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Design capabilities for the evolution of value creation

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The process of value creation cannot be an exclusive preserve of designers, but it is rather the result of a diffuse problem solving capability. The creation of new value is also connected to the concept of innovation and can happen in different logical contexts, from limited and confined contexts (niches) to consolidated structures (regimes) and to wider sociotechnical contexts (landscapes). In all those contexts, design can have a different role and whoever designs should use different capabilities and tools. Furthermore, design capabilities can also be useful when aligning value creation and change in different levels, thus contributing to understand the relationships between small scale interactions and wider scale transformation of sociotechnical landscapes. This paper proposes a framework to understand the contribution of design to the value creation process at the three levels, focusing on design capabilities and tools to work across different logical contexts.

Keywords: value co-creation, multilevel perspective, design capabilities

Introduction: design and value creation

The concepts of 'value' and 'value creation' have been discussed since Aristotle (Johnson, 1939). In the last centuries, such concept became the founding element of economic theories. The definition of such concept in economic terms would go beyond the scope of this paper, but two interesting paths can be followed, which make the concept of value creation relevant to reframe the activity of design.

On the one hand, some studies have spot a light on the logical difference between considering the value as a unit of market exchange or as something related to what happens in the phase of use (Lusch & Vargo, 2014; Vargo et al., 2008). On the other, a design perspective would focus on value not only in relation to the creation of the tangible reality of goods and services, but also on the role they play in practice and in the context of people's life (den Ouden, 2012; Heskett, 2017).

Following those paths, it is possible to move the centre of the value creation activity from the chain of production of products and services, to the moment and context of use. This is a fundamental shift in the way to interpret both economic processes and design actions. Furthermore, given the critical role design has in innovation process, it is possible to consider the role of design not only in radical innovation processes, but also in incremental innovation actions that everybody performs in everyday life.

This perspective shift would not exclude the relevance of design as a support to manufacturing or service systems, but would refocus such activity around the centre of value production and articulate it on different layers. Therefore, starting from this perspective shift, this paper will explore the activity of design at different logical levels of intervention, highlighting the abilities required to design at each level.



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Changing views on the value creation process

The application of knowledge and skills for the creation of value is the fundamental basis in economic exchange. With this concept Vargo and Lusch (2004), later refined in other works (Lusch & Vargo, 2014; Lusch & Vargo, 2006; Vargo & Lusch, 2008) refuted the dominant view that material goods were the primary unit of exchange, to propose a view in which services, seen as exchange processes and relationships, are dominant (Vargo & Lusch, 2004). In Vargo and Lusch' view, goods are only resources for a process in an exchange of competences, that is the core of value creation.

This simple and plain ascertainment is in fact a substantial revolution in the way of interpreting the value creation process, because it changes the role of the actors and elements of this process. Goods are just part of an *infrastructure* that organisations create to offer a *value proposition* to service beneficiaries. Such infrastructure integrates resources (services, expert knowledge, products) to be used in the value creation process, but it does not constitute value *per se*.

The functional change of the elements in value creation leads to rethink the role and capabilities of the actors in this process. The customers (beneficiaries¹) of the service are no longer passive, as they have the key role to co-creating value within a constellation of actors (Normann & Ramirez, 1994; Ramirez, 1999). Value is cocreated by integrating the infrastructure proposed by the enterprise and the beneficiaries' personal resources (personal knowledge, preferences, habits, problem solving strategies). This integration capability basically represents the natural problem solving attitude that is common to every individual; this is an attitude that depends on the capability to *device courses of actions aimed to change existing situations to preferred ones*, which according to Simon (1969, p. 55) is a characteristic of the design activity. The value co-creation process happens within a broader ecosystem (Vink et al., 2017), which includes values, implicit rules, regulations and knowledge, that is what Vargo and Lusch (2016) define as *Institutions* (Figure 1)

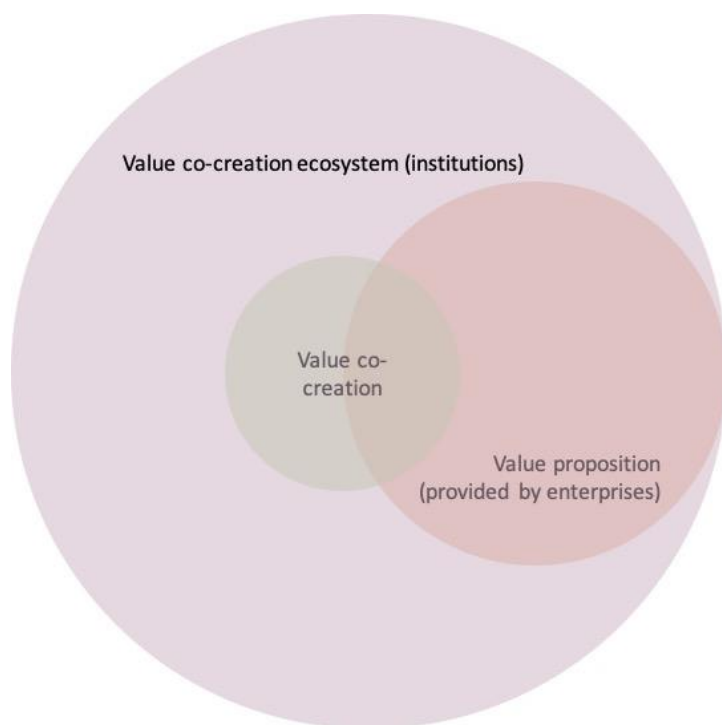


Figure 1 Value co-creation and its ecosystem

¹ Vargo and Lush highlight the inadequacy of the terms *customer* or *user*, in respect to a process of value co-creation (because the customer/user is in fact also value creator). They prefer to use the term *beneficiary*, instead. This paper will therefore use the term *beneficiary* to indicate those who participate to the value-creation process by aggregating resources provided by other stakeholders (service providers, resource providers).

Redefining the design action

The recognition of the beneficiary's active role in service delivery and the revision of value creation as a design process within a network of relationships (Vargo & Lusch, 2016) poses the problem of redefining the characteristics of the design action and the role of design in a logical context in which the typical competence of designers - to envision possible desirable futures and to take action towards them - is no longer an exclusive capability of trained experts, but a diffuse one (Manzini, 2015).

The design perspective can be useful to link the process of value creation with some considerations about innovation in services. Design has often been considered as a crucial component in innovation processes (Brown & Katz, 2009), and as a driver of a specific kind of innovation, that works at the same time on radical innovation in technology and in the system of meanings (Verganti, 2009). Focusing on design as a diffuse capability however, makes it possible to zoom in, to the individual act of value creation - the everyday actions rather than the radical innovation - and back out, to analyse the systemic context of such actions. According to this approach, design is an attitude that informs the process of value creation at the microscopic level, but at the same time such innovation may imply change and evolution in the infrastructure that supports value creation, in the relationship between the actors that integrate resources for value creation, and even in the quality and modes of resource integration.

Every action of value creation is in fact producing new value, because it is producing something that was not there before, whatever the relevance of the novelty is (incremental or radical). In some instances, the value creation process is generating novelty not only in the value that is created, but also in the structure of the value creation ecosystem. Such change is often part of an evolutionary process, or the result of a process of social construction - i.e. a process of negotiation between social, cultural and technological instances of different social groups (Bijker et al., 1987) - which changes the structure of the value co-creation ecosystem at different levels. Unlike other evolutionary processes in nature, though, the changes produced by this process are deriving - though they are not the direct result of - from the ability of human beings to act through purposeful action, in other words, from design actions.

Innovation processes, a multilevel perspective

The evolutionary mechanisms described in the previous session refer to change and innovation at different scales. It is therefore interesting to analyse innovation processes in value creation systems in relation to the magnitude of change and to the design capability that comes to play, when working on different levels of innovation

Studies of innovation have provided useful conceptual structures to understand the mechanisms of change in complex systems. They have explained, for instance, the paths from invention to innovation (Nelson & Winter, 1982), the action of technological paradigms in selecting and directing innovation towards preferred trajectories (Dosi, 1982) and the relevance of large or incremental changes in scientific knowledge (Kuhn, 1962). The analysis and comparison of such contributions goes far beyond the scope of this paper, but a common characteristic of such studies is to focus on the tension between elements of change and elements of resistance to change, mainly embedded in infrastructures (services, organizations, rules, policies or institutions).

Such tension is the engine of a transition process that provokes different types of innovation, from incremental changes to technological revolutions (Freeman & Perez, 1988). This tension has also been studied at different scales, identifying different levels of heuristic analytical concepts: a frequent definition of such levels distinguishes between niches, socio-technical regimes and sociotechnical landscapes (Geels, 2010, 2012; Geels & Schot, 2007; Smith et al., 2005). Such levels are very useful to understand the insurgence, diffusion or consolidation of innovation.

According to Geels, and Schot (2007), **niches** are protected environments, like incubator rooms, in which innovation emerges, and is developed by a network of dedicated actors. Novelties, and especially radical novelties, originated by the action of outsiders and fringe actors can mature in such niches, protected from the adverse action of conservative forces, which tend to preserve the existing status and routines.

Socio-technical regimes refer to consolidated infrastructure and recognizable communities of experts, which stabilize existing trajectories through cognitive routines, regulations and standards. The solidity of such trajectories is essential for attracting investments in machines infrastructures and competences.

Finally, **sociotechnical landscapes** form an exogenous environment beyond the direct influence of regimes and niches actors, they represent the ecosystem of values, rules, regulations, cultural frameworks and institutions that shape innovation. The three levels also define different speed in innovation processes, with rapid and unstable changes in niches, solid and slower changes in sociotechnical regimes and very slow changes in sociotechnical landscapes. Change, however, does not simply happen within those logical levels, but also across them: niche changes create pressures towards regimes, landscape changes press for regime transitions and destabilization of regimes creates opportunities for niche innovation.

Niches and socio-technical regimes have similar kinds of structure as both are driven by the purposeful action of a community of actors, although the interaction among them is regulated by explicit rules in regimes, whereas it is unstable and depending on implicit structures in niches. Niches innovation is based on unstable aggregations of actors, whereas regimes have a consolidated aggregation, where mutual motivations and interests are binding the actors. The rules that govern the interaction at both levels have different nature: regulative (regulations, standards, laws), normative (relationships, values, behavioral norms) and cognitive (belief systems, pragmatic knowledge, problem definition, search heuristics). Such rules are essential for enabling actions - thus empowering and amplifying their effect - and legitimating them or delimiting their action, when their impact tends to be disruptive. Innovation, however, is often depending on how such rules are interpreted and possibly broken to generate new rules.

The socio-technical landscape instead does not influence change directly, but rather by providing *gradients of force*, i.e. the substrate of values, policies, knowledge, on which niches and regimes are based. Change at this level is much slower, but it can indirectly determine turbulence, shocks, disruptive phenomena or support *avalanche* changes (i.e. a number of uncoordinated changes of multiple dimensions at the niche level) (Geels & Schot, 2007).

Multilevel innovation perspective and the structure of value creations systems

The multilevel perspective proposed in the previous section is providing an operative framework to understand innovation processes, but how can this structure be used to read and understand concrete changes in the value creation processes? How is purposeful action (or design action) working at the three levels?

The service- dominant logic, proposed in the first sections of this paper, considers value creation as uniquely and phenomenologically created by the beneficiary, although such process happens through the interaction of multiple actors, and is coordinated through actors' generated institutions and institutional arrangements (Vargo & Lusch, 2016). Every instance of value creation is by definition creating something new, however most of the value creation actions are clearly framed in a system of normative, regulative and cognitive rules. For the scope of this paper, the focus is on the mechanisms of innovation, that is, on those novelties that bring about changes in the structure of value creation (i.e. the network of actors that contribute in the value creation process) or in the way resources are integrated.

Every time individuals or groups use a product (e.g. a car) or a service (e.g. public transport) they create value by integrating their personal knowledge (e.g. how to drive a car, where to sit or when to step out of the bus), knowledge deriving from rules and standards (e.g. driving rules, rules to access to the bus service) and knowledge embedded in their products or services (e.g. the car, the bus, the bus driver). Innovation in the way knowledge is integrated could consist in the change of the interaction between those different kinds of knowledge, e.g. assisted driving, or a different way of paying the bus ticket. Within a niche of a specific service, this change could be integrated into a more complex interaction structure (e.g. new interaction systems for a car or a new app for paying the ticket in the bus). This structure could be limited to a specific context, e.g. a neighbourhood in which specific infrastructures have been installed, to support autonomous or assisted driving, or a bus line in which the new ticket system is implemented. The confined environment of the niche creates an error friendly environment in which it is possible to create small experiments, that could eventually produce larger changes. The persistence of an element of novelty within a niche may encourage the definition of a more solid organization (e.g. a local service) which can be built by codifying the interaction among the actors in the niche or formally organizing the resources available in the context (for example organizing a network of charging spots for electric cars in a town, or creating protected lanes for self-driving vehicles).

The pressure for broader regime change comes when innovation structures in the niche reach a level of maturity that allows replicability and scalability. The regime includes large organizational structures, such as service organizations, public service systems or infrastructure. Such infrastructure has been designed and codified, in order to support *routine* procedures, which in fact facilitate any form of value creation that is compatible with them. The resistance of this infrastructure to the pressure from niche innovation derives not only from the conservative behaviour of the communities within those structures (organizations, administrations) but also by the solid framework they derive from, which privileges compatible forms of value creation. The resistance also depends on the solidity of such framework, where moments of weakness, frictions between regime structures and the sociotechnical landscape, can reduce the resistance to niche innovation. This is happening for instance, when increasing pressure of environmental concerns on the existing production systems, require a substantial infrastructural change (such as a shift in the energy production systems); in those cases, niche innovation can wedge into the regime weaknesses, to propose a new infrastructure. Unlike the experimentation activity of niches, the creation of novelties at the regime level requires a purposive and codified behaviour that justifies the new structure and aligns it with the sociotechnical landscape and with other existing structure at the regime level.

Unlike niche and regime changes, landscape changes are not directly depending from purposeful actions of communities or individuals. They are slow, evolutionary changes, often triggered by shocks, turbulence, or disruptive phenomena (Geels, & Schot, 2007). The sociotechnical landscape is the logical level of institutions, as described by Vargo & Lusch, (2015). Institutional change consists of cultural change, or change in large political trends or broad geo-political patterns. The disruption can come from traumatic political issues, large and rapid migrations or evidences of environmental changes. Changes in sociotechnical landscapes are obviously influencing niches or regimes, as the rules and knowledge at this level may gradually come to collision with regime structures that are no longer adequate (e.g. the progressive inadequacy of existing public administrations in respect to the growing pervasiveness of social networking) and can support or hinder experimentations and multidimensional innovations in niches. Even at this level, purposeful action could have an effect, in defining policies or governance structures, that trigger new political and governmental landscape.

Design and value creation in a multilevel perspective

The previous section highlighted the opportunities for purposeful action to generate innovation at different levels of the value-creation structure. This section is instead zooming-in the purposeful action at each level to describe its design specificities.

Design and the value creation in niche contexts

The very moment of value creation is the result of an interaction between beneficiaries, other stakeholders (enterprises, institutional actors, service providers) and other resources (objects, technologies, services) (Vargo & Lusch, 2004; Vargo & Lusch, 2008). Value creation happens in the local context of the beneficiary, i.e. in the logical and geographical niche in which s/he operates. Beneficiaries are the centre of the value co-creation process and their design action is based on their own experience, knowledge, problem solving capabilities. However, the interaction in this moment can be facilitated by more specific design abilities, to create interfaces, control systems, engaging rules (such as games), competition or cooperation mechanisms or creativity tools, such as cards to support the dialogue between citizens and experts (Cottam & Leadbeater, 2004a). The attention of several design studies has been focused on the process of *infrastructuring*, that is the process that supports, triggers or empowers customer creativity or creates the *agonistic* ground for interaction (Björgvinsson et al., 2010; Manzini & Staszowski, 2013). In some instances, the effect this kind of design intervention can have is to provoke *avalanche* changes around specific innovation areas. Such avalanche consists of multidimensional and multidirectional innovation flows, that increase the innovation tension in a niche, with the expectation that such tension will find preferred paths to create more pressure over the regime structures or even on the sociotechnical landscape (Figure 2).

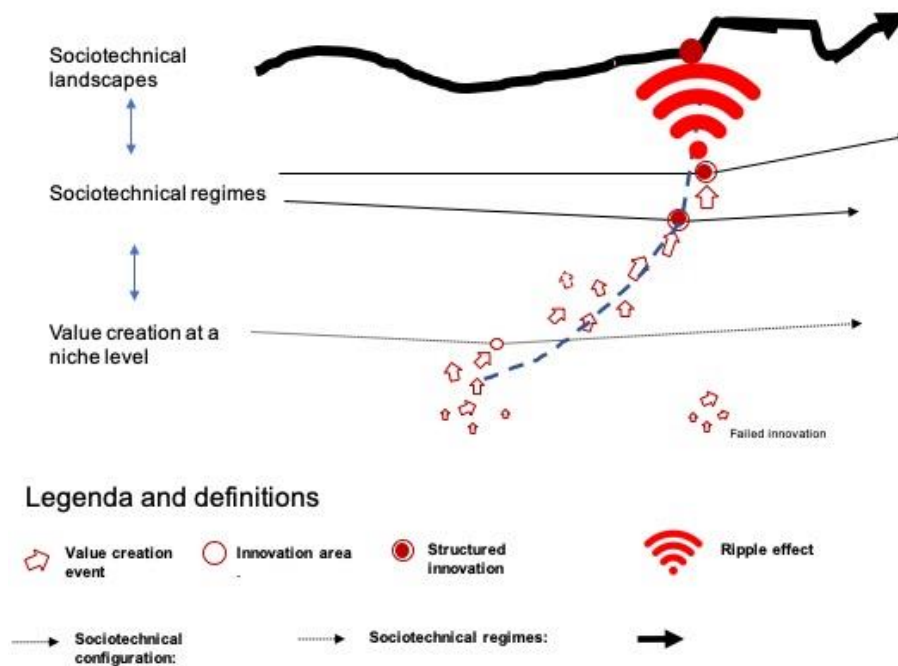


Figure 2 design in the value creation context and pressure on sociotechnical regimes and landscapes

It is however important to point out that design may also have a role of creating frameworks that address such flows towards preferred paths, as exemplified by Manzini and Rizzo (2011). The *Design of The Time* (DoTT07) program, for instance, was a program that enhanced a number of innovation initiatives in a northern England region. Such initiatives were touching different dimensions (from school reform to sustainability, from local food production to health issues) (Thackara, 2007). The framework program is not yet an organized infrastructure, but rather a way to align a number of initiatives to scenarios about desirable landscape changes (framework programs will be analysed later in this paper).

Purposeful action at the niche level can also aim at aggregating resources or actors (and therefore relevant knowledge) around local niches, thus creating proof of concepts for possible reproduction of local innovation in further niches or possibly to scale up innovation created in local communities. This was the case of some EU-funded project, such as Life 2.0 and My Neighborhood, which created innovation in a small network of actors, but also highlighted skills and competences that would consolidate a reproducible ecosystem (Morelli, 2015).

More generally, the organization and integration of resources at the niche level corresponds to the activity of designing a single instance of a service - a local fast food concept, a car pooling group or a solidarity purchasing group - where any innovative element is organized in a way that makes business, social and cultural sense. Even some experiments of migrants' integration in local communities, where any available resource, from empty apartments to migration regulations are organized to create meaningful reconfiguration of a local community, may represent an example of organized resource integration (Elia, 2013). It is worth noticing that the purposeful action at this level does not imply the intervention of an expert designer, as in the case of migrant integration in Riace, Italy, promoted by the mayor of the city (Elia, 2013) or the initiative of Social Streets invented by a citizen living in Bologna (Ecchia & Maria, 2016)². The design skills involved in the action at this level concern problem solving, conflict management, prototyping and visualisation of meaningful opportunities. Although sometimes complex, those skills are very close to the natural capability to organize change and to integrate the available resources.

² The mayor of Riace re-vived a depopulated town in the South of Italy by opening empty apartments to migrant families, who created new activities and new needs for schools and civic infrastructure. The social street movement was initiated by a citizen in Bologna who used a Facebook group to create new physical interaction with his neighbours

Design at the regime level

The institutional arrangements, that support the value creation system at the regime level are service organizations (e.g. fast food chains, franchising systems), public administrations (taxation systems, municipalservices, healthcare systems), or interaction platforms (created by private initiatives or cooperative movements, such as social networks, mutual help platforms, or share-based transport or residential solutions). Those arrangements organize the value creation ecosystem, by specifying rules of engagement, interaction modalities, actors' motivation, business purposes and motivation systems. This is typically the activity of service design. It concerns the visualization and organization of service interaction in a coherent architecture, the visualization of interaction mechanisms, motivations, business opportunities and social ecosystems. These competences are more specific of expert designers, because they require the capability to recognize value and embed it into the structure of the institutional arrangement, the capability of linking each element of detailed interaction to the systemic whole, and the capability to figure out, and possibly visualize scenarios of possible use of services or deployment of resources (Conley, 2004). New competences are recently being highlighted, in relation to the construction of service platforms, which represent a substantial transition in the concept of service organization, in which the traditional roles of producer/consumer is declining, in favour of a complex interaction system, based on value integration for mutual purpose, information exchange and filtering, relationship management, accessibility and redefinition of new exchange currencies (Choudary, 2015).

Design in landscapes

As mentioned in a previous section, the purposeful intervention at the landscape level does not produce direct changes in the landscape, but can actually trigger change processes. This is the logical level of institutions, which facilitate and regulate value creation by representing shared systems of values, social, cultural and political premises. Innovation in institutions depends on the aggregation of a number of factors, including, but not limited to human action. Design action is therefore unlikely to produce direct and controllable institutional changes. Nevertheless, several examples are evident, of purposeful social constructions aimed at influencing this level. This is the case of healthcare reforms, the Australia tax reform (Terrey, 2012), the construction of the American electricity system (Bijker, 1995), or the psychiatric reform in Italy (Manzini, 2015). The role of design at this level is still being discussed. What are the most successful strategies to amplify the impact of design action on institutions? Can we recognize more effective methods or tools to influence this level? What are the interactions between policy instruments (i.e. the institutional arrangements that actualize values and principles) and institutions? Are there tools to align design actions to institutional change, in order to link operational design aspects, even at the niche level with *desired* directions for institutional evolution?

Summarising design skills at different logical levels

The previous sections identify different levels for design action and some specific skills that lead to change in each of them. Table 1 synthesizes such skills, from everyday problem solving (at the bottom of the table) to major landscape changes.

Everyday problem solving refers to everybody's attitude to solve recursive or trivial problems - like driving a car, cooking, going to work - which usually do not represent any particular challenges to individual problem solving capability. This routinized type of behaviour has been described and studied as *practice*. Practices represent behaviors that depends on the interconnectedness of contextual elements, such as "things" and their use, background knowledge, know-how and emotional states. (Reckwitz, 2002, pp. 49-50). Practices are constantly repeating sequences of actions, although they may tolerate changes which may exercise higher or lower pressure on the practice framework.

Designing (i.e. generating purposeful change) at the **niche** level require different capabilities to interact with other actors or to organize or *infrastructure* such interaction, as for the organization of a web page or a service activity. Building upon Conley's definitions (Conley, 2004) the design capabilities required at this level concern:

- **Contextualization skills**, i.e. the ability to identify and respond to relationships between a solution and its context.
- **Experiential control**, i.e. the ability to use form to embody ideas and communicate their value and
- **Modeling skills**, i.e. the ability to model and visualize solutions before all the information is available (as in prototypes).

The activity of design at this level may use tools, such as visualization (Journeys, storyboards, dramas), analytical tools (personas, experience-, context- or technical- analysis) and models (such as prototypes, or role playing). Such tools describe the change that is intended to propose, simulate and experiment on such change and make sure that all the stakeholders in the value co-creation context be able to figure out and interpret their role in the perspective change. The literature about such tools and their use in design disciplines has been widely studied, especially in the disciplinary areas of service design, interaction design and industrial design. A number of projects, in the previous decade (Meroni, 2007; Parker & Heapy, 2006; Thackara, 2007) paved the way to the construction of a rich framework of competencies and skills. It is also worth mentioning the influence of schools and academic courses on service design, interaction design and more recently on social innovation in defining strategies and tools for design action at this level.

Changes at the **regime** level consists in designing and organizing services and platforms, the design skills at this level concern:

- **Architecture building skills**, i.e. the ability to add or maintain value as elements are integrated into a whole.
- **Vision skills**, i.e. the ability to recognize a broad range of potential in a given problem statement and
- **Open Problem solving skills**, i.e. an approach to problem solving that involves the creation and evaluation of multiple alternatives.

The activity of design at this level may use tools that help recognizing the element of a value co-creation ecosystem (such as stakeholders' maps, business model canvasses), and organizing complex interactions (such as blueprints, system maps, platform canvasses). Those skills are consistent with a vision of design as part of a production process, thus using the contiguity with management and marketing studies to borrow methods, tools and problem solving strategies. At the same time the skills related to this logical level aim at generating structured architectures and visions that can define subdivision of work (stakeholders' maps, motivation matrix) codification of knowledge (blueprinting) and opportunities for economy of scale (system maps) (Morelli, 2009). While the competences at the niche level may also refer to existing social practice or personal experience, this level obviously requires *expert* competences. Like the competences at the niche level however, the design competences at this level are quite well known and familiar to the design discipline, also because of the growing relevance of the design profession in new areas, such as service design and innovation.

Finally, the design skills related to changes at the **landscape** level concern the ability to influence and direct change in governance - in particular in policies - and in the principles and values that are eventually expressed into institutions. The design capabilities to impact on this level are:

- **Modeling skills**, i.e. the ability to model and visualize solutions before all the information is available
- **Intra-level design ability**, i.e. the ability to work at varying levels of abstraction.

Unlike the previous levels, the role of design in supporting landscape changes has not been systematically studied in the design discipline. This is probably due to the infrequent involvement of designers in governance and policy making bodies. The debate on design for policies has been quite active in the last decade, and the blossoming of government innovation labs connected to public administration and policy design³ has highlighted the relevance of this issue. The debate however, has been limited to the role of design in delivering concrete results, rather than to the alignment of such results – and the strategies to achieve them – to the ongoing or desirable cultural, social or policy related horizon.

The next section will therefore consider some relevant contributions for a more systematic analysis of design approaches and tools to support purposeful changes of the sociotechnical landscape

³ On this matter, it is worth mentioning NESTA, in UK; MindLab and Innovationshuset in Denmark (both closed now); la 27me Région in France, Public Policy Lab in New York, Helsinki Design Lab and the Design Policy Lab (at Politecnico di Milano), also recent projects, such as Design for Europe (designforeurope.eu/) and Designscales (designscales.eu) are contributing to this debate.

Table 1 Design skills and their relevance at the different logical levels. The value creation facilitators are the resources (people, technologies, organizational forms) that support value creation. The last column also includes some of the common tools used in relation to the various capabilities

	Resource integrators	Value creation facilitators	Example	Design Skills needed
Value creation in Sociotechnical Landscapes	Principles/values	Institutions	<ul style="list-style-type: none"> • Long-medium term Sustainability plans • Healthcare reforms • Tax reforms (Terrey, 2012) • Policy labs • Urban Health (Geels 2010) • Edison's electricity system (Bijker 1995) • Psychiatric reform (Manzini 2015) • Gas stove systems (Shwartz Cowan 1987) • DoTT 07 (Manzini-Rizzo 2011) 	Modeling skills Intra-level design ability <ul style="list-style-type: none"> • Framework design programs • Design orienting scenarios • Theory of Change
	Governance (Policies)			
Value creation at regime level	Services, service platforms Policy instruments	Service organizations Public administration	<ul style="list-style-type: none"> • Taxation services, Healthcare services, Fast food chains • Franchising • City Labs 	Architecture-building skills. Vision skills. <ul style="list-style-type: none"> • System mapping tools • Alignment tools (to align services to policies or corporate values) • Business modelling
			Cooperative platforms Commercial platform (like AirBnB, Uber, Facebook)	Architecture-building skills. Open problem solving skills Platform building, HCI, Business modelling canvas
Value creation in niche contexts	Local Organization	Local service providers, expert designer, citizens	Solidarity purchasing groups, urban gardening groups	Contextualization skills Architecture-building skills <ul style="list-style-type: none"> • System tools • blueprint • system maps • business modelling
		interaction structure	Mobile/web application, interaction cards, games.	Modeling skills Experiential control <ul style="list-style-type: none"> • Service journey/touchpoints. • User-driven methods
		Social practice	Restaurant	Professional experience
Everyday problem solving			Driving a car	Personal problem solving strategies

Aligning design at the three levels

The focus of the early experiments on design in public administration (Cottam & Leadbeater, 2004a, 2004b; Leadbeater & Cottam, 2008) highlighted the need to focus on citizens and enhancing their participation, thus proposing strategies for social innovation and practical tools (e.g. card games, prototypes) with the direct involvement of citizens in projects that were mostly developed at the niche level (Murray et al., 2010; Thackara, 2007). The need to develop design capability and strategies for policy change was more explicitly framed by the *Design for Europe* project (VV.AA, 2013). The focus of the contribution on this matter, however, has often been on the *policy delivery* process, that means on the process of developing policy instruments to solve concrete and specific cases, or to create proofs of concept (again, at the niche level), or to reframe the administrative structure of specific services (e.g. healthcare or taxation services) focusing on citizens' need, rather than organizational efficiency (Nesta, 2016).

The open question remains: can design – and designers - have a role in the process of change that concern the larger frameworks of principles and values that inspire policies and government action? This question can be translated into practical and operative terms: are there tools or strategies that allow designers to align interventions at niche or regime levels to larger actions that purposefully contribute to change the sociotechnical landscape?

Changes in sociotechnical landscapes, as mentioned above, are not directly deriving from purposeful action, but rather from small movements of the system of values and knowledge and social practices.

Manzini and Rizzo (2011) propose an alignment between small experiments at the local level and large sociotechnical changes. Such alignment would be possible through the definition of *framework design programs*. Those programs are generated as a result of different kinds of actions: they could be the result of scenarios proposed by design teams (as in DoTT07) or of negotiation among different stakeholders, or could be triggered by inspirational exhibitions or local living labs.

The intermediate steps between the small-scale experiments and the larger scenario changes is however seldom explored. Scale-out or scale-up processes⁴ are supposed to support larger changes starting from local phenomena. Scalability happens according to different processes: *wild fire diffusion* (the most common case of diffusion phenomena, such as the take-up of social media) or *diffusion by nodes* or by *circles* (Morelli, 2015), which is based on the reproduction of small scale value-creation ecosystems. Scalability and diffusion, however, describe the expansion of a small-scale phenomenon, but still do not provide indications on *purposeful value creation* at the level of socio-technical landscape. That means they give no insights on how change can be addressed towards desirable landscape configurations.

Scenarios are a frequently used approach to the definition of large and long term changes, because they create the ground to generate strategic insights to align present actions to future desirable sociotechnical landscapes. This approach has been particularly relevant in studies on sustainability, where *backcasting* was used to imagine and select possible future scenarios and project them back into the present. (Holmberg, 1998).

Working with scenarios has always been implicitly or explicitly part of design activity. "Scenarios are images of possible, probable, or preferable futures or futures to be avoided, and sometimes comprise the steps to achieve them" (Jonas, 2001, p. 76). The organization of design work on the basis of scenarios implies a work of analysis, projection and synthesis (Ibid), which in operational terms has inspired Manzini et al. (2009), when proposing *design orienting scenarios*, a tool to align a framework of desired values.

- The analytical phase in this approach consists on mapping the current system of actors and negotiating and define a set of common goals and intentions at the systemic level.
- The scenarios (the projection phase) are built on the basis of hypotheses about the changes of the most critical factors (values, lifestyles, technological issues, social and ethical issues)
- The synthesis consists in plans for concrete solutions (services or infrastructure for local interaction), that use a kit of descriptive tools, including system maps, storyboard, and motivation matrix).

⁴ Scaling out has been defined as a horizontal process of scaling up (diffusion) whereas scaling up has been defined as a vertical process (institutionalisation) (Concilio et al., 2013; Morelli, 2015; Uvin et al., 2000)

A more systematic alignment between large scale changes and local/present design solutions can be facilitated by the use of *theory of change*.

A Theory of Change is a structured way to map a journey towards an expected change, starting from some assumptions about the causes of a present problem. It is therefore a useful planning tool, which shows the ‘intervention logic’ of a project, showing the actions that need to be taken to realize a desired goal or impact, the output, the outcomes and the expected changes deriving from the action. By figuring out this “causal pathway” between action and their impact, the theory of change proves to be a good evaluation tool, that can be used to align short term value creation with larger sociotechnical changes.

The Theory of Change can be used to boost innovation pathways in environments, such as urban contexts, where a number of small innovation ecosystems, composed by the alliance of different stakeholders, are proposing promising solutions to relevant or emerging urban issues. This is the case, for instance, of the Designscales project⁵ (Simeone et al., 2019)(Figure 3).

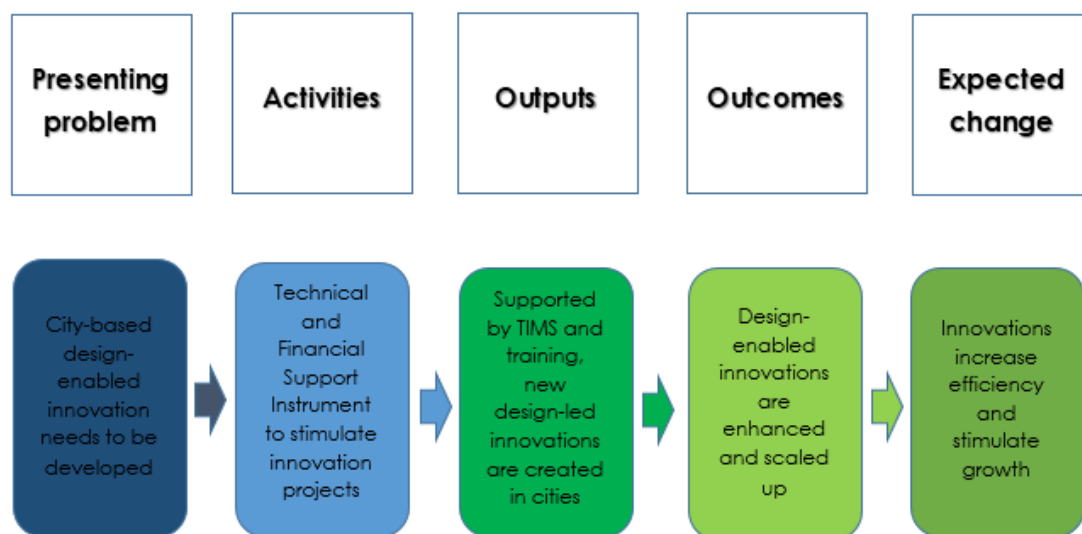


Figure 3 The Theory of Change, as used in the DESIGNSCAPES project. The the project aims at providing design-driven tools to leverage niche and regime oriented projects towards landscape changes (Source Designscales project).

Conclusion

This paper starts from the assumption that the process of value creation depends on the human attitude to aggregate resources of different kinds (knowledge, services, technical infrastructure) to devise solutions that change the human beings’ conditions. Design, intended as a purposeful change to an existing situation, is therefore a diffuse capability. The co-creation of new value, however, is also linked to a process of change, that can have different levels of definition, different structures and speed. When seen as a purposeful action, the ability of design consists of *infrastructuring* such change with different capabilities and different tools: capabilities and tools to support interaction and value co-creation at the niche level, to consolidate and codify innovation into solid regime structures and to align such changes to wider perspectives of transformations in the sociotechnical regime. The debate about value co-creation and the role of design has often focused on the niche level - how to engage people in design activities, how to design the interaction at the front desk, how to design experiences - or at the regime level – how to create service systems, how to manage change in organizations or administrations or in a production system. In recent years, new projects and studies are focusing the attention on the sociotechnical landscape and the contribution of design to this higher level, where design was hardly considered as a relevant attitude. This is the level in which design can contribute to policy making or to change the system of values, rules and regulations. Defining design as an attitude to generate purposeful change means investigating on how design capabilities can support and organize those

⁵ Designscales is a EU-H2020 funded project that aims at promoting Design-Driven innovation in urban contexts. More information about the project is available at designscales.eu.

changes and align change along different levels. From the perspective of expert designers this implies a better overview of the implications of design action on wider contexts and even on the most general system of values, beliefs, culture, policy and government-related issues. From the perspective of whoever is actively involved in innovation and change - managers, policy makers, organizations or single citizens - the framework proposed in this paper can help building up new value-creation capabilities.

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