroidery as compared to imported tulle. There are also locally-produced and imported beads, embroidery embellishments and iron-on crystals. Here, imported versions are preferred for their more competitive pricing.
6	Experimentation	Mainly design experimentation with the designer
7	Biological resources	Could not confirm if the embroidery threads are made of locally produced silk although it is possible. Dyes are not natural but could not confirm what type is used.

8	Human resources	Embroiderers mainly from Kolkata and Uttar Pradesh. They are skilled in different types of embroidery but are willing to experiment and try new things with the designer. No discrimination against race or religion. Hiring is based on skill. Every embroiderer has different skills. The factory owner/designer has to know this to assign the right person to the right job.
9	Education and knowledge-transfer mechanisms	Hand embroidery is passed on largely through apprenticeship. No evidence of printed or digital documentation being used for knowledge-transfer. Artisans learn the craft from a young age. Many, not all, from childhood. The embroiderers spoken to do not want their own children to continue the craft. Prefer their children to seek better career prospects after their studies.
10	Communication	No examples of folk media or rituals. Working on new designs/sampling requires direct in-person communication. Follow up orders can be done by smart phones and messaging apps with the use of photos and videos in addition to speech and text.

Table 2. Types of knowledge pertaining to this case study's craft ecosystem

Discussion

This embroidery factory was established for commercial purposes and the craft practised was not connected to any specific cultural heritage. While some of the embroiderers learnt their craft from their families, the practice has been dislocated from any possible heritage or ritualistic or ceremonial connection. This makes it malleable to the design directions from the market through buyers and the designer.

While embroidery is not considered an endangered craft practice in India, attention should be paid to talent renewal today in order to ensure its continuation into the future.

To incentivise the continuation of this craft, we need to explore levers across all the tenants of holistic sustainability. The designer currently pulls the economic lever by paying above-average rates, providing his favourite artisans with additional financial support, and treating the whole team to food and drink during festive celebrations. However, the author believes that elevating the dignity of the craft to attract the younger generation to consider it as a possible career option should be a priority. Designers can play a part in re-establishing the cultural significance of the craft. To this end, the work of Sabyasachi Mukherjee comes to mind.

An attempt was made to complete Reuben's (2019) holistic sustainability checklist (Appendix 2) in relation to this case study's design-craft practice. Items that were assessed to be true of this case were highlighted in grey. However, the author did not proceed with the scoring as the depth of data and models for comparison are currently lacking.

Conclusion

The purpose of this paper was to introduce the KNOWNS framework for developing a more rounded understanding of craft ecosystems/communities and to identify opportunities for driving design-craft initiatives that respond to all four tenets of holistic sustainability. The current case study was far from a perfect example albeit an honest one. Designers and stakeholders who wish to engage in design with/in/for craft projects are invited to use and build upon this framework for their practice.

Design should not be about change for the sake of change, but with the intention of “changing existing situations into preferred ones” (Simon and Laird, 1969, p. 130). Our responsibility as designers, makers, and educators is to approach design with clear intentions based on a sound assessment of the context of our practice. Making the effort to learn about the ecosystems we engage with is a fundamental step in developing products and designing solutions that better address the tenets of holistic sustainability. We can advocate for a sustainable fashion future by incorporating longer-term thinking, clearly identifying priorities within our design brief and sharing and celebrating even small wins.

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Appendix 1. Types of indigenous knowledge (Reubens 2016, p.94)

No.	Type of Indigenous Knowledge	Examples
1	Information	Trees and plants that grow well together, indicator plants, flora-fauna and seasonal patterns
2	Practices and technologies	Seed treatment and storage, medicines, nature-based processing technologies, craft-technologies
3	Beliefs	Stewardship of natural resources and resource allocation, and sharing vested in belief systems
4	Tools	Tools and implements including utilitarian craft products for agriculture and subsistence
5	Materials	Bioregional input materials for construction and craft
6	Experimentation	Trial and error towards improved knowledge of bioregional resources
7	Biological resources	Indigenous flora and fauna
8	Human resources	Socio-economic systems of labour, exchange and specialization
9	Education and knowledge-transfer mechanisms	Oral traditions, apprenticeship
10	Communication	Folk media, rituals

Appendix 2. Holistic Sustainability Checklist (Reubens, 2019)

HOLISTIC SUSTAINABILITY CHECKLIST		ECOLOGICAL	SOCIAL	CULTURAL	ECONOMIC
Material Considerations	1 Renewable materials	•			
	2 Minimally treated materials	•			•
	3 Recyclable materials	•			•
	4 Recycled materials	•			
	5 Local materials	•	•	•	•
	6 Fairly traded materials		•		
	7 Ecologically certified materials	•			
	8 Non-toxic materials	•	•		
	9 Less/no materials from intensive agriculture	•			
Material Considerations	10 Minimum materials	•			•
	11 Minimum production steps	•			•
	12 Renewable energy for production	•			
	13 Minimal energy for production	•			•
	14 Low-emission-techniques	•	•		
	15 Proper management of production effluents and waste	•	•		
	16 Reduce/reuse production waste	•			•
	17 Indigenous treatments and processes	•	•	•	•
	18 Consulting indigenous communities on production issues that affect them		•	•	
	19 Safe and healthy work environment		•		•
	20 Fair wages and benefits to producers		•		•
	21 No child labour		•		•
	22 No forced labour		•		
	23 Fair working hours		•		
	24 Freedom of association and collective bargaining		•		
	25 No discrimination		•	•	
	26 Local employment opportunities		•	•	•
Material Considerations	27 Minimum production volume and weight	•			•
	28 Minimum and clean transport	•			•
	29 Local PCS	•	•		•
	30 Minimum packaging	•			•
	31 Reusable packaging	•		•	
	32 Recyclable packaging	•			•
	33 Packaging made from low-impact materials	•			
Consumer Use Considerations	34 Minimum/clean energy during usage	•		•	•
	35 Minimum consumables	•			•
	36 Safe to use		•		
	37 Customizable	•		•	•
	38 Easily upgradable	•		•	
	39 Classic design	•		•	
	40 Minimum and local maintenance and repair	•		•	•
End-of-Life Handling Considerations	41 Reduced material complexity	•			
	42 Biodegradable	•			
	43 Easy to disassemble	•			•
	44 Reusable	•		•	
	45 Recyclable	•			•
	46 Promotes/Uses local recycling systems	•	•	•	•