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## Traces as service evidence

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### Abstract

In this paper, the idea of leveraging traces in service design for sustainability is presented. Physical evidence is an essential aspect of services as the service experience exists as a choreography of people, things and processes. These designed, tangible aspects of services play an important role in the overall service experience and at the same time act as affordances, leading the user through a desired service journey without interpersonal interactions.

Viewing services in the context of actor network theory, as networks of humans and non-humans suggests that this service evidence act as a carrier of explicit knowledge relegated to it by the designers. Integrating tacit knowledge in the design process is a meaningful endeavour especially in the context of service design for sustainability. Traces is a notion associated with focal practices that shed light in this unexplored direction of service design. Traces exhibit similar characteristics to evidence but in a capacity of carrying tacit knowledge.

**KEYWORDS:** traces, service design, craft, tacit knowledge, social innovation

### Introduction

This paper aims to introduce the idea of traces in the design of services. Traces, the perceptible enduring marks left on the material world through the engagement with people with it (Ingold 2007), are carriers of tacit knowledge acting as the keystone (Robbins 2016) between people, practices and things. We turn to the idea of service evidence to better understand the tools that create meaning in the intersection of time and material in contemporary service design in order to identify the meaningful design space for the integration of traces in service design.

In the first section of this paper the importance of the tangible in service systems is discussed. This is followed up by analysing how Actor Network Theory can be the perspective that provides an ontology necessary for such a way of designing service. This perspective opens the door to bridging the service design and craft discourse, especially when dealing with services aiming to transform organisational models such as relational services or transitional services. In the fourth section the need for traces is discussed followed up by a taxonomy of lenses that provide a clearer picture of traces and some

practical recommendation to integrating traces in contemporary service design process. In the final section, the conclusions and future direction of this research are discussed.

## The importance of tangible service evidence

In their core services exist as an interconnected network of people, processes and tangible artifacts (Titz 2001) that aim to create value in exchange within this system and provide a predetermined experience for all the parties involved. Service design is considered as being the process that explicitly aims to create and form services that are desirable from the clients' sides and effective from the service providers' perspective (Mager 2007 p. 355). Services, being the Holon above this system of value production are characterised by intangibility, escaping the human touch. This quality points to the performative character of services that "cannot be seen, felt, tasted or touched in the same manner that goods can" (Zeithaml et al. 1985). This is one of the four characteristics of services according to the IHIP model, the others being Heterogeneity, Inseparability, Perishability. The IHIP model points heavily to the differences between services and goods and is widely used and accepted (Moeler 2010) within service discourse. The main issue with the IHIP model is that it, explains what services are not rather than accounting for how services work in practice (Edman 2009). The experience focused perspective points to a phenomenological approach to services, looking at them as a collection of curated, mediated experiences. However, most human experience is grounded in the physical materialities that surround us.

Service design discourse has adopted the idea of physical evidence as "a functional form that acts as the interface between service providers and consumers." (Lo 2011) Physical evidence makes the intangible service tangible. Service tangibles are, in fact, one of the five dimensions of service quality in the SERVQUAL model (Parasuraman et al 1988, 1994) the other four being reliability, responsiveness, assurance and empathy. These service tangibles create a breadcrumbs trail before, during and after the service experience and act as carriers of knowledge passed on between the service providers and the clients. They tell the tale of the journey through the service and play an important role in most aspects of the way a service is experienced as they are the foundations upon which this experience is built. Service evidence plays a central role in service blueprints, a widely adopted method of service design (Shostack 1982, 1992; Bitner et al 2007). Service evidence is modelled above the 'line of visibility' in service blueprint and can be seen as an interface between the actions happening above and below this line. The characteristics of this evidence depends on the type of servicescape (Bitner, 1992) of the designed service. They are anchors of micro-experiences within the whole macro-experience of the service as a whole. (Bofylatos et al. 2016). Managing the evidence (Berry and Bendapudi 2003) can provide necessary, tangible clues that steer the users in the right direction within the servicescape.

In the Actor Network Theory perspective described in the next section, tangible evidence is an essential part of the service network as pieces of evidence act as delegated ushers guiding flows within the network. Evidence is a carrier of empirical knowledge, enabling users of the service to move along the lifelines, paths and flows of social life (Hallam and Ingold 2007). These context-specific field research approaches enable designers to engage in a design practice characterised by reflection-in-action (Schon, 1987). ANT coupled with Schon's reflection in action enable us to respond through a dialogic engagement with humans and nonhumans that would be impossible in the rigid framework of scientific knowledge and naturalistic operationalism. What is missing, however, in design today is the integration of tacit knowledge with the same rigour that empirical knowledge is embedded in the designed experience and artifacts.

The importance of "material experience" (Karana et al. 2013) and craft thinking as a way to better manage knowledge (Neidderer et al. 2011) further support the necessity to design with the tangible and the intangible in tandem. Turning to service evidence provides a fertile field for new knowledge and application that brings together those two aspects of services. For too long services have been entranced with their intangibility, the ontology of service design has to include more tangible aspects of services.

## Services as actor networks

A framework that can support the modelling of services is one proposed by French sociologist Bruno Latour called Actor Network Theory (ANT). The starting point of ANT is the need to move away from the modernist subject-object distinction and move towards one of humans and non-humans, in this distinction both natural objects and sociotechnical artifacts belong. ANT treats humans and non-humans symmetrically, which means that it does not want to impose on them *a priori* distinctions, such as a distinction between intentional human action and casual action. Artifacts, natural objects and humans are nodes in networks of relations. No node of the network enters it as a pre-given entity. The essences of these entities are constructed in stabilizing networks, they are the output of these networks, not their input. Artifacts and humans co-constitute each other in these networks creating collectives or associations of humans and non-humans. Artifacts may be means for human ends, as humans may be means for the ends of artifacts. Agency, moral or otherwise, is distributed over all actors in a network of associations, properly speaking only associated entities acts (Latour 1999). A service experience is a moment of creation of such a network. Anything that makes a difference in the way other actors behave is in turn an actor. Actors can make other actors do things, in particular they can delegate actions to other actors. But these actors may overtake action and behave in unexpected ways. To address this ‘uncertainty surrounding action’ Latour proposes the distinction of five sources of uncertainty (Latour 2005). The uncertainty about the outcome of putting artifacts into this world is one of them. The way to deal with said uncertainty is to let the artifacts themselves become things that act by making other actors do unexpected things. This is why artifacts are mediators and not simply intermediaries (Latour 2005). Intermediaries transport meaning and force without altering them, and they are deterministic, meaning that given their input their output can be predicted without uncertainty. On the other hand, mediators “transform, translate, distort and modify the meaning or the elements they are supposed to carry” (*ibidem*). Artifacts as mediators are therefore a source of uncertainty and surprise. Artifacts, in this context, execute programs of action and are therefore agents, just like living beings. These programs of action are inscribed in them. The idea of the sociotechnical artifact offers an ontology that better integrates the idea of the artifact as “a semiotic organism in the centre of a threefold design semiosis.” (Zingale & Dominguez; 2015) within ANT. What emerges in this context is the idea that we can benefit from looking at services as networks of actors that create new knowledge through design semiosis. The tools we use nowadays are better suited for empirical and scientific knowledge but the need to differentiate the service dominant economic model from the goods dominant economic model (Vargo and Lusch 2006) has caused us to miss out on material experiences and the co-creation of tacit knowledge within the networks that create the service.

This widening of service ontology can be complemented by turning to the philosophy of craft. A field where in the past years new knowledge that aligns itself with the goals of design for sustainability and the transition towards sustainment, the next epoch of human societies. Reshaping the epistemological and ontological assumptions behind our worldview is necessary in transitioning towards a new paradigm, a shift necessary to alleviate the ecological and social issues humanity is facing. This new posture has more uncertainty and fuzziness due to not being reductionist and thus provides harder to use but more robust tools that are able to address the wicked problems we are facing.

## Crafting social innovation

Service design has been recognized as an approach that has a capacity to foster deep organizational and societal change. Starting at the periphery of an organization service designers act as enablers and facilitators engaging in a process that builds trust within the organisations. This process, when successful, creates a common language leading to shared

transformative insights into the organisations' fundamental assumptions, values, norms and behaviours that will eventually give birth to pilot projects that embody the direction of change (Junginger, Sangiorgi 2009)

This process of organisational change enabled by service design has been taxonomised in three different levels (ibid.). Service interaction design, where the main focus of the process is the creation of new artifacts and behaviours. Service design intervention, with the focus here being in questioning the norms and values of an organization and providing a way towards an alternative. Finally, service design can act as a facilitator in organizational transformation changing the bedrock upon which an organization has been built, changing the fundamental assumptions in the DNA of an organisation. This gives a perspective of services as an engine for wider societal transformations, and as a means for a more collaborative sustainable society and economy. The six important principles in these transformative services according to Sangiorgi (2011) are: Active citizens, building capacities and project partnerships, redistribution of power, infrastructure and enabling platforms, community as an intervention size and enhancing imagination and hope. These six principles point towards a posture that provides a valuable connection with approaches in the field of design for sustainability. In the intersection between the two, we find solutions that enable the transition towards sustainable society through the re-evaluations of the system of values and the undergoing of an epochal shift (Fry 2004) from Modernity towards the next era of human development. In this vein, three important directions have been identified in service design discourse: Design of relational services for social innovation, transition design and the logic of craft.

Social innovation is seen as the application of service design tools and methods by creative communities to create services that enable the solutions of problems they face without expecting the change in the underlying problems. (Meroni & Bala. 2007) These organisations are positioned in the core of taxonomy of levels of potential impact of service design (Junginger, Sangiorgi 2009) as they embody a different system of values based around conviviality (Ilich 1973) openness and trust. These services bring together the diffuse design capacity of their members and the professional design capacities of trained designers (Manzini 2015) and have the capacity to foster the 'sustainable everyday' (Manzini & Jegou 2003) and reconstitute the domains of everyday life (Kossof 2015). The goals of such communities overall have been identified as:

- *creating micro-narratives that challenge the dominant narrative of modernity,*
- *empowering local distributed creative communities,*
- *challenging the addiction of consumption and the institution of private property and fostering degrowth (D'Alisa et al. 2014)*
- *fostering lifestyles based around conviviality, reciprocity and solidarity"*  
(Bofylatos 2017b)

Another differentiating factor between service design undertaken in commercial settings and social innovation is the type of service produced. Building on Martin Buber's work (1921) the distinction between standard and relational services is proposed (Cipolla & Manzini 2009). Standard services exist within an object subject, or "I-It", relation whereas relational services exist in a subject-subject, "I-Thou" relationship. In the context of the first model agents and clients exist in predefined roles, performing scripted actions in a strictly choreographed journey. In contrast, under the scope of relational services benefits are reciprocally produced and shared by participants in a collaborative way. This points to the need for a shift in our material culture (Walker, 2017) coupled with the adoption of service dominant logic (Vargo & Lusch 2006) and value in use (Grönroos 2008) instead of product dominant logic and value in exchange. Taking a step back and considering both Buber's work and Actor Network Theory it becomes evident that this difference expands to artifacts as well as people. As such it is necessary to create a living, circular, dynamic interaction with the material touchpoints inside a service encounter. The view of artifacts as means in the service experience is not able to incorporate the ongoing evolution in the fields of craft and tacit knowledge and as such new tools and perspectives have to be identified, prototyped and debated within service thinking discourse especially in the context of transitioning towards sustainability.

Irwin (2015) proposes that service design, design for social innovation and transition design be viewed “along a continuum in which spatio-temporal context expand and deepen” (Irwin 2015). Transition design argues for the transition towards “sustainable futures is a design process that requires a vision, the integration of knowledge and the need to think and act at different levels of scale” (Kossoff 2015). Transition design advocates a radical shift of the socioeconomic and political paradigm within a long-term vision of change. As it is an approach that complements social innovation providing the solutions on the strategical level, it is complementary to the tactical solutions provided by social innovation. The main areas of focus of the transition design framework are: visions of transition, theories of change, mindset and posture and new ways of designing (Irwin et al; 2016). The logic of craft provides valuable tools and perspectives for all four areas of knowledge.

The logic of craft has emerged as an important vehicle for transforming design into a redirective practice (Fry 2007) as it provides an ontology that is compatible with sustainability and both social innovation and transition design. The ambition of a redirective practice is to realise a new system of values, to redirect the structural and social conditions that inform ways of being in the world. Craft has the capacity to act as a framework that foster engagement with human values (Sennett 2008; Crawford 2009) and in practice imbues and embodies these values in material form (Walker 2017) providing a practical way to reshape material culture by engaging in exploration and practice (Niedderer et al. 2011). Craft is a way of thinking through the hand manipulating a material (Nimkurlrat 2010, 2012) and a way for the thinking body to express itself (Malafoutis 2013) and thus a by engaging in a dialectic process with the material (Massumi 1992), it is a way of creating and embodying tacit knowledge into material form. (Bofylatos 2017a). Craft is more than a tool for understanding and designing for materialities and goes beyond process as according to Fry “[t]he qualification of craft practice is neither predicated upon established hand working, machine-based skills nor new methods which employ advanced technology but rather on the articulated relation between hand and mind in making which secures a direct human presence, as the loci of power and knowledge, in the made.” (Fry,1994). This points to the synergy between the agendas of craft, sustainment (Kiem 2011) and social innovation (Mazzarella et al. 2017).

## The need for traces

So, the question that arises in the context of the evolution of service design field is how can the aforementioned common ground between the two fields translate in the practice of service design. In order to organize the wealth of intersections we can taxonomise these inside the four areas of the focus of transition design. For example, in the context of mindset and posture, the idea of ‘mastery’ put forward by David Harvey (1990) can be beneficial in the context of communities engaged in social innovation. Mastery that ‘is both non-propositional and time intensive process’ (Harvey 1990:284). The same can be said for the process of fostering the evolution of diffuse design capacity (Manzini 2016) in collaboration with designers in a participatory design process. The knowledge governed by mastery is slowly created and due to its embodied nature can only be shared locally, in close spatial relationships. Bearing in mind this notion when designing in the context of social innovations allows for integrating both the looser time constraints and novel ways to disseminate new knowledge leading to a more realistic management anticipation by the participants.

Another important way that craft can inform social innovation is through the idea of ‘focal things and practices’ (Borgman, 1984) which refers to activities that use technological equipment in an engaging way as opposed to easy-to-use commodified activities. Participating in a creative community has to be a focal everyday practice that led by a new vision challenges and changes the socio-ecological context and fosters a new way of being in the world compatible with sustainable lifestyles. Borgman’s line of thought is also better suited for service dominant logic due to the fact that it is antithetical to what he refers to as the ‘device paradigm’ (*ibid*). In this paradigm, technology is seen as the ‘device’ when its

means are separated from its ends, shifting from this paradigm to one of human engagement with the socio-ecological context of our senses, whereas engagement with sociality and materiality are the goal of focal things and practices. This perspective once again points to the shift from the perspective of value in exchange in the device paradigm to value in use in the focal paradigm that provides opportunities to come up with alternatives to the device and to change the relationships between technology and people.

Traces, the perceptible enduring marks left on the material world through the engagement with people with it (Ingold 2007) have the capacity to act as the keystone for the dialogue between people, practices and materials (Robbins 2016) In the context of service design for social innovation we can perceive traces as the marks left on the **material by people** engaged in in a focal **practice**. Materials have the capacity to contain tacit knowledge and through engagement to communicate it back to us. Traces can be seen in relation to service evidence in the same way that relational services are related to standard services. The reasons for the need for such an approach are practical, aesthetical and ontological.

The practical reason has to do with the evolution of the diffuse design capacity found in creative communities. Looking at social innovation as a learning process, one that has to create new knowledge, the need shifts from solutions to processes and tools. With the role of the designer shifting towards a facilitator or master designer the aim turns to guiding apprentice designers to better use the design process. Traces can be the physical manifestation of these lessons and as such they are necessary in the process co-creating with the community.

Modernist aesthetics have been shaped by the capacities of mass production causing the creation of culturally neutral and bland products with pristine smooth surfaces that conceal the insides of products (Walker 2006). These aesthetic characteristics are telling of the device paradigm and have made traces an unwanted characteristic. This points to an aesthetic informed by the Kantian idea of beauty in which “what we call beautiful what we each believe everybody should acknowledge as perfect, complete. We take pleasure, from a disinterested distance, in finalities. [...] The beautiful needs no sustenance; it is anorexically self-satisfied. It puts us in touch with pure reason, not the practical reason of duties of care.” (Tonkinwise 2003). This view cannot support meaningful, long term relationships and can only foster a ‘throwaway culture’ guided by the market that is responsible for the devastation of the natural environment. Yet there are traditions that find meaning in imperfection and unfinishedness such as the traditional Japanese practices of *wabi sabi* and *kintsugi* (Tsaknaki and Fernaeus 2016). These ways of working go beyond the aesthetic as the idea of beauty and point to the underlying system of values. The appreciation of traces left by focal practices points to a different aesthetic system, one guided by beauty in use “the sort of appreciation that does not coincide with use, but perhaps comes afterwards. It is because this unmetaphysical judgement of beauty-in-use takes the form of giving thanks, that it is active, returning the favour by taking the form of care.” (Tonkinwise 2003). Rituals of care promote interaction with the material sprawling around indebtedness, thankfulness and conviviality. Leaving the space for the people who will be part of the service system is necessary to foster the emergence of traces.

Ontologically, traces provide a framework to design with tacit knowledge in the context of service design. Any human activity with a high degree of using the hands or the body, for example, craft processes, has a common thread in connecting them; it is impossible to put into words what happens in its entirety. For example, everybody breathes, but it is impossible for most people to explain how they do it. This kind of experiential, embodied knowledge is referred to as ‘tacit knowledge’ (Polanyi, 1958; Niedderer, 2007; Biggs, 2004). In the context of design and the creation of artifacts, craft has been mostly associated with it. The majority of knowledge held by craftsmen is tacit. The artisan work establishes a skill and knowledge sphere that may exceed the explanatory verbal abilities of man (Sennett, 2008; Pallasmaa, 2009; Wilson, 1998).

Since design inevitably embodies and reinforces values, it is important to pay close attention to what kind of values design should seek to strategically promote and legitimise in order to accelerate a transition towards human flourishing and sustainability (Ehrenfeld, 2013). At the same time, the designed artifact sits in a middle of a threefold design semiosis (Zingale and Zingale & Domingues, 2015) where each of its aspects leads to the creation and embodiment

of new knowledge associated with each of its facets. These types of knowledge are tacit, empirical and scientific (Bofylatos 2017a). This ontology calls for the reconstitution of the tacit in the design process as an equal to the other two kinds of knowledge. Having accepted this ontology, the next logical step is to translate it to methodological directions in the field of design.

## Integrating traces in the design process

With traces being multiply authored events created through time, the question of how they can they be designed arises. Going back to their explicit counterparts, service evidence, they are the tangible manifestation of different stages of the customer journey through the service system. Each bit of evidence is predetermined and contains specific knowledge. Traces are created over time through the everyday life of people inside the service system, traces are carriers of implicit knowledge. This translates to design as creating the space for traces to emerge and identifying the instances and places within the service journey that can leverage the characteristics of traces to more robustly create relational services.

Traces are not important for assessing what we have done, rather they provide subtle cues for what we should do. To better understand them three lenses are used, attributes, entanglements and trajectories (Rosner et al. 2013) these are views of traces not categories and thus are not mutually exclusive. The lens of ‘attributes’ points to the material experience (Karana et al. 2013) and the nuanced particularities that each trace and the material upon which it is inscribed possess [...]. The second lens is that of ‘trajectories’ unmasking the way that the interactions of things and people evolve through time resulting in wear. The final lens is that of ‘entanglements’ revealing the interactions of materials and people.

Entanglements are the points where the attributes are experienced when the trajectories of humans and/or non-humans meet. These three lenses uncover the main characteristics of traces. Traces are tied with the materiality in which they are created, traces signify an activity through time, a flow. Traces appear on the intersection of materialities and humans and can be used to understand the past and to guide the future.

The perspective that understands the characteristics and the intersections of people and things through time is one that is highly compatible to the service design methodology. Touchpoint analysis, customer journeys and service blueprints are tools of service design that aim to document the flow of people, things and information through time. Integrating the different lenses of traces in the appropriate parts of contemporary service design practice is thus not a hard task.

In the context of ‘attributes’ a meaningful direction is the integration of parts of the Material Experience Design methodology (Karana 2015) in the design of touchpoints for a service. By selecting appropriate materials designers can more robustly contribute in creating a desirable experience within the service system. Building on the framework of Micro-Macro UX (Von Saucken et al. 2013) the design of the overall experience grounds itself in the micro experiences with touchpoints the user interacts with.

The second lens associated with traces, trajectories, unfolds itself in time. As people, things and information flow through the service system they leave traces that both tell a story of the past, but also guide the future. Due to their tacit knowledge, as with attributes, trajectories are not designed. Instead the designer has to create the conditions that will allow these traces to emerge. Selecting where and when these traces are complimentary and useful can become apparent by a closer analysis of the customer journey and the service blueprint.

If appropriate attributes and trajectories have been selected, the entanglements within the service system will create the traces that are desirable. The emphasis is in creating the conditions that enable the emergence of these traces. These traces will document the tacit knowledge created at different times by different people, and through engaging those engaged in focal practices will enable the co-creation of tacit knowledge between different humans and nonhuman agents.

An example of a system that bring together tacit, empirical and scientific knowledge is a hiking trail in the wilderness. The trail itself is a trace, a line of earth pressed under the feet of

many different hikers through time. It embodies knowledge about the trail such as ‘where do I get sheltered from the wind’, ‘which is the most stable way to go down?’. The trail exists in a dialogic relationship with the environmental conditions, the local fauna and the hikers themselves. In addition, the signage that documents the time needed to reach different destinations is part of the evidence that is employed. The time is based on empirical observations of past hikers and cannot be considered ‘hard data’, it is an estimation. On the other hand, the GPS data that can be saved in a mobile phone tracking the hike create the irrefutable hard data that can tell a story about the metrics of the hike but nothing about the experience of the people who participated. If we were to design the hiking experience we would need go beyond organising all of the aforementioned touchpoints, evidence and traces and allow for their uncertainty to emerge.

## Conclusions

Incorporating tacit knowledge in design provides novel challenges and opportunities. This process aims to bring about a new balance in the design process, but not to dethrone scientific and empirical knowledge. The aim is to bring tacit knowledge back in the discussion as an equal. The reasons behind this choice are associated with the need to engage in research through design with alternative systems of values. Tacit knowledge provides a way towards a new “restoring narrative unity” (Walker 2017) fostering a more meaningful material culture and unlocking the redirective potential of design. Especially in the context of service design for social innovation, due to its transformative position and distributed character, tacit knowledge seems like a necessary consideration.

Traces as a notion are not foreign to the design of services. Service evidence is an aspect of service design that already addresses some of the same issues but from the perspective of empirical and scientific knowledge. Designing with tacit knowledge is still foreign to designers as the discourse has been dominated with the values of Modernity. Creating the tools and adopting a position that can take these considerations into account is necessary for the shifts required to transition towards a sustainable everyday life. As such the frameworks of research through design and community design provide unique opportunities for unlocking the transitive nature of service design by coming up with new ways of making social innovations into focal practices.

The intersections of the fields of craft and design are a fertile ground where ideas of the material and the immaterial cross-pollinate creating a framework that can be challenging but is necessary if we are to imagine design in an alternative system of values. Developing, prototyping and evolving design tools that allow for these new perspectives to be integrated in practice is the next big step in this process. Creating new tools and frameworks that enable service designers to creatively incorporate traces in practice is the next logical step in this direction.

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