

Reconsidering (Service) Design in View of Systemic Challenges: Insights from a Quantum Theoretical Perspective

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Abstract

(Service) designers must increasingly navigate complex and interconnected challenges in their daily work. In response, new design practices are emerging that are more systemic and strategic in their orientation. However, there is insufficient discussion about, or questioning of, the onto-epistemological foundations of design and their appropriateness in the emerging context. This paper aims to support the service design discipline in its transition towards conceiving of and responding to systemic challenges as entangled phenomena. To do so, we draw on quantum mechanics, specifically a Baradian view, which centres on the notion of entanglement and enactment to understand and navigate the world. We propose an alternative theoretical foundation for (service) design that considers ontoepistemological building blocks about the world we live in and its elements, assisting designers to question potentially taken-for-granted, yet limiting assumptions and perspectives.

Keywords: service design, design theory, quantum mechanics, ontologyepistemology

Introduction

Our world is facing complex, interconnected challenges with many contingencies and uncertainties, often referred to as 'wicked problems' (Rittel and Webber, 1973; Buchanan, 1992). These challenges relate to major super-systems essential to life on planet Earth. From financial to social, health to justice, major systems existential to life are under strain (e.g., Rockström et al., 2009). Wickedness has become the norm (see Coyne, 2005). Hence, scholars and practitioners aim to enhance design

theory and practice in response to this emerging world. For example, service design is increasingly moving beyond a focus on well-defined user journeys, towards more systemic and strategic design approaches (Blomkamp, 2020; British Design Council, 2021; Koskela-Huotari et al. 2021; Sangiorgi, 2011; Sangiorgi, Holmlid & Patricio, 2022; Windahl, Karpen and Wright, 2020). The emerging societal and business landscapes challenge designers to re-conceive their worldview, work, approach, character and role.

This paper aims to support the (service) design discipline to respond to systemic challenges as entangled phenomena. To do so, we draw on a Baradian view of quantum mechanics (Barad, 2003; 2007; 2010), which centres on the notion of entanglement and enactment to understand and navigate the world. Our proposed theoretical framework considers onto-epistemological building blocks about the world and its elements, helping designers challenge limiting assumptions and perspectives that shape their practice.

By drawing on quantum mechanics, we offer an alternative view to mainstream design beliefs and principles that reflect a 'dominant narrative of service design' in the international design community (c.f., Duan et al., 2021). Although systemic design frameworks offer great benefits, they can describe practice that rest on outdated assumptions. We thus offer alternative insights into (1) how we can conceive of (service) design from an onto-epistemological perspective, and (2) how we conceive of ourselves as practitioners in this field. In so doing, we also support new theory development in design, a call that is growing in relevance (e.g., Cash, 2018).

Ultimately, we believe this onto-epistemological reconsideration in the (service) design discipline is necessary to enable greater future positive impact. Researchers argue that designers are at risk of reproducing existing institutions and power structures with their designs (Duan, Vink and Clatworthy, 2021), if reflexivity of beliefs, character and approach is not present (Vink and Koskela-Huotari, 2021). Transitioning our discussion to practice, deliberately focusing on developing one's own design character (Senova, 2022) enables a more effective response to entangled challenges.

Theoretical Background on Service Design

Design (or designing) can be seen as a way of making sense and shaping meaning (Krippendorff, 1989), and represents "an activity aimed at intentional change" (Stolterman, 2021, p. 68). To achieve such real-world positive contributions, service design emerged as a counterweight to industrial design, and moved past its roots in



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ergonomics, computer science, and engineering-based approaches (c.f., Gasson, 2003). Instead of focusing on goal-directed solutions considering predefined, technical problems, service design sought to better accommodate heterogeneous human needs, experiences, and perceptions, contextual usage, and interaction dynamics (e.g., Maguire, 2001; Krippendorff, 2004; Sangiorgi, 2009). To do so, service design employs various practices, methods, and tools to explore the problem space and creatively advance the solution space, while considering human-environment interactions.

Yet, the increased focus on humans comes with challenges, as do the underlying assumptions that inform this work. Service design's human-centered nature creates an anthropocentric risk, prioritizing human interests and degrading other ecosystem elements into resources. Whether natural resources (e.g., trees, rivers) or artificial resources (e.g., technology, products), the conventional value of resources lies in their ability to increase human productivity. Capitalism's underlying perspectives have further reinforced service design's doctrine of human dominance, leading to dangerous approaches and unintended consequences. Resource extraction and 'take-make-waste-logics' in the service of growing business and making more money now challenge the stability and even liveability of many planetary ecosystems (c.f., Rockström et al., 2009). The lack of a 'systemic livingbeing orientation' over a human orientation, of a regenerative long-term orientation over a short-term maximization orientation, challenge service design to its core.

As governments, policy makers, firms, and consumers increasingly demand sustainability (e.g., UN Sustainable Development Goals, Patagonia's sustainability approaches), service design aligns with social, environmental, and interdisciplinary sciences, leveraging new methods for greater impact. Similarly, academics seek to theorise service design from both a broader and deeper level, offering conceptual frameworks that consider its changing role in view of design being a systemic and strategic change enabler (e.g., Koskela-Huotari et al., 2021; Sangiorgi et al., 2022; Windahl et al., 2020). Overall, service design theory and practice seek new directions in harmony with the natural, human and technological world.

Over time service design has developed a dominant narrative that revolves around commonly accepted design practices and principles (c.f., Duan et al., 2021). Such practices and principles include a view that service design is "human- and meaning-centred", "co-creative and inclusive", "transformative and betterment-oriented", "emergent and experimental", "explicative and experientially explicit", and "holistic and contextual" (Karpen et al., 2017, p. 388-389; see also Koskela-Huotari et al., 2021; Sangiorgi et al., 2022). Although these principles are taken for granted in the service design community, complex design contexts are challenging them. This brings into question to what degree the underlying beliefs still hold or are relevant



from an onto-epistemological and practical perspective. For instance, we argue that service design emerged in a world of 'abundance thinking', assuming ample resources to fulfill human needs for the foreseeable future. Yet, despite scarce resources, a naïve assumption (or perhaps ignorance or avoidance) persists that alternative resources can be found and extracted in time. Similarly, service design typically takes multiple stakeholders into consideration, illustrated in approaches such as co-design or co-creation. However, the underlying assumption is that it is sufficient for business success to only consider the human constituents (rather than the natural ecosystem constituents equally). This relates to another assumption that designers assume the responsibility of ethical and sustainable concerns during the design process instead of recognizing it as a shared responsibility. Moreover, we assume we can treat ecosystems and their elements as rather discrete phenomena, designing for specificity and context, while potentially ignoring or missing ripple effects.

Abundance thinking is giving way to scarcity and more reflection, requiring a different understanding of resources and the (design) management thereof. Consequently, service designers are increasingly involved in creating economic models of circularity and sustainability (e.g., Baldassarre et al., 2020). An ecosystem responsibility is emerging that challenges designers to balance monetisation with regeneration, while maintaining the quality of present experience without compromising the experience of future generations. Along with these developments, we need an alternative ontological perspective that can inform (service) design practice for the future. Indeed, service design would benefit from a stronger theoretical foundation that better serves as an explanatory framework for the emerging design world, emphasizing its relationship with epistemological understandings. For this purpose, we bring together research into quantum mechanics and use it as an organising framework for the proposal of a new (service) design perspective.

Quantum Mechanics and (Service) Design: Towards a Theoretical Foundation

In this short conference paper, we can only present a selective snapshot of Karen Barad (e.g., 2003, 2007; 2010) and their quantum mechanical understanding. In so doing, we will juxtapose common service design views with proposed alternative ones, which we generate based on quantum premises drawing on Barad. Table 1 illustrates this proposed transition.



Common Beliefs in Service Design	Proposed Beliefs in Service Design, Drawing on Barad	Explanation	Illustrative Implication
Separability	Entanglement	<p>Current beliefs assume all aspects and actors of a service are separate. It describes interactions at separate touchpoints, as discrete instances in a sequence of interactions. The designer is separate from the service being designed.</p> <p>Entanglement suggests that everything is interconnected, blurring boundaries between designers, stakeholders, and objects like artifacts. Phenomena like atoms also constitute and influence each other, just as wicked problems are entangled - addressing one aspect of a systemic challenge impacts another.</p>	<p>Conceiving services as interconnected, non-separate actors, actions and elements requires methods of research and representation to be holistic rather than reductionist.</p> <p>We must reconceive agency and intentionally consider the effect of passive or inanimate objects that mutually impact other system elements due to entanglement. More knowledge and experience from other fields such as cybernetics and systemics are needed to augment current ontologies and epistemologies of design.</p>
Interaction	Intra-action	<p>Current beliefs focus on inter-action between a customer/client or a product/service system, for example. It is externalized to the experience of the designer and treats stakeholders as separate entities.</p> <p>Intra-action challenges the designer's active role in observing and translating service systems into findings and recommendations, as the designer's presence affects the system.</p>	<p>The designer's personhood intra-acts with the service system under study, highlighting the importance of developing one's design character to raise awareness of these intra-actions in line with the entangled nature of phenomena. For example, a designer's values literacy can help understand how their preferences direct attention. What a designer attends to creates an impact on the service system being designed. Designers need to concurrently develop their inner selves and master skills to gain insight into intra-action forces. Without</p>



		<p>Intra-action enacts phenomena and their components, creating a particular and more determinate reality. As designers are part of and shape a focal context, ontology and epistemology merge into an onto-epistemological situation.</p>	<p>understanding a designer's inner orientation, the principles that inform their outward efforts are unknowable, making it impossible to pay attention to and account for intra-action.</p>
<p>Linguistic representation (thingification)</p>	<p>Performativity</p>	<p>Current beliefs support the use of linguistic representations to give shape to abstract knowledge, a strength of design. However, the representation only approximates the inquiry and is open to interpretation.</p> <p>As Barad states, "Performativity is actually a contestation of the unexamined habits of the mind that grant language and other forms of representation more power in determining our ontologies than they deserve" (Barad, 2003, 802). This supports a belief in enactment as sense-making.</p>	<p>The symbolic representation of traditional service design artifacts, such as personas or service maps, are filtered through the eyes of the designers and actors involved in research, analysis, and delivery. We need to remember they will not accurately represent the subject or the actual service.</p> <p>Enactments already exist within the practice of service design though used more in prototyping than in sense-making or knowledge sharing. Performativity facilitates integrated, embodied knowledge through felt experience, rather than cognitive processing. This enables the closest approximation of a service for an individual.</p>
<p>Beginnings, endings and instances</p>	<p>Historicity and continuity</p>	<p>Current beliefs view services as having a beginning, middle and an end; that they are a series of instances of discrete interactions (touchpoint to touchpoint) in an overall 'journey', assuming classical causality or rather linear causal chains.</p>	<p>Historicity and continuity challenge the bounding of what comprises the service from the viewpoint of the service provider. It warrants a new conceptualisation of service approximations to acknowledge the historicity of the proposed experiences.</p>



		<p>Yet, Barad challenges linear time concepts, recognising entangled future-histories, assuming a mutual co-constitution of future, present, and past.</p> <p>Every human involved in design research, ideation and the delivery of a service brings to it their past experiences, some intergenerational in nature, as do those receiving the service.</p>	<p>Every time a customer comes back to a service experience, it is not disconnected from a previous experience with the same service. There is a continuity of experience that exists beyond what our individual and collective approximations can communicate.</p> <p>We cannot design for this continuity directly, our work must be pragmatically bounded, but we need to acknowledge that historicity and continuity are critical design premises that shape how we conceive of and interpret our work as designers.</p>
Human-centric	Post-humanistic, de-centred	<p>A human-centric view sets up a dichotomy between human and non-human with an inherent priority for the human experience in design.</p> <p>Alternatively, designers can conceive the world as distributed yet co-constituting elements, with the nature of experience and the consideration of experiences beyond that of humans.</p>	<p>A 'more-than-human' stance requires destabilizing differentiating boundaries to expose other perspectives and reference points in designing. Primacy is not about human beings, but about entangled situations that need support to thrive.</p> <p>For example, we have the practice of creating personas to represent the human experience in what we are designing, but we do not readily create "florsonas" or "faunsonas" to represent the plant and animal kingdom (of which we are an inseparable part).</p>

Table 1. Illustrative Onto-epistemological Perspectives: From Current to Proposed Beliefs and Illustrative Implications



Discussion

The role of (service) design is evolving rapidly to meet the demands of the marketplace and planet Earth. Although new methods, tools and practices emerge, the onto-epistemological foundations of (service) design remain insufficiently questioned. While principles and practices around human-centredness, co-creation, experimentation etc. are being challenged, the way we conceive of the world in (service) design remains unchanged. We might design for more sustainability, with more embedded responsibility, and ultimately for increased liveability and productivity. But the question remains out of which motivation this type of designing arises: due to a change of personal beliefs and perspectives of the designer—built on a coherent onto-epistemological foundation—or largely due to marketplace pressures?

For those designers who seem to favour reflective practice, we provide a preliminary attempt to reconceive the world and its phenomena. As Dunk (2020, p. 225) highlights, “a “quantum” understanding of the world provides productive and insightful avenues of investigation across interdisciplinary areas.” We argue that this is particularly the case for the notion of entanglement, a core theme of the SERVDES.2023 conference, yet we have limited space to elaborate in this short paper. We draw on Barad (e.g., 2003; 2007; 2010) and present an alternative set of beliefs/perspectives and juxtapose these against more conventional views in (service) design. Specifically, we argue that viewing the world as entangled phenomena, with intra-action, performativity and de-centred views, offers designers an alternative worldview that can serve as an onto-epistemological foundation for (service) design. In so doing, we also contribute to recent calls for “developing theory-driven design research” (Cash, 2018). Specifically, we aim to build theory that can function as a coherent perspective and organising framework for (service) design. Such theorising is essential, as shown for example, in complementary thinking towards a feminist theory of design (e.g., Bosley, 1992). In this case we connect design to quantum mechanics, arguing in line with Cash (2018) that this integration of theory from other fields can enrich conceptual debate, rigor and coherence within the design discipline. Moreover, we believe interdisciplinary theory connections can be rather helpful in dealing with complex, entangled phenomena.

In this paper, we have drawn the relationship between entanglement and intraaction to show that designers are active influencers of the system they are designing within and co-creating with others. Their very presence effects what is researched and how,



the sense made from this research and what gets prioritised, even when done in a participatory framework (Barad, 2007). Intra-activity means the personhood of the designer influences what gets designed and how. We can never be fully neutral or unbiased in our interpretation of our research, or the prioritisation of our ideas and work. What we pay attention to is directed by our beliefs, values and becomes manifest in the world through a mutual, co-constitutive becoming (Senova, 2022), an entanglement of all actors and elements involved.

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