Constructing a Service Innovation Model for Creative Industrial Parks

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Abstract
This study sought to identify the important constructs associated with service innovation and elucidate the role of information and communication technology in the innovation management. These phenomena are examined from the perspectives of technology as well as soft innovation. A review of the literature related to service innovation, cultural production, and service systems led to the development of a novel service innovation model designed specifically for creative industrial parks. The Cultural and Creative Industrial park at National Taiwan University of Arts and the Gold Ecological Park were used as case studies to illustrate the applicability of the proposed framework. This approach can be used to promote new service concepts, new client interfaces, new service delivery systems, technological options, etc. Especially the new service transformation systems is a process linking the other four constructs to improve organization development, creative sub-systems and communication sub-systems, so as to create value for the customer.

Keywords: Service innovation, ICTs, Case study, Innovation management, Creative industrial park
1. Introduction

Growth in the service industry has prompted researchers to examine trends in service innovation. This has included the driving forces of innovation, models, strategies, and organizations (Gallouj and Sundbo, 1998). However, with the advent of the internet and web-based services and growth in high-technology environmental services, knowledge-intensive business services (KIBS) are taking a proactive role leading the economy (Wei, 2004). Service-dominant logic and service science are useful frameworks emphasizing the service perspective of innovation (Michel et al., 2008). Moreover, non-technological service innovation is an emerging issue in innovation studies (Gallouj, 2002). Innovation must be viewed in a broader technological context in which social dimensions are also considered (Edvardsson et al., 2000; Gustafsson and Johnson, 2003).

Culture has become an important source of economic growth and job creation, particularly within advanced urban economies (Pratt, 1997; Kloosterman, 2004; Currid, 2007a, b). This has raised questions as to the objectification of culture for economic purposes, particularly as the policy discourse around creative industries shifts from a cultural to an innovational perspective (Garnham, 2005). Creative industrial park as a creative industry space carrier, rising accompanied with the development of creative industries (Yang et al., 2011). Creative industrial park has apparent feature of area choice. In the background of globalization, location selection of creative industrial park appeared two big trends which is concentration in big city and globalization spread (Scott, 2005). In foreign scholars perspective who mainly study creative industry park from the aspect of location factor, creative industrial park tend to formed in the city or region having good environment, perfect public services, convenient transport, low barriers to entry and leisure function (Hutton, 2000; Howkins, 2001; Hartley, 2005; Doris et al., 2006; Keane, 2010). Research on creative industrial park in Taiwan deals mostly with the utilization of vacant space, operational management, marketing activities, formation and transformation park zoning, industry selection and assessment, and the local creative industries. Little attention is paid to the need for innovation in the provision of services in creative industrial parks (Chiu and Chu, 2010).

This paper addresses the non-technological dimensions of service innovation. Despite its enormous importance, there is a lack of research into the “soft side” of service innovation, and the goal of this paper is to compensate for this deficit. The term “soft” refers to innovation that is specifically related to people and organizations, markets and relationships, knowledge and integration, and meanings and experiences (Roberta & Marco, 2010). These are established dimensions that are crucial to nurturing sustainable competitive advantage. This study examined the dimensions of service innovations that are necessary for the further development of a creative industrial park by analyzing the progress of innovation activities and exploring value transformation and value repositioning from a service science point of view. We examined service innovation at the firm level within a creative industrial park in Taiwan, and it is from these observations that we propose a service innovation model for creative industrial parks. We also analyzed the impact of information and communications technologies on service innovation activities. We attempted to fill gaps in the existing literature by answering the following questions: 1) How do information and communication technologies (ICTs) impact service innovation activities; and 2) What are the soft innovations in the proposed service innovation model?

2. Theoretical Background

2.1 Connotation of service innovation

Service innovation can generally be divided into product innovation, process innovation, transfer innovation, market innovation, technological innovation, organizational innovation, structural innovation, and specialization innovation (Yu and Lei, 2005). Product innovation, process innovation, and transfer innovation are closely
related to developments in technological innovation; other forms of innovation, such as organizational innovation, structural innovation, and specialization innovation, tend to be non-technical in nature. This article holds that innovative service implies the following: the application of new ideas and new technologies to reform existing services, improve service quality and efficiency, create new value for customers, and ultimately enhance competitive advantage. Recent researchers have focused on the integration (Gadrey and Gallouj, 1998; Gallouj, 2002) of technology with other aspects of innovation. This approach is a synthesis of prior approaches (Coombs and Miles, 2000) intended to overcome the traditional dichotomy between manufacturing and services (Sundbo and Gallouj, 2000). Thus, innovation is no longer restricted to the adoption of new technologies, but must instead be viewed as the creative application of technology in order to interpret the market or integrate the knowledge of supply chains (Tether and Metcalfe, 2003).

2.2 Models of service innovation
The growing importance of the service sector has led to the development of numerous models for service innovation. Bilderbeek et al. (1998) presented a model based on the following four dimensions: new service concepts, new client interface, new service delivery system, and technological options. The aim was to expand the applicability of innovation within the services industry, describe the content of service innovation, and provide guidance regarding the development of new services as a framework for the development of new products in service-related enterprises. In addition, several recent theoretical and multidisciplinary developments have shed new light on service innovation with an emphasis on culture and organization (Normann, 2001; Kandampully, 2002; de Jong and Vermeulen, 2003; de Vries, 2006), experience (Pine and Gilmore, 1999; Schmitt, 1999), the integration of customer knowledge in the process of value creation (Preissl, 2000; Prahalad and Ramaswamy, 2004; Zeithaml et al., 2006; Edvardsson et al., 2007; Gro¨nroos, 2007), and relationships and networks among organizations (van der Aa and Elfring, 2002; Gummesson, 2004; Love and Mansury, 2007; Tether and Tajar, 2008). This study sought to integrate the above-mentioned dimensions within a single model.

2.3 Cultural production system
Cultural production is the process by which cultural products (including goods, artifacts, visual and experiential objects, services, and art forms) are created, transformed, and diffused into the constitution of consumer culture (Lin, 2009; Lash and Urry, 1994/ 2002). A central premise of the cultural production process is that culture itself is constructed and negotiated by cultural actors (producers, intermediaries, consumers) through an interplay of symbolic and sensory modes of experience and the concomitant meaning systems in which the cultural actors are engaged (Venkatesh, Alladi and Laurie A. Meamber, 2006). According to the models set forth by Joy (1998, 2000), Kozinets (2001), McCracken (1988), and Solomon (1988), individuals and organizations involved in the production and diffusion of the arts contribute to the creation of symbolic meaning and the transfer of these meanings to cultural products. Solomon (2003: 558–9) outlined a conceptualization of the cultural production system (Figure 1). According to Solomon (2003), the set of individuals and organizations that create and market a cultural product constitute a cultural production system. The cultural production and distribution process entails relationships among a complex network of organizations that both facilitate and regulate the innovation process (Hirsch, 1972). A creative industry comprises all of the organizations engaged in the process of filtering new ideas as they flow from the creative subsystem to the managerial subsystem, communications subsystem, cultural gatekeepers, and finally to consumers. The creative subsystem is responsible for generating new
symbols or ideas. The managerial subsystem is responsible for selecting new ideas, making them tangible, mass producing these ideas, and then managing their distribution. The communications subsystem is responsible for imbuing the new ideas with meaning and providing them with sets of symbolic attributes that are communicated to consumers. Finally, cultural gatekeepers are responsible for filtering the overflow of information and materials intended for consumers (Solomon et al., 2002; Parsons, 1960; Solomon, 1988).

2.4 Service system

Creative industries differ from most other industries, in that their products are primarily intended to provoke particular responses from users. To varying degrees, these products enable experiences to be co-produced in tandem with consumers (Miles and Green, 2008). Thus, this study sought to determine how theorizing about service systems could contribute to an understanding of developments in a creative industrial park. Service innovation is concerned with changes in service systems (Spohrer and Maglio, 2008). A service system can be considered a value co-creation configuration (Maglio and Spohrer, 2008) or array of resources (including people, technology, organizations and shared information) connected to other systems by value propositions (Spohrer et al., 2007, 2008). Service systems include internal elements (e.g. employees), private systems and resources (friends and stockholders), and market systems and resources (suppliers and other economic exchanges). Suppliers and customers (together with other social and economic actors) create “service systems,” acting as resource integrators on various levels, interacting through the mutual provision of services in order to co-produce (in the upstream value chain) and co-create value (downstream between the customer and the firm) within a “logic of togetherness” (Roberta & Marco, 2010). Value is co-created in service systems when resources are used. The role of the customers is not limited to consumption; customers are active (operant) resources in the value creation process and co-creators of value.
3. Model Development

3.1 Method

The purpose of this research was to identify important constructs in service innovation and elucidate the role of information and communications technology (ICT) in the management of innovation-related activities. We compiled research on innovative service models ranging from the more traditional technology model to modern service innovation models as well as the more recent integration model (Gallouj & Weinstein, 1997). Integrating the concepts found in a range of studies related to service innovation, cultural production systems, and service systems enabled the development of a service innovation model specifically for creative industries. In-depth interviews and secondary data analysis were used to assess the impact of ICTs on a creative industrial park at The Cultural and Creative Industrial park at NTUA (National Taiwan University of Arts) and the Gold Ecological Park in New Taipei City. Two of the interviewers were industry experts with more than 15 years of experience working in information technology. The other three interviewers were teachers in the College of Design at NTUA, or staff in the Gold Ecological Park. Building on these conceptual and theoretical roots made it possible to develop the framework for a service innovation model in creative industrial parks. To be useful, such a framework would have to be simple, logical, comprehensive, and operationally meaningful. In seeking to generalize, extant perspectives tend to oversimplify models. The challenge is to produce a framework that is applicable to firms in general but which serves the needs of the individual enterprises. Accordingly, the framework becomes a customizable tool enabling enterprises to focus on value creation through service innovation. In the cross-case analysis below, the insights that emerged from each of the cases were compared with those from other cases to identify emerging patterns and themes (Eisenhardt & Graebner, 2007). To refine our understanding, similarities and differences between cases were noted and further analyzed by revisiting the data. Graphs were used to map out levels of constructs and tables were employed to compare several constructs simultaneously (Miles & Huberman, 1994).

3.2 Constructing a conceptual model

The proposed conceptual model of service innovation in creative industrial parks was used to map the following dimensions: new service concepts (den Hertog, 2000; Mile & Green, 2007; etc.), new client interfaces (Bouder-Pailer, 1999; Caves, 2000; den Hertog, 2000; Goss, 2009; Holbrook, 2004; Venkatesh & Meamber, 2006; Mile & Green, 2007), new service delivery mechanisms (Burns & Stalker, 1971; den Hertog, 2000; Houben, 2003; Mile & Green, 2007), technological options (den Hertog, 2000; Mile & Green, 2007; etc.), and new services transformation systems. The five dimensions relate to the characteristics of existing and competing services (business intelligence); the characteristics of actual and potential clients (market intelligence); the relationships among actors, co-production, and the transformation of new services (management intelligence); the capabilities, skills, and attitudes of firms with regard to service workers (human resource management); and the availability of technological options (technological intelligence). These five dimensions are discussed below and illustrated in Figure 2.

We added a fifth construct from the New Services Transformation System for the following reasons. The new services transformation system considers the means by which the producers of cultural products, cultural intermediaries, and consumers of culture interact and collaborate to produce symbolic meaning. These actors operate within the domain of art and aesthetics within a consumer culture. It is through service subsystems (production and consumption processes) and networks in the creative industry that aesthetic symbols, meanings, and creativity are integrated. Communication subsystems direct marketing communications to cultural
gatekeepers (such as the media, formal gatekeepers, and opinion leaders) and foreign networks. The subsystem eventually transforms these offerings into new services through co-production in conjunction with the above-mentioned actors. In a creative subsystem, aesthetic symbols attached to the cultural product operate as a code or language that contributes to the understanding of meaning. The meaning system includes abstract ideas, values and ethics, and material objects and services that are produced or valued by a group of people (Solomon, 2003). In the ultimate analysis, this meaning system is the sum of shared meanings, rituals, norms, and traditions among people (Geertz, 1973). The goods derived from creative industries have an aesthetic or semiotic content (Scott, 2000). They have “an influence on our understanding of the world,” “drawing on and helping to constitute our inner, private lives and our public selves” (Hesmondhalgh 2007: 3).

4. Case Study and Analysis

4.1 Background

The Cultural and Creative Industry Park was established by NTUA in the Fu-Jhou suburb of Banciao District in New Taipei City, a ten minute walk from the main campus. Four crafts-related companies are incorporated in the Innovation and Incubation Center of NTUA. Ceramic and metal studios provide workshops for hands-on experience using a range of materials, including ceramics, glass, metals, and fabrics. The goal of the Cultural and Creative Industry Park is to combine artistic craftsmanship with service design and economics. To accomplish the goal, NTUA initiated the “ABCDE Plan”, which refers to the process of transforming turn “Art” into “Business,” through “Creativity” and “Design” (Lin, 2007, 2009, 2010), allowing creative products to be transformed into “E-business” (Fig. 3). Three divisions have been established: Our Museum, Our Studio, and

![Five-dimension model of service innovation](image-url)
Our Factory. NTUA has also used E-business ICTs to integrate design, culture, artistic craftsmanship, creativity, service innovation, and customer preferences within the Cultural and Creative Industry Park. The Gold Ecological Park is located in the “mountain town” of Jinguashi, in Reuifang district, New Taipei City. This area has rich historical, cultural, and natural resources. This was the first public museum in Taiwan to combine site preservation and the living environment with museum operations. Unlike most museums, which limit activities and operation to clearly defined goals, the Gold Ecological Park is a museum comprising the living environment and historical stories with no boundaries between the museum park and the local community. Because the boundaries between the museum and the community are not clearly defined, the museum management has bi-monthly meetings with community leaders, along with an annual “open meeting” in which all community members can participate, so that the museum can run smoothly and the residents can influence daily operations. The Gold Ecological Park emphasizes the importance of objects naturally occurring within the environment. From the service innovation perspective, the aim is to provide visitors with experiences related to the living stories of the local people, nature, and the landscape. In this way, visitors may be able to be refreshed both mentally and physically.

Fig. 3 Concept of the E-business model

4.2 Demonstration of Five-dimension Model
In the following, we present the five dimensions believed to be the most helpful in describing service innovations. This model has not been statistically tested and should therefore only be viewed as a tool with which to map and characterize a range of service innovations.

1) New Service Concept. The first stage of the ABCDE plan involved the establishment of an art museum in 2007, known as Our Museum. The aim was to link professional teaching with the research, education, and the display functions normally associated with museums. In the Gold Ecological Park, a number of professionals proposed the idea of combining site preservation with local development, in which cultural and natural heritage could be better preserved as a “museum park”, rather than as a “museum”. Thus was born the concept of an
“eco-museum” which then served as the inspiration for all subsequent planning. The term “ecological park” was adopted later.

2) New Client Interfaces. To cope with the challenging environment of creative industries, NTUA sought to develop regional and international networks by operating a creative industry park, known as Our Factory, serving as a link between Art and Business. The use of this client interface enables companies in crafts, metals, and ceramics to be incorporated into the Innovation and Incubation Center of NTUA. While establishing the Gold Ecological Museum Park involved the coordination of the Taiwan Power Company, Taiwan Sugar Company, and the museum team by the New Taipei City government. Museum staff visited influential local leaders to establish relationships and interviewed them to obtain suggestions for further development.

3) New Service Delivery System/ Organization. Developing craftsmanship and creativity as well as competency related to the arts are a strategic goal of NTUA. Thus, a design studio, known as Our Studio, was established at the College of Design in NTUA to promote the creation of innovative craft products. The college strongly emphasizes human resource management, including improving the capabilities and attitudes of students and craft workers. All departments of the city government cooperated in implementing the Gold Ecological Park under the supervision of the magistrate. Official city-based meetings were also held regularly to overcome problems including the planning of transportation in the area, marketing strategies, communication with companies, responses from local inhabitants, and financial difficulties.

4) New Technological Options. Technology plays an important role in facilitating various forms of innovation. Creativity and business are the elements used to reach aesthetic economy, similar to the often-used concept of “Think Globally- Act Locally.” These elements process the digital archive of Our Museum through the creative projects of Our Studio, to produce creative products in Our Factory. The use of ICT channels enables participants to reach new factories, create new experiences for consumers, and provide a co-production platform for designers and consumers. Most of the firms in the NTUA Cultural and Creative Industry Park and the Environmental Educational Center of the Gold Ecological Park have been made more effective through the application of technology-related techniques, such as providing online access to art and knowledge databases as well as downloadable and streamed multimedia content (audio, video, podcasts), virtual museums, QR-code attachments for products, firm-dedicated websites, and wireless connectivity enabling instant access to information and tools.

5) New Services Transformation System. One example of this system is the establishment of an innovative service operating between NTUA main campus, the NTUA Cultural Creative Industry Park, and the Lin Family Mansion and Garden by the Holiday Cultural Bus Tour in conjunction with the city government. The aim is to promote the creative development of Banciao District, where the university is located. After visiting The Lin Family Mansion and Garden, tour participants can appreciate the art of Our Museum, experience crafts in Our Studio, and purchase creative products from Our Factory. The purpose is to connect design and culture by blending humanity, creativity, creative products, and technology. In this way, it achieves the aim of promoting service design in public (Heckert & Leder, 2008; Heckert et. al., 2003; Helander & Tham, 2003). Another example is the presentation of the Corporate Identity System of the Gold Ecological Park, where ecological
characteristics are illustrated in the impressionistic rendering of Mount Teapot. The revolving calligraphic letter “G” stands for: “Gold” and “Green”, representing the commitment to ecological tourism, researching natural resources, preserving ecological landscapes, and popularizing environmental education. It is hoped that cultural tourism in the area will also benefit local development. Next two examples illustrate the application of the proposed five-dimension model: 1) A “creative fashion show” at the Cultural Creative Industry Park of NTUA combines aesthetics, creativity, fashion, technology, design, and commercial networks. Government officials, students, teachers, art personnel, and the creative community are involved. Students perform as catwalk models to present the products they created in Our Studio, supervised by professors and co-produced with Our Factory. Students are also given the opportunity to gain experience communicating with potential customers; 2) Annual events of the Gold Ecological Park include The Gold Carnival, and the Festival of Silver Grass. Each summer, the Gold Carnival features the art of goldsmiths. Each autumn, the Festival of Silver Grass deals with eco-tourism and eco-education. During the holidays, more than ten thousand people cluster in the museum park each day.

The new service transformation system links the four constructs to improve organizational development, creative sub-systems, and communication sub-systems to create value for customers. Nonetheless, organizations must be managed and coordinated using appropriate technological tools. These attractions provide good examples of how technological management within an organization can enhance valued co-creation, highlighting the importance of the soft side of innovation, which is oft-neglected in studies of the industry. This approach allows organizations to shift their attention from innovation output to different ways to serve their market better (Vargo and Lusch, 2008).

4.3 The Roles of ICTs in Service Innovation

Although this study focused on non-technological innovation, we do not deny the importance of technology in innovation. It is important to understand the role played by technology in various dimensions of service innovation. In these two cases, technology was used to 1) enhance the effectiveness of strategies, 2) virtually integrate and widen the boundaries of the physical environment, 3) provide a platform for the distribution of information, and 4) promote value co-creation within service system networks. Specifically, the new services transformation system echoes stylistic innovation dealing with two types of changes in creative industry parks: (1) aesthetics and (2) changes in symbolic value expressed through new meaning and the language of products (Tran Yen, 2010).

1) Enhancing the effectiveness of a particular strategy
The elements linking the two cases that embark on the virtualization process at the operational level are quite rich. A client company could show more openness towards potential customers by new technologies, as one interviewer indicated, e.g. interactive gallery maps, dedicated sites, games and play spaces for children and young people; multimedia tours simulation and virtual reality experiences sound, laser and light shows; IMAX presentations and ‘theme-park-like’ attractions; etc.

2) The virtual integration and widening of the physical environment boundaries
The virtual, as we have observed in the digital archive or on the website of two cases, neither substitutes nor opposes the physical environment. It integrates with the real and widens the park’s boundaries, which then open up to the creation and reinterpretation of actual reality. In this sense, we are witnessing concrete manifestations
that stem from ICT and other technology (e.g. virtual museums; wireless connectivity enabling live feeding of information and tools; e-learning etc).

3) Platform for information distribution
Our findings also draw attention more directly to the role that ICT can play in reconfiguring the supply chain structure. From our observations, we find ICT and other technologies play a central role, like a hub or platform, instead of in the industry supply chain structure. It is not just a facilitator to other drivers but also a starting point and link to other constructs for value creation. One of the interviewers stressed, “The CAD, CAI, e-learning systems in the Craft and Design Department are helpful for meeting the industrial demands of delicately designed products. This is especially because the design system can encourage industrial employees to work together with the student designers of NTUA”.

4) Value co-creation with the service systems networks
With the new service transformation system dimension, the customer experience could reflect much more about value integration and transformation, especially when joined with ICTs applications. Any organizations and individuals involved in the service innovation model will contribute to the creation and transfer of creative products or a cultural journey experience. When the new service transformation is positive, it will develop a good client relationship network (e.g. CRM system), where it will integrate the whole service innovation’s process. The new service transformation system can combine and transform creative ideas, technology application and consumer preferences from a global trend website or artwork and knowledge databases/virtual museum into service innovation operational reality.

4.4 Linking Various Dimensions
The individual dimensions of the proposed five-dimension model are interrelated. Naturally, all of the innovative works in a creative industry park are produced through a process involving the above five dimensions. Service innovation can only be achieved consistently through developing each dimension individually and strengthening the connections between them. The proposed service innovation model is connected to five constructs using the following six activities related to value creation.

In practice, connections are forged between the constructs by those who are responsible for marketing, organization development, and distribution. Launching new aesthetic content or service concepts (for existing or new clients) requires marketing expertise (e.g., play spaces for children in the creative industrial park). Similarly, creating a suitable interface with clients, and adapting a service delivery system requires knowledge of how services are distributed (both in terms of where they are produced and of how they are delivered). Below, we briefly introduce three additional activities to forge the pathways between specific dimensions:

1) Service Subsystem Network
The service subsystem network includes internal employees, friends of the employees, and other cultural gatekeepers (e.g. opinion leaders, etc). The pathway emphasizes the opportunity to select people with specific technical capabilities (e.g. craft skill, etc.)to support interactions in an industrial domain. Moreover, it is important that managers and staff possess specific competencies to take an active part in the guidance and advancement of a cultural organization.
2) Creative Subsystem
Creative subsystems are responsible for generating new symbols or ideas. Examples of this pathway include Our Museum in NTUA and the professional workshop at the Gold Ecological Park, where artisans submit their offerings. Social and economic actors (e.g. museum guides, college professors, etc.) play a key role in the transfer of knowledge within the creative subsystem. Our observations illustrate that attention paid to the promotion of creativity from a widespread cultural tradition or cultural origin. The knowledge of many artisans must be combined to generate greater creative activities.

3) Communications Subsystem
The communications subsystem has dual objectives. First, the subsystem strives to make vital processes specific more efficient. Second, it is responsible for giving meaning to new ideas and providing symbolism to increase the added value of their services. In this approach, in which firms are involved in the process of replicating a school’s niche strategy, factory staff, artisans and professors become knowledge integrators, and include the information generated from their interactions with customers.

5. Conclusions
This study combined Bilderbeek’s four-dimension service innovation model with service systems and cultural production systems as well as a fifth “new services transformation system”, which plays an important role in the service innovation model for creative industrial parks. This new service concept is expressed synthetically and supported by factories and organizations, to maintain relationships via a new client interface. Thus, customer experience reflects much more about value integration and transformation, especially when joined with ICT applications. Organizations and individuals involved in the service innovation model contribute to value creation and the transfer of cultural products/services. When the new service transformation is positive, a healthy client relationship is developed, thereby integrating the entire process of service innovation. This paper emphasizes the specificity of each construct, particularly in terms of new service transformation systems and the role of technology. The convergence of cultural production systems and service science was particularly helpful in establishing a basis for systematic service innovation. A competent services transformation system identifies relationships with actors, values co-creation and transforms new services, enhancing management intelligence. We do not only see a new generation of service models but also perceive previous models increasing their efficiency and flexibility. From a service science perspective, the “ABCDE” model involves turning “Art” into “Business,” combined with “Creativity,” “Design,” and “E-business” to transform aesthetic values into commerce through service innovation.

This paper is a starting point for a better understanding of the role played by ICT and soft innovation in redefining service innovation models and the conditions that enable business development. The next step is to provide more in-depth analysis. The proposed framework provides practitioners with a structured approach to manage service innovations in creative industrial parks. Future research efforts could include qualitative as well as quantitative methods to deepen an understanding of the practical implications of the different roles played in service innovation. To improve the generalizability of these findings, the sample size should also be increased with participants from a range of creative industries and locales.
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