BUILDING A COMMUNITY PLATFORM FOR ARTISANS AND DESIGNERS ARTISANS IN ISTANBUL

by
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ARTISANS IN ISTANBUL

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by

ABSTRACT

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M.A., THESIS, MAY 2015

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Keywords: design, artisan, craft, integrating design to crafts, technology

"Technology" derives from the word "technē" in Greek, which means "craftsmanship." The suffix "-logy" derives from "logos" which means "to reason." The meaning of "Technology" resides in its roots: a way of knowing by making and crafting. This thesis aims to find a sustainable solution for the artisans of Istanbul whose story appears to constitute a noteworthy example to a much wider spread, seemingly global, problem: The location of artisans in the city, a failing system of apprenticeship, and the lack of a critical role of artisans within industrial production systems has led the author thesis to a search for solutions regarding the future welfare of their livelihoods. Artisans are professionals who stand outside mass production systems, hand-manufacture individual products, mostly through traditional techniques that are handed down from master to apprentice whereas designers are professionals who are the first links of a chain of mass production. Unlike artisans, designers mostly do not directly manufacture creations themselves but instead develop prototypes / templates that are to be turned into products by others who are the further links of the above the mentioned chain. Yet, artisans demonstrate the ability to adapt to new technologies and procedures. This leads the ~~author~~ thesis to query whether designers, who have formal knowledge (logos), can be an instrument of social change for artisans who have tacit knowledge (technē). Through collaboration between these two seemingly disparate professions, a joint strategy whereby artisans can readapt their traditional handcraft oriented skills towards autonomous unique design processes and develop small-scale productions.

Visual Matter
Website, photographs, video, one set of jewelry (including one pair of earrings, one broche, one necklace), one set of lighting (including three glass lamps), one wooden stool, one tabletop lamp

ÖZET

TASARIMCILAR VE ZANAATKARLAR İÇİN ORTAK BİR PLATFORMUN OLUŞTURULMASI : İSTANBUL ZANAATKARLARI

Rezzan Hasoğlu

M.A., TEZ, MAYIS 2015

Tez Danışmanı: Hüseyin Selçuk Artut, PhD

Anahtar kelimeler: tasarım, zanaatkar , zannat, zanaatın tasarıma entegrasyonu, teknoloji

"Teknoloji" Yunanca'da "technē" kelimesinden türetilmiş olup "zanaat" anlamına gelmektedir. "-loji" eki ise "logos" kelimesinden türeyip "mantık yürütme" anlamındadır. "Teknoloji" kelimesinin anlamı kelimenin kökünde yatmaktadır: Zanaat ve üretimle bilmek. Bu tez görünüşte küresel bir soruna da kayda değer bir örnek teşkil eden İstanbul zanaatkarları için sürdürülebilir bir çözüm bulmayı hedeflemektedir: Zanaatkarların şehirdeki konumu, çırak sisteminin açmaza gidişi ve zanaatkarların endüstriyel üretimlerde önemli rol alamamaları araştırmayı zanaatkarların geleceği ve geçimi için bir çözüm arayışına yönlendirmiştir. Zanaatkarlar, seri üretim sistemlerinin dışında bulunan profesyoneller olup, az sayıda el üretimi yapmakta, geleneksel üretim tekniklerini ustadan çırağa aktarmaktadırlar. Öbür yandan tasarımcılar, seri üretim zincirinin başındaki halkalardır. Zanaatkalarlara kıyasla, tasarımcılar yaptıklarını genelde kendileri üretmektense prototip ve şablonları ürün olmak üzere hazırlayarak bunları yukarıda bahsedilen zincirin diğer halkalarına aktarmaktadırlar. Halbuki zanaatkarlar da yeni teknikleri ve prosedürleri öğrenme becerisini sergilemektedirlerdir. Bu durum araştırmayı formel bilgisi (logos) olan tasarımcıların örtük bilgisi (technē) olan zanaatkarlara sosyal bir değişim için araç olup olamayacağını sorgulamaya teşvik etmiştir. Bu görünüşte farklı iki meslekleğin işbirliği sayesinde, zanaatkarların geleneksel el sanatları odaklı becerilerini, özerk benzersiz tasarım süreçleriyle ve küçük ölçekli üretimlerle yeniden adapte edebileceği ortak bir strateji geliştirilebilir.

Görseller

Websitesi, fotoğraflar, video, bir takı seti (bir çift küpe, bir broş, bir kolye dahil), bir set aydınlatma (üç adet tavandan sarkıtmalı lamba), bir ahşap tabure, bir masaüstü aydınlatması

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LIST OF SYMBOLS AND ABBREVIATIONS

İMÇ	Istanbul Manifaturacılar Çarşısı (Istanbul Stores of Drapery and Haberdashery)
ITU	Istanbul Technical University
IKO	Istanbul Kuyumcular Odası (Istanbul Chamber of Jewelry)
CNC	Computer Numerical Control
METU	Middle East Technical University
TÜBİTAK	Türkiye Bilimsel ve Teknolojik Araştırma Kurumu (The Scientific and Technological Research Council of Turkey)
UNESCO	United Nations Educational, Scientific and Cultural Organization
İSMEK	İstanbul Büyükşehir Belediyesi Hayat Boyu Öğrenme Merkezi (The Art and Vocational Training courses by the Metropolitan Municipality of Istanbul)

1.

INTRODUCTION

The meaning of "craft" in the dictionary corresponds to "an activity that involves making something in a skillful way by using your hands."[1] Similar to this, in the article by Nimkulrat, "Craft is thus a means for logically thinking through senses" is also stated as a definition. (Nimkulrat, 2012, p.1) In Sennett's book, a craftsman represents the special human condition of being engaged. (Sennett, 2008, p.20) Through a deep level of engagement and making things by hand, the subject learns though making. The "learning by making" is "technē" in Greek, which is also the root of the word "technology." Such technical knowledge comes from practical intellect. (Wang, 2013, p. 15) The suffix of "technology" is "logos" which means to reason. In Wang's article, both Plato and Aristotle defend the idea that reason reveals necessary, universal truths and the source of reason comes from the unity of mind and body. As the craftsperson is immersed in the activity of making, to perfection a skill (as Plato coins the term, "arete" as a standard of excellence), the subject will be able to think deeply upon what they are doing as they perfect their skill. To perfect skill, technique no longer has to be a mechanical activity: One has to dwell in difficulty to learn new information (Sennett, 2008, p. 20). In Heikkerö's article based on Albert Borgmann's, "Focal Things and Practices" (1984) the author gives examples of kendo (sword practice) and chado (tea ceremony) as focal practices in Japan to support his argument on the integral and unifying aspects of craft making:

> Focal practices call fort exertion, skill, self-transcendence, perseverance, endurance, patience, commitment and attention qualities that device-enhanced leisure tends to undermine or dissipate. (Heikkerö, 2005, p. 253)

[1] (http://www.merriam-webster.com/dictionary/craft)

In Heidegger's studies, the craftsman does not fit into the systematics of modern machine-powered technology. (Heidegger, 1977, p. 48) People rely on machines and workers who serve as "smart-machines" that perform the tasks that machines are incapable of doing (Flusser, 1999, pp. 51-54). Human beings have become "smart-machines" that operate other machines that they themselves have manufactured. Craft as a mean for, "Logically thinking through the senses" is hardly possible, as people no longer make things by hand. When an equipment fails to function, its usefulness and reliability also fails with the equipment, and consequently reveals the truth that it belongs to a certain way of knowing (Heidegger, 1977, pp. 160-161). Therefore, Heidegger states that, "technology is a way of revealing." (Heidegger, 1977, p. 47)

In a functioning system of crafts, the artisan has some basic characteristics. These characteristics include the know-how, mastering techniques of extraction of raw materials, concept solutions, process production, and customer service. Artisans have the ability to regulate their entire business by tacit knowledge. (Filho, 2013) In addition, their objects of craft have uniqueness due to the process of making, material and skillset. This uniqueness represents a craft tradition of that geography and according to UNESCO, is considered as "intangible cultural heritage." [2]

This thesis assesses the issues and systems of artisans in Istanbul as an example to create a community platform of artisans and designers as a solution for the disappearing tradition of craft making. All the qualities and characteristics that artisans have, which are explained above, confirm that their "tacit knowledge" is valuable for prototyping and improving design production. Their contribution would only be possible if the artisans are willing to strengthen their network, agree on the issues in the following sections and willing to participate to the process.

[2] (http://www.unesco.org/)

2.

OVERVIEW OF PROBLEMS AND SOLUTIONS FOR ARTISANS IN DFFERENT GEOGRAPHIES

2.1. Impact of Industrial Revolution on Artisans

To understand why today artisans cannot compete with mass-production companies, one would have to look at the origin of this competition. Before the Industrial Revolution in Europe artisans were skilled workers who were trained by their master to become a journeyman. They repeated and imitated certain routine tasks to craft a product. After a certain level of experience (ten thousand hours according to Sennett's claim) artisans became capable of performing these routing tasks and evaluate them on a complex, but tangible level to create the craftwork in the best possible manner. On the other hand, the engineers, who were schooled for three to four years in a formal institution learned how to perform these routine tasks but were also able to plan, change and arrange them on an abstract level. This enabled the formal-educated engineers to advance into a higher level of intelligence and skill.

The engineers were the competitors of the artisans. During the pre-industrial era, artisan guilds controlled the production of textiles, ceramics, glass, leather, wood, metal, shoemaking and so on. The urban tradesmen would buy these goods from these master craftsmen or from their families who lived in cottages (the putting-out system). With the Industrial Revolution, this balance of life shifted from cottage industry to urban industry. The engineers aimed to invent better methods of textile weaving, engine power, higher temperatures for casting, better molds for metal and tool bits for lathe turning. They formulated the production steps into smaller increments to facilitate semi-skilled workers who did not demand high wages to do the production faster than the skilled workers (artisans). Another issue revolved around authority was that the artisans

were able to make decisions about the production without the need to consult higher authorities, which at this juncture were the engineers who wanted more control on production procedures. According to Stinchcombe (1990) artisans were facing during the Industrial Era to two major problems which can be formulated as: 1) Such a big growth in the market threatens the artisan trade to such an extent since it pays main money holders to break the elements of a single craftsman's skills into many separate jobs for which a large number of semiskilled workers to do those jobs are needed - in other words, the mass production threat; or radical technical change in the product or, more rarely, in the process of production. 2) Radical technical changes in the industry make artisan trades and the whole product obsolete. Machine industry, dominated by engineers (artisans' main competitors) required design to be simplified, which eliminated many ornamental decorations for faster production. Artisans who showed their skill in ornamenting products were not able to find as many clients as before since their clients were more inclined to buy new machine-made products.

The new machines created different products than what artisans made and they were in large quantities, which meant that large segments of the population were consuming a wide range of new products. In many situations, the trend was more important than the craftsmanship of the product. Consequently, artisan originated products became outdated.

In the 1890s, to improve the assembly line, Frederick Taylor created the scientific management. Taylor measured every single step of a production line, how many seconds it takes to screw a thread or assemble parts of a product (also known as Taylorism). His method was very rigid. The artisans, who had a looser working regimen, could not adapt to Taylorism. John Ruskin, later criticized this division of labor as:

> "It is not truly speaking, the labor that is divided; but the men: Divided into mere segments of men-broken into small fragments and crumbs of life; so that all the little piece of intelligence that is left in a man is not enough to make a pin, or a nail, but exhausts itself in making the point of a pin, or the head of a nail."(Gorman, 2003, p.16)

Henry Ford adapted Taylorism in the 1920s to manufacture cars faster. Instead of improving the design of the cars, Ford perfected the assembly line and was able to

manufacture cars faster than any other company. His approach to manufacturing provided a democratic distribution of cars to the citizens in the US. Since the price got lower, many people were able to afford buying cars for their families. Yet, after the 1950s, the customized car design succeeded the Ford. Users wanted to choose colors, seating material and other parts of their cars and did not invest on identical Ford cars. The uniqueness of the product for consumer became an essential criterion again.

3.

ARTISANS IN ISTANBUL: STORY OF ARTISANS IN A HISTORICAL STORY GOING THROUGH TRANSFORMATIONS

The reason why "Artisans is Istanbul" is chosen, as an example is that the city is dealing with the two similar issues of the case studies above. First is the threat of losing "intangible cultural heritage." The second is the lack of communication between the two types of knowledge: tacit (by artisans) and formal (by designers.)

3. 1. A Brief History of Artisans in Istanbul

Throughout the Ottoman Era, the Sultans encouraged artisans to pick the best location for their workshop. They called the crafters "Ehl-i Hiref" who worked under the authority of Tradesmen's Guild (Lonca) of the Ottoman Empire. The Ottoman Empire aimed to create a royal branding for all artisan crafts, which the aesthetic criteria is defined by the Tradesmen's Guild to become a product for elite customers. The branding named under "Istanbul School" had political and technological ambitions to lead and survive through the domestic and international market competition. (Ökten, Evren, 2013, p. 39) The artisans would call a low quality work as "alçak iş" and reject its trade. (Sakaoğlu, Akbayar, 2000, p. 57) Such a requirement for high quality also implies that artisans were held responsible for both the design and the manufacturing of their product. During the 16th and 17th Centuries, the guild system had lost its power due to the industrial production and merchants' different ways of commerce. Moreover, inheriting the "Artisan" certificate **(Figure 1)** from father to son or the ability to purchase a certificate created discontent, which also contributed to poor product quality. (Doğan, 2012, p. 73) After the fall of the Ottoman Empire, the Republic of Turkey promoted the nationalist identity. Most of the skilled and well-trained Armenian, Greek

and Jewish artisans, who trained the next generation of Turkish artisans, faced difficulties in their professional and social environment due to the effects of nationalism.[3]

Figure 1. Artisan Certificates are still required for artisans for practice their professions.

3. 2. The Network of Artisans in the City

Artisans in Istanbul are clustered in various districts based on their material of production. Jewelers are mostly located around the Grand Bazaar; the silversmiths work in Kalcılar Han near Mahmutpaşa; chandelier makers are in Şişhane; furniture makers and carpenters are in Tophane. This clustering, as stated before, also creates a network within itself. The bulk-sellers and shops for jewelry are located around the Grand Bazaar. On the other hand, metal parts for chandeliers are sold in Perşembe Pazarı in Karaköy (a neighborhood in very close proximity to Şişhane). Artisans, who the author of this thesis interviewed, said that they economically supported and motivated each other during difficult times of their long-term friendships. The artisans who have been practicing over thirty years can recognize other artisans work by eye and pay their

[3] During oral interviews conducted with living artisans, mostly non-Muslim, in Istanbul, they recited their own apprentice-master experiences

respect to the artisan's craftsmanship. The interrelations between artisans demonstrates that they create a community where their objects of craft represent the social communication they have established. Drinking tea, sharing daily anecdotes and evaluating each other's craftwork are only few of the many traditions of the artisan community. The social community translates into handcrafts over generations through along with its traditions. Thus, artisanal crafts are also products of intangible cultural heritage. (Doğan, 2012, p. 78)

3. 3. Issues Endangering the Last Generation of Artisans in Istanbul

In the present day, there are not many artisans left in Istanbul. The Istanbul Chamber of Jewelry (IKO) recorded about a thousand working artisans of which 959 are located in the Old Peninsula of Istanbul in 2012. (Ökten, Evren, 2013) Bulk-sellers, customers and vendor-shops are other actors of the artisan network. The scholars, Aslı Kıyak İngin, Özlem Er, Serkan Bayraktaroğlu, Associate Professor Ayşe Orlandi and Professor Yonca Erkan, who participated to interviews for this thesis stated that, although IKO records these artisans, most of them are still working unrecorded due to problems of permits and taxes. Secondly, old masters lack new apprentices due to the obligatory education system and enclosure of technical high schools where students can train to practice a craft. The scale of production is minimal and it only economically supports the master's family. Their own children do not respect the artisan's professions in order to take over for three reasons: First, the design aspect of products is either outdated or do not follow the current design trends. Second, the public does not value the wisdom of a skillful artisan: the industry turns him into a human-machine by using artisan's skill set as a mechanical tool. Third, the financial outcome is unsatisfactory in comparison to other fields such as engineering and law.

The State's solutions for artisan workshops lack the approval of artisans. Ongoing projects starting from the 1960s, such as Istanbul Manifaturacılar Çarşısı (İMÇ), Modoko and Perpa are commercial sites where the State aimed to relocate workshops out of the city center. Most of the workshops in the city center contain hazardous materials, lack safety regulations and ventilation. However, their location in the city is critical for two reasons: (1) The uniqueness of the craftwork comes from the network

and tacit knowledge. (2) Designers can directly visit artisan workshops for prototypes, exchange ideas with artisans to accelerate and improve the manufacturing process of their product.

One significant issue is the limited communication between artisans and designers. In the current university design education model in Turkey there are limited locations, such as some private universities and some of the Industrial Design programs attached to Technical Universities such as Istanbul Technical University (ITU) and Middle East Technical University (METU), where design students have the opportunity to use software programs, 3d printers and CNC cutters to generate their designs. When it comes to the larger scale, State operated Fine Art Universities such as, Mimar Sinan Fine Arts University, Marmara University, Sakarya University and Eskişehir University, we find that these institutions train their students with hands-on learning. In contrast to private universities, most state universities also have a larger student body and insufficient funding for computational education. Although “learning by making” is a considerable option for many design students during their formal education, the educational budget from the state and obtained through public support is still not enough to resolve health and safety issues in these learning spaces, or to provide students with enough material and work space to ensure that the "hands-on" learning reaches a full fruition that gives its graduates a sufficient level of proficiency in craft oriented skills which would allow for a meaningful discourse between them and the artisans of the city to develop. On the other hand, the artisans, who do not have a formal education but “learn by making” have skills to evaluate time, cost and material for a mold or a prototype. Designers, who are aware of this situation, visit artisanal workshops, but face difficulty due to the lack of information on the surroundings. A designer has to ask around in a neighborhood to find a specific craftsman who makes a specific product/object, such as plasterboards for interior ceilings.[4]

Following this idea, the designer has to establish trust for confidentiality of the project. While Artisans in Istanbul are motivated to design original products, they prefer when a client brings an idea or a drawing. Artisans find it easier and more profitable to copy

[4] Cemal Cinbız is a plaster mold-maker located in Tophane. His three stories tall workshop has been active for more than four decades.

other products to keep their business and respond to the demands of clients. They do not see the ethical problems of intellectual theft as they identically copy one's designs. (İngın, 2011, p. 127) In Made in Şişhane, the process of making down-copy and up-copy is described below:

> You get a German design, which first went to Şişhane. In Şişhane the German design is copied in a way that makes it simpler to mass-produce. The Chinese are coming into Şişhane...because the Turkish craftsmen already translated the complicated or the high-quality design into something simpler or of diminished quality, it is easier for the Chinese to mass-produce that thing than the German original. Then the same thing comes back to Şişhane as a Chinese mass-produced object...There are down-copies and up-copies. Generally, Chinese to a hotel is up-copy and Italian to Şişhane is down copy. (İngın, 2011, p. 127)

As a result of this issue, designers face a problem of trust when it comes to commissioning projects to craftsmen. Although designers establish a trust with artisans to design new products, the artisans still cannot design by themselves new unique products that meet the current market trends.

The designers' role in these circumstances is to contribute their knowledge to artisans to guide them into thinking in the present conditions. As artisans acquire formal knowledge, they will be able to communicate to designers who have curiosity in learning new skills and tacit knowledge.

4.

EVALUATING SUSTAINABLE SOLUTIONS FOR ARTISANS

4. 1. Building a Community Platform for Designers and Artisans

Scholars and volunteers who have an interest in finding solutions for artisans have been actively working in Istanbul. Several major projects are "Crafted in Istanbul" by Barış Gümüştaş, Bilal Yılmaz and Seda Erdural which is an interactive mapping of artisans in the city[5], 'Made in Şişhane' by Aslı Kıyak İngin, a scholar from Bilgi University who assigns her students to collaborate with artisans in Şişhane[6] **(Figure 2)**, research projects by Studio X[7], an extension from Columbia University and Özlem Er[8] from the Istanbul Technical University help develop ideas on this topic. Ayşe Orlandi and Yonca Erkan from Kadir Has University have received research funds from TÜBİTAK[9] and UNESCO for "intangible cultural heritage" and are revitalizing the jewelry district in the Old City.[10] On the other hand, Faruk Malhan (one of the pioneers of Turkish industrial design) established the Design Foundation[11] to reunify designers, culture and artisans. Armaggan[12], a high-end giftware company located nearby the Grand Bazaar, trains and collaborates with craftsmen for textiles, copper and glass products. Designs and production of the Armaggan products draws references from the Anatolian, Ottoman and Central Asian cultural heritage. ATÖLYE İstanbul[13] focuses on creating a multi-disciplinary collaborative space where members can also make their

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[5] http://www.craftedinistanbul.com/about?locale=en
[6] http://madeinsishane.blogspot.com.tr/
[7] http://www.studio-xistanbul.org/en/
[8] http://www.tasarim.itu.edu.tr/akademik_kadro/ozlem_er.html
[9] http://www.tubitak.gov.tr/
[10] http://www.khas.edu.tr/news/1109
[11] http://tasarimvakfi.org/en/
[12] http://www.armaggan.com/
[13] http://atolyeistanbul.co/roof/#atolye

prototypes in the production space. Acknowledging the value of artisans, ATÖLYE shoots short documentaries of craftsmen in the city under the title ‘Mercek’ (translates as Lens’) to emphasize their focus on the artisan values.

Figure 2. Made in Şişhane is an ongoing Project led by Aslı Kıyak İngin where design students work as interns for artisans on a project for a semester.

The effort is still ongoing and its ultimate aim is to prevent the disappearance of artisans. All these platforms are functioning independently from each other and do not directly include an artisan-based perspective. The solution lies in the appropriate formulation of the problem: the gap between artisan’s skill (tacit knowledge) and designer’s vision (formal knowledge).

As a solution, this thesis proposes to create a digital and physical platform where all these formations can gather, interact and act as a moderator to artisans. The platform, which will be explained in detail in the following section, has to be approachable for artisans as well as design professionals, scholars and students.

4. 2. Initialization Process To Create A Platform For Artisans

Before creating the platform, the first step is to locate, conduct interviews and define those artisans that qualify as 'masters' The next step is to create a digital archive of artisan works that would set a timeline of the evolution of craft to see the change in quality throughout generations. One of the reasons lying behind today's craftwork quality issue is that the master forgets or does not acknowledge previous master's work, resulting in low quality imitations. The lack of competition detracts from the originality of products (Sennett, 2008, 79). When a time line of three generations of artisan work is created through photo-documentation, the viewer will be able to see the transfer of knowledge, where it lacks quality and originality. Not all craftwork is artisanal craftwork: Some are of lesser quality and more commercially oriented. The decision of whether the person who makes craft is an artisan or a simple craftsperson has to be made via a certain list of criteria created by the experienced artisans and designer members of the platform through evaluating the craftsperson's skills and previous accomplishments. The next step is to exhibit "master's works" in the physical space for designers to observe and understand intricate ways of working with materials. Not only will this give them new ideas but it will also demonstrate the skill set of the craftwork's master.

An industrial designer has the formal knowledge of market segments, trends, user needs, new manufacturing techniques, aesthetics, proportion and presentation. A qualified master would have specific characteristics formed by intuitive knowledge. The two professions can exchange knowledge on the physical platform: designers can help artisans to adopt new methods of technology. Artisans can demonstrate their intuitive skills on making to the designer. The weekly meeting sessions of the two will start contributing each other's knowledge to the platform. The combination of tacit and formal knowledge would lead to a sustainable work model where artisans are valued for their expertise.

4. 2. 1. Existing Artisan Platforms

Physical and digital platforms such as İSMEK[14] (organized by the Municipality of Istanbul), İstanbul'un Ustaları[15] (Masters of Istanbul), Türk Kültürüne Hizmet Vakfı[16] (Foundation for Service to Turkish Culture) and Classical Turkish Arts Foundation[17], act as a model for the intended strategy. All have structured visions, an extensive database of artisans, workshop schedules and conferences. Masters of various crafts are tutors in these institutions where people can pay a fee for training. The organizations also have bilingual interactive maps, mobile applications and social media to stay dynamic in their field.

Yet these institutions aim to guard the traditional arts and crafts without translating the visual language to contemporary design trends. Contrarily, the "Artisans in Istanbul" platform will aim to form a mutual language between design and crafts. The New School organized two models, "Made By" for Guatemala and "Designed By" for Colombian artisans, which both stand for a good example to this platform:

> Where teams of students lead workshops in work time, valuation, pricing, inventory, quality control, the association's organization, new product development, patternmaking, sewing, marketing, computers and English. (Lawson, 2009, pp. 3-4)

Artisans who acquire the skills above would have a wider range of skillset, which would empower their business in the field. The website "Artesanías de Colombia" gathers all related information under one roof to maximize the interaction. The YouTube tutorials such as "How to create a Facebook page for your business?" are also enhancing learning through an online resource.[18] The feedback on the website and the amount of sponsors demonstrate that the "Artesanías de Colombia" is a sustainable model to take as an example.

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[14] http://ismek.ibb.gov.tr/ismEng/index.asp
[15] http://istanbulunustalari.com/en/
[16] http://www.tkhv.org/
[17] http://www.ktsv.com.tr/
[18] http://www.youtube.com/user/artesaniasdecolombia

4. 2. 2. Ateliers d'Art in France

Another successful working example of an artisan platform is Ateliers d'Art in France. Initially founded in 1868 as a federation by ceramists and glassmakers, the union evolved into a foundation in 2001 with the support of the French Government. The foundation's aim is to "safeguard, promote and develop the professions devoted to crafts, creativity, tradition and the maintenance and conservation of heritage, particularly through the award of prizes, scholarships and subsidies, the organization of colloquiums and publications." Currently the federation has a community of over six thousand professionals, craftsmen, artisans and art workshops throughout France, who are accessible through an online directory.[19]

The organization ensures a promising professional image. In each newsletter, the products are presented with various artisans' background. Members not only exhibit in fairs and large exhibitions but also can sell their work through Ateliers d'Art stores. The stores are mostly located in prosperous touristic neighborhoods of the cities, which pitches to customers who have higher-income.[20] In any of these stores, a designer would notice artisans of this community have a contemporary aesthetic taste. The products have a design approach and sensibility towards the market demands, layered with cultural references. The reason why French artisans have a design approach would be the strong network established by the Foundation. Their community enables them to stay in contact and follow up with the new trends.

[19] http://www.ateliersdart.com/index.php
[20] http://www.boutiquestalents.com/en/opera/

4. 3. Physical and Digital Platform for Artisans

From this point onwards, the solution proposal for artisans is speculative. The good news is that Internet and especially social media usage is very high in Turkey[21] and the overwhelming majority of artisans has cell-phones, social media accounts (especially WhatsApp, Facebook, Twitter and YouTube) and mobile chat applications. They are familiar in using these tools not only for their business but also to stay in contact with their family and friends. However, from the examples and models analyzed above, it also becomes evident that digital platforms, by themselves, will not suffice and thus will need to be augmented through physical events and locations. Therefore, before going into the digital platform, the physical platform has to establish the following guidelines:

1) Meet artisans individually and motivate them to have a casual routine meeting with other artisans.
2) Spread through word of mouth and social media, which they are familiar with that there is a platform for them.
3) Make artisans feel at ease and welcomed at this platform.
4) Inform artisans, if they are willing to participate, that industrial designers are there to serve as "an instrument of social change."
5) Create a work plan/schedule for artisans for their training sessions.
6) Provide multiple options of workshops based on the skill level and interest of artisans.
7) Include students to act as "assistants" or "teaching guides" depending on the type of a workshop. (In some workshops, artisans can teach "making" to students and in the other ones the students can lead courses on design principles and market demands.)
8) Show artisans how to navigate on the digital platform and explain how it will be beneficial to their learning and business.
9) Have feedback sessions once a week.

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[21] http://memeburn.com/2012/10/meet-the-worlds-10-most-facebook-addicted-countries/

After the physical platform establishes a sense of trust, artisans can create digital profiles of their ateliers, projects and contact information to become more accessible to the public. Similar to the Etsy model, where people sell their craft projects, complete transaction, ship the product to their clients and receive customer feedback, designer can lead artisans to learn these systems and teach each other.

While the physical platform can provide face-to-face interaction with designers and design students, the digital platform will make artisans more visible to clients. The education process requires time, effort and patience, which can be realized through meeting in person and "knowing by making." Hence the latter process requires design refinement, client-relations and exposure. The exposure process also needs to incorporate social media and online resources.

4. 4. Originality in Design

As previously explained above, the issue of up-copy and down-copy resides in the root of artisan's inability to design new products. Since in the present day, the quality of apprentice-master training deteriorates, the skill-level of the artisan cannot go beyond the imitation level to the pro-active approaches to design. Yet the artisan can replicate a chandelier or a furniture excellently just by looking at a photograph. This shows they are strong in observation skills but lack in ideation. To resolve this issue, the designers at the physical platform can guide artisans to approach the same object from different angles. To create iterative design alternatives to the product in the photo can be a challenge for the artisan for this learning experience. When the first and the last iterations are put next to each other, the artisan can observe the iteration process to understand his capacity in expanding the design. New design can be documented through video and photography, put on a display at the physical platform and sold on the digital platform. The critical point in here is to make the artisan feel confident enough to be autonomous in performing the craftwork.

Another significant issue is to create a sense of respect to design ethics. One way of realizing this is to remind craftsmen how old masters distinguished each other's work and rejected low quality work. The physical platform has to describe the boundaries of

intellectual property, bad influence of copied work on the market and how original work would make their business more resourceful. The digital platform also has to re-emphasize the same idea and protect artisans' work by copyright.

4. 5. Finances Regarding the Physical and Digital Platforms

One way to fund the "Artisans in Istanbul" platform is to find stakeholders including designers, scholars and educational institutions that have a certain concern for artisans. This could also be possible through crowd funding such as the Kickstarter to encourage people to invest. The multi-investor method will make the platform more independent and prevent it from corporatization. After a certain amount of time, through sales of craftwork and artisans' success in their business, the platform would become self-sustaining. In case there is a need for investment (such as buying new equipment and maintenance) the platform can promote collaboration with material and construction companies. For instance, if a wall needs to be repainted, participants in the platform can collaborate with a paint company and offer in return a "hands-on" training workshop to the company's employees. In this scenario, the artisans "tacit knowledge" gain value in the "skills economy." (Sennett, 2008, p. 37) The artisan is perceived as "an intellectual human-being" rather than a "human-machine."

5.

VISUAL DESIGN LANGUAGE OF THE PROJECT

In order to test the speculative digital platform, the author created a website and linked social media to made artisans visible to each other and to the people interested in the study.

The website has two domain names: www.istanbulzanaatkarlari.com to address both artisans who have Turkish mother-tongue and www.artisansinsistanbul for international users who might have interest in the subject area. Users can switch to both languages from 'Türkçe-English' tab. The website is designed in a very straightforward, grid system to be as user-friendly as possible. The aim is to bring forward the identities of the artisans while keeping the website easy to navigate and to associate website's identity with the artisans to encourage them to participate to the platform.

The same idea applies for the logo design created in collaboration with Murat Ersoy[22]. The logo in 'Lekton' font is used for the design to have a similar look to metal label designs, which artisans can relate from the metal machine labels. "Istanbul" can be later replaced in the with other city names in the logo if the platform succeeds and the research expands further. The logo is also used on the social media, on posted photographs and videos, physical items such as business cards of the website and postcards to give away items such as aprons to the artisans.

On the website, at the 'Artisans' page, the thumbnail artisan thumbnail photo-grids are responsive when the mouse is on the thumbnail photographs to provide name of the artisan. In the "Interviews" page under the "Artisans" tab, the menu filters in material categories since the artisans specialize in the material they are working with.

[22] http://ersoymurat.com/

For instance, Master Sıtkı, a wood carver, is filtered under “Wood.” Also when the user clicks into certain artisans, a video starts playing immediately on the top section of the website and the photographs start to auto-play a slideshow below the interview. The aim is to provide direct and clear information about the artisans. The content of the interviews are direct, very minimally edited conversations with artisans about their troubles in the profession, their demands and stories. Some interviews are taken from another website such as the Glass Furnace since it is difficult to interview all the artisans working there.

The photographs in the website, all taken by the author of this thesis, are also aligned with the website aim to be straightforward. There is little amount of postproduction editing (Photoshop or Lightroom), such as adjusting the exposure or contrast, to be more objective about the workspace of the artisans. The author of the thesis wanted to show the difficult working conditions such as lack of ventilation, uneven floor surface and chipping paint off the walls but also the cultural references including family photographs of the artisans, their license, tea glasses which they use, objects that they have made, national flags and flags of the soccer teams which they support, collected small knick-knacks, musical equipment (old record players or tapes) which they listen while working. The photographic documentation explores the full sphere of their environment, machines they use and the social side of their professional lives. The videos in the website are also parallel to the photographs, only they show more how artisans work while creating a product, edited in a linear chronology of the story of making. When a user enters to the website, whether an artisan, designer or a researcher, can view and understand directly the honest documentation of the subjects.

The “About”’ page briefly explains the aim of the website and the thesis and links to the author of this thesis portfolio website.

On the “Links” page, the website directs the users to related websites or books that they can purchase. The author of the thesis created this tab to give credit to the scholars and research projects prior to the ‘Artisans in Istanbul’ project had begun and started expanding with the people who contributed to the research.

On the “Contact” page, social media links (Facebook, Twitter, Instagram, Pinterest, Google +) are provided to encourage artisans to participate and raise awareness to regular social media users about the platform. Users who want to give feedback and receive more information can enter their text into the contact box. So far, Alice Taranto (A Fullbright scholarship applicant from Rhode Island School of Design), Giovanna Morelli (a fellowship applicant from Tulane University) and Serya Yeşil (a journalist from a British Media Agency) few of many other people who have contacted to receive more detailed information about the thesis project.

6.

A CASE STUDY: COLLABORATION WITH ARTISANS IN MAKING PRODUCTS

To assess the 'Artisans in Istanbul' platform, the author of this thesis initiated a prototype model of the platform. Through designing and making four products in collaboration with artisans, the author observed if the platform would work, how artisans communicate and how the production process evolves into final products. This chapter explains the multiple steps and feedbacks of the visual language, product design and the process

6. 1. Products made with artisans

The author of this thesis has designed four products and worked with artisans for production. This chapter explains a detailed description of the design process, production and the aftermath.

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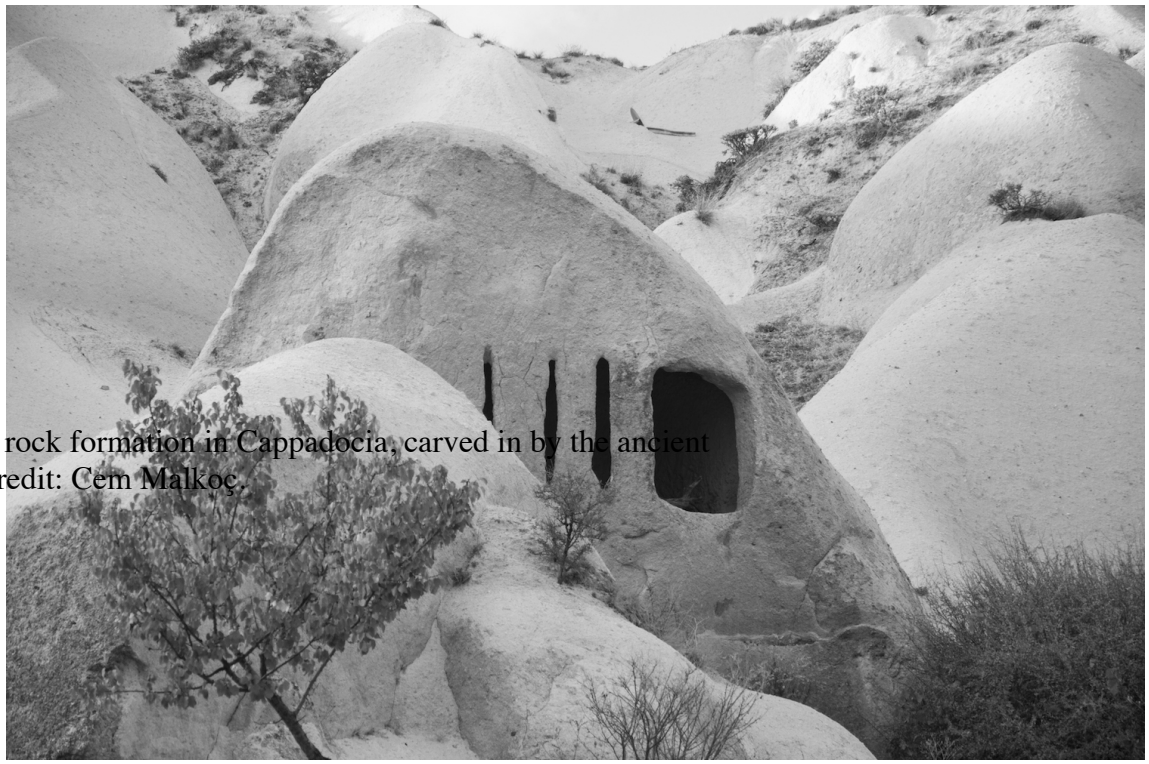
6. 1. 1. Design process

The first product is a jewelry set inspired by the Cappadocia, a volcanic area where ancient Anatolian and Christian civilizations resided for several centuries. The author of this thesis visited Cappadocia in November 2014. The archeological UNESCO World Heritage site was formed through volcanic eruptions of the Erciyes Mountain and carvings of the ancient residents. The stories of the ancients civilizations were very inspirational to the design process since everything on the site were learned by making and the technique had many scales from creating a earthenware cooking pot to a ventilation system for an ancient monastery. The author applied this idea of 'learning by making' via learning how to make jewelry, which has a one of the forms of the carved houses of Cappadocia. **(Figures 3 and 4)**



ure 3. A volcanic rock formation in Cappadocia, carved in by the ancient
ilizations. Photo credit: Cem Malkoç.

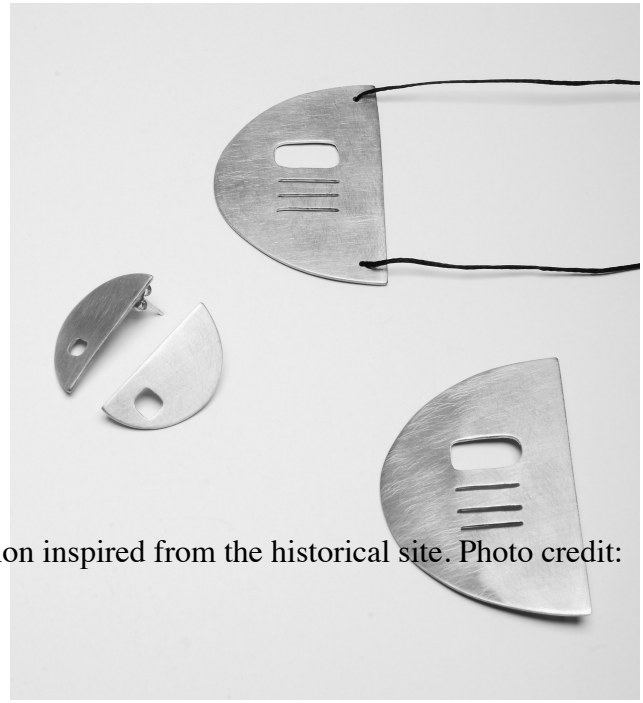


Figure 4. Cappadocia Jewelry Collection inspired from the historical site. Photo credit: Zem Malkoç.

The second product is three lamps titled ‘Moirai’ (taking its name from the the three faiths in Greek mythology) made with the Çeşm-i Bülbül technique. The lamps carry a similar curvilinear form language of the Cappadocia Jewelry set to become part of the product family. The lamps, when hanged in high-low orientation from a ceiling would create an optical illusion. Inspired by the idea of cultural heritage again, the author researched about the history of Çeşm-i Bülbül technique that was adapted by Murano’s filigrana glass technique during the late Ottoman Period. As a play on the idea adapting an interest in multiculturalism, the author used the same glass production technique for a new design.

The third product is a reproduction of a previous design, stool with a side table. The original design of this product emerged from the idea to have a place to sit down in a studio and have a sketchbook/coffee on the side. The compact wooden product is produced with the minimal amount of waste.

The fourth product is an interactive tabletop object, which lights up when in long contact and turns off when the hand contact is short. The idea initiated the loss of tactile and physical interaction due to the immerging technology. People tend to forget the experience of tactile physical interactions while communicating via digital media. The

lamp, as a tabletop object, fades into different colors of red, green and blue when not contacted. As a user touches the conductive touch sensor strip on the lamp (which is made from raw materials of wood and glass), the fading out would pause until the tactile contact is finished. The interactive lamp would have a small computer, microchip known as “Arduino” board minimized to an ATMEGA processor inside and have a conductive strip outside which is connected to a touch-sensitive sensor on the microchip.

Table 2: Production process of designs for the case study

6. 1. 2. Production process

The production process of the all three designs required going into different location in Istanbul for certain production methods. Having this difficulty, demonstrated that a platform where artisans can meet and guide how the production can evolve would be beneficiary for both artisan and designer. While artisan can find customers more easily and stay in better contact with current trends, designer can save more energy and time for the prototyping process. **(Table 1)**

PRODUCTION PROCESS

CAPPADOCIA JEWELLERY SET	STOOL WITH A SIDE TABLE	MOIRAI LAMPS
Perşembe Pazarı *Karaköy* Buying the bronze plate	**Wholesale wood site** *Merter* Buying the chestnut log	**The Glass Furnace** *Riva* Making the glass lamps, annealing, cold working and drilling the holes
ECNP Gallery *Teşvikiye* Cutting, welding, polishing	**Master İsmail's woodshop** *Tophane* Initial meeting for the stool	**Murat Avize Shop** *Şişhane* Buying the electrical parts for the lamps
THE GRAND BAZAAR *Master Lefter's workshop* Plating with gold	**Master Mustafa's woodshop** *Galata* Cutting, plaining and pressing waiting the chesnut log to dry out	**An electrician's shop** *Teşvikiye* Wiring all electrical parts with the glass lamps
	Master İsmail's woodshop *Tophane* Turning all the parts on the wood lathe	
	Master Tayfur's woodshop *Tarlabaşı* Drilling holes to join the stool parts, sanding and matte finishing	
	Master Mustafa's woodshop *Galata* Gluing all the parts	

The Cappadocia jewelry set took the most time and effort since it required a learning curve for the author. She worked in Ela Cindoruk and Nazan Pak's studio (ECNP), two known jewelry designers and makers based in Istanbul. Bülent Demir, a jewelry maker, trained in the Grand Bazaar for many years also helped the author to learn how to use a jeweler's saw, welding and polishing. While the author is familiar with all these tools coming from an industrial design background, it was the first time that the author worked in such small scale.

Figure 5. Moirai Lamps inspired from the Ottoman tableware made with the Çeşm-i Bülbül technique.

For the Moirai lamps **(Figure 5),** the author of this thesis travelled to the Glass Furnace Foundation in Riva, Istanbul to work with Master Mehmet Kömürcü, one of the very few gaffers in Istanbul who can make Çeşm-i Bülbül vessels. Prior to the author's meeting with Mehmet, technical drawings were emailed to discuss if the lamps are suitable for production. However, the meeting was delayed due to a health problem of Mehmet's wife. As Mehmet is the only person that the author knows who can produce Çeşm-i Bülbül, his presence was crucial for product to be completed. In a contrasting situation, the production process would have stopped due to the absence of the only gaffer who can make the lamps. A master's presence is valuable for these types of production. The entire production of three lamps took forty minutes (very short amount of time for such a complex hand-blown glass technique). During the production, the

author was able to give feedback to Mehmet on how the glass lamps will be formed. Yet, Mehmet was able to make the exact shape from the technical drawing just by looking at the digital lamp renderings. The next day, the lamps came out from the annealer (a kiln which cools down the glass incrementally to prevent cracking) and sent to cold working. Cold working took one hour including taking of the tip of the extra glass on the lamps and drilling a hole for the lamp cables. Later on the electronic hardware for the lamps was bought in Şişhane.

Figure 6. Stool with a side table

To make the Stool with a Side table **(Figure 6)**, the most difficult step was to locate where to find a massive hardwood in Istanbul. The wood was bought in İkitelli Whole wood Sale site, located in the suburbs of Istanbul and brought to Mustafa Yasak, son of recently deceased Master İbrahim (a woodcarver since 1956.[23]) Mustafa is a friend and neighbor of Master Ismail who is a lathe worker for forty-five years. Ismail referred Mustafa's woodshop for plainer, jointer and cutter since his woodshop only has a band saw and two lathes. Mustafa, surprised by the large and heavy chestnut log (150 x 35 x 15h cm), helped the author to cut and plain the wood.

[23] (http://www.yasaoyma.com/default.asp)

In the following days, the wood had to dry in Mustafa's woodshop before Master Ismail started turning the parts on the lathe. The lathe turning took about three and a half hours. The author of the thesis also worked on turning the leg parts of the stool before taking all the parts to Tarlabaşı to a larger woodshop. At Master Tayfur's woodshop in Tarlabaşı, there is a 25mm drill bit to drill the joint holes at a ten-degree angle of the stool. Master Kadir who works in the woodshop also did the sanding and matte finish of the furniture piece.

The production of the interactive lamp's housing to the least time for production among all the products yet the electronic components required more skill and attention. The glass dome was previously made at a glass furnace. The author of the thesis brought the glass dome and the technical drawing to the Master Ismail who made the wooden foot in an hour. The two components tightly fit into each other to house the electronic components. The author showed the existing glass dome and asked Ismail Usta to make a wooden base, which follows the same curvilinear form of the lamp. The interior components for the interaction with the user were made with Selçuk Artut who is a professor at Sabancı University, teaching courses on "interaction design" and "physical computing." All the components such as resistors, sensors, cooing fans are controlled by an Arduino code to fade out colors combined in variations of red, blue and green. When a user interacts with the lamp by tactile contact, the lamp color would stop the light fading into another color. As the contact stops, it would start again. The aim is the show a interaction of human tactile senses to a digital technology.

6. 3. The Aftermath

During all the production steps of Cappadocia Jewelry, artisans were very helpful and patient with the author. Artisans gave suggestions and feedback on Cappadocia jewelry about the finishing variations (shiny or matte finish), needle shapes and cutting style (by hand or via laser.) In order to get feedback, the author of the thesis explained the thesis project, showed the logo and the website to artisans in Tophane and the Grand Bazaar. The feedback was not only very positive but also the artisans requested the author to design a website for their business.

For the Moirai Lamps, Master Mehmet Kömürcü was very helpful and responsive to the design. Kömürcü said he started glassblowing as an apprentice in Denizli while he was thirteen. When Kömürcü was asked about his opinion on Paşabahçe, one of the largest glass production companies in the World, he responded that the production scale is too large for what he looks into. Kömürcü prefers to make sculptural glass objects in the glass furnace in collaboration with students who participate to the summer workshops. One of the members of his glass team, Egemen Kemal Vuruşan is a recent alumnus from the glass department of the Mimar Sinan University of Fine Arts. Vuruşan works with Mehmet to learn more and have access to the glass blowing. Vuruşan also applied to Corning Museum of Glass, Pilchuck Glass School and few glass studios in Prague. When formal education is combined with tacit knowledge, as in the example of Vuruşan, the outcome can be very successful. In response to 'Artisans in Istanbul' Egemen and Mehmet showed positive interest and supported the development of the project.

Moirai Lamps were also exhibited at Lambrate Ventura in during Salone del Mobile in Milan on April 14-19th, 2015. A prestigious design blog, Designboom published a visually rich article[24] about the concept and the production process with of the Moirai lamps and requested the author of this thesis to sell the lamps on Designboom's online shop[25]. Publishers from China, Ukraine and Holland contacted the author via email about their interest in the production methods Master Mehmet and the story of making.

Many visitors, especially artisans, came in to say condolences for the Master Ibrahim to his son Mustafa during the wood cutting process of the stool with a side table. The social concern for Master İbrahim was genuine and showed the strong social ties in the artisan network. Additionally, Bahar Korçan, a known Turkish fashion designer came into the woodshop to check upon the decorations for her store. This meeting indicates that a popular fashion designer collaborates and credits the artisans. Mustafa explained that students from Bilgi University work in the woodshop on carving

[24] http://www.designboom.com/design/rezzan-hasoglu-moirai-glass-lamps-milan-design-week-2015-04-19-2015/
[25] http://www.designboom.com/shop/design/moirai-lamps-rezzan-hasoglu-04-24-2015/

projects as interns. Mustafa's projects include the restorations of the carvings of the Presidential House on the Bosporus, artist projects, mirror framings and larger scale interiors. Mustafa also made checkered patterned cutting boards from chestnut and oak, which were inspired by the products of popular design stores in Istanbul. The woodcarver uses WhatsApp, email and Facebook to stay in contact with his clients, which confirms that the digital platform the author of this thesis is likely to success in application.

The case study demonstrated that designers and artisans could collaborate in harmony to design and create products. During the manufacturing process, while artisans learned different approaches to designing, the author of this thesis also advanced from learning through making and observation. The approach of an individual with a tacit knowledge encourages the observer (with a formal knowledge) to think in different ways. While a designer approaches to the same problem of manufacturing in a systematic way, an artisan can quickly find effective solutions to the issues. The case study provides to a designer a new learning approach while artisan learns a new designing standpoint.

The necessity of a platform is essential to create the same dialogue from the case study between artisans and designers. The author of this thesis was the only test-subject for the case study. More subjects, voluntary designers studying in different materials and areas are necessary to act as social moderators for the artisan community to present as many different approaches to them as possible for a sustainable platform. The diversity would create a better balance between the artisan and designer communication.

7.

CONCLUSION

As stated in the introduction, “Craft is thus a means for logically thinking through senses” (logos) (Nimkulrat, 2012) as the artisan is immersed into an engaging activity of making. This immersive condition is a way of learning through making (technē) and represents the tacit knowledge. On the other hand, in a formal education, students in a design or art school, who train to become designers, use the various means of technology to make objects. While some schools also train students in making objects by hand skills, in order to become a Master in a certain technique, a student has to train like an apprentice for several years, repeat the same practice for perfect solution and analyze the problem in different view points to find different perfect solutions (arete). Some may say that the artisans do not belong to the machine-powered technology yet to design machines for production, a person has to know first how to make the first prototype. The characters of an artisan, discussed in the introduction, demonstrate that skills and tacit knowledge have an enormous contribution to the design and production process.

The platform, which this thesis proposes, creates a digital and physical environment where the artisan and the craftwork, is valued. Artisans can align themselves with the visual identity of the platform, participate to the social network to receive updates from each other and explore the website to learn that they all share similar issues stated in the interviews.

In the case study of four objects designed by the author of this thesis, the outcome proves that design becomes more unique and engaging because it has a human factor involved in the process. If Master Mehmet was not present to make the lamps, there would be no other option (except for travelling to Paşabahçe’s factory in Denizli, a city 650 km away from Istanbul) to make Çeşm-i Bülbül style products.

James Auger claims, “Speculative design, is not only to encourage contemplation on technological future but can also provide a system for analyzing, critiquing and re-thinking contemporary technology.” (Auger, 2013, p. 12) The author categorizes “design fictions” under the speculative design. The strategic design of the “Artisans in Istanbul” platform is a design fiction, which is feasible with funding, participation, collaboration and public attention.

While the contemporary technology for manufacturing such as the 3D printers, laser cutters and CNC machines provides designers to make instant prototypes, it prevents them from learning by making. Designer who have not recognized material properties of wood, metal, glass or textiles would design products that are destined to have a short term life-cycle which would end up in a hazarding our environment. An individual, whether an artisan or a designer, would design better products by knowing “technē.”

This is only possible by formulating a future strategy for artisans and designers envisioning a collaborative scenario of technology, communication and manufacturing. Although it involves some risks, the similar models have sustainably worked in different geographies with different artisans. It is only possible to move forward for artisans adapting their knowledge (technē) to new design practices (logos).

For a long-lasting solution, the artisans need to strengthen their network by collaborating with each other, train students as their apprentices and consult designers. Additionally designers have to acknowledge that artisans are not human powered machines, that they are beings who can logically find solutions to design, production and business problems with their extensive experience in their field. Uniqueness of artisans’ work also contributes to the intangible cultural heritage. Designer’s role is to become a moderator between an artisan and the designed object.

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GLOSSARY

3D printing. A process for making a physical object from a three-dimensional digital model, typically by laying down many successive thin layers of a material.

Alçak iş. (Tr) Low quality work in Turkish.

Annealer. A machine to heat (metal or glass) and allow it to cool slowly, in order to remove internal stresses and toughen it.

Arduino. Arduino is an open-source electronics platform based on easy-to-use hardware and software.

Arete. (Greek: ἀρετή), in its basic sense, means "excellence of any kind".

Atmega328. A single chip micro-controller created by Atmel and belongs to the megaAVR series.

Band saw. An endless saw, consisting of a steel band with a serrated edge running over wheels.

Capacitor. a device that is used to store electrical energy.

Çeşm-i Bülbül. Traditional Ottoman style, generally striped in blue and white glass, learned from the Venetian filigrana technique.

Chado. Japanese tea ceremony.

Cold working. To shape (glass) while it is cold.

Cultural Heritage. Cultural heritage is the legacy of physical artifacts and intangible attributes of a group or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations.

Down-copy. Reproducing an object while downscaling the quality.

Drill. an instrument with an edged or pointed end for making holes in hard substances by revolving or by a succession of blows.

Ehl-i Hiref. The title for crafters used during the Ottoman Empire.

Filigrana. Glass made with twisted colored cane glass.

Gaffer. A person who blows glass.

Jeweler's saw. A piercing saw is a type of saw commonly used in jewelry making on sheet metal.

Jointer. A woodworking machine used to produce a flat surface along a board's length.

Journeyman. Skilled workers who were trained by their master to become a journeyman.

Kalaycılar Han. An artisan arcade near Mahmutpaşa, Istanbul.

Kendo. Japanese sword ceremony.

Kiln. A thermally insulated chamber, a type of oven, that produces temperatures sufficient to complete some process, such as hardening, drying, or chemical changes.

Laser cutter. A technology that uses a laser to cut materials, and is typically used for industrial manufacturing applications.

Lathe. A machine tool which rotates the workpiece on its axis to perform various operations such as cutting, sanding, knurling, drilling, or deformation, facing, turning, with tools that are applied to the workpiece to create an object which has symmetry about an axis of rotation.

Lonca. Tradesmen's Guild in Turkish.

Matte finish. Having a non-glossy appearance.

Mercek. Lens in Turkish.

Modoko. A large furniture outlet in Dudullu, Istanbul.

Molding. A hollowed-out block that is filled with a liquid or pliable material like plastic, glass, metal, or ceramic raw materials.

Perpa. Commercial sales site at Okmeydanı, Istanbul.

Perşembe Pazarı. Hardware wholesale district near Karaköy, Istanbul.

Plating. A thin coating of gold, silver, or other metal.

Polishing. To make the surface of (something) smooth and shiny by rubbing it.

Rendering. The process of generating an image from a 2D or 3D model (or models in what collectively could be called a scene file), by means of computer programs.

Resistor. A device that is used to control the flow of electricity in an electric circuit.

RGB Led. ("Red-Green-Blue Light-Emitting Diode") led is a special light whose color can be adjusted.

Sanding. To smooth or polish with sandpaper or a mechanical sander.

Shield. Shields are boards that can be plugged on top of the Arduino PCB extending its capabilities. The different shields follow the same philosophy as the original toolkit: they are easy to mount, and cheap to produce.

Tacit knowledge. Tacit knowledge (as opposed to formal, codified or explicit knowledge) is the kind of knowledge that is difficult to transfer to another person by means of writing it down or verbalizing it.

Technē. a term, etymologically derived from the Greek word τέχνη (Ancient Greek: [tékʰnɛː], Modern Greek: ['texni], that is often translated as "craftsmanship", "craft", or "art".

Up-copy. Reproducing an object while upscaling the quality.

Usta. Master artisan in Turkish.

Welding. To join together (metal pieces or parts) by heating the surfaces to the point of melting using a blowtorch, electric arc, or other means, and uniting them by pressing, hammering.