NEOCRAFT: EXPLORING SMART TEXTILES IN THE LIGHT OF TRADITIONAL TEXTILE CRAFTS

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ABSTRACT
Smart and interactive textiles have resulted from exploration and adoption of new materials and technology in the Digital age and can be described as the next phase in the evolution of Textiles. As we learn to make textiles with new properties, it is important that we also define the narrative of smart textiles. To develop narratives for smart textiles we can learn from the traditional textile craft communities who, for generations, have successfully embedded their cultural narratives within their fabric, creating textiles that are functional as well as coded with meaning and purpose. This paper describes ways in which craftsman understood and explored materials; the need for us to be craftsman and explore materials that can create new narrative and myths; it also highlights the need to involve traditional artisans to be part of the smart textiles exploration and to learn from them to create transient textiles that can lead to new interactions and experiences.

Keywords
Traditional textiles, Craft, Smart textiles, NeoCraft, Digital technology, Democratising technology

INTRODUCTION
Recent years of research in the field of smart textiles has begun to redefine the function, meaning and language of textiles as we know it. Whenever there has been a new wave in technology, we have also seen a new wave in the evolution of Textiles. The two have been closely connected, each pushing the boundary of the other. At the dawn of the Digital revolution, we began to see the Textile industry quickly adopting and exploring new materials and technology that was now available.

At present we are in a transitional phase, trying to understand and create a new vocabulary for smart textiles. As we explore new materials and create fabric that are dynamic, responsive and smart, it is important to also reflect on the larger picture of what we are creating and why. How do these new properties change the meaning of textiles? Are textiles becoming the new gadgets? Are we able to create new value and meaning with these new possibilities and fulfill a void that products of the industrial society have so far failed to fill? We are surrounded by products but most of these have been unsuccessful in satisfying a deeper longing that humans have. Gianfranco Zaccai states:

“the exact nature of the missing ingredients is difficult to define. This absence is perceptible, however, in the fact that most of these objects (industrial products) are not sufficiently satisfying to either our souls or our senses”[17].

So what kinds of artefacts or products satisfy our soul and our senses? What is the essence of such an artefact?

ESSENCE OF TEXTILES
The ‘essence of an artifact’ mentioned above can seem a bit abstract and intangible, but if we look at traditional craft artefacts, it is clear that these products fulfilled something more in our lives than our present day gadgets and products. To better understand gadget and craft objects, one can refer to the work of Wallace who differentiates between Gadget and Non Gadgets as shown in Fig 1 [15]. Here one can see the qualities of the Non gadget as being those also associated with craft artefacts.

<table>
<thead>
<tr>
<th>Gadget</th>
<th>Non gadget</th>
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<tbody>
<tr>
<td>Short life span</td>
<td>Enduring lifespan</td>
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<tr>
<td>Transferable significance</td>
<td>Non transferable significance</td>
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<td>Personal attachment based</td>
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<td>on function</td>
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<td>Object represents elements</td>
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<td>of consumer identity</td>
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Fig 1. Gadgets and Non gadgets

Non gadgets or Craft objects creates a personal attachment that is based on personal significance. One would keep a pocket watch given to them by a family member (even if it did not tell time anymore) because the watch has memories attached to it and this significance cannot be transferred to...
another watch. There is a personal memory or significance attached to the object that makes it valuable to us. Craft and its associations with memories (or significance) can be seen as the result of the relationship of the craft process and time, as well as the use of the artefact over time. In his book, Kundera very profoundly points out the simple but direct relationship between speed and memory:

"There is a secret bond between slowness and memory, between speed and forgetting. Consider this utterly commonplace situation: a man is walking down the street. At a certain moment, he tries to recall something, but the recollection escapes him. Automatically, he slows down. Meanwhile, a person who wants to forget a disagreeable incident he has just lived through starts unconsciously to speed up his pace, as if he were trying to distance himself from a thing still too close to him in time.

In existential mathematics, that experience takes the form of two basic equations: the degree of slowness is directly proportional to the intensity of memory; the degree of speed is directly proportional to the intensity of forgetting" [9].

The traditional textile craft processes are known for its slow and lengthy processes be it spinning, weaving, knitting or printing. Craftsmen spend long hours in their studio and workshops preparing materials and applying various techniques to produce fabric. Repetition of patterns and rhythms in making were an integral part of the process. The focus was on the making and through this making one gained knowledge and understanding of the particular material and its possibilities. Once the textiles was bought and used, over time the user ingrains memories and stories in the fabric and even when the fabric is not of any functional use, it is sometimes kept safely for the memories it holds. In contrast to this when we buy textiles from the high street shops, we know that these mass produced garments were each made within minutes - each identical to the next. These clothes serve a much shorter lifespan, we are more quick to discard these clothes as we are subconsciously aware of the speed at which these garments were produced and how quickly they go in and out of style. The sheer volumes that factories produce has numbed us to very object we hold in our hands [13]. These clothes gain significance from fashion trends, and the speed at which market trends change does not allow us enough time to create personal significance. As new trends are set, the significance of the old are lost or easily transferred to the new, which once again only lasts for a season.

Craft calls for time to slow down and when time slows down, according to Kundera, we are able to remember better, we are able to create memories and value. Memories give us our identity and context in society, it creates for us the narrative within which we live. Time also weaves in myths and narratives in traditional textiles and gives the wearer their identity and context in society.

Traditional textiles have served a myriad of roles. It performed functional roles as well as religious, political, cultural and mythical ones. M.K Gandhi created the narrative of self reliance through textiles, where handspun and woven textiles served the concept of democracy [7]. Textile is believed to have magical powers that can transcend the physical world and affect the spiritual realm, it can protect, bless, guard and guide. Research has shown that textile and embellishment worn in the physical world often acted as a bridge to the spiritual world [12]. Pabuji Ka Phad is a painted textiles that tells the story of Pabuji, whom the Rabaris of Rajasthan believed was a hero and god. The textiles not only told the story of Pabuji, it contained the deity himself. The painting was completed with the last act of drawing in the eyes of the Pabuji, and this was a ceremony that welcomed the deity to reside in the textiles, from then on the textiles was considered sacred - the painted textiles was now an alter; at the end of its life it was immersed in water, releasing the god from the fabric. In Thailand and Laos, consecrated shirts painted with Buddhist religious designs, was believed to make the body invincible, so warriors wore these garments to make themselves bullet-proof [12]. Numerous such examples can be seen in traditional textiles across cultures. Textiles were also deeply coded to communicate identity and one's context in society. The Rabari community in Western India wear extensively embroidered clothes and veils. The embroidery was a coded language people knew how to read, the colours and patterns would reveal ones social status, their trade, if a woman was married, had a son or was a widow. Textiles was considered powerful, spiritual, protective, beautiful and it reflected the hopes, believes and identity of a culture.

It is this intangible essence of traditional textiles, the narrative it carried, that made it such an integral part of culture and community – it enabled one to transition through the multiple narratives of society. These narratives and myths embedded in craft artefacts were part of a collective mythology that the community lived by [2, 5]. When the world outside – economy, technology, environment etc. was changing, the anchor for a community was in the myths they believed. These were embedded in their fabrics to carry them through the worldly shifts [2, 6].

Craft served a far deeper purpose than functional and decorative, the essence of these textiles was its ability to not be bound by time and space, it enabled the creation of memories, gave identity and context. It allowed room for transitions and change and were anchors in a shifting landscape. The ability to transcend the physical through myths and the slowness in the making and use of craft artefacts could be some of the missing ingredients that our soul and senses are longing for.

It is important to note here that the past is not being romanticised or that one is not claiming that we go back to the dark ages. Society has advanced in many ways and technology (bringing with it speed) has enabled many positive and needed change to our lives. What we need are tools and artefacts that help us to find a balance when the changes are happening too fast.

There are three Japanese words here to help us understand the idea of 'transition'. In Japanese, Utsutsu is the word for
realism, *Utsu* is the term for dream and then there is a third term for the transition between these two states which is *Utsuroi*. This word means changing, transient, fading and shifting. *Utsuroi* enables us to transition, or fade from one state to the other. Torri gates and bridges are considered paths of transition or shift. *Torri* gates are found at Shinto temples in Japan. Walking through these arches that start at the entrance and leading to the shrine symbolizes the *Utsuroi* or transition of a person from his/her everyday life to the spiritual, from the impure to the sacred and pure.

If we can grasp this concept which allows us to oscillate between the real and dreamt, tangible and intangible, the physical and spiritual, it could be a concept we adopt to create narratives and meaningful relationships between the users and artefacts and can guide us in the kind of artefacts we make as we define the future of smart textiles.

Chandavarkar highlights the work of Michael Goldhaber who stated that we live in an "attention economy". We are overwhelmed with information and all the information is calling for our attention, this makes attention the most scarce resource [4]. Craft calls for two of the scarcest resources of our society - time and attention. When we interact with craft artefact we are aware of this and value craft highly because the product is a result of resources that we highly value and wish we had more of. Smart textiles craft can help us to reflect on our times, to create new narratives and myths that allow us to shift between the ever increasing changes in our lives due to the influx of information and the increase in speed. Chandavarkar argues, in the context of architecture, that by creating spaces for reflection and memory, we are able to slow down time [4]. The same concept could be adopted in smart textiles - through the process of crafting smart textiles that create memories and personal engagements, one can slow down time.

**NEOCRAFT - CRAFTING SMART TEXTILES**

Smart textiles is still at its infancy and we have the privilege and responsibility to decide what the purpose and role of smart textiles can be. As designers and researchers, our core mission has been to identify and fulfill the needs of our society. We have recognised the need for products that satisfy the soul and senses. We have also identified craft artefacts as being successful in satisfying us in this way. Craft requires time to slow down and helps us to create memory and value. Its material and physical qualities satisfied the senses. Traditional textile crafts have served multiple roles in society including being a medium to connect with the immaterial and spiritual - this satisfied the needs of the soul. We have also seen the need for creating narratives; myths and slowness have been identified as key elements in our use and engagement with artefacts. It is necessary that we integrate these ideas into our practice to create artefacts that sit in the gap between gadget and craft. I have referred to this new group of artefacts as NeoCrafts [14], a new kind of craft that results in creating products that enable us to create memories and personal significance, thus allowing us to reflect and create our identity and place in society. These artefacts are also tools that will allow us to better transition between the material and immaterial.

In this context, we can now define a direction for the craft of Smart textiles. Over the last decade, like children with a lego set, we have been building, breaking, making and exploring the possibilities of a new genre of textiles - Smart and Interactive textiles. Having recognised the value and essence of traditional textiles, contemporary craftsmen and women can learn and borrow from existing knowledge about making found in craft communities to create NeoCrafts.

“Craft presents us with the oldest knowledge there is: the most fluid knowledge our culture has produced – knowledge about making things” [11].

Since the craft of Smart Textiles is still young, we can draw from this ‘fluid knowledge’ that exists in the traditions of textile crafts. In our pursuit to create a new world with possibilities that technology and smart materials has offered us today, we can learn from the creative processes of the traditional artisans.

The challenge faced by society today, according to Sennett, is knowing how to think like a craftsman while making good use of technology [13]. The process of knowing through making is an integral way of thinking for a craftsman. It is his/her material consciousness, curiosity of the material in their hands, that motivates them to create something original [13]. Smart textiles is at this stage where we are curious about new materials (information technology, electronics, smart materials). We are making and learning with materials that previously was not part of the textiles discipline and vocabulary. New materials brings with it new challenges and possibilities that have caught our imagination.

The majority of work seen in the field of smart textiles has been mainly in the realm of early material exploration and prototyping. These explorations have been important and necessary but the time has come to push past the gimmicks of new materials to really constructing meaning and narratives through these new textiles, and to develop smart textiles into a craft in its own right. During this process of making, we need to be humble and accept that we do not entirely understand what we are making [13]. As Heidegger says, the meaning of what we have made can only be gleaned through its use, by using it we begin to understand it. Although we might not always know what we are making, it is necessary that we still make them so that it can be used and it is in the use that we can gather new knowledge about what to make. Numerous smart textiles prototype examples have remained as prototype and has not moved to products that can be used and tested. Part of the reason for this has been because the field is still young and it is difficult to find an environment where all the elements are available to turn a prototype into a product, limitations in technology also makes this translation difficult. Nonetheless, we still need to push our work beyond prototypes and test of ideas. Until we have smart textiles in our homes and work spaces, we will never fully understand what they are and how we will use them. Adrian Forty
points out that products often go through different phases during its aesthetical evolution. First the products are technical solutions to a problem, then these solutions are hidden in familiar objects (making it easier for users to accept the new solution) and finally the product finds its own form and function in the home [3]. I would like to stretch Forty's idea of aesthetic evolution of products to see the change thermochromic inks have gone through since its development. Thermochromic inks were developed in the 1970s, these inks temporarily lose colour when exposed to heat. This technical solution soon moved to the next phase in its evolution to become hidden in familiar objects around us like the mood rings and t-shirts that were popular in the 80s. It was also integrated into thermometers and coffee mugs for advertisements. The works of Linda Worbin has moved the material into its third phase where she has extensively researched on thermochromic inks for Dynamic textile patterns. The work explores hidden patterns in textiles, where patterns are revealed when it is used; the ability to get precise and controlled pattern changes such as stripes to checks using heat as a material (something textile designers never had to think about before); pattern repeats are rethought as static print design has become dynamic and offers infinite expressions [16]. This body of work is an example of how thermochromic inks is moving into its final phase where it is trying to find its own form and function. Here the material was explored not only for its colour changing properties but it raised questions about how designers design textiles that will continuously change with use. Time and information technology are new materials to be explored by textiles makers, these materials are changing the way we make textiles as well as how we use them. Worbin's work is an example of pushing past the initial excitement of new materials to really engaging with it in a deeper way, to understand the inherent potential of the materials and in the process moving smart textiles to a craft form.

One can relook at the Bauhaus process to understand better what is required of us today. Anni Albers left for us an extensive collection of work where we can see her experimentaton with composition, colours, construction and materials through weaving and other techniques. The Bauhaus called for a time of deep exploration of materials, it was a personal and intimate exploration of materials. They gave little attention to what the material was previously used for, its practical application, instead they deepened their techniques and played freely with materials, this resulted in a new style [1]. Smart textiles is a young field and there is still very little knowledge and expertise available. As we build the foundation of this field, we need to be thorough in our study of these materials, turning into craftsman who engage with materials in an intimate way, to produce new knowledge and skills that will mature the field.

The intent of new technology we create should not be to replace existing activities such as craft, this is what technology built during the industrial revolution aimed for, but it should complement and enhance existing activities [10]. Smart textiles again gives us the opportunity to rediscover crafts and its new role in contemporary society. For this we need to also invite existing craft communities, often in the margin of textile communities, to be part of this process. We need to create opportunities for more artisans to engage with new materials and technology. There needs to be a democratisation of technology that will enhance craft activities and enable the Crafts to evolve and artisans to sustain themselves. We need to create an environment that encourages and enables the bi-directional sharing of skill and knowledge.

CONCLUSION
Chandavarkar said:

“Craft objects originally were objects of use as well of contemplation...the thinking and making of an object was always interlinked... Craft really is a rooted tradition – it is a process by which a community reflects on its condition – this sort of reflection is actually a search for identity” (as cited in Kasturi, P.) [8].

Smart textiles has the ingredients and potential to be far more than functional fabrics as examples in the field show us. By exploring smart textiles in the light of traditional textiles we can regain the essence of textiles. This can be done by developing smart textiles into a craft in its own right, producing work that calls for deeper skill and knowledge that enables one to create memories, meaning and value as well as be a tool that allows one to oscillate between the states that our society and self demands of us. We can do this in collaboration with traditional artisans, each sharing their body of collective tacit knowledge and sensibility. Smart textiles artefacts should enable us to transition between the fast and slow, physical and virtual, intellectual, spiritual, material and immaterial - satisfying both our soul and senses. It should facilitate the creation of meanings and memories through the symbiosis of traditional craft knowledge, craftsmanship and new technology. The result of this explorations can define the future of textiles, its meanings and language, and be a medium that enable Utsuroi, or transition between the ever increasing changes of our textile, technological, social and cultural landscapes.

REFERENCES


