ADVANCEMENTS IN DESIGN RESEARCH

11 PhD theses on Design as we do in POLIMI

edited by Lucia Rampino and Ilaria Mariani

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Contents

Collaborative Processes Enabled by Design

Design for Cultural and Creative Companies

Design and Technology for Social Change

Dialogues on the relationship between Spatial and Service Design

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Department of Design, Politecnico di Milano

Abstract

The central topic of this study is to identify dialogues on the relationship between Spatial Design (SpD) and Service Design (SD), exploring their disciplinary implications in a theoretical analysis of specific areas of the research landscape through design. The aim is to take a first step towards an approach defined as Service+Spatial (S+S) Design, and the doctoral thesis by the author is a foundational act in this direction. The topic has been studied from a design perspective and from a design culture background in order to attempt a first contribution towards transdisciplinarity[1], in order to expand on an unexplored gateway into SD, that of SpD. In this contribution, however, the author illustrates only a specific part of the theoretical discourse elaborated, through two "dialogues". These are meant to explore a wide range of theories and aspects of design that are necessary for the foundational shift towards transdisciplinarity between SpD and SD. The Dialogues act as inter-

[1] The notion of *trans-disciplinarity* is based on the hierarchy of increasing complexity from multi-, cross- to inter- and trans-disciplinarity in the cooperation and coordination among disciplines as discussed by Erich Jantsch in his seminal work published in 1972: *Technological planning and social futures*. New York, NY: Halsted Press. Also: Gustafsson, A. *et al.* (2016). Developing service research-paving the way to transdisciplinary research. *Journal of Service Management, 27*(1), 9-20; Edeholt, H., and Löwgren, J. (2003). Industrial design in a post-industrial society: A framework for understanding the relationship between industrial design and interaction design. In *Proceedings of the 5th Conference of the European Academy of Design, Barcelona*; Muratovski, G. (2015). *Research for Designers: A Guide to Methods and Practice*. London, UK: SAGE. Celaschi, F., Lupo, E., and Formia, E.M. (2012). From trans-disciplinary to "undisciplined" design learning: educating through/to disruption. In *Third International Forum of Design as a Process*. Torino, Italy: Allemandi.

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nal conversations about converging factors across the disciplines to identify an effective "conversation". They represent the scope of creating supportive structures between SpD and SD, meaning the disclosure of the fundamentals of an S+S design to reconsider the tangibility and intangibility of SD through a spatial perspective.

Introduction

Over the last twenty years, SD has become more and more defined: building its specific approaches and methods; understanding its boundaries and mutual connections with other disciplines (i.e. management, marketing innovation, service science, social/behavioural science, computing and engineering, industrial design, etc.); and being itself an already structured methodology. Furthermore, SD received contributions in its definition from those disciplines, as well as from the design tradition, where it has been explored in the branches of strategic design, design for sustainability and interaction design. It is important to clarify that this study is based on a design background: "service design is concerned with systematically applying design methods and principles to the design of services" (Holmlid and Evenson, 2008, p. 341). In fact, service science in turn built its origins on different streams (Mager, 2008), being an interdisciplinary area of research of its own right. The "spatial" component has been implied within theories and practices when exploring services with physical evidence, but without an in-depth analysis of a direct dialogue in research through design, between the scientific communities involved. There is a lack of research on the languages, theories and methods linking them.

These observations hint at new potential scenarios in which to design the unfolding of services in physical spaces and open the doors to exploration into this gap of knowledge.

Framing the research

Service innovations are reshaping spatial experiences.
Spaces are a part of the service system to be designed.

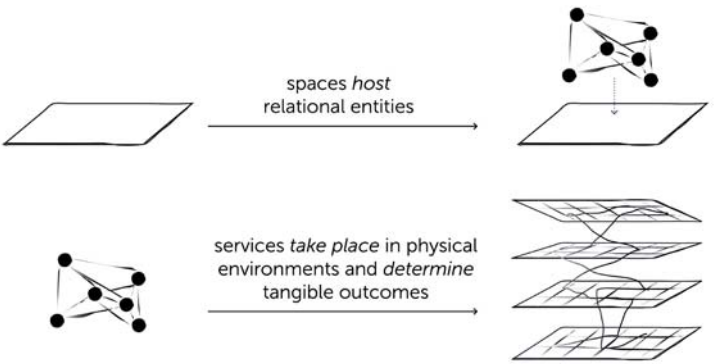

Fig. 1 – Diagram by the author representing the initial and fundamental assumptions of the research presented.

The study originates from the perception that services are influencing and identifying spaces, and new uses thereof: SpD encounters SD in urban planning, and in the design of workplaces, retail settings, private interior spaces, public services and infrastructures. In this range of settings, spaces *host* relational entities and vice-versa, services *take place* in physical environments and *determine* tangible outcomes.

Yet, despite the strategic importance of the theme, demonstrated by S+S experimentations in design university courses[2] and in design practices[3], the

[2] I.e. 1) the programme in "Interior & Service Design" (final year of the Bachelor and post-graduate year of specialisation) at the Thomas More University College in Mechelen (Belgium); 2) the Master's programme in Product and Spatial Design at the Aalto University School of Arts, Design and Architecture; 3) the programme of Environmental Design at Tongji University in Shanghai where, due to the double degree programme with the PSSD classes of the Politecnico di Milano School of Design, approaches and tools of Service design have been applied.

[3] I.e. 1) Studio Tilt in London, working especially on work environments design; 2) Frog Design international consultancy, with offices in Europe, USA and Asia, has applied SD methods and tools for the development of private and public services and their spaces; 3) DINN!, a design Italian company with a strategic and consultancy attitude, designing for example innovative concepts for traditional services.

absence of a coordinated design culture[4] and the lack in a theoretical development in the research in design is not negligible.

The aim is thus to identify a common ground for the two disciplines in order to explore areas of differentiation and of balance: these areas are identified as the *dialogues*. They explore a wide range of theories and aspects within design: overall, the study, in fact, is not focused on a deep understanding of a specific area, but remains on a higher level of research. This approach was necessary since the related overall work is a foundational shift towards transdisciplinarity between SpD and SD and the Dialogues act as converging factors in that direction, focused on a mutual and reciprocal theorising across the disciplines.

Here, the Dialogues have been organised into two main areas of exploration into design as a process: i) the evolution of the design process as an adaptive dynamic system (the meta-design approach and the evolution of a design methodology in the 1970s); ii) the narrative dimension of the design process, in terms of generation (managing the complexity of triggering creative thinking) and of representation (the management of data transfer), and their impact on the aesthetics of the relationship within the design outcome.

Several direct experiences in research projects and in educational activities were analysed as case studies[5] and test environments analysed before and during the doctoral activity[6] identified a lack of a specific literature review on

[4] "Design culture" is the English translation of the Italian "Cultura del progetto", where *progetto* has a broader meaning. It includes any discipline in which there is a planning component, where a prefiguration activity occurs.

[5] The research activities observed, the educational activities as study cases and the interviews supporting the overall research are not included in this contribution.

[6] Field experimentations by the author, with her research lab, have been disseminated in the following publications: Fassi, D., Galluzzo, L., and De Rosa, A. (2018). Service+Spatial design: introducing the fundamentals of a transdisciplinary approach, Service Design Proof of Concept. In *Proceedings of the ServDes.2018 Conference*. Linköping: Linköping University Electronic Press; De Rosa, A. (2017). *Unconventional spaces for art and design: enabling community synergy. A methodological approach*. In Camocini, B., and Fassi, D. (Eds.), *In the neighbourhood. Spatial Design and Urban Activation* (pp. 103-121). Milano, Italy: FrancoAngeli; Fassi, D., Rebaglio, A., and De Rosa, A. (2017). Designing a cultural event as an inclusive educational activity. *The Design Journal. Design for next. Proceedings of the 12th European Academy of Design Conference.* (Vol. 20, pp. S988-S999). London, UK: Taylor & Francis; Calvo, M., and De Rosa, A. (2017). Design for social sustainability. A reflection on the role of the physical realm in facilitating community co-design. *The Design Journal. Design for next. Proceedings of the 12th European Academy of Design Conference* (Vol. 20, pp. S1705-S1724). London, UK: Taylor & Francis; Fassi, D., Galluzzo, L., and De Rosa, A. (2016). CampUS: Co-designing spaces for urban agriculture with local communities. *PAD*, 13, 254-278; Fassi, D., Galluzzo, L., and De Rosa, A. (2016). *CampUS: How the Co-design*

this topic, highlighting the absence of supporting structures that the doctoral dissertation this contribution relies on attempts to begin to define.

The Dialogues

The first Dialogue explores the evolution of the design process as an adaptive dynamic system, dealing with the development of a meta-design approach and the evolution of a design methodology in the 1970s, specifically with regards to the disciplines of Architecture, Architectural Technology and, subsequently, to the design area that flows into SpD (Rosselli, 1973; 1974; Ciribini, 1984; Crespi and Schiaffonati, 1990; Bertola and Manzini, 2004; Collina, 2005; Branzi, 2006; Crippa and Di Prete, 2011; Crespi, 2013).

The transition towards an open methodological approach in design

The act of design is a multifaceted act since it is at the same time a creative process, where experience and intuition have a fundamental role, and a scientific process, with criteria for decision-making and rational systems. When theoreticians first began to focus on design, they applied the philosophical and practical elements of analysis as the premise for a scientific approach (Rosselli, 1973, p. 5). Following WW2, in fact, dealing with the concept of complexity as a determining condition became fundamental for an *open* methodological approach in architecture, where intuition and creativity, on one side, and an analytic and deterministic method, on the other, were not already explored as dialectical counterparts. In that period, the need for a rationalisation of the design process led to the effective introduction of methodologies coming from other important scientific fields, such as computer sciences, mathematics and statistics (Collina, 2005). From this debate, it become clear the indissoluble relationship between, one side, reality seen

Approach Can Support the Social Innovation in Urban Context. In *Advances in Design for Inclusion* (pp. 609-621). Cham, Switzerland: Springer; Galluzzo, L., and De Rosa, A. (2016). *How educational processes and social entrepreneurship can support an urban regeneration in Milan*. In *4th International Scientific Conference A.L.I.C.E. 2016, GoingGreenGlobal International Design Week, Sustainable Design Paradigms* (pp. 72-77). Ljubljana: Faculty of Design, an independent higher education institute, Associated member of the University of Primorska.

as a complex system to be approached and understood, and, on the other, the way – *method* – to deal with reality's issues – *design opportunities* – as a complex system as well as the factors to be analysed, to be moduled into ideas among the unlimited possible solutions and, finally, to be approved for production and dissemination.

The elaboration of a *comprehensive, unique* and *right* method to deal with any design problem, researched by those trying to establish an operational approach for the design process is, in fact, neither a solution nor the object of design method studies. The qualitative and intuitive creative act needed a supportiving methodological approach: not mechanistic but way to make sense (sense-making) of the design act immersed in the contemporary socio-technical system. As Rosselli[7] stated (1973, pp. 9-10), design methodologies must not be operational – that is dependent on the ultimate benefit and in line with its determination – but must be reconnected to philosophical research in order to be reframed within problems that are dimensionally different. A transition from a deterministic view of the system to a complex one thus took place: methodologies in design were now seen as fundamental in guiding and making sense of design act itself.

This debate generated internal contrasts within the field, and the innovative approaches had an impact on the transformation of the idea itself of Architecture. A crisis of the discipline's unity becomes a great cultural opportunity, opening new possible paths to the design culture. Furthermore, Rosselli (1974) clearly stated that the overcoming of the contrast between architecture and design was desirably to be achieded through the development of a methodology broad enough to accommodate a more evolved and relevant social need, towards a complementarity between culture and method.

Within this complexity, the design outputs were already seen as *relational phenomena*, not obtainable through linear processes but through a complex system of prevision (models) with an impact overcoming the borders of the output itself. This logic has been transferred to the theoretical reflection on the value of space, which can't be qualitatively solved within the architectural object, rather it must be understood as part of a socio-economic sphere, where an integrated relationship between spaces and objects needed to be explored.

[7] With the research team of the Faculty of Architecture at the Politecnico di Milano, Progettazione artistica per l'industria [Artistic design for the industry] course, composed by Alberto Rosselli, Adriana Baglioni, Costantino Corsini, Luigi Moretti, Marco Simonazzi, Giuseppe Turchini. Alberto Rosselli (1921-1976) was an Italian architect, designer and professor of the Faculty of Architecture at the Politecnico di Milano, co-founder of the ADI - Associazione per il disegno industriale (the Industrial Design Association).

Neither places nor objects should be seen as independent parts: the object is part of a system in time and space and space is a relational issue, resulting from certain situations, certain activities and certain objects (1974, p. 8).

Clearly rooted in this debate, a need emerged throughout the '70s to include a systemic approach to the design process itself and not only in the nature of design, thus introducing the meta-design approach and clearly driving the architectural studies reflections into the design ones, opening the Italian *cultura del progetto* to the international meaning of *design* as a disciplinary field (and not only as the pure translation of *progetto)*. Ciribini[8] spoke of the management of the design process as *"an adaptive dynamic system"*: a sequence of actions of the programmatic act of the designer, that works through qualitative models and preventive solutions (Collina, 2005). The iteration throughout the whole process is constitutive: using a meta-design approach means structuring norms able to indirectly produce infinite and different yet homogeneous morphological solutions.[9]

In these definitions, the basic notions pertinent to the design process are evident: the *notion of system* – the structural order of the relationships between the parts in a given set; the *notion of process* – when the time variable introduces the dynamic sequencing of states; and the *notion of iteration* and the *notion of creativity*. This last notion is not *opposed* to a systemic approach but is its *dialectical counterpart*: the system is the undeniable structure of reality; the system is the undeniable structure of the method as an operational and cultural reformulation of problems; creativity is the undeniable and founding variable of any human act. Hence, the design method progresses through being systemic and strategic into the techno-physical system and by acquiring provisional and probabilistic components of the human and socio-cultural environment (Rosenman and Gero, 1998; Norman and Stappers, 2015), renouncing integral control over the reality to which it is applied, through a strategic and abductive approach (Crespi, 2013, pp. 28-29).

This section highlights how the broader shifting context following the Second World War, particularly the impact of technological changes due to

[8] Giuseppe Ciribini (1913-1990) was an Italian engineer and professor of Architectural Technology at the Politecnico di Torino. He is considered the father of the discipline of Architectural Technology in Italy. It is important to report that the process that resulted in the foundation of the School of Design – formerly Faculty of Design up until the Italian reform (L. n. 240 of 30/12/2010) – developed from the Department of Technology, then to the Department of Planning, Design and Construction [Dipartimento di Programmazione, Progettazione e Produzione Edilizia].

[9] Mendini, A. (1969). Metaprogetto sì e no [Metadesign yes or no]. In *Casabella*, n. 333, p. 13.

economic and social transformation, and their many implications, had a relevant influence on the debate surrounding design methodology and in the development of Interior and Spatial Design approaches, operating between spaces and relationships. A debate in the educational process about the role of architects in rebuilding cities that brought about an entirely original point of view with regards to the role of architectural technology, in that it needed transforming, and its relationship to design and its approach. The need for methodological and systemic research derived from the inadequacy of an intuitive procedure in architectural education, which was unable to cope with new dimensional, quantitative, operational and productive problems, paved the way to the definition of a design education. The research has defined a connection between the contextual impact on the methodological development in the SpD discipline and the development of a meta-design approach with the subsequent structured acquisition of provisional and probabilistic components into the SD methodology, dealing with the complexity of variables entering into the design process through the contextual processes of co-creation and co-design. SD has developed in the last 20 years procedures – methods and tools – to deal with the creative and the operational sides of the design process, having the *relational* component at the centre of any methodological and approach evolution. SpD, instead, lacks in the development of a shareable method; that is why this *dialogue* is useful to delineate a first complementarity aspect, useful to build a S+S transdisciplinary approach.

The narrative dimension of the design process and representation

The second Dialogue explores the narrative dimension of the design process, in terms of generation (managing the complexity if triggering the creative thinking) and of representation (managing data transfer), and their impact on the aesthetics of the relationship within the design outcome (Alexander, 1977; Anceschi, 1992; Pacenti, 1998; Pine and Gilmore, 1998; Segelström and Holmlid, 2009; Bourriaud, 2010; Stickdorn *et al.*, 2011; Diana *et al.*, 2012; Forsey, 2016; Penin, 2018).

In particular, it creates a connection between the sequential dimension of the design operational process – see above – and the sequential dimension of the physical manifestations of the service interface. The inadequacy of a single intuitive procedure as a unique design methodology was argued, towards complex, non-linear, systems of previsions (models) able to understand the relationships between components within a higher level of complexity and of

variables. These *models* provide sequences of actions towards infinite possible solutions encompassing the unexpected. By reaffirming the focus on the design process rather than on the final design solution (Muratovski, 2010, 2016), the approach of SD is embraced, and the focus on the deconstruction of the design process into steps becomes of fundamental importance. Particularly, there is a clear connection with the Product Service System (PSS) dimension.[10] The PSS concept represents the shift from a purely tangible dominant practice to an integrated design strategy oriented towards design solutions, where the connection between products and services is not random but conceived from the very beginning (Meroni, 2008). New forms of consumption and new social demands require a participatory complex and contextualised product-service-systems (Meroni, 2008, p. 32), designed, made and delivered on a case by case basis and viewed from the client's perspective (Baines *et al.*, 2007, p. 1549). Since PSS includes acquiring knowledge about the end users as well as all the various players (administration, associations, companies, supply chain actors etc.) and may include their engagement in some phases of the design process, this perspective is explored through processes of co-creation and co-design that are frequently discussed in SD and which have their origins in strategies of inquiry in the social sciences, e.g. Participatory Action Research.[11] Once again, an overall system view invests both the object of research and of practice as well as the necessary operational and cultural dimension. As Morelli states (2002, p. 6), the extension of a design activity to incorporate services requires the use of new methodological tools to address PSS, in terms of: understanding the users' needs and the friction between complex technologies and the users; the complexity of variables entering into the design process and the tools and methods to deal with this; the understanding of the material of services (Bitner, 1992; Blomkvist *et al.*, 2016); and the validation of the process via shared forms of representation, communication and dissemination.

[10] A PSS is defined as a system of products, services, supporting networks and infrastructure designed to be competitive, user-centred and sustainable (Mont, 2002) and *"a marketable set of products and services capable of jointly fulfilling a user's need"* where a product is a *"tangible commodity manufactured to be sold"* and a service is *"an activity (work) done for others with an economic value and often done on a commercial basis"* (Goedkoop, Van Halen, Te Riele and Rommens, 1999, pp. 17-18).

[11] Participatory processes had little impact on service development, while they have been strongly assimilated by service design because of its co-created nature. See: Holmlid, S. (2012). *Participative; co-operative; emancipatory: From participatory design to service design* (pp. 105-118). In *Conference Proceedings ServDes, 2009; DeThinking Service; ReThinking Design*. Linköping, Sweden: Linköping University Electronic Press; Gilmore, T., Krantz, J., and Ramirez, R. (1986). Action-based modes of inquiry and the host-researcher relationship. *Consultation: An International Journal*.

This paves the way towards reflecting on the connection between the *sequentiality* embedded in the design methodology and the *sequentiality* needed in the representational methodology. If for Pacenti (1998, p. 104) the fact of dealing with a range of possibilities could mean a loss of the programmatic nature of design, towards what she proposed as the concept of "expanded direction", the need emerges for a specific sensitivity including the coordination of the process together with a coordination of the overall identity of what is designed. The concept of an "expanded direction" opened the way to the one of *performance*. SD is strongly embedded in the *experience economy* (Pine and Gilmore, 1998), since services happen in the moment of the encounter, when the interaction takes place. It is when the service is *performed* (through a face-to-face interaction, a digital one or through a combination of channels between the user and the provider) that the scene of the performance becomes alive. In these terms, the service scene includes the design of the physical environment, of the tools used by the operators, of the products that the user uses directly to obtain the result and of the communicative and visual elements. The physical evidences constitute the *scenography* and the *props* of the service interface. But the design of the interface also includes the potential *plot* – among infinite yet defined possibilities – of the interaction between the user and the delivery system as a whole, including the interaction with service operators, and the human elements of the scene of interaction (Pacenti, 1998, p. 97).

In the same way, the interpretation of the space is not unanimous; spaces are also *possible mises en scène*, depending on the variables and on the complexity of the context as well as depending on the plot of the interaction. Crespi (2013, p. 41) sees the connection with worlds that are contiguous to SpD – such as cinema, visual arts, theatre and television – as inspirational for the connection between human beings and places, for the elaboration of the programmatic design idea in terms of narration, allegories and metaphors. Thus, the narrative dimension of spaces stands both in their uses and in their elaboration: spaces are, in reality, the *enablers* and the support system for interactions to take place, within a higher level of unpredictability. The relational space between artefact and observer/user is a concept that evolved throughout the last century especially with the contribution of visual art: art movements such as futurism, constructivism and surrealism studied, looking into how space is occupied by the artwork, the relationship with the observer, questioning the notions of space and time in different ways (Krauss, 2000). This cultural process merged into the loss of ability to govern the space and the need for solutions that are not univocal but flexible. This is one of the core

SpD processes: the deconstruction of the process corresponds to the structured embedding of the other components – actions, interactions – integrated in the narration of the *journey* into spaces. In this way, the no-longer static understanding of spaces could have found in its dynamic narrative a new way to design and interpret it. SpD triggers a process of exchange, being a system that creates and defines relations and exchanges between the subjects. It acts on a temporal dimension; it is not a closed system but an open and flexible one, potentially ready to accept changes (Crippa and Di Prete, 2011, p. 38). Thus, the narrative structure is open: open to the unexpected as well as to an operational act. In terms of visualisation of the process, SD usually adopts the concept of *sequencing* to break down actions and interactions and to focus on the different components of the service. This is the *service period*, divided into pre-service, during-service and post-service phases: various methods and tools are used to explore and exploit the steps and the variables along the sequence, both as generative tools and as representational ones. The first is the case of live narratives such as the *desktop walkthrough* or *bodystorming*. Representational tools deal with the management of data transfer; it is the case of *storyboards* and *journey map*s, or of *system maps*. Without delving into too much of an in-depth description of these tools, which are codified and shared by the scientific community (both in academia as well as in the agency and practice environments), it is interesting to highlight how SD has identified structured ways to deal with the processional nature of services and to transfer them into the design process, at the operational level and at the representational one, to enact the creation, validation and capacity of communicating the complexity of the object to be designed. Instead, SpD, even if is itself defined within the development of a design methodology as illustrated above, has not yet incorporated sequential, temporal and narrative components in its representational tools, which are still more connected to a static visualization of the overall physical evidence, and limiting the communication of possible futures embedded in the design of a place. Plans, sections and 3D models, at the same time, demonstrate the ability to provide an overall representation of the physical side and flow charts or functions are unlikely to be able to provide the sense or the aesthetics of the relationship, meaning the narrative structure of the story (Pacenti, 1998, p. 105) that includes the time-span. Aesthetics, which has traditionally been connected to the spatial dimension and to its symbolic values transferred through words-images-forms, has thus acquired a temporal dimension and unfolded into the time of the interaction, the engagement, the participation, and the relationship that SD has acquired in its process and methodology. Representational and generative tools from SpD and SD could therefore be explored as possibly complementary approaches, to include the

physical evidence, the aesthetics of the relationship and the sequencing within the time-span. This need emerged when SD emerged as a discipline.

Conclusion

It is important to understand the ability of SD to have developed a diverse range of methods and tools for representing and managing the complexity of the systems taken into account and to be designed, aware of the fact that there is no unique way to represent the *full story* of a design. Visualisations are used in SD as tools for translating raw data into insights and as a way to communicate these. Conversely, SpD has explored, throughout its history linked to the discipline of Architecture, methods and representational tools aimed at representing the object of the design itself, with codes and regulations, while lacking *the rest of the story*. In other words lacking in defining codes and tools to generate, communicate and visualise the space's potential to be an *enabler* of interaction within its exploitation.

The unfolding of services in the physical environment implies and determines a narrative dimension where the physical evidences constitutes the scenography and the props of the service plot. Both the design of services and the design of spaces are possible *mises en scène*, enabled by design itself and within a state ofunpredictability. The *sequencing* nature of SD's object and process is codified into operational and representational tools while SpD's representational tools are still more connected to a static visualisation of the physical elements. Time sequencing and spatial aesthetics should merge in a complementary orientation towards an *aesthetic of the relationship*, including the spatial dimension and its symbolic values as well as the time of the interaction, the engagement and the participation. This leads to an integrated design of spaces taking into account the narration of flows. The diverse methods and tools of SD and SpD for representing and managing complexity, making the service performance tangible and expressing assumptions and processes, offers a codified range to represent the full story of a design solution broken up in fragments.

The doctoral thesis results in a taxonomy, a qualitative comparison which outlines principles for the foundation of an S+S approach, showing how aspects of the two disciplines can serve to show the needed complementarity towards a S+S transdisciplinary coordination. The taxonomy has not been presented here. This contribution is meant in fact to propose only a part of the wider landscape on which the taxonomy relies.

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