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Digitalization in the Craft-Based Design Enterprises in Istanbul: The Emerging Business Models and their Competency Needs in the Creative Industries

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ABSTRACT
Digitalization is transforming communication and business processes, having significant impacts on the creative industries. The concepts of craft and design have undergone a paradigm shift as digital technologies converge the physical and digital worlds, and the interaction between crafters and designers embraces new venues for value creation in the post-industrial world. The design network that continues to exist in Istanbul is a unique case for a modern city, where designers collaborate with craftsmen to produce designed products without opening their ateliers. This paper aims to investigate the design and craft interaction in the digital era by exploring emergent business models in craft-based design enterprises and their competency needs. This qualitative study is based on ten in-depth interviews conducted with "designer-makers" and ecosystem stakeholders in the ceramic and glass sector in Istanbul. Each business model was analyzed utilizing the "Holistic Business Model" by Li (2020), explicitly developed for examining the digital transformation of business models in creative industries. The competency needs were determined following the ESCO (European Skills, Competences, Qualifications, and Occupations) classification. The study indicates that certain enterprises successfully penetrate external markets through collaboration between designers and artisans, requiring them to speak a common language and acquire entrepreneurial competencies.
Keywords: Design, crafts, digitalization, designer-maker, business model, creative industries

INTRODUCTION
Digital technologies significantly impact the entire value chain of creative industries, from creation, production, distribution, and marketing to consumption (European Commission et al., 2017; McKinsey&Company, 2018). These technologies accelerate the transition between the physical and digital worlds (Kagermann, 2015), enabling creatives to reach suppliers and customers without intermediaries in the old business models (European Commission, 2016; KEA European Affairs, 2019). Indeed, creative industries are considered pioneers of the digital economy due to their impact on business models, creativity and innovation, and skills development fields (KEA European Affairs, 2019; Lindgardt et al., 2015a; Petruzzelli & Savino, 2015; Pratt & Jeffcutt, 2009; UNIDO, 2019). The rise of new-generation technologies such as artificial intelligence, augmented reality / virtual reality, and blockchain presents significant opportunities for the creative economy. Creatives employ these tools to personalize and professionalize content, increase its accessibility, and reduce production costs (McKinsey&Company, 2018).

The creative industries are an essential source of growth in the global economy, and the impact of COVID-19 has triggered the acceleration of the process of digital globalization and the growth of online trade in services (UNCTAD, 2022). Developing countries have contributed to the rise of the creative economy through increased capabilities in the production and export of creative content (Nurse, 2020). The global trade in creative goods has been expanding with an average export growth rate of more than 7 percent between 2002 and 2015 (UNCTAD, 2018). Since 2021, the creative goods and services trade has seen growth, with exports of creative goods increasing by 3.1% in 2022 and services by 2.9%. The primary drivers of growth are the increasing demand for crafts, design goods, software, video games, and recorded media products, while software services are the main drivers of creative services (UNCTAD, 2024). The overarching argument is that the enhanced integration of developing countries' creative industries in global value chains requires a shift in the industrial paradigm and business practice from the low-value-added, stand-alone creative firm, cultural practitioner, or artist operating in isolation to a strategic collaborative approach that facilitates higher levels of creative and digital entrepreneurship through higher levels of collaboration, coordination, and organization (Nurse, 2020).

The preservation of crafts signifies not only the safeguarding of culture but also the protection of a vital production capacity and employment sector. In an increasingly digital world, the interaction between craft and design points to a critical collaboration that enhances innovation. Examining the changes brought about by digital technologies in the craft sector is essential for ensuring the sustainability of craft knowledge and skills, as well as for developing capacities and competencies that can be transferred to new areas (Yair, 2011b). Efforts to raise awareness among designers and artisans about the evolving nature of craft and design interaction with digital technologies are essential for the advancement of design education (Kermik, 2012). It is important to share successful practices from both local and global perspectives that explore the fundamental values of design. These initiatives are also crucial for the craft sector, which is in danger of fading away.

Among the developing countries, Türkiye is a net exporter of cultural content, ranking 4th in the world (UNCTAD, 2022). The creative economy in the country is forecasted to employ 1,000,000 people by 2030 (Deloitte, 2021). Craft production in Türkiye, a country that has not yet fully completed its industrialization, continues to exist, albeit with a decline. Unlike European and American examples, Istanbul is a unique modern city that has an operating craft sector. The design network that continues to exist in Türkiye allows designers to make joint productions with craftsmen without opening their workshops. According to Er (2011), it is important to develop mechanisms and policies to support hybrid business models in which craftsmen produce value together with designers to protect this valuable production and employment capacity, which is necessary to meet demands such as 'flexibility, innovation, and distinctiveness', which tend to increase especially in the post-Fordist era.

Istanbul is the most important city in the country in terms of its weight in the Turkish economy, has the highest population of creative occupations in the country (Günsel et al., 2011), and was selected as a Creative Design City by UNESCO in 2017. The Ministry of Industry and Technology, Istanbul Development Agency, and Istanbul Metropolitan Municipality are supporting programs on creative industries to develop policies toward the Creative Istanbul 2050 vision (IPO, 2023). Bringing designers and craftsmen together is one of the strategies toward that vision. However, there is insufficient evidence about the state of design and craft interaction regarding entrepreneurial activities in Istanbul. For the city to grasp the opportunities of digitization with the available craft infrastructure and designers in the city, there is a need to explore the present situation to inform policymakers to develop the right policies.

Online Journal of Art and Design
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The design and craftsmanship of ceramic and glass tabletop products in Turkey are competitive in terms of price and quality compared to international rivals (Kocabağ, 2009). It is crucial to assist "designer-makers" in growing their businesses internationally by providing them with the skills needed to transform their competitive edge into valuable brand recognition. Policies that promote craft-based design enterprises with strong potential for growth will also positively impact the design ecosystem and the sustainability of the ceramic and glass artisans' network.

With this context as background, this article identifies the competencies of craft-based design entrepreneurship in Istanbul in light of the new business models emerging in the creative industries with digitalization.

BACKGROUND

1. Digitalization

The digital revolution, which has been ongoing for decades, has significantly transformed communication and business processes through the evolution of electronic information exchange. Digitization, originally a concept from the third industrial revolution referring to the conversion of analog data to digital formats, has evolved in meaning to encompass smart value-creation processes facilitated by advanced information and communication technologies (Härting, 2000). Kagermann (2015) defines digitization as the ongoing confluence of the physical and virtual realms, serving as the primary catalyst for innovations and transformations across all sectors of the economy. In the context of Industry 4.0, the concept of digitization now encompasses intelligent business processes enhanced by advanced technologies like Big Data, Cloud Computing, and the Internet of Things (Schmidt et al., 2015). Alongside Industry 4.0, the notion of digitalization encompasses:

— New methodologies for digitization that are widespread across the industry, especially within the consulting and services sectors (Loebbecke & Picot, 2015).

— Digitization as a facilitator for the emergence of new business models that include innovative products (Tilson et al., 2010).

Despite its widespread usage, there remains a lack of a consistent definition of the term in the literature, and the potential benefits of digitization for business strategies are not well articulated. This ambiguity hinders firms from effectively leveraging digital processes to enhance their performance.

2. Digitalization and Creative Industries: Emerging Business Models and Skill Needs

As Mangematin et al. (2014) emphasize, creative industries are the sector that is most influenced by digitization in the economy since digital technologies have disruptive consequences on traditional modes of creative production and consumption. These impacts are particularly significant in areas like music, film, and publishing, where digital content is replacing physical goods (Currah, 2007; Koch, 2008; Kozul-Wright & Andersen, 2007). In their traditional business models, these industries generate income through restrictions on copying or access to their content. Digital technologies have transformed both the content production methods (e.g., from analog to digital cameras) and the content distribution and consumption methods (e.g., from CDs to MP3s, from newspapers to blogs), yielding important changes in their business models. The COVID-19 pandemic has significantly facilitated this process, consequently reinforcing the economic significance of the creative digital economy. Digital platforms that distribute creative content have been expanding for at least a decade, where online cross-border activities, such as music and film streaming, yield remarkable financial outcomes for companies like Instagram, Netflix, Spotify, TikTok, and YouTube (UNCTAD, 2018a). Firms operating in the creative sector have been among the fastest adopters of online and digital technologies, which have impacted their business models as well as the earnings from sales and exports (UIS, 2016). In addition, digital creative content accounts for a

significant share of e-commerce as well as content on mobile networks, the internet, and blockchains.

In his seminal essay, "The Work of Art in the Age of Mechanical Reproduction," Walter Benjamin (1936) explored how the mass reproduction of cultural objects, such as paintings and films, diminished their traditional value and ritual significance. Despite this loss of 'aura,' he noted a 'reactivation' of art as it became more accessible to the masses. Mangematin et al. (2014) claim that digital technologies further this trend by reducing reproduction costs to near zero and allowing direct distribution to consumers without traditional mediators. As they point out, the internet creates an immersive environment for audiences, paralleling architecture, and digital artifacts are now crafted for user interaction. This interaction extends to collective experiences, enabling segmented sharing rather than mass broadcasting (Mangematin et al., 2014).

Digital technologies affect creative industries by enabling recombinations in their value chains (Bilton, 2010; Lange & Bürkner, 2013) and facilitating new business models. A business model, a multidimensional complex concept, is not a comprehensive account of a firm's activities; rather, it is a simplified representation that encapsulates the fundamental cause-and-effect dynamics among customers, the organization, and financial resources (Baden-Fuller & Mangematin, 2013b, p. 419). The term business model explains the way customers are chosen (Baden-Fuller & Mangematin, 2013b) and the way value is created (Amit & Zott, 2001; Kivleniece & Quélin, 2011; Porter, 2001), sensed (Day & Moorman, 2010; Teece, 2010), distributed (Casadesus-Masanell & Ricart, 2010), and captured (Baden-Fuller & Mangematin, 2013a; Massa & Tucci, 2013).

Digital technologies have played a significant role in driving business model innovation through the creation of new exchange mechanisms and transaction architectures, new methods of generating and capturing value, and new organizational forms that transcend boundaries(Al-Debei & Avison, 2010; Lindgardt et al., 2015a). The changes facilitated by digital technologies can be grouped into three categories depending on the magnitude of change they created in the business model construct: automation, extension, and transformation (Li, 2007; Lindgardt et al., 2015b; Massa & Tucci, 2013) , and serve as a tool to analyze the emergent business models with digitization (Li, 2020). Automation describes situations where an organization uses digital technologies to streamline or improve current operations and processes, including information presentation and communication facilitation. The extension exemplifies situations where a company employs digital technologies to develop new business processes, complementing rather than substituting defined activities and processes. Transformation implies cases where digital technologies facilitate new methods of conducting business, substituting traditional methods (Li, 2020).

The digital transformation has a significant influence on employment and skill requirements and opportunities for the creative industries (Bowes et al., 2018). Similarly, the anticipated growth of the creative economy implies an increase in the number of freelancers. All these changes highlight the need for the development and implementation of policies regarding social security systems, particularly in the areas of copyright protection, career development in creative industries, and inter-sectoral transitions (Panteia & SMIT, 2020).

According to the OECD (2012), current educational systems are inadequate to support the transformation expected in the labor market in the coming period. Therefore, one of the most significant challenges of the 21st century is the need for lifelong education to be conducted individually during the transition from an industrial society to an information society. The existing workforce must continuously improve their competencies and acquire new skills.

Online Journal of Art and Design
volume 13, issue 3, July 2025
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Individuals must be aware of changes and equip themselves with competencies that allow them to remain open to new information and demonstrate flexibility in inter-professional transitions (OECD, 2012).

In their study, VVA et al. (2021) grouped the competency needs in creative professions into three main categories:

Technical, Creative, and Artistic Competencies: These competencies represent a broad category that can be observed in all activities within the creative economy. The most common feature of technical competencies is that they can be learned through the educational system's curriculum or additional training after graduation.

Behavioral Competencies: This group of behavioral competencies cannot be exclusively attributed to creative industries; rather, they consist of transferable skills across professions and sectors, thus regarded as fundamental skills. Competencies such as teamwork and problem-solving, which are primarily based on social communication and interaction, fall into this category (Bowes et al., 2018; VVA et al., 2021).

Entrepreneurial and Managerial Competencies: Competencies in this group are seen as the most critical for creative businesses, particularly for freelance actors in the creative economy. Among entrepreneurial and managerial competencies, skills such as fundraising, marketing, project management, and network development are invaluable for bringing an idea to life and ensuring the sustainability of a business. Creative professionals, especially due to their increasing tendency to work freelance, require entrepreneurial competencies. They must possess skills in management and accounting, in addition to engaging in "multiple job ownership" to protect themselves from job instability. Entrepreneurial competencies are often linked to what are referred to as "critical job competencies," such as designing business models and developing marketing strategies, as well as negotiating with banks and other financial institutions (OECD, 2018). Past studies suggest that, for creative professionals lacking these competencies, partnering with individuals who possess expertise in these areas can be a viable solution for sustaining their businesses (The European Commission, 2018).

3. Digitalization of the Craft and Design Sector

With the rise of digital technologies, there has been a paradigm shift in the perception of crafts, a sector that has been recognized as part of the creative industries since the initial definition provided by the Department for Digital, Culture, Media and Sport (DCMS) in 1998. Craftsmanship is known for its 'passion for working with materials and processes' (Yair, 2011a, p. 1) and embraces core values of originality and quality that are reflected in the characteristics of its handmade products (Sennett, 2009). Despite this, digital technologies such as rapid prototyping, computer-generated imagery (CGI), and augmented reality (AR) take the craft work outside of traditional materials -clay, wood, and fabric- into the post-industrial world (Yair, 2011a). As digital manufacturing and communication technologies redefine the borders of digital and material worlds, the definition of crafts also changes. Schwartz & Yair (2010) define craft in the new era as:

"A set of unique knowledge, skills, and abilities centered on the interaction between material and digital worlds."

Digital technologies also affect design practice (Ferrari, 2017). In contrast to artisans, designers are not limited to a particular material and do not require a knowledge of materials in the sense of hand-making (Shiner, 2007). In the early design stages, designers often use digital methods, which can enhance efficiency but also limit the use of hand-made materials

(Pinski et al., 2018). Hands-on craft processes can provide in-depth knowledge and help solve complex design problems (Sennett, 2009; Treadaway, 2007). The craft-based design approach allows designers to navigate complexity and examine an issue or situation from several viewpoints by producing embodied, tangible knowledge (Pallasmaa, 2009). Hence, the intersection between craft and design disciplines offers a fertile ground for innovation in the post-industrial age, where some designers seize this opportunity and can also produce unique, personalized items, often blending traditional craftsmanship with modern technology (Ferk, 2017; Ferrara, 2011; Kermik, 2012).

Digital technologies facilitated the elimination of traditional intermediaries in the value chain, and these changes enabled designers and crafters to transform their productions into entrepreneurial ventures (Ferrara, 2011). Consequently, the professional field of craft has expanded, blurring the lines between amateur and professional, giving rise to the Maker Movement (Bauman, 2016; BOP Consulting, 2012). The contemporary maker movement upholds its original ethos of creation as a counterculture to mass consumption, advocating for individual autonomy and empowerment. Nonetheless, the distinction lies in the fact that the modern maker movement embraced machinery and technology, along with the advantages and possibilities they present (Wooley & Sabiescu, 2015). In the context of the contemporary maker movement, terms such as "crafter", "maker," and "designer-maker" started to be used interchangeably.

The focus of the study is on designer-makers from diverse backgrounds who use craft knowledge and skills to produce unique objects from ceramic and glass that embody both aesthetic and functional purposes for running an enterprise, either alone or with a team.

METHODOLOGY

This research aims to investigate the emergent business models with digitalization in craft-based design enterprises in Istanbul and identify the required competencies to perform them. It also looks into the challenges that might come up with the next-generation technologies. The study was carried out by Özyeğin University as commissioned research for the Kale Design and Art Center's Innovation Project sponsored by the Istanbul Development Agency. The fieldwork was conducted between March and April 2022, and the results were partially reported (Bıyık, 2022).

Qualitative methods are appropriate for this exploratory study; therefore, in-depth interviews and a focus group study were conducted to gather data.

From an empirical perspective, the investigation was conducted by analyzing the business models of 8 craft-based design enterprises that produce table-top objects from ceramic and glass in Istanbul and assessing the required competencies of designer-makers to run their businesses. Two additional interviews were conducted with design ecosystem actors for a better understanding of the business context before and after digitalization. These interviews were conducted with the owner of a pioneering curated shop selling design products and an innovative digital publisher that collaborates with artisans and brands in producing special experiential projects.

The first interviewee was a key informant, a successful designer-maker, the owner of the brand, and the founder of the export-oriented ceramic design studio in Istanbul. The consecutive interviewees were reached by the snowballing technique. The interviewees selected were purposeful and representative, focusing on the following criteria;

- The designer-makers are self-employed or small business owners.
- The designer-makers utilize digital technologies in their enterprises.

Online Journal of Art and Design
volume 13, issue 3, July 2025
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- The stakeholders are a part of the design ecosystem in Istanbul, having commercial and/or marketing relationships with designer-makers.

Table 1 presents the list of interviewees:

Table1. Qualifications of interviewees

Interviewee	Bachelor Degree	Self definition	Position	Products
Respondent 1	Fine Arts - Ceramics and Glass	Designer	Founder of Design Studio	Desktop objects
Respondent 2	Fine Arts - Ceramics and Glass	Ceramic Artist	Owner of Ceramics Atelier	Desktop objects
Respondent 3	Fine Arts - Ceramics and Glass	Designer	Project Manager in Glass Studio	Desktop objects
Respondent 4	Business Administration	Glass Artist	Founder of Glass Studio	Desktop objects
Respondent 5	Foreign Language Teaching - English	Designer Maker	Owner of Brand / Home Atelier	Desktop objects
Respondent 6	Architect - Interior	Publisher	Founder	Projects/ Art & Design
Respondent 7	Architect	Shop owner	Founder	Curated Design Objects
Respondent 8	Fine Arts - Ceramics and Glass	Glass Artist	Owner of Brand / Home Atelier	Desktop objects
Respondent 9	Fine Arts - Ceramics and Glass	Designer Maker	Founder of Ceramic Atelier	Desktop objects
Respondent 10	Engineering Management	Designer	Founder of Brand and Studio	Art and Jewelry

Data collection
The first part of the data collection was conducted through face-to-face, semi-structured interviews with designer-makers and ecosystem stakeholders on their current experience with digital technologies. The interviews were composed of 3 main parts to obtain data about:

- Background of the interviewee: Education, experience, current role in the job, other active participation in design-related organizations.
- How digital technologies changed their business models: The aim was to identify the processes and activities in which the digital technologies were utilized.
- The challenges they faced while founding their businesses and performing their work: The aim was to understand their work environment, relationships, and responsibilities to assess their competencies.

In the second part of the data collection, a focus group meeting was conducted to explore the expectations of the design ecosystem stakeholders on the challenges driven by the next-generation technologies in the marketplace. Six designer-makers (also participants of the first research stage), an academician from the design field, two business leaders from the sector, and a cultural agent attended the focus group study. A presentation was done introducing the next-generation technologies and their foreseen effects on the creative economy, followed by a guided discussion session. The aim was to gather data on the expectations of designer-makers of the upcoming challenges in their businesses driven by new-generation technologies.

Data Analysis
The empirical data from the interviews were analyzed with frameworks from academic literature to answer the first two questions of the study.

To answer the first research question, the 'Holistic Business Model Framework' developed by Li (2020) was utilized. This framework was developed specifically to analyze the impact of digital technologies on business models within the creative industries. Firstly, the business model of each enterprise was systematically analyzed, and the processes and activities where digital technologies were used, and their corresponding component in the holistic business model framework were identified. Then, these changes in the components were coded using one of the three classifications: automation, extension, and transformation (AET), as proposed in the study by Li (2020). Using the analysis results of each enterprise, emergent business model trends were calculated and tabulated.

Online Journal of Art and Design
volume 13, issue 3, July 2025
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Secondly, the interview data was analyzed to evaluate the competency needs of designer-makers, focusing on their education, career backgrounds, current business practices, and challenges in performing their work. As the researcher was a former HR manager, she utilized her former expertise in assessing the competencies. The ESCO classification was used as a reference system and the skills were further categorized into three (soft, technical, and entrepreneurial) following the study by VVA et al (2021) conducted for the European Union.

FINDINGS

1. Digital Technology Usage in Craft-based Design Enterprises

Regarding the first area of inquiry, which was aimed at examining the digital technology usage in the business models of craft-based design enterprises, it was found that digital technologies were frequently used in distribution, marketing, and sales processes rather than in creation and production.

The groundbreaking innovation of 3D printing technology, which gained attention in production, was rarely utilized. Lack of know-how and high usage costs were identified as the reasons for not using this technology (Respondents 1, 2, 3, 4, 5, 8, 9). On the other hand, 3D visualization programs (Render, etc.) that offer solutions for the conceptualization phase were frequently used by designer-makers.

It was observed that the pandemic served as a catalyst for enterprises to embrace digital technologies in reaching customers and maintaining sales. The most common digital tools utilized for these ends were websites, social media accounts, and e-commerce platforms. Instagram was identified as the most prominent social media platform. Shopier links, yet another digital tool, was recognized as the main facilitator for ordering and sales through Instagram accounts. The second most popular digital tool for communication was e-mail, followed by direct messaging on Instagram. It was mentioned that email was preferred for customer relations due to its legal significance.

Concerning the marketing and promotion processes, digital images and 'in the making' videos were identified as crucial tools for increasing the perceived value of products in digital channels. It was found that 'in the making' videos were particularly utilized for limited edition series targeting high-income consumers by showcasing the production process or specific product details. In addition, these videos were recognized as creating additional value for the enterprise by promoting the capabilities of designer-makers. It was observed that these videos were shared with customers via the brand's digital communication platforms (website, YouTube, Instagram, Facebook) as well as with suppliers or stakeholders during the development phase of special projects.

Concerning intellectual property rights, it was found that all examined craft-based design enterprises possessed registered trademarks, but most lacked design registration certificates for their products due to burdensome material obligations and bureaucratic processes. On the other hand, it was seen that Respondent 4 pursued design registration certificates for all the products despite the challenges since she recognized the potential benefits of communicating product uniqueness and brand value. It was observed that the increase in the number of new makers entering the market was creating pressure on the existing ones as the competition increased. It was seen that the ethical values and community ethos, which were recognized as social norms preventing the copying of designs, were losing their ground. It was also observed that the difficulties in registering and protecting original designs were also affecting the collaborations between designer-makers and artisans. Trust was mentioned as the crucial

Online Journal of Art and Design
volume 13, issue 3, July 2025
DOI: https://doi.org/10.30935/ojad/2513043

factor in these collaborations, and the artisan was often positioned as a team member responsible for production rather than an equal partner in creation (Respondent 1, 3, 4).

Analyzing the digital technology usage in each craft-based design enterprise and identifying the corresponding business model component, the changes in the business models were codified utilizing the AET (Automation, extension, or transformation) classification proposed by Li (2020). The table below was prepared to present the changes in the business models of the seven examined enterprises.

Table 2. How digital technologies change business models in design-oriented craft businesses

	Automation	Extend	Transform
Value Proposition			
Product offering	0	0	0
Market segment	0	7	0
Revenue model	0	7	0
Value Architecture			
Value sensing	0	7	0
Value creation	0	7	0
Value Distribution	0	7	0
Value capture	0	7	0
Functional Architecture			
Product innovation	0	7	0
Infrastructure management	0	2	1
Customer relations management	0	6	1

As can be seen from Table 2, it is found that digital technologies were predominantly used to expand the existing components of the business models, which means keeping the traditional processes and activities and supplementing them with new processes utilizing digital technologies.

In only one enterprise (Respondent 9), digital technologies were utilized to transform the traditional business model, replacing the old processes. In this case, digitization departed the designer-maker from the traditional business model, which involved marketing and selling a specific range of products based on the existing stock. In the new business model, each product batch, having fresh designs and seasonal colors, was presented weekly through social media, employing a pre-scheduled plan. The available products for sale on the website were updated weekly, creating pressure on the customers to purchase, since they may not find the unique product on the site if they wait too long after seeing it on social media. This strategy, reminiscent of the "fast fashion" concept in the clothing industry, has now been applied to the production of ceramic desktop items. This change was achieved primarily by altering the functional structure of the business model, restructuring the production, order receipt, distribution, and sales processes. The online order receipt, sales, and distribution of products have been coordinated according to a specific schedule that is communicated to customers through social media. The readiness of products for sale has been announced through live ‘kiln-opening’ videos on the Instagram account. This approach has turned the ordering and distribution schedule into a celebratory event rather than a rigid guideline. Social media served as an active marketing tool, enhancing the connection with customers and increasing brand

Online Journal of Art and Design
volume 13, issue 3, July 2025
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value. This strategy improved the interaction between the product and the customer, elevating the overall experience provided by the brand and transforming the entire value framework of the business model.

2. Competency Needs of Designer Makers

Regarding the second area of inquiry, which aimed at identifying the competency needs of designer-makers, a total of 28 competencies were assessed, and they were categorized under three main groups: soft skills, technical skills, and entrepreneurial/managerial skills.

The most noticeable competency need of designer-makers was identified as entrepreneurial and managerial skills. It was observed that designer-makers must adopt many roles to oversee the entire value chain from production to sales, encountering significant obstacles related to business and interpersonal skills, particularly when working independently or in small teams. Interestingly, it was observed that this group of skills was not gained through bachelor's degrees received from either the Fine Arts Faculty's Ceramic and Glass or Industrial Design departments. It was also seen that the designer-makers' knowledge of business management significantly impacted the growth and international expansion of their businesses. Thus, Respondent 4, who was a graduate of Management Science and a former businesswoman, was the founder of the most active enterprise in the international project networks. In the rest of the cases, it was observed that financial and emotional challenges were faced by designer-makers lacking entrepreneurial and managerial skills, which in some cases ended in market withdrawal. On the other hand, it is also found that resilient and passionate designer-makers acquire those skills either by receiving training or through practice in real life (Respondents 1, 5, 8, 9).

"Until today, I have learned everything by falling and getting up. I had many unsuccessful experiences… Once, I had one or two prototype products and went to a luxury retail store to ask if they would sell them. They said OK! … But I couldn't get into the branding process, so I couldn't contact them again… that work stopped there… I lost my confidence… They told me to send them information… what should I send? I have no brand name, no pricing list… I was so inexperienced… but I had goals, therefore, I did not give up." Respondent 9.

Foreign language proficiency, particularly in English, was identified as crucial for designer-makers aiming for global expansion. The utilization of English alongside Turkish on social media and websites was found to be essential for attracting tourists and international users. Furthermore, the necessity of foreign language proficiency was highlighted for facilitating collaborations at international fairs (Respondents 1, 4, 5, 9).

It was observed that utilizing digital technologies enabled craft-based design enterprises to open up to new domestic and international markets (Respondents 1, 2, 4, 9). It was also found that the increase in sales channels led to an increase in sales, corresponding to an increase in production volumes. The observed sales channels were private showroom sales, private online sales, sales through consignment in curated design shops, retail sales in luxury and department stores, museum store sales, e-commerce platform sales, and sales through special productions for domestic and export customers. The necessary competencies to manage this growth were identified as team management, organization and time management, conflict management, project management, e-commerce for export, customer relations, and problem-solving skills. The most important skill needed was identified as business management, which included formulating new business models for each sales channel and assembling and managing the team to realize the potential business projects (Respondents 1, 2, 4, 8, 9, 10).

Online Journal of Art and Design
volume 13, issue 3, July 2025
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Another crucial competency to manage growth was identified as proficiency in pricing and profitability calculations since it was essential for entrepreneurs navigating the complexities of multiple sales channels and business models (Respondents 1, 2, 3, 4, 7, 8, 9). It was seen that maintaining price consistency through the sales channels was also found important since the consumers often cross-check prices on Instagram, websites, and curated shops before deciding on the channel to buy the product (Respondent 1,7). It was observed that designer-makers earned low profits from museum sales stores, particularly for consignment products (Respondents 8, 9, 10). However, these sales were viewed as a PR expense, considering the positive impact added to their brand value.

The next critical competency needed was identified as marketing and packaging (Respondents 1, 4, 7, 9). Before the emergence of social media and e-commerce, consignment stores were the dominant sales channel, and the salespeople of the stores were engaging in proactive marketing and packaging strategies. It was observed that marketing and packaging emerged as additional responsibilities of designer-makers as they adapted to the new digital marketing and sales channels. It was found that designer-makers without prior experience found it difficult to select customized packaging and distribution channels that respond to diverse market demands and consumer expectations. Consequently, marketing, digital marketing, and packaging were recognized as essential competencies.

Legal literacy was identified as a crucial skill for designer entrepreneurs seeking to manage their businesses and maintain financial stability (Respondents 1, 2, 4, 7, 8, 9). Commercial contracts were recognized as the typical mechanism for securing large orders from corporations and retailers. Consequently, entrepreneurs needed legal literacy to confidently create these contracts, clearly define responsibilities, and resolve any resulting disputes. This understanding of legal matters was also deemed essential for successful collaborations during international trade shows, where export opportunities could arise. Finally, it was observed that practical experience gained through working with domestic corporations on large-scale sales could provide a valuable avenue for developing this necessary skill. The summary of the competency requirements is presented in the Table 3.

Table 3. Competency requirements of designer-makers

Soft Skills	**Technical Skills**	**Entrepreneurial/Managerial Skills**
Teamwork	IT and new technologies	Marketing
Problem-solving skills	Foreign language (English)	Digital Marketing
Communication and interpersonal skills	Ability to speak common language with artisans	Shop presentation skills and merchandising
Proactivity		Packaging
Organization and time management		Business management and planning
Being passionate		Customer orientation
Emotional intelligence and social skills		Networking
Conflict resolution		Knowledge of basic business law
Team management		Project management and monitoring
Flexibility to adapt to the changing environment		New business models
		Accounting
		Cost calculation
		Budgeting
		Basic financial literacy
		Ability to use and exploit e-commerce (export)

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3. Expected Challenges through Next-Generation Technologies

Regarding the projected impact of next-generation technologies on their businesses, it was observed that designer-makers were insecure about the blurred lines between the physical and digital worlds. Participants of the focus group study expressed particular uncertainty about the potential benefits and applications of NFTs within their field, given the tangible nature of their craft. Likewise, it was seen that designer-makers were unable to perceive the integration pathways of these technologies into current business models.

"They come and say, "Your designs must be NFTs." However, selling a glass digitally means nothing to me. A design made of glass is a product that changes color and shadow throughout the day and seasons, depending on the environment, the objects next to it, the reflection of the sun, and the light in the room. No one can replicate that in a digital environment; that's one aspect. The other aspect is ownership and having a certificate for it. I don't need such a thing; I already signed the designs I physically made. I don't require any other accreditation for that, at least I don't understand it. I grasp digital art; it already exists as a product of that medium. But why should I transfer a glass object to that medium? I don't think it holds any meaning for craft' Respondent 4.

In the focus group study, it was observed that the designer-makers need to develop enhanced skills to capitalize on emerging business opportunities presented by next-generation technologies. Participants expressed a desire for training opportunities to effectively utilize and implement these technologies.

RESULTS AND DISCUSSION

1. Emerging Business Models in Craft-based Design Enterprises

The pace of digitization encouraged entrepreneurs to rethink their business models. Designer-makers who chose to maintain both online and face-to-face sales expanded their existing business models through digital technologies. Analyzing the emergent business models of craft-based design enterprises, the following three trends were identified:

1.1. Reaching out to New Customers – in Domestic and Foreign Markets - Who are Willing to Pay a Premium Price for Distinctive Designer Products.

The customers of craft-based design enterprises producing ceramic and glass desktop objects are mainly women with high incomes, tourists, and corporations seeking specialized products for awards and gifts. The preference for these products stems from their limited production, unique designs, and handcrafted nature that impart a sense of distinctiveness. Indeed Mazanti (2011) claims that craft is employed to provide utilitarian things with an aura of authenticity through the 'feel' and 'the hand' and 'time investment'.

Digital technologies have provided creative industries with the opportunity to offer products and services with 'exclusivity' value through *personalization* applied in various components of the business model (Li, 2020, p. 6). Li (2020) also highlights that one of the main objectives of new business models focused on personalization in terms of product offering is to attract customers who are ready to pay extra for exclusive products and services. By their very nature, craft-based design products embody this exclusivity value from their distinctiveness. The preference of customers for handcrafted, limited-edition design products over mass-produced items is rooted in this exclusivity value.

A significant opportunity provided by digital technologies to craft-based designers is the potential to reach customers, both domestically and internationally, who are willing to pay a premium for distinctive products without intermediaries. The traditional business model, which typically involves limited interactions through face-to-face meetings and intermediaries, has

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been transformed by digital technologies into limitless online interactions ranging from communication to marketing and from project planning to sales. The ability of "designer-makers" to sell directly to end customers also positively impacts their profitability.

As an example, Respondent 1 effectively launched a collection that allows for product personalization using digital technologies. She created an online ordering system where customers can choose colors and patterns for their products, enhancing customer engagement and meaning attribution. This innovation expands the business model across product presentation, value architecture, and functional infrastructure components. The new collection was promoted via social media and the brand's website, effectively targeting the desired customer segment through digital channels.

Some enterprises implemented new business models for developing distinctive designs drawing on their existing product portfolio to fulfill the various requests from both local and foreign customers. In the case of Respondent 4, a customer liked the bird figure of the designer-maker on the brand website and requested her to design a chandelier comprised of bird figures for her villa in Manhattan. In the case of Respondent 2, a tourist visiting her studio in Istanbul, after returning to their country requested a unique candlestick made of ceramic for their restaurant in Dubai inspired by her angel artwork. In both of these examples, digital communication tools, particularly modeling and visualization software, and online meetings with customers and suppliers were utilized for the coordination and execution of the projects.

1.2. Revenue and Brand Value Increase through Collaborations (Artists/Brands/Retailers) and Interdisciplinary Projects

Another emerging business model was identified as collaborations, where profitability and brand value increase. In a business case, Respondent 1 and a worldwide famous retail store came together to develop unique design projects. This kind of collaboration is a win-win where the designer-maker reaches a wider customer base and the retailer extends the product range with unique products for market niches. Retailers with high brand value have a prestige-enhancing effect, especially for new entrepreneurs. Through joint marketing communications conducted on online channels, particularly social media, both brands and designer-makers enhance their brand values. This business model of co-creation of value is also favored by museum shops for selling souvenirs or jewelry specifically designed for unique exhibitions (Respondents 1, 4, 8, 9, 10).

Partnerships in e-commerce platforms that showcase distinctive design products were identified as another emergent business model. An example of this trend is a notable e-commerce platform that connects architects, interior designers, and designer-makers through a digital platform that enables architects and designers to digitally prepare and present their projects, including the products by designer-makers in 2D and 3D formats (Respondent 7). The platform also includes the dimensions and the prices of the products, enabling the end-customer of the project to purchase the designer products. This business model enhanced the collaboration among creative professionals and provided design makers with opportunities to engage with other industry members and reach end customers. Overall, digital technologies facilitated the cumulative value creation within the creative industries ecosystem.

Another example of this trend is Respondent 6, who collaborated with consumer brands and designer-makers on a joint initiative to develop unique experiential initiatives. The initiative began with a concept created by the digital publisher, which is built on the collected data regarding the visions, core values, and future objectives of the brands and designer-makers via online communication platforms. After analyzing the common values and objectives, he subsequently developed a preliminary proposal grounded in the concept. He subsequently

disseminated the project across all relevant parties to actualize the idea, allowing any requisite adjustments during discussions. This collaboration allowed "designer-makers" to produce unique artworks while brands improved their image through promotional and public relations activities associated with the project. The publisher's initiative created a network that promoted creativity among all members by enabling the creation of innovative and distinctive productions. As a result, all parties gained from enhanced brand perception and increased profitability. Endorsing multidisciplinary projects is essential for the ecosystem since they have the potential to revolutionize the conventional perspective on craft production.

2. Designer-maker Becomes an Entrepreneur and a Manager to Operate in Global Project Networks and Collaborate with Artisans for Production

Digital technologies enabled designer-makers to connect with customers and business partners for new design projects, benefiting those who have developed successful business models and well-structured teams. It was found that custom-made design projects significantly contributed to revenue growth, while this emerging business model necessitated a team and a project network based on partnerships. Following this trend, designers began their careers as freelancers and gradually evolved into "designer-makers" who founded their small businesses. As the number of personnel and responsibilities increased the "designer-maker" needed to move into a managerial role, prioritizing leadership and the effective execution of the business model over direct involvement in the creation process.

In this context, the collaboration between designers and artisans was observed as a noteworthy area. The artisan network in Istanbul offered significant opportunities for designers to become entrepreneurs without establishing their workshops. This partnership created a win-win relationship for both designers and artisans in terms of increasing functions and task sharing. Indeed, working with a designer enabled artisans to better adapt to both technology and changing market conditions. However, it was observed that young designers increasingly prefer to work in the UX design field and this trend was recognized as one of the barriers to this valuable collaboration (Respondent 3). The loss of essential production capabilities and specialized skills was identified as the consequence of the combination of challenges associated with master-apprentice relationships within the craft sector, as well as the reported decline in designers' engagement with the production processes. Additionally, the designers interviewed reported a substantial decline in the number of glassblowers in Istanbul. This dual trend highlighted a critical concern for the sustainability of related industries and the preservation of traditional craft practices.

3. Tomorrow with the Next Generation Technologies: The Rise of the Immaterial

It was observed that designer-makers struggled to envision how their tangible products would integrate into a more abstract digital environment. One of the reasons for this was identified as the veneration of the materials of designer-makers since the tangible outcome of the crafting process is seen as a fundamental proficiency in ceramic and glass craftsmanship. Correspondingly, it was recognized that the focus on tangible elements and the production process clouded the minds of the "designer-makers" when assessing the abstract value of their products and the value of design in a digital environment. It was observed that artisans necessitated to acquire new competencies to utilize digital technologies, especially in the conceptualization and production phases. Likewise, it was observed that designers necessitate the material knowledge to ensure that a product designed with digital technologies could actually be produced. Therefore, it was foreseen that the competency gap would increase since the interaction between these two sets of knowledge would be essential in the context of new-generation digital technologies.

The retail sector is expected to be one of the pioneering sectors to adopt new-generation technologies. In this respect, it can be predicted that digital technologies will predominantly enhance or revolutionize business models in marketing, distribution, and sales, as they presently do. Blockchain technology promises to address the problems faced by creators in the field of intellectual property. However, the definition of legal processes and the establishment of effective frameworks through use scenarios have not yet been completed globally. Indeed, the entrepreneurs interviewed expressed a need for information regarding the use of new-generation technologies. In the same way, blockchain technology was observed as another vague topic for the designer-makers, since it was essential to establish a digital representation of the product to utilize the technology. They indicated that they would observe the attitudes and pioneering projects of leading organizations in the sector before implementing these technologies in their businesses.

CONCLUSION

This paper contributes to the understanding of how digital technologies affect the craft and design sectors and the emergent competency needs driven by these changes. As Istanbul holds an operating craft sector and a high number of designers, it portrays a valuable field to explore the questions of the study.

The study indicates that certain enterprises have effectively penetrated external markets by promoting collaboration between designers and artisans, where the designer becomes a manager and an entrepreneur. A primary problem recognized is the need to establish a common language among designers and artisans for efficient collaboration. If ambitious designers do not acquire this skill at university, they must obtain it through practical experience with artisans early in their careers. Revising university curricula to incorporate this common language and entrepreneurial competencies may facilitate the development of new enterprises centered on craftsmanship, design, and digital technology. The opportunity to reach international customers primarily begins with participation in trade fairs and evolves through collaborative opportunities. On the other hand, participating in major international fairs such as Maison Object can be financially challenging for designer-makers. Support in this area is crucial for designers in Istanbul to evaluate their export potential and expand internationally. Another important area to consider for policy intervention is blockchain technology. Universities, the private sector, and policymakers responsible for local blockchain application frameworks must consider the requirements of small businesses. This approach will enhance the inclusivity of their policies and offer essential support in achieving the technological solutions that safeguard the value of entrepreneurs' unique innovations. More research is needed to cover all the sectors of craft-based design in Istanbul to provide a holistic picture of the design and craft interaction.

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