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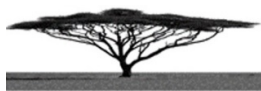
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The Role of Design in Design Intensive Start-ups

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This paper analyzes the role of design in start-ups that focus on design as the primary source of value creation. These “design-intensive start-ups” (DIS) have, to-date, received little attention, in either the entrepreneurial or the design related literature. In particular, our explorative study focuses on how do DIS leverage design in the first years of the venture and suggests that this type of start-ups use design to: transform the meaning of the product/service offered, provide a different socio-cultural narrative of how value can be created, incorporate the social-capital in the value proposition. Implications of these findings are discussed.

Keywords: Entrepreneurship; Design; Transformation; Design Intensive Start-up (DIS)

1 Introduction

The adoption of design and design management processes by both large and small corporations has been widely studied (Ravasi and Lojacono, 2005; Capaldo, 2008; Verganti, 2009; Cautela and Simoni, 2013; Cautela and Zurlo, 2012), particularly in design-intensive sectors, such as furniture and fashion (Cillo and Verona, 2008; Cappetta et al., 2006; Dell’Era and Verganti, 2010). In an “experience economy” domain – intended as a competitive context where the value creation and capturing depends upon the shaping of enticing and performing user experience – the role of design often expanded beyond the technicalities domain to which it was assigned in the past innovation view (Eppinger and Ulrich, 1994). Design has been becoming a lever used by companies and managers to affect the user visceral impression through the product aesthetics or style (Noble and Kumar, 2010); moreover design - constructing the actions required from the user-product interaction - determines the way people use and relate to the product-services (Norman, 2013; You and Chen, 2007); design indeed determines also the “reason-why” people buy products manipulating the “product meaning” (Verganti, 2011; Norman and Verganti, 2014) and the “cultural soul” of the products deeply affecting the “reflective layer” of the overall user experience (Norman, 2013). The diffusion of design practices and the creation of a whole research stream known as “design thinking” (Brown, 2008; Dorst, 2011) – configuring a new reasoning and innovation generating pattern – prompted a piece of managerial literature to introduce design as a new paradigm in innovation

studies (Verganti, 2008). On the other hand the concept of design-driven or design-led innovation (Verganti, 2009; 2011) has been enlarged to refer to the spectrum of innovation not only within the product but also within the overall strategy and business model (Battistella et al., 2012). That is consistent with the view that design is nowadays employed by managers of incumbents as a strategic lever aiming at opening new market opportunities and redefining the competitive rules of industrial sectors (Ravasi and Lojacono, 2005; Verganti, 2011; Capaldo, 2008).

Notwithstanding the lever of design as a strategic weapon and as innovation paradigm mainly remained in the area of management studies, without impacting entrepreneurial studies.

Only some inspirational contributions highlighted how new ventures can thrive by using design, or highlighted how designers – given the emerging conditions of new distributed manufacturing as 3-D printers – become self-entrepreneurs proposing a strong and local based connection between the design and manufacturing phases (Bianchini and Maffei, 2012) and an updated perspective of designer as modern craftsman.

Moreover John Maeda (*Design in Tech*, 2015, 2016) – investigating the complex intertwined relationship between technology and design – is diffusing the idea that design and designers impact new entrepreneurial activities through their visionary and human-impacting proposition of new services and products. As Maeda claims, it is not accidental that in different Unicorns start-ups boards – as Airbnb – there is a designer; or companies as Google and Facebook search and attract talented designers every year; or moreover management consulting companies as McKinsey and Accenture are buying design consulting companies to promote new service bundles for companies and entrepreneurs.

Such signals encourage scholars to focus on new forms of entrepreneurship where design is the core competence that drives the venture creation and development. These new “Design Intensive Startups” (DIS) are characterized by value creation and capturing processes that strongly depend upon the proposition of new meaning based product-services, or new consumptions experiences that recall novel social and cultural messages.

To increase the understanding of this new entrepreneurial category and to analyse the role of design in DIS, we performed an exploratory research based on qualitative case study analysis. The analysis has been run on the Italian Registry of Start-up launched by the Italian government in 2011. Four DIS have been selected and investigated through repeated interviews and the analysis of secondary sources (press, web-site). Three main features have been identified as intrinsic features of all four of the DIS firms we studied. The first feature is connected to a specific way to employ design, to reframe and transform the user experience and thereby to create a comprehensive cultural message with a systemic view of the entire offering and brand touchpoints. Second, each of the four DIS we observed employ a specific business socio-narrative to educate markets, entice users and diffuse cultural values that legitimate and sustain the transformative new meaning proposed for their product/service. Third, each of the four DIS seems to be anchored within a social capital that embodies and reinforces their socio-cultural messages and value context, and to leverage and extend this social capital to make it an integral part of the customer value proposition.

The relevance of this explorative study is both theoretical and practical. From a theoretical perspective, the paper contributes to the entrepreneurship and design literatures pointing scholars attention to features of start-ups yet poorly understood and little studied. From a practical perspective, the paper describes the salient features of an alternative mode of carrying out and developing entrepreneurship. This is of particular relevance because the conditions, ecosystems, funding rules, incubation policies, and supporting services are likely to be specific to the DIS and hence, should be molded on DIS intrinsic features. This paper provides guidance for policy makers and other actors involved in supporting entrepreneurship, to develop and promote the proper conditions for start-ups that leverage design as their main competitive tool.

2. Methods

In order to explore the role of design in Design Intensive Start-up (DIS), we performed an exploratory study consisting of a multiple case studies analysis. We used an inductive method based on the examination of four case studies, to analyse the key characteristics of DIS and to identify how these enterprises leverage design in the first years of their new ventures.

In particular, we used each case to reinforce or disconfirm preliminary insights drawn from the others cases and to build a preliminary model about the peculiar use of design made by these firms. The first step in our research was aimed at confirming the validity of the idea that the DIS exists as a distinct and not uncommon entity. To establish this, we delivered a semi structured questionnaire to 11 prominent scholars in the fields of design, entrepreneurship, innovation management aimed at identifying the key issues related to a start-up that largely grounds its initial business activities on an intense use of design (See Annex A).

Thorough the questionnaire we asked respondents to highlight the key features of start-ups that are built around founders design capabilities selecting among a set of attributes related to: motivation for the start-up formation; use of and reasons for using personal stories; composition of the founder team; source of idea inspiration, genesis and evolution; business model construction logic; customer value creation logic, and user-engagement models. These insights were used as underpinning knowledge in the subsequent steps of our study.

The second step consisted of identifying, screening and selecting four cases to be studied and to be used as primary sources for our inductive research process. We identified the cases using the Italian Start-up Register. This register, launched in 2011, included 2,622 start-ups – as recognized by Italian Government.

A first screening was performed to discard both very young start-ups, i.e. founded later than 2011, and start-ups that lacked a own website.

Among the resulting 211 start-ups we focused in those that possessed at least two of the following three features:

- at least one of the start-up's founder was a designer, architect or artist;
- a user-centred approach was easily recognizable in the solution offered by the start-up (being it a product or a service)¹;
- there was a particular attention paid to aesthetic and/or experiential aspects both in the start-up website and in the start-up's final product or service offering.

As a result of this second step, 38 design-related start-ups were identified. In order to maximize the sampling variety we then selected four cases that addressed different types of markets (business to consumer, business to business and business to government), that delivered different design “artefacts” (from pure product to pure service) and that contemporarily offered the richest bouquet of information, according to an initial desk research performed on each of them.

The selected cases² are: Milan farming (B2C, product/service), Municipality 3.0 (B2G, service), Immersive events (B2B, service), and Safe mooring (B2B, product). Table 1 provides a brief description of the four cases.

¹ A user-centered approached has been identified through the explicit description of the design process contained in the startup website.

² The names attributed to the cases are the result of imagination at the behest of the CEO.

Name	Core business
Milan farming	Online marketplace for genuine and fresh food from local farmers. The start-up selects the best farmers and connects them directly with consumer through its website and home delivery service. Products are always seasonal and genuine as they come directly from the nearest producers. The aim is to build a sustainable network for the delivery of fresh food.
Municipality 3.0	Web-based tool that enables municipalities to receive alerts from concerned citizens regarding current urban problems and to manage their resolution. Citizens can report problems from their smartphones or personal computers and the management platform helps municipality employees to resolve the problems faster and better.
Immersive events	Three-dimensional highly persuasive visual contents, suitable for all types of non-conventional communication. Thanks to continuous testing of new digital languages, the start-up responds to the growing demand for advanced creativity from companies and public entities that organize events based on artistic experimentation for their employees and main stakeholders (sales force, providers, consultants, logistic partners, etc...).
Safe mooring	The start-up's first product, a stopper-fairlead, is especially conceived for owners and captains of both sailing and powered superyachts. It enables safer mooring operations with fewer and less experienced crew.

Table 1: The core business of the four DIS

The third step was the desk and on-field data collection based on both primary and secondary sources.

The desk analysis consisted in the content analysis of:

- start-ups' official websites (primary sources);
- press articles about the start-ups, collected by web search based on keywords (secondary sources).

This exploration was useful to get a preliminary understanding of the start-ups' features, activities, and history, which helped us to better structure and perform the subsequent interviews.

The field activity involved interviewing the start-up founders. The semi-structured interviews focused on seven key topics: motivations and personal stories; founder team formation and composition; idea generation and development; sources of value, user engagement models; business model features; idea diffusion and networking. Questions were intentionally kept open-ended and explorative, as they were aimed at generating discussion around the identified topics.

The interviews were conducted by couples of researchers, with different backgrounds (i.e. architecture/design, sociology and management) to create couples of interviewers with diverse (and competent) points of view over each case. The interviews ranged from one hour to 90 minutes in length. Interviews were recorded and transcribed.

The last step was data analysis that was carried out according to the grounded theory method. First, we performed an in-depth analysis of data coming from interviews, website and press articles. Each researcher highlighted independently “conceptual blocks” that represent start-ups’ features related to the study’s research topic. Only conceptual blocks that were consistent across the four cases were identified as relevant and further analysed. Through an iterative procedure, which requested in some cases to go back to informants, three constructs were assessed as sufficiently relevant and robust. In our view, they represent the key features of DIS related to the role played by design in these types of start-ups. These three main constructs are described in the following section, where they are supported by the most significant quotes from the founder interviews that helped with the identification and the explanation of the constructs.

3. Results

The analysis of the four case studies highlights that DIS use design in three complimentary ways: (a) to transform the meaning of the product/service offered to customers; (b) to provide a different socio-narrative of how the value can be created; (c) to incorporate the start-up social capital in the value proposition .

a) Meaning and user experience transformation

In all four of the start-ups that we studied design played a transformative role, where the user experience is fundamentally changed to the extent that the link between existing and past product-services traits and new products-services is tenuous. From the new user experience it’s thus difficult to retrace features of old user experience.

There are two main transformative types of change or direction that design can influence. The first tries to generate a new fundamentally different product/service meaning that leverages emerging or weak early stage socio-cultural trends. For example, Swatch transformed the watch user’s experience by acting on the visceral side, which changed the meaning of wearing a watch and changed behavior by persuading wearers they needed multiple watches for multiple settings. Similarly, the Nintendo Wii fundamentally changed video game playing behavior to include physical and social activities (Norman and Verganti, 2014).

The second tries to reframe the relationship between the user and the context in which the product/service are experienced. Philips Electronics, for example, developed Ambient Experience for Healthcare, a breakthrough application for reducing the anxiety and stress for patients - and especially for kids - when they undergo medical scans with computed tomography (CT) or magnetic resonance imaging (MRI). By rearranging the lay-out of medical devices, introducing cartoons, video and relaxing images into the room, and using sound and interactive walls, the company fostered a new vision of the user experience.

The design intensive startups that we analyzed performed similar steps that reframed – in a transformative way – the user experience.

Municipality 3.0 conceived a software-based application that allowed citizens to signal problems in the city and helped the municipality’s employees to follow easy procedures and protocols to fix the signaled defaillance. According to the CEO:

“We transformed the citizen-municipality relationship. Since Facebook was born, some municipalities opened their virtual walls but they mostly received complaints and unreliable

messages. With Municipality 3.0 the institution receives specific alerts from an identified citizen, activates an internal procedure of verification and initiates a solution process with the identification of a supervisor. In other words, we help municipalities to offer a satisfying service to citizens”.

Previously, the citizen-municipality relationship was managed with the citizen’s frustration and disappointment in their municipality’s responsiveness. The individual had little guidance on where or how to be a good citizen by informing the municipality of problems that needed to be addressed and the municipality had no effective process for screening ‘complaints’ or moving toward resolution. With Municipality 3.0, the individual has the opportunity to be an active participant in making improvements. More have become involved citizens and the municipality’s problems are addressed quicker and with more efficiency and effectiveness.

On the other hand, *Milan Farming* transformed a routine-based and low-efficiency purchasing process – i.e., that of supermarket shopping – into an e-shopping experience centered on zero-miles products, to emphasize the freshness and seasonality of food, and the environmental sustainability of the farm-to-table process. To do this, they market only the vegetables and fruits available in the agricultural vicinity of the south park of Milan, designing a delivery system, which takes care of all the service aspects: the visual image, the delivery process, the package, and the payment system based on a monthly or yearly subscription. Moreover, they centered the business model on the subscription concept, to create loyalty in the market but also proposing a continuity in the supplying of fresh vegetables and fruit considered as healthy elements at the bottom of the Mediterranean diet. Their experience-centered view of design is expressed by the words of the CEO:

“(Milan farming) takes care of the entire shopping experience: the product is the core of the offer, but the service component is also very important. By service, we mean both the digital component (i.e., website and online selling) and the tangible component (i.e., packaging, product delivery and waste disposal processes). Milan farming thus deals with both the sell-in and sell-out, with the aim of enhancing the total consumer experience. We want our customers to perceive the whole process as a streamlined one that avoids any feeling of waste (...) I have a holistic idea of design, which is connected to the whole user experience and not limited to single details such as the logo, or the button on our website user interface”.

In a similar vein, *Safe Mooring* – a start-up operating in the yacht and boat equipment industry – transformed the mooring experience by reducing the potential dangers related to the mooring operation. Their reasoning was based on the observations that sailing tourism is growing and very few younger skippers have the same sailing capabilities of older sailors. Therefore, their design approach transformed the operations in the cockpit during the mooring process to turn this activity into a safe and ordinary one (without creating anxiety and concern for the – usually inexperienced – crew). According to the words of the CEO, the use of design can be expressed as follows:

“Our bet is innovating a sector which has a high propensity for the simplest combination of technology, design, and security. Indeed, with a distant remote control, now you can manage and overcome situations that so far were managed by experienced sailors’ skills that today are disappearing. (...) The distinctive values of our product are safety and simplicity [...]. The product simplifies the mooring operation and, consequently, makes it safer. On the one hand, it adds the possibility to free the moorings from a distance, therefore a single person can set everything, go the helm with the motors on, free the ropes and leave. This is much appreciated by captains, who otherwise would be forced to hire a guy only to get on, free the ropes, do nothing until they arrive at the next port and repeat the operation again. On the other hand, it is safer because when you have to take hold of the moorings you don’t have a tightening rope in your hands”.

The four start-ups we analyzed thus used design to “re-think” the process that is experienced by the user, allowing for the discovery of a set of “meaning-based needs”. In conceiving their business

space, these start-ups do not refer to the product meanings or cultural messages and symbolic values codified by existing industry players. Rather, they propose product and service meanings and messages that transform the user experience to satisfy a need, a desire, or to “get a job done”. *Milan Farming* proposes a new context and a new form of relationship with consumers to help them to buy fresh fruit and vegetables; *Municipality 3.0* also changes the citizen-municipality relationship to give both parties a new space for exchange; *Safe Mooring* creates a new relaxed and safer meaning of the process of mooring in sailing; and *Immersive events* redesigns business events blending culture, local heritage and new technologies (3D mapping). Table 2 highlights the meaning transformation performed by the four start-ups.

Design intensive Start-up	Old meaning/ user-experience domain	Reframed meaning/ user-experience domain
Milan Farming	Buying fruits and vegetable at supermarket/street market	Buying on-line local last-mile fruits and vegetable through subscription
Municipality 3.0	Signalling public interest issues through the municipality social media	Activating ad hoc procedures to check and solving the public interest issue
Safe Mooring	Mooring with the necessary concentration and attention of all the crew	Mooring as a relaxing maneuver without a full crew involvement
Immersive Events	Creating company events involving individuals with interactive activity	Creating company events enriching the enjoyment of local heritage

Table 2: The meaning transformation in DIS

b) Socio-narrative of value creation

Design is connected to specific socio-cultural trends, intended as local frames shaped by the interaction among media, artists, retailers, technologists, manufacturers, anthropologists, sociologists, marketers that tend to locate artifacts in specific socio-narrative discourses (Verganti, 2008; 2009). The meaning of a product/service is determined by the storytelling in which it appears as soon as it enters the conversations among stakeholders, bystanders, critics, and users.

In this vein, in the analysed DIS, the socio-narrative of the business is used to both support and affirm new socio-cultural trends and to legitimate new consumption behaviors that are consistent with the transformative meaning developed by the start-up. In this way, DIS seem to belong to those broader set of new entrepreneurial initiatives that, within the framework of the “social economy” (Murray, 2009), are oriented to steer new forms of “civilization”.

DIS convey their the socio-cultural messages, in some cases, directly through the structure of the offering itself, or in the way product-services are delivered or communicated; in other cases, through the way user relationship are built and maintained, or the way partners are engaged into the business system.

For example, the focus on the emerging socio-cultural trend in the narrative of the business by *Milan farming* seems to be evident in the words of its CEO:

“We were in the full boom of the green economy launched by [US President] Obama; Expo 2015 was just assigned to Milan, and in 2008 there had been a sort of down shifting in different industries

that provided a review of distributive models. In a nutshell there were different suggestions, different changing drivers from the demand side and a clear offering gap."

The choice to leverage local agricultures, the zero-mile product philosophy, the selling of only seasonal and biological products, the overcoming of past distributive and logistic patterns constitute per se – beyond the interactive pieces of a business model – a cultural proposition that takes part as a specific voice within the local discourse about the food industry.

The concept of emphasizing the habits and cultural behaviors of local forces is vivid also in *Immersive Events*. The words of the CEO about the avoiding of interactivity in the core offering in Italy constitutes a good proof:

"For example we do not offer interactivity. Nobody wants it...in Italy nobody uses it, nobody makes it, in USA they do it, with Kinect you can find all the interactivity you wish, not in Italy. In Italy interactivity is not cool for the recreational character the producer is trying to create. The extent of the interactivity we provide is the users' interaction with a controller".

More or less explicitly, all the analyzed DIS promote new social and cultural messages in the narrative of their business.

Milan farming – leveraging the farmers (as providers) of Parco di Milano – proposes a zero-mile consumption model; *Safe mooring* wants to drive a radical shift in the perception of mooring operation through a safer preinstalled sailing equipment; *Municipality 3.0* aims at rewriting a new form of dialogue between citizenship and local authorities; *Immersive events* intends to increase the cultural and historical content of business events.

c) Local social capital incorporation in the value proposition

Product meanings, socio-cultural trends, user behavior and purchasing habits deeply depend on context and culture. The same artifact may invoke different meanings at different times, in different contexts of use, and for different people. The local structure of the social capital can thus have a strong impact on the way individuals and communities give sense to the product/service domain.

In DIS the employing logic of social capital seems to focus on creating a tight relationship between the characteristics of this capital and the start-up's value proposition.

Accordingly, social capital manifests itself as an integral part of the offering in which the local network of actors qualifies and enriches both the product meaning and business socio-narrative.

This is the case for example of *Immersive events* where the business events are hosted in historical and cultural heritage buildings and these are virtually mapped and valorized according to visual mapping and sound. It's hard to imagine the operation of this DIS without a vast network of cultural heritage and territorial assets.

The words used by the CEO of *Immersive events* emphasize that concept:

"In our territory the richness and the partial use of cultural heritage helped us to design and implement our business idea. Our key concept inextricably admits the presence of an historical building, a piece of local heritage that we valorize with our mapping technology, the creation of a specific sound and the relative projection of images and patterns on the frontage of the building in order to generate the requested atmosphere consistent with the aims and mood of the business event".

Here the value proposition offered by the DIS, the process and the supply chain employed to create it appear inextricably linked to the social capital. Start-ups as *Immersive Events* leverage parts of local capital as part of the product-service system they pose on the marketplace. Without that part that start-up simply cannot exist.

As shown in the case of *Milan Farming* local capital can be used also as the fundamental piece of the business narrative. In promoting specific value of the product-service local asset and social capital can be leveraged in form of a brand. The connection of an asset with a particular belonging

or place can enrich the value of the offering itself. Here the local social capital – intended as local network of relationship embedded in a specific geographical area - is leveraged as a brand. It's something deeper than the concept of "Made in (...)". In some case the belongingness of a resource, a semi-finished or final solution to a specific embedded web of relationship is a sort warrantee of quality, of advanced productive system, or the outcome of a local social behavior.

According to the words of the Milan Farming CEO:

"In order to guarantee the offering quality is fundamental for us selecting the right farmers and presenting their offerings on our website. We help farmers to [craft a narrative that effectively communicates] themselves and their product, in order to create the strongest relation between producer and final user, increasing the latter's consciousness: the zucchini we deliver is not an ordinary zucchini, it's a product identified with a precise farmer, with a name, a story, a productive pattern. When we created Milan farming, one of our goals was to impact the territory, beyond our direct profitability: the stories of our affiliates demonstrate this".

The case of *Milan Farming* underpins how DIS exploit attributes of the social capital as narrative means to be leveraged in business model. Before *Milan Farming* the single farmers of Milano Parco Sud were anonymous and unable to valorize by themselves their identity, intrinsic quality, territory branding. *Milan farming* recalling the farmers old traditions and the agricultural past of that area implicitly created its own brand revitalizing and updating the old local capital evocations.

From the studied cases indeed there seems to emerge two specific directions regarding the relationship between DIS and local capital.

The case of *Immersive events* proposes a sort of extension of the use of social and local capital. That startup gives new life and revitalizes pieces of local heritage that were not leveraged in this new context. As matter of fact DIS can be seen as local actors extending and stretching local capital opportunities in order to promote a transformative product/service meaning. Alternatively, the case of *Milan farming* shows how DIS create local based narratives identifying and updating local tradition and past activities. In that case DIS employs a key-resource not only as a piece of the offering but as the core message of the business narrative.

4. Discussion and conclusions

Recently, a variety of distinct start-up types have been described. These include distinct forms of entrepreneurial ventures, such as the NTS or New Technology Start-up (Park, 2005) and hybrid organizations, such as the social enterprise (Mair and Noboa, 2006). They also include distinctive entrepreneurial processes, such as effectuation (Sarasvathy, 2001) and cultural entrepreneurship (Lounsbury and Gleen, 2001).

Each of these various organizational forms and processes has its own unique characteristics, including structural features and developmental dynamics and these in turn lead them to adopt tools, funding logic, and supporting services that are typically common to that form or process and different from other forms and processes.

Our paper analyses the role of design in a particular form of start-up where design capabilities are key in the new venture. This role extends beyond that of determining the competitive advantage of the enterprise, in that design is used to establish the uniqueness of the overall nascent business. We have identified three key traits that characterize how DIS leverage design. They are illustrated in Figure 1.

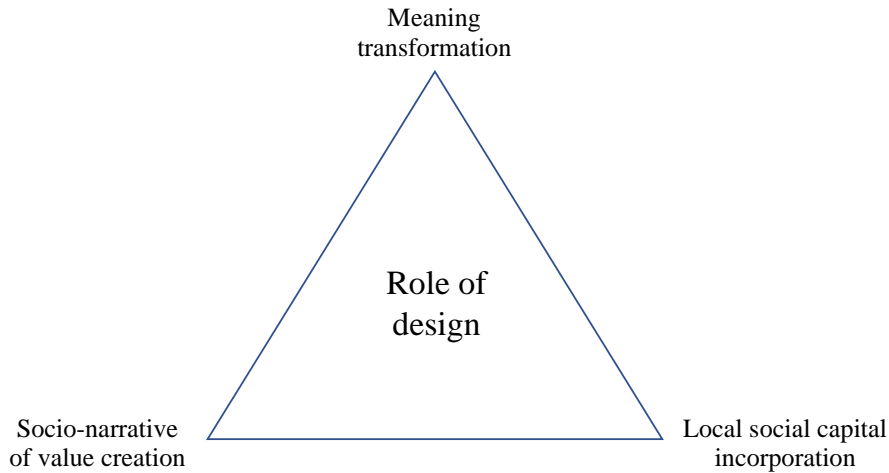


Figure 1: the role of design in DIS

In the managerial literature design has long been considered as a technical activity – employed at the end of the innovation process and typically oriented to increase the appeal of the product and to adjust its aesthetics (Eppinger and Ulrich, 1995). For a long , designers have been employed in technical departments, with the aim to concretely translate and apply the principle “form follows function”, a widespread design principle that animated industrial products and modernist architecture of the 20th century.

More recently, design has been seen and described as a competitive weapon, one that firms use to guide the innovation process and mold the company’s strategic path and brand identity (Verganti, 2008; 2009; Dell’Era and Verganti, 2007; 2010; 2011; Simoni et al. 2014).

In the four cases we studied design plays a different more strategic role – one that prompts suppliers and/or consumers to change their perceptions regarding the product concept, the way value is created, and the role played by local stakeholders (Battistella, 2012).

Whereas in its conventional use, design highlights aesthetics to enhance the salience, functionality or ease of use of a technology, product or service, in DIS design redefines the meaning of a product and thereby reorders its place of value in the market. As such design plays specifically a *transformative role* (different by a “changing role”) that consists in the use of design as a means to create ‘from scratch’ the competitive rules of an industry and the overall user experience related to the fulfilment of a specific need/behaviour. As a result of this transformation, Design intensive start-ups incorporate design as a means to conceive radically new user experience where it’s difficult to retrace features of old paradigmatic user experience.

Transforming the user experience means having impact at three interdependent experiential levels (Norman, 2013): visceral, behavioral and reflective. Visceral, relates to how the user perceives the product-service with his/her primary senses. Behavioral, expresses how the brain induces and controls routine behavior. Reflective, invokes the self-reflection and self-consciousness of the user regarding the social and cultural meaning implied in using product-services.

These three levels can be viewed as a chain, where design can act on each link and thereby impacts another. For example, a radical change to the “visceral” side of a product – e.g., through new forms and languages – can impact user behavior by changing the product’s usability or affordability intended as structural suggestion and material cues designed in a product or service. In the same

vein, changing behavior (e.g., the way a product is used) could impact the meaning and the cultural messages that product or service tends to convey.

Considering the user experience as one that is expressed at any of the three levels, DIS transform that experience in at least two ways:

- proposing new meanings (Verganti, 2008; 2009; 2011) via socio-cultural messages associated with the product-services;
- altering the relationship between the user and the context or product/service, given that the overall experience in using a product-service is mainly driven by the role of the user and its interaction in the experience place (Dorst, 2011; Norman and Verganti, 2014).

This specific transformative role of design is reinforced by two additional features: i) the adoption of a specific business socio-narrative about value creation; and ii) the incorporation of social capital into the start-up's value proposition.

Regarding the first feature, DIS do not just adopt a business model to create and distribute value among the players but they are focused on a "story that matters" (Magretta, 2002) on which to build the business narrative (Lounsbury and Glynn, 2001). The aim is to create a sort of vehicle to test and diffuse a story that is able (a) to educate the nascent market regarding the new meaning of value and (b) to diffuse the new rules of the game among the different players. In other words the different aspects of the company's business, partners, retailing and distributive channels, branding interfaces, interfaces to keep relationships with the users and models to generate revenues, can all become storytelling device that contributes to create business positioning, to mold new cultural messages, to legitimate the transformative meanings of how value can be created (Battistella, et al., 2012).

Regarding the second feature, DIS leverage social capital as means not solely to access to needed resources but as a part of the value proposition to customers.

The value of social capital to the nascent entrepreneurial firm is well known and because of this, the important role that social capital plays in entrepreneurship has received considerable attention (e.g., see the May, 2013 special issue on social capital in *Entrepreneurship Theory and Practice*). As do the mainstream literatures in regional economy and sociology, the entrepreneurship literature sees social capital as forming and developing within the network of personal relations that the entrepreneur (or actor in the general case) has with other actors or holders of key resources. Social capital emerges and develops as a by-product of resource exchanges that take place between and among the actors who are connected via social relations. In addition, the value of social capital to the entrepreneur (or any actor more broadly) is in the access it provides the entrepreneur to unique and valuable resources and in its facilitation of exchanges, through which the valued resources are conveyed.

Given their limited means and confronted with organizational and market failures, entrepreneurs depend more than most other economic actors upon their network of social relations as a crucial pool of valuable resources (Sarasvathy, 2001). To be sure, like countless others, each of the four firms we studied, attend to developing and exploiting their social and local capital through their networks of social relations. However, each of these firms also uses its social capital in another way that differs both from the conventional view of resource access. Indeed, localness plays for DIS a main role allowing these types of start-ups to create a strong connection between local partners and customers, thereby enriching the storytelling underpinning the business. Value is created not solely through the products and services delivered to customers, but also through the specific local partners embedded in the DIS social network and whose identity is made accessible to customers.

This implies that, rather than transitioning away from this local market to an expanding set of consumers as the venture scales, the DIS retains its focus on its social capital as it scales. Moreover, in addition to providing access to valued resources to the focal firm, the DIS communicates and

embeds much of the social capital that it acquires from suppliers and distributors directly into its customer value proposition.

This aspect highlights a sort of dependency of the DIS on a particular local form of capital. Thus, it exhibits a limited potential for scalability of the DIS' offer in global or other markets. The DIS scalability cannot be sought as an exponential global growth with the same peculiarities of the original nascent business system. DIS replicability in other contexts mainly appears as an adaptive replicability where some product-service system components have to be replaced by pieces of local and social capital found in other cultural and geographical contexts

The analysis of the role of design in DIS has several theoretical and practical implications.

From a theoretical perspective, the use of design by this type of start-ups highlights dynamics of value creation and business growth different from those usually considered in the entrepreneurship literature. In particular the importance of intellectual property and of business scalability for business development is quite tempered. Indeed, on the one hand, DIS do not base their competitive advantage on the protection of intellectual propriety but rather on the acquisition of a sort of socio-cultural leadership in the business where they operate. On the other hand, DIS business scalability is limited by the embedding of value proposition, obtained via design, in a specific local context. In order to grow DIS have to adapt the overall user experience (characterized by a new meaning/cultural message/user behaviour) to new local context habits and values. Accordingly, entrepreneurship and design scholars may be required to adopt different theoretical lenses when analysing DIS.

From a practical perspective, policies and tools designed to promote and sustain usual start-ups need to be profoundly redesigned when applied to DIS. Indeed, for this type of start-ups aspects such as patenting incentives or VC seeking at scalable businesses are of little value. Instead, initiatives that promote the affirmation of new cultural and societal models can be very useful to help DIS creation and development.

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Annex A

Questions directed to international scholars addressing the relevance and the peculiarity related to Design-Intensive Startups phenomenon

- 1) Do you consider only the development of a new technology as a source to create a new venture?
- 2) What are other vectors and levers that support new form of entrepreneurship?
- 3) Do you recognize design – and all the related forms of innovation – as a source of new entrepreneurship?
- 4) According to you does a Design related startups admit the same evolutionary path and source of value of a New technology startup?
- 5) What are – according to you – the most promising areas of inquiry to deepen that peculiar startup category?