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Anticipating Connectivity in (UX) Design Practices

Reframing Challenges by Introducing Theory Cards

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This paper presents a design anthropological study with User Experience design departments from five large companies in Denmark, ranging from manufacturers of medical equipment through toys to control systems for industrial infrastructures We explore the challenges they face as products, services, and user research are increasingly connected. Our research shows that current methods, development processes, and organizational structures do not sufficiently support User Experience design teams in dealing with emerging design and organizational challenges that follow from increased digitalization. As a result, UX designers are struggling to anticipate the future of product interaction, user data, and their organizational role. In this paper, we explore how playing with theoretical concepts and introducing a new vocabulary may facilitate fundamental shifts in perspective necessary to instigate change. We deploy 'theory cards' in an experiment with one of the companies to see if theories might serve as instruments for seeing field material and design problems in ways more supportive for future design endeavours.

Keywords: design anthropology; design practice; product ecology, digitalization; user experience

INTRODUCTION

In this paper, we propose a pragmatic and playful approach to theory in the field of user experience (UX) design. Through an experiment with theory cards, we illustrate how theoretical concepts and perspectives (like product ecologies, fluid assemblages, and intra-action) can help re-frame challenges in anticipating connectivity in UX design practices.

This direction emerged from our collaborations with design teams from large-scale manufacturing companies, who were all struggling to adapt their products and practices to increasing digitalization. They approached us asking for new methods to support them in dealing with issues of connectivity when designing physical products. Initially we were puzzled by this request as they all seemed to be familiar with most of the user-research methods we found relevant and that we would teach to our students. This sparked our curiosity: Were the current methods available insufficient for the job? Was there really a need for design researchers like us to develop new methods? What would these look like?

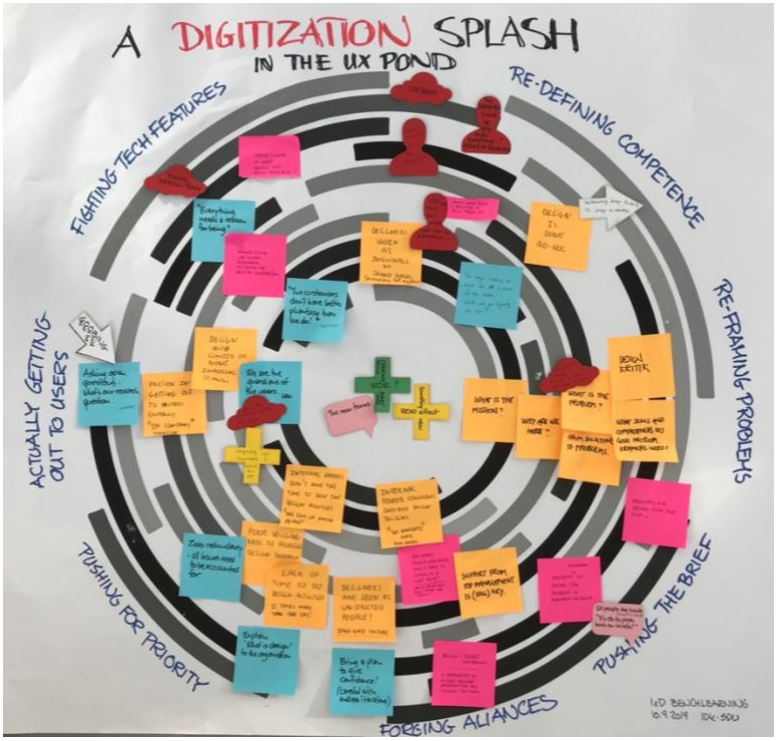

Figure 1: Poster from the first participatory research workshop, which describes digitalization as a 'splash in the pond' that expands the complexity of UX design challenges. Photograph © Jacob Buur.

We organized an initial participatory workshop with the UX practitioners, where we invited participants to describe, visualize, and materialize their current UX practices and challenges (Kjærsgaard et al. 2021). From the workshop emerged the idea of digitalization as a splash in the UX pond (depicted in Figure 1), with challenges that ripple into many aspects of UX design practice. Many of these challenges went deeper than the surface of user involvement, and spread beyond the UX practitioner's current purview, and thus might not be remedied by simply introducing new methods.

Our analysis of the workshop showed that current methods, development processes, and organizational structures do not sufficiently support these UX design teams in dealing with emerging design and organizational challenges. While their product-centered organizational structures, linear development processes, and popular UX tools (such as the 'user journey') are helpful when dealing with goal-directed, sequential activities, and stand-alone products or systems, they seem to fall short when products, relations, and technologies become more interconnected and embedded.

The way these companies create products and anticipate use is shaped by a particular taken-for-granted vocabulary which is deeply embedded within the practices, methods, processes, and structures of these organizations. Hence, to be able to imagine other futures, products and practices it is not only the methods that are in need of changing, but the concepts and vocabulary through which they are formed and used.

Connectivity in Product Design

To better understand exactly what these UX design teams were struggling with, and how we might collaborate to find new ways of meeting their needs, we undertook design anthropological fieldwork with five large manufacturing companies whose products range from medical equipment, to toys, to control systems for industrial infrastructures. While none of the companies produces IT products in the common sense, they were all trying to embrace connectivity, while struggling to integrate the digital into their physical product experience.

Our company collaborators included specialists in interaction design, UX design, design research, and managers of such functions (in short, *UX practitioners*). Working from a design anthropological approach (Kjærsgaard & Otto 2012; Otto & Smith 2013), we combined classical ethnographic methods such as interviews and field studies with design interventionist approaches (Halse 2013; Halse & Boffi 2016) in our attempts to understand our collaborators' current challenges and future possibilities.

We collected empirical data consisting of transcripts from interviews and multi-modal material from workshops with the UX practitioners and their managers. The analysis was a collaborative endeavor within the research team, where we systematically went through the transcripts to identify recurrent themes and patterns across the different companies, that we later corroborated with the industry participants during subsequent workshops. As part of our analysis, we identified a number of shared challenges that were directly or indirectly linked to product *connectivity* and *digitalization*.

1. **The interface challenge (connected products)**: Anticipating *interactions* when expanding from designing single user-interfaces to designing interaction across products, which, due to connectivity, were neither separate entities nor integrated in a common system, yet engaged with systems, practices, and contexts beyond their control.
2. **The data challenge (connected data)**: Anticipating the future of *data* when shifting from qualitative data collected in the field by the designers themselves, to combinations of those data with quantitative data acquired by other departments through the company's products, which were increasingly *connected* and able to report back from 'the field'.
3. **The organizational challenge (connected problems)**: Anticipating design solutions when 'UX problems' and their solutions increasingly cut across and beyond organizational structures.

In the following, we describe and analyze these challenges as well as the practices and perspectives that shape them.

THE INTERFACE CHALLENGE – CONNECTED PRODUCTS

A central challenge the UX practitioners in our study face is dealing with issues of 'connectivity' as products become increasingly interconnected. They are moving from designing the physical product itself, to also developing the digital stuff *around* the product, such as apps and services. As one of the design managers in our study explained:

> "Many different project teams are making digital products and services… We are moving away from the product to the stuff around the product… We are struggling to do it in a synchronized way. Each product is shining on its own, but right now, we are not thinking about them in a connected way."

A designer from another company added:

> "Every unit is developing their own products, but nobody is monitoring whether these are connected and how to increase the user experience across."

A particular vocabulary recurs when they refer to the challenges involved in addressing 'connectivity'. They talk about the challenge of identifying "*touchpoints*" between physical and digital products, and between products and the larger systems these products become part of when in use. As a consequence, the overarching design problem is described as one of achieving "*seamless touch across products and systems*."

Methods and Paradigms

A similar vocabulary is found in the 'user journey', a method widely used in the companies when attempting to understand and articulate user experience across user interfaces, apps, and services. During our field studies we saw examples of different ways of using this method. One UX team used what they called the "customer journey" as a framework for describing the (potential) touchpoints that customers may have with company products. They intended the overview as a design checklist for product development teams to ensure they have taken the customer's perspective into account. Another UX team used the customer journey as a tapestry for marketing and sales representatives to share their experiences of actual touchpoints they had encountered – typically problematic ones.

Figure 2: Customer Journey as design standard or conversation tool? Photograph © Jacob Buur.

In both cases, user journeys (or customer journeys, as they were often called) were used as a central tool to identify touchpoints between users and products as well as between one product and another in the attempt to secure 'seamless touch' across physical and digital artefacts. Moreover, in both cases, they found that user journeys did not quite do the job. As products became increasingly connected, the numbers of touchpoints and possible user journeys through these points proliferated, and they became increasingly difficult to identify, map, and navigate.

On closer inspection, we might see 'the user journey' as a method based on particular ideas of users, products, and their mutual relations embedded within the tool and the vocabulary it relies on. This approach implies a rather mechanistic understanding of the nature of 'things' and people, depicting them as separate entities with clearly identifiable boundaries and touchpoints. Furthermore, the user journey relies on an understanding of products, tasks, and relations as stable over time and across contexts. Focusing on single users attempting to accomplish predefined tasks through sequential engagements at separate touchpoints, this approach pays little attention to the way technologies and people are situated, entangled, and shaped by various socio-material contexts over time. The vocabulary introduced by the user journey, as well as the perspective it implies, seems therefore insufficient for describing and addressing the challenge of 'connectivity' faced by the companies in our study. In the paper "Changing the Hammer," Gardien et al. suggest that: "If a company continues to use processes, methods, tools and competencies from an older paradigm, it can only come to solutions that fit that older paradigm" (2014, 119).

Inspired by Gardien et al. (2014), we wonder if the challenges the UX practitioners experience could be the result of using methods, concepts, and vocabulary emerging from one paradigm (for example, an experience economy paradigm) to solve matters characteristic of another (for example, a transformation economy paradigm). If so, what these UX practitioners originally described as a methodological challenge might not be solved by solely introducing new methods, but would, in fact, require a fundamental shift in the mindset and vocabulary of the organization. As Gardien et al. point out:

> According to Kuhn, it is not possible to understand one paradigm through the conceptual framework and terminology of a rival paradigm. It requires a fundamental shift in mindset and vocabulary, and this is what makes moving to a new paradigm so difficult. (2014, 119-20)

To be able to imagine other futures, products, and practices, it is not only the methods that require changing, but also the concepts and vocabulary through which they were formed and used.

From Entities to Assemblages

Exploring alternative conceptual frameworks, we became interested in *product ecologies* (Forlizzi 2013; Sung et al. 2010) and *fluid assemblages* (Redström & Wiltse 2018; Suchman 2007), as they provide a vocabulary for describing and addressing 'the connectivity problem' in other and possibly more interesting ways. Forlizzi (2013) and Sung et al. (2010) introduce the concept of *product ecology* as an alternative to thinking about products in terms of separate entities and systems. Whereas systems are usually understood as solid static entities consisting of separate parts that work according to a machine logic where each part

contributes to the whole in a mechanistic way (Morgan 1980), ecologies hold a more dynamic and organic quality. Here, people, objects, practices, and environments are inter-related and mutually constituted over time. Forlizzi emphasizes that we need to remain attentive to how people, practices, and 'things' are entangled in a dynamic relationship that evolves over time, rather than merely focusing on the product interaction in user experience. This focus on product ecologies alerts us to the fact that products and people do not exist in isolation but are continuously shaping and shaped by the socio-cultural and material conditions they become part of.

That products are interconnected, and that designing for user experience requires looking beyond single units, are not new insights. CSCW and design ethnography (Blomberg and Karasti 2012; 2013) are examples of research fields that have been particularly attentive to the fact that products cannot be understood separately from the socio-material context that they become part of. What is interesting in our study is the extent to which this still challenges UX practitioners working within the industry and how increasing digitalization makes it harder to ignore.

One of the UX practitioners expressed that they also need to improve their products after launching them, and thereby remain attentive to the subsequent process of contextual use –mainly because digital products can be continuously subjected to updates and do not need a development process as long as that of physical products. Another company highlighted that their organization was not originally set up for the type of work that needs coordination across physical and digital solutions. Therefore, understanding products in context does not appear to be enough here; we might also need to understand the products themselves and their constellations in a different light.

Building on Deleuze and Guattari's (2013/1980) concept of 'assemblages', Redström and Wiltse (2018) suggest *fluid assemblages* as a way of understanding objects in a digitalized world. The authors describe fluid assemblages as constellations of 'things' (actors and materials) that do not quite 'fit' together. Assemblages might be understood as situated somewhere between a collection of 'things' and a seamless totality, more like open-ended collectives than solid blocks. Redström and Wiltse use the smartphone as an example of an assemblage of hardware, apps, and networks, which are not a seamlessly integrated totality, yet have capabilities beyond the sum of its parts. What characterizes fluid assemblages is that properties are not inscribed and embedded 'within' them but *emerge* in their composition. As such, the notion of fluid assemblages challenges the idea of the product as a separate unit with fixed boundaries, and instead introduces the idea of such assemblages as unstable, dynamic, and continuously changing and developing in use.

Thus, the concept of fluid assemblages – like product ecologies – challenges understandings of 'things' as static entities, often implied by our case companies' approaches to product development. With increased digitalization, it no longer seems meaningful to look at products separate from each other or separate from the context in which they are located, adapted, and appropriated. Thus, thinking in terms of fluid assemblages, relations, tasks, and environments rather than 'entities' might help us develop new approaches and reframe current aspirations towards designing for seamless touch across physical and digital products.

THE DATA CHALLENGE – CONNECTED DATA

The second challenge UX practitioners face concerns user data. Across the five companies, the increased interest in connected products comes with an increased interest in built-in data collection. UX practitioners are under pressure to add digital data collection to product design, without understanding the purpose of the data collection, as though the data has inherent value. As a designer said:

> "Just adding connectivity for someone (…) without understanding what they'll use the data for --or what even we will use the data for-- then, we've just made something with a chip in it."

Big Data Needs Thick Data

The data users generate through interactions with digital products is generally perceived as a critical asset for companies, yet it is experienced more like a "*data tsunami*" by the UX practitioners. They struggle to access and make sense of vast amounts of decontextualized user data produced in ways that do not appear transparent to them. As one of the practitioners explained:

> "I find it difficult... I have no clue how we got the data. Personally, I was not there, but I need to trust it. We are not in a transparent phase... someone is digging out some data, but we are not making it visible or transparent where it came from... if I really want to use it effectively, I need to know who said it and why they said it. What is the context? But we are just not there right now."

That we need 'Thick Data' (detailed, qualitative understandings of people) to realize what 'Big Data' means has been argued by the design ethnographic research community for quite some time (Wang 2013; Boellstorff 2013). However, design ethnographers are still struggling to come to terms with Big Data on an equal footing with ethnographic data (Curran 2013), as are the UX practitioners in our study. In trying to combine 'big' and 'thick' data (and the professionals that work with them), we are confronted with different ideas of what data is, how it is obtained, how we can make sense of it, as well as what it is useful for. As one of the UX practitioners explained:

> "One challenge is how we understand and visualize data and how we can work with it…how do we actually create an interface into that data. The department that is in control of that, they do not have the same eyes on research and data as we have".

One of the problems with digital data is that analysis methods are dependent on how people 'out there' themselves make sense of digital data, or as Nafus puts it; " 'digital data as method' and 'digital data as thing in the world' are becoming increasingly intertwined," (2016, 384). Connected products with built-in data collection are not passive instruments for harvesting neutral ready-made data in 'the field'; they act within and upon the world. They construct data, through their algorithms, and they engage with people and things through their digital and material presence in the field and in the organization.

Data as 'Things'

In design research, there is currently a strong move towards new ways of visualizing user data (e.g., Anderson 2009) and even physicalizing data (Jansen et al. 2015; Buur et al. 2018) to make Big Data accessible to data non-experts. Data physicalization may be a way of generating narratives with the people from whom the data originates (Karyda et al. 2020), and thereby using big data to create thick data. From our study, we find that UX practitioners are highly concerned with digital data as a new source of user data, as they consider it an external influence on the way they design. It appears that the fundamental understanding of 'data' is at stake. In engineering dominated companies and in medical industry the conceptualization of 'data as fact' can be detrimental to arguing the value of qualitative research. Actor Network Theory (Latour 1992) inspired notions of material agency, however, may provide an alternative perspective on the role of data in the field and in organizations. Seen in that light, data physicalizations may offer a way of turning data into 'things' that warrant a fundamentally different engagement (Buur et al. 2021).

From Data to Relations

As mentioned previously, embracing digitalization is not simply about adding 'connectivity' to existing products; rather, it implies thinking of products in a completely new way. Likewise, connectivity demands a reconceptualization of user research and user data. When products send information back and forth between companies and users, they are not simply harvesting more and bigger data. They are, in fact, establishing relationships with people and other products in the context of use, thereby fundamentally changing not only the nature of the product, but the role of the product in the user-company relationship, the nature of that relationship, as well as the nature of user research. From the perspective of classic anthropological theories of *exchange* and *reciprocity* (see Mauss, 1993/1925; Lévi-Strauss, 1969/1949), the exchange of data that takes place between users and companies does not simply result in 'disinterested' data moving back and forth, the exchange essentially shapes their relationship.

The theories of exchange and reciprocity explain how humans form relationships through obligations to give, to receive, and to reciprocate (Mauss 1993/1925). Gift relationships are cyclical: Give-receive-reciprocate/give-receive-reciprocate/… New or casual relationships have short, frequent intervals with gifts of equal value (taking turns buying coffee, e.g.), while deep or familial relationships have longer reciprocation intervals where the value of the gift varies (buying each other birthday gifts, e.g.). Transactions, on the other hand, are linear: Give. Receive. Reciprocate. No relationship is established because the debt in the exchange is immediately settled.

When talking about physical products, companies usually have transactional relationships with users. The company provides the user a product, in exchange for money. The product and the money are equal in value, and the exchange is completed in a short time frame (a transaction). When connectivity is integrated into physical products, companies exchange services or features for continuously collected user data. Instead of a monetary transaction, the value of the things exchanged becomes unclear. The time frame for reciprocation is more open-ended, leaving the relationship ongoing, rather than transactional. By rethinking user data and product connectivity in terms of *exchange* and *reciprocity*, we understand the user-product-company relations in entirely new ways.

Similarly, this continuous exchange changes the nature of user research. To some extent, products with built-in data collection never really *leave* the company and user research potentially never really ends. The movement of data back and forth means that companies have a continuous 'presence' in the field, and users a continuous presence in the company, thereby blurring the boundaries of what constitutes the 'inside' and 'outside' of the product, the field, and the company.

This blurring of the boundaries of separate entities, things, and spaces can be understood through Karen Barad's (2014) concept of *intra-action*. Barad describes intra-action as:

> [T]he mutual constitution of entangled agencies. (…) In contrast to the usual 'interaction,' which assumes that there are separate individual agencies that precede their interaction, the notion of intra-action recognizes that distinct agencies do not precede, but rather emerge through, their intra-action. (Barad 2007, 33)

To think of *exchange* and *intra-action* of *entangled agencies* makes it possible to rethink UX research as well as the relationship/contradiction between 'big' and 'thick' data. The premise is moved, and the possibilities are different. The user, the product, the organization, and the field, all become intertwined.

THE ORGANIZATIONAL CHALLENGE – CONNECTED PROBLEMS

The third challenge our design teams face is organizational. With increased 'product connectivity', design problems may also be seen as increasingly interconnected. Therefore, UX departments are challenged to find local solutions to issues that cut across organizational divisions and company boundaries. This challenge is enhanced by existing practices and structures within the companies that tend to sustain an understanding of products as separate entities, positioning UX design as the finishing touch at the end of product development. One of the practitioners in our study described how working as a UX designer "*often feels like putting lipstick on a pig*," as they attempt to fix a product that is ready to go to market, rather than design a coherent experience before the development of this singular entity. Another practitioner put it like this:

> "One thing is top-management saying that design should play a bigger role in the strategy, but another thing is what becomes possible on a daily level. I have been in the company for many years, and things have not changed drastically. Despite the aim to involve design on a broader and more strategic level, we are still seen as the ones fixing the user experience. But design cannot just fix something that already started off wrong."

The companies we collaborated with tend to understand UX design as a function that supports specific parts of the development process and sits in a particular UX 'silo'. As one of the design managers says:

> "Design-type people do not sit next to the CEO, it is still a bit lower in the organization. That also says something about how we look at design internally."

However, our study shows that UX problems and their solutions increasingly tend to cut across and beyond organizational structures.

From Local to Global Problem-Solving

Increasingly complex and interconnected products challenge company structures that maintain and support the idea that "problems are best solved in separate departments." Thinking of products and data in relational and dynamic terms, as we have suggested above, implies moving from the companies' treatment of UX design as a compartmentalizable specialist task, to positioning UX design as a critical part of identifying the larger problems that the products solve and the value that they bring. Ultimately, it also implies rethinking organizational structures as well as collaborations across different companies and organizations. Gardien et al. (2014) suggest thinking in terms of *competence networks* that span various forms of companies and organizations when working with connected design problems, characteristic of a transformation economy, which are simultaneously local and global.

To make the transition toward these competence networks, trust must be established between collaborators. One way of establishing trust is by creating value through reciprocity (Gardien et al. 2014, 131). Just as connected products stimulated relationships between users and the company, through data exchange, UX practitioners can generate trust between themselves and different company and external actors through, e.g., the exchange of big and thick data, in design research collaborations. In fact, Gardien et al. point to design methods, like concretizing ideas and using visuals and tangibles to smooth cooperation and communication between stakeholders (2014, 133). In a sense, this is what we experimented with, with the introduction of theory cards.

THEORY CARDS

Recently, we have worked closely with UX practitioners to explore how playing with theoretical concepts may facilitate fundamental shifts in perspective, necessary to instigating change in UX practice. Rather than developing new methods – as originally requested - we wanted to tinker with theoretical perspectives that might allow new ways of understanding and responding to connectivity challenges.

We were invited by one of our collaborator companies to host a workshop where we could bring theoretical perspectives into a collaborative analysis of their user research data. From our side, we wanted to experiment with introducing a new vocabulary, to challenge taken-for-granted perspectives within the team and the company, and to unfold new questions, insights, and ideas.

In this experiment, we were particularly interested in the way concepts such as product ecologies (Forlizzi 2013; Sung et al. 2010) fluid assemblages (Redström & Wiltse 2018; Suchman 2007), or intra-actions (Barad 2007) might become part of the company's vocabulary, and how that vocabulary may gain practical relevance through their daily practices and allow for the imagining of other futures, practices, products, and use(rs).

To that end, we developed a deck of 14 'theory cards' (see Figure 3). Each card represents a particular theoretical concept or perspective (for example, 'fluid assemblages, 'product ecology', 'intra-action'), and includes a short explanation, an illustration of the central idea, a quotation and a reference. We curated the deck of cards to include theories we

found particularly relevant for re-framing issues of connectivity, as well as 'wild cards' that were less obviously relevant, but might turn out to elicit interesting perspectives on the material. In contrast to the more well-known 'methods cards' (IDEO 2003; Wölfel et al. 2013, Lucero et al.2016), these 'theory cards' were intended to support 'ways of seeing' rather than 'ways of doing'. It was important for us that the cards supported a more playful and pragmatic approach to analysis rather than a deductive one. We therefore saw the theories as lenses which in some cases allowed us to discover new and interesting perspectives into the material, and in other cases not.

The participatory research workshop had 7 participants, 4 from the company and 3 from the university. As part of new product development, the UX design team had asked potential users to conduct video diaries for 2 weeks. This user material was meant to inform the development of a new 'health product' that would replace an existing product.

The co-analysis process consisted of starting with selections of user data and/or salient insights emerging from the UX practitioners' field research, then picking 1-3 theory cards to discuss what these particular perspectives would let us see in that material, and what additional questions they would inspire in continuing field research.

Figure 3: The deck of theory cards used in a participatory research workshop to encourage perspective shifts on qualitative field material consisting of a large number of self-recorded user videos. Photograph © Jacob Buur.

Re-Framing the Connectivity Challenge through Product Ecology

To illustrate the way this theory card co-analysis experiment worked, we will take the product ecology card as an example. We matched a particular user's video diary data with the product ecology card, and began discussing which things, people, and spaces were present in the video material. Then we tried collaboratively mapping the 'product ecology' that this user is a part of. The task required constant negotiations of what could be seen in the video and what it meant. While mapping people, products, and the dynamic relations between them, the team started to notice connections between things that were previously understood as belonging to separate realms. Facebook is an example of a seemingly non-related technology that made it onto our product ecology map. For the user whose data we looked at, Facebook plays a central role in the way she relates to her health. Facebook is where she forms relationships with other people with health issues similar to hers. The information and advice shared in Facebook communities play an important role in shaping her understanding of her own health, and the way she could or should use various health products to improve her condition and her life.

Based on the product ecology map, the team discussed how replacing the old health product with a new version might not simply offer new functionalities for the users, but may in fact lead to an entirely new type of product ecology. Working from a product ecology perspective sparked an awareness in the group of how things that were previously seen as merely in the 'background' might actually be integral to the way a product is used and made sense of. For the project leader, an engineer, working with this theory card uncovered what he saw as a flaw in the way 'connectivity' had thus far been marketed internally in the company: as a desirable 'user feature' and a 'unique sales point'. Through mapping product ecologies, he realized that in order to fully understanding how adding connectivity would eventually serve the user, an in-depth understanding of the context of users and products would be essential. The product ecology perspective eventually served as way of re-framing the project team's understanding of connectivity as something way beyond simply "adding a chip" and extra functionality to their product.

This experiment with the UX practitioners demonstrated the potential in using theory cards as a way of playing with theoretical perspectives (in user research) to allow new ways of seeing (products, data, and design problems) in the attempt to find new and more meaningful and innovative solutions.

CONCLUSION

We see the contribution of the design anthropological research presented in this this paper as four-fold:

First, our research offers ethnographic insights into the ways that emerging UX design challenges are experienced and addressed within and across five manufacturing companies in Denmark, at a time where we look into an increasingly complex and digitalized future. We identify three general challenges across the five companies involved in the study: 1) the challenge of connected products, 2) the challenge of connected data, and 3) the challenge of connected problems. Our material shows how (the description and experience of) these challenges are linked to particular cultural understandings of people, products, and design processes embedded within the current vocabulary, methods, practices, and structures of the organizations.

Second, we introduce alternative theoretical perspectives and vocabulary - such as product ecologies, fluid assemblages, and intra-action - to illustrate the potentials of playing with different conceptual lenses, in order to see the challenges and possibilities for UX design and its practitioners in new ways.

Rather than new methods, more fundamental mind-shifts within the organizations are required. We see a need for developing and expanding conceptual frameworks and professional vocabulary in order to re-frame issues of connectivity and redevelop research methods. We discuss how implementing ideas of product ecologies, fluid assemblages, and intra-action in product development practices in companies does not only challenge popular UX tools such as the user journey, it also challenges company structures and practices on a more profound level.

Third, we propose *theory cards* as pragmatic and playful approach to introducing new perspectives and vocabulary into design projects and organizations to help re-frame current practices, challenges, and possibilities.

We argue that introducing theoretical perspectives and concepts from anthropology and broader fields of human interaction in a pragmatic and playful manner can be instrumental in shifting perspectives towards more fundamental understandings of how digitalization influences people and organizations. Through an interventionist experiment with one of the companies, we show how theory cards may instigate a shift from thinking in terms of entities (such as users, products, and systems) to thinking in terms of socio-material assemblages, product ecologies, and intra-action.

Finally, our work shows that what ethnography and design anthropology may offer design is as much about challenging and re-framing taken-for-granted understandings as it is about providing methods and user insights.

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