# Glass art: A discussion of the impact of digital manufacturing processes on craft practice

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**Abstract.** The traditional glass art industry has changed over time and technological renovation, and its forging and forming methods have been fused with the latest technologies that began to prevail ten years ago - 3D printing and laser cutting - in terms of production processes. The involvement of machines in the process has greatly saved the time needed to make crafts, and the changes behind it have had a series of impacts on the lowering of the manufacturing threshold of the industry, the liberation of beginners in terms of skill acquisition, The changes behind this have had several implications in terms of the lowering of the manufacturing threshold for the industry, the liberation of beginners in learning skills, and the scarcity of skilled craftsmen in the artisanal field. This paper will focus on the ethical issues and considerations behind the changes and richness of the glass art industry.

## 1 Introduction

From the industrial revolution to the present day, digital manufacturing processes have subtly influenced the creation and development of traditional crafts, with localized craft production around the world now semi-digital or, in a few cases, still clinging to traditionalism. This paper questions traditional understandings of craft as a means of survival, revival, or resistance to capitalism, focusing on designers, DIY enthusiasts, traditional artisans, and programmers who consider their work to be a craft to learn more about how they see the craft. The authors' anthropological study, which focuses on individuals and communities who claim certain practices as their own, sidesteps the question of the craft's survival by asking how the activity known as the craft is and has been reproduced.

Beyond regional studies of traditional craftsmanship, the author contends that the concept of craft is, by definition, part of a larger global dialogue of rights and identities and that by focusing on these sometimes contradictory voices, this paper demonstrates that there is a great deal of flexibility in terms of what activities are referred to as 'craft.' There are numerous craft-related ideas that shape various encounters with materials, people, and economies. Case studies from China, the United Kingdom, India, and Japan bring together evidence based on linguistic, sociological, and participant observation to explore the shifting terrain in which those engaged in craft operate, presenting an intriguing picture of how craft claims are an integral part of contemporary global change.

## 2 The conflict

### 2.1 The conflicting ideologies of digital and craft

Nowadays, digital crafts and handicrafts are frequently developed concurrently as components of the same project. Craftspeople, on the other hand, loosely combine these projects to produce a variety of different parts, digital or otherwise, that can be split up. In this day and age, these works can also be found on various craft blogs. Craft objects can be difficult to identify in these environments, especially when they become both digital and material[1].

While the involvement of digital codes has undoubtedly 'invaded' the social values of craft communities, a practise that some see as socially destructive, the intergenerational 'enhancement' of digital machines has also plagued existing craft projects. 3D printing processes, for example, blur the distinctions between digital and material while also challenging artisans' ethical demands on their craft. Craft practitioners seek to rigidify other aspects of permeable physical-digital boundaries in order to maintain control over specific practises by embracing the history of feminised manual labour[2] and selectively linking their bodies and practises to the surrounding community of skilled makers.

Craftspeople in handmade crafts are visibly uncomfortable with digital intrusion, which may expose important technological understandings that are often overlooked in everyday life. Douglas demonstrates in Somaliland how the separation of spiritual and mundane

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power can give spiritual power to the physically weak, undermining notions of social authority. The weaving community saw technology as the 'other': an innovative culture that initially resisted the incorporation of digital devices into the matter, revealing not only a semiotic but also an aesthetic and political purpose for their opposition. It emphasises the new stakes of digital components while going beyond their substantive framework. Craft histories reinforce a lack of belonging within the surrounding technological culture, and they highlight what happens when a social world that has not yet been mandated to reject existing ideals is forced to build new categories around craft: resistance and silent revolt.

## 2.2 Time and memory

Crafts are a type of social thing that is often associated with the memory of places and people, but also with specific production processes, scale patterns, and the past. There is a theory explaining why and under what conditions craft production would continue in the face of increased efficiency. According to Johnson (1978), crafts will continue to be produced as long as demand exists, and crafts cannot be replicated or acquired on a larger scale. The craft heritage movement, on the other hand, contends that when mass production of objects leads to the extinction of handmade and artistic objects, the processes, materials, and people involved in arts and crafts production must be protected[3] (Probst, 2011).

Even so, I revisit the Johnsonian materialist perspective to explain the continuing demand for some craft works and the reasons for their existence as it relates to the memory of people, time, and place in the past, as well as Weiner's (1992)[3] conceptualization of 'non-transferable objects,' with the difference that such objects may be newly made and not simply made up of things 'handed down.' In the case of the horse-face skirt, for example, the cultural connotations underlying each hanbok's embroidery can reflect the process of historical change. "I have watched the sudden rise of the Hanfu movement in the last twenty years, and the movement itself is a miracle," says Meng Hui, a researcher on traditional Chinese material culture. Generations of Hanfu youth are concerned with the entire history of Chinese civilization, and they are reviving traditional dress with a desire to re-understand and re-affirm traditional Chinese civilization. As a result, following the Dior dress incident, it was the Hanfu youth who were the first to be alerted and the most active in fighting back, a situation linked to their sentiments and because they understood the idea that Chinese dress has been a symbol of civilization since ancient times." The anthropologists' analysis of this process explains how they distinguish the study of craftsmanship as development, cultural heritage, intellectual property, and aesthetic objects by treating craftspeople and their work as part of a social, political, and economic disruption that reflects changing global flows of people and things from the perspective of other disciplines. The ethnographic study of artisans in specific socioeconomic and political

contexts, such as shifting notions of work and gender, and the nuances of such contradictory forces that contribute to the perpetuation or destruction of craft forms of production when embroidered women are defined as workers[4].

"The embroidered clothes worn by Miao girls when they get married usually take three to five years from embroidery to completion, and the girl's heart and soul permeate the completion of each embroidery piece," said the owner of an embroidery shop in Xijiang's Thousand Household Miao Village. And the cost of an embroidered piece can range from a few thousand to ten thousand yuan. The fact that many aspects of the trade have declined and that only one or two local dye houses remain in succession, with only a few older women still embroidering, suggests that demand remains, in part because they represent a management system that has yet to be completely replaced. So, while demand for handicraft embroidery has decreased today due to price or politics, I believe there will come a time when these embroiderers will be needed again, and I hope this will occur. It is also likely to last for many years as something valuable and not to be forgotten.

# 3 Boundaries

## 3.1. Process and technology production

How does rationing in the arts manifest itself? Handicrafts frequently involve digital processes: the kiln must monitor temperature, knitting must calculate the number of knots, and the chemical recipe for dye must be followed or adjusted. Technology frequently brings numbers into play in crafts. Both digital and analogue sensors (temperature, scales, etc.) are common in craft practise, and digital technology can even be deeply integrated into 'traditional' processes like weaving via 3D printing technology, as well as glass crafts. They shape things with materials at hand, sometimes elegantly, sometimes not so elegantly, through do-it-yourself sensor systems in the diversity of crafts - including all those who call themselves artisans. Sensors are not the antithesis of craftsmanship; rather, when people assemble, change, and redefine them, they become craftsmanship themselves.

As an academic, I spend the majority of my time considering the social implications of digital technology. I believe that anthropological thinking about craft is a critical theoretical framework for understanding the social dimensions of digital technologies. Measurement is widely regarded as a form of utilisation. We don't mean that people believe numbers are the sum of many things; rather, they frequently regard sensor readings as the sum of things that are knowable and worth knowing. One could argue that people confuse heuristics with hermeneutics, and as any good scientist knows, numbers are just tools for a more thorough hermeneutic analysis and should not be taken at face value. Few people are going to 'prove' certain electrical properties or perform a thorough analysis, so assuming that so many people are simply mistaken is assuming that people are attempting

to do science, which they are not. We must keep in mind, then, that our research participants live in a social world in which numbers are increasingly being used as totalization - in a variety of areas of life - that are themselves timeless truths. To a large extent, the performative nature of numbers has come to dominate economics[5].

In this broader context, the generation of numbers is viewed as the generation of an answer that contains all of the necessary components for understanding and acting[6]. It is worth noting that in glassblowing knowledge, the figure becomes boring to the maker; it is information that is useful for a specific context, and the figure essentially loses its interpretive meaning when it is not required for making. In cultural and gender politics that position the craft as the material culture of the inferior and the scientist as the dominant, we should remember how numbers are in trouble, and how both scientific practise and our larger social world are awash with both kinds of numbers, but only one dominates, claiming to be able to stand as an independent truth and loudly. Sensor projects are frequently discussed as a type of science rather than craft, as if science and craft were diametrically opposed. However, the association of craft with grand numbers grants them the same privilege as science, and it is precisely this desire to make numbers more meaningful than they are that causes the numbers that emerge from this privileged position to be rarely useful.

## 3.2 Materials, country, and self

In terms of the current glass art industry, as the threshold of the art industry has been lowered, many practitioners have entered the glass art industry one after the other, resulting in increasingly fierce competition between industries that is also becoming increasingly diverse. One of the most prominent points is that the single marketing means of enterprises are difficult to obtain and maintain the competitive advantage of enterprises, but are also unable to meet the end consumer diversity of complex service needs, product quality, price, style, and so on. Aside from the basic decorative functions of glass art, the range of applications has expanded in response to market demand for limitless expansion, and manufacturers have explored various aspects of functionality and various fields in terms of product innovation.

The first level is about the materials and how the artisans work with them. Material properties overlap with and influence human properties, and glass as a material has a history that is both local and inextricably linked to the country's past and imagination[7]. Clay and glazes have a special significance in Taiwanese debates and tensions over defining 'authentic' Chinese or Taiwanese culture and identity, and other distinctions come to mind when referring to craft objects. In Europe and America, however, the term "handicraft" is frequently associated with "industry," "mass production," or "modern." Craft, particularly based on social status and the dichotomy between the local and

the national, has the potential for material properties to be useful in production and power relations, both in and through human work, and more broadly in mediating a variety of relationships.

Clays and glazes have a geological history as materials, as well as a transformational history in the hands of artisans. They may also have a unique history, as in the case of Taiwan. What it means to be a person or an artisan in Taiwan is inextricably linked to what it means to be Taiwanese. Clay and glazes not only shape two distinct ideas about what it means to be a person or craftsman in Taiwan, but they also relate to ideas about nationhood. To understand the relationship between craft and nation in Taiwan, it is necessary to look at the history of Taiwanese ceramics. Rather than the Chinese ceramic tradition, the first products were for everyday use, such as bowls and food storage containers. The goal of bringing ceramic technology to Taiwan was to improve production efficiency. These techniques are now associated with the manufacture of low-cost industrial products, primitive industrial techniques that were transformed into industry by the Japanese in the early days. When Taiwan became a global export source for industrial ceramics in the 1970s, the industry began to thrive. Whereas these techniques had been imported from Jingdezhen in inland China over 200 years before, the shift to labor-intensive porcelain production also involved a revolution in production techniques: the unreliable coal-fired kilns were replaced by gas-fired kilns, a technique imported from Japan. The factory was involved in the production of antique reproductions, drawing inspiration from the National Palace Museum's collection, and other factories quickly followed suit, the success and symbolism of the Taiwanese factory also fueling the latter's nationalism in publishing "free" China, so that it was not the result of a long tradition, but simply one that originated in the interior of China. "invention tradition."

The value judgments made about these materials and the people who use them, on the other hand, are at the second level. Certain discourses about education, intellectual and physical work, ideas or ideals of self-motivation, and self-development are made possible by the different properties of the materials and the various ways of dealing with them. They contribute to the overall shape of the artisan. Their characteristics and histories change and mutate over time. However, in terms of the artisan's engagement with materials, I believe it is important to consider the history of materials not only because of their transformations, but also because it affects the lives, work, and ideas of those who use and transform them. Subjectivity, in other words. Material culture has a greater influence on subjectivity than language and discourse, and focusing on materials rather than material culture allows us to offer a different perspective on these issues.

## 3.3 Market scarcity and challenges for manual practitioners

The term "artisan" conjures up feelings of stability and identification with the individual and the function. Nonetheless, identity is frequently deceptive. If we are to understand the present and possible future by focusing on the specificity of workers' lives and the internal diversity of experience and expression, we must recognise that they are an internally differentiated reality that does not necessarily fit into the universal model of 'labour' as a single category. 'Artisans' are distinct from 'labourers,' who simply do the work, because artisans are embedded in a larger socio-cultural context based on craftsmanship. Who was considered an artisan and who was a labourer is an ethnographic question, though it is not treated as such in much of the literature.

Dollmakers in Japan are convinced that they can link their knowledge of their craft to a long and glorious history, giving the dolls a "blessing," a "guardian," a "peace," and other symbolic meanings to proclaim, thus evolving into the core culture of traditional Japanese cultural practises and continuing the spiritual support. The term artisan or craftsman appears to imply a variety of emotional and political commitments in the Japanese context. The complex history of trade and commerce in Japan is replete with admiration for artisans, and observers frequently praise the work produced in the region. In many ways, the history of crafts is symbiotic with the history of globalisation, including the role of craftspeople as history changes and their role in the spiritual hierarchy of the nation's people. Craftsmanship history is an inherently powerful symbol of national struggle and identity in India. The relationship between the artisan's role and the historical development of the nation-state results in a particularly resilient construct in which the artisan remains entrenched as a rigid categorization - the construction of crafts as heritage and tradition. Craft production as an expression of heritage and tradition frequently served the interests of nation-state building or nationalism in general, and the concept of craft, symbolising heritage and tradition, was influenced by the arrival of industrialization in Europe in the late colonial period. Work's separation from other aspects of life, as well as workers' alienation from their jobs, provided fertile ground for the categorization of the artisan as the antithesis of industrial labour or the proletariat (Mollona 2009; Thompson 1963)[3].

We cannot deny that the craft industry has gradually re-emerged in the public eye in China since the modern period, thanks to the efforts of writers, artisans, and activists. This phenomenon has romanticised the work of de-industrialization, and the impact of modernity is seen as a threat to extinction for craftspeople, as the state continued to adopt the concept of "crafts as heritage" in its policy agenda in the early days, which was undoubtedly very frightening for craftspeople. Because they believed that traditional crafts had a special connection to society, that they symbolised organic solidarity, that they were timeless for their ideological successors and contemporary craft revivalists, that it was a community vision that was being realised rather than

an individual vision, that artisans had been inscribed in the national imagination and needed to be rescued or recovered from radical change.

Again, tourism, civil society, and government initiatives have reshaped the closely related categories of artisan, heritage, and tradition. Faced with modernity and globalisation, artisans have become little more than symbols of traditional values. At the same time, this discourse ignores the artisan as a worker, as a producer embedded in local and global economic structures and social relations. Perhaps, with the rise of export-oriented production and the hegemony of 'free market ideology,' the rigid category of an artisan is reinforced and strengthened by its commercial appeal to domestic and international buyers. Ethnic fashion, fair trade, and 'lifestyle' shopping are all forms of commerce and development drivers that project certain types of 'people' (artisans) who produce certain "types" of things to satisfy a mix of modern and traditional consumption.

## 4 Imagination and innovation

Craft and material culture theorists have been debating the value and meaning of products since the 1980s. In an ever-changing global context, this bachelor's research challenge allows us to reconsider the links between contemporary craft production, distribution, and consumption and issues of modernity, tradition, authenticity, nationalism, and race, gender, class, and identity.

Craft historian Paul Greenhalgh[1], for example, contends that craft is a constantly changing and evolving set of practises, claims, and positions, a viewpoint shared by archaeologist Christopher Tilley. According to him, "each object has its own material properties...... is processual."[3] Rather than claiming that the value of a craft is determined by how closely it resembles a 'authentic' tradition, Greenhalgh claims that it is 'authentic.' Greenhalgh, on the other hand, encourages a focus on "the integrity of the practise, the vitality of the object, and the ideas and needs of the maker and consumer."[8]

Against this backdrop, Bruce Metcalf[3]proposes viewing craft as a 'accidental' object, emphasising how craft is inextricably linked to the various processes of everyday life. Rather than being separated from the various processes of everyday life by some abstract aesthetic distance. Craft operates along a continuum of innovation by referring to past events, values, and meanings in a direction that is also ongoing on a larger scale.

Understanding the craft's chameleonic nature, then, necessitates dissolving the essentialism between craft-artwork-commodity and focusing on how arenas interact based on the intentions of different actors and specific socioeconomic contexts. Furthermore, as a result of the global economy and changing consumer tastes, product demand is constantly changing. Thus, relations between the production and exchange of goods not only reinforce, but also have the potential to reproduce, class differences in this context. Furthermore, one of the challenges for

indigenous artisans in maintaining a competitive edge in their products is ongoing product innovation, which is the complex, culturally mediated process of designing across borders to develop new products that can still tell the story of their place or terroir. Transformation as a result of interaction with other influences such as personal preferences and global fashion trends. Labor flexibility, networks, and trust, as well as shifts in consumption and craft innovation, are the various drivers of the system's constant reinvention and persistence, exposing the supply system's chaos - 'it is futile to think in terms of an ordered sequence' (Leslie and Reimer 2003). By repositioning place-based production and trade in a broader sense of meaning and agency, artisans, intermediaries, and entrepreneurs were all able to achieve varying degrees of industrial advantage in this context. Craft and material culture theorists have been debating the value and meaning of products since the 1980s.

## 5 Conclusion

Digital technologies and information and communication systems, such as the Internet, have revolutionised the last century and had a significant impact on the production, dissemination, use, and consumption of creativity. The craft sector's local and internal variability is sometimes contradictory, and 'artisan' is frequently defined as an over-defined and distorted category that has served colonialism, nationalism, global capitalism, and the state at various times. Rather than treating these categories as pre-existing social facts, I examine them through an anthropological lens, highlighting the spatial, temporal, and historical contexts in which the term "labour" is frequently associated only with unskilled labour. Economic liberalisation has benefited a few in the sector, but the majority continues to struggle to survive within the fragile boundaries that separate artisans and labourers. The artisan category's stability still necessitates a larger platform and social connectivity. "We are in a place and time...... constitute ourselves in quite specific, local and historical ways," writes philosopher Ian Harkin (2004).

Both the state and the market are powerful institutions that have a profound impact on the lives and work trajectories of many people who fall somewhere between artisan and labour status, and it is in the face of these contingencies and uncertainties that rigid categories break down and new realities and imaginaries emerge. When these barriers are broken down, the distinction between digital technology and craftsmanship becomes less important, as the value of the product is more closely linked to its creative meaning and local cultural values or narrative spiritual quests in the face of demand. The craft industry's future is also dependent on a balance between product innovation and the various actors involved in production and consumption.

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