TRIALOGUES: A FRAMEWORK FOR BRIDGING THE GAP BETWEEN PEOPLE RESEARCH AND DESIGN

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ABSTRACT

In design research literature, several tools and techniques have been developed that support design teams in establishing creative understandings of people and their contexts of product use, e.g. [1] [2] [3]. Many of these approaches suggest that designers simply adopt the role of people researcher. However, in industrial design practice, the interaction between users and the design team is often mediated by a third party performing the people research – an external company, or experienced people researchers from within the company, who may or may not be part of the design team. In these cases, the rich user experience data gathered in people research needs to be conveyed to the design team in ways that enable the team to establish creative understandings of users.

This paper introduces *trialogue*, a framework for communicating user experience data in industrial design practice. Using the framework, seven guidelines are identified aiming to support design practitioners and researchers in developing ways for communicating rich user experience data that support design teams in establishing creative understandings of users and their contexts.

Keywords: user experience, communication design, social narrative

1   INTRODUCTION

This paper introduces the concept of trialogues. Trialogue is the exchange of narratives between three different parties aiming to establish creative understanding.

Creative understanding is quintessential in people-centered design. It is the combination of a deep, cognitive and affective understanding of the other, and the ability to translate this understanding into people-centered products and services [4] – or 'scaffolds for experiencing' [5]. Creative understanding includes information about the user and his/her context of product use, empathy for the user, and inspiration for design. By 'empathy for the user', we mean "*an understanding of what it feels like to be the user, what the user's situation is like from his/her own perspective*" [6].
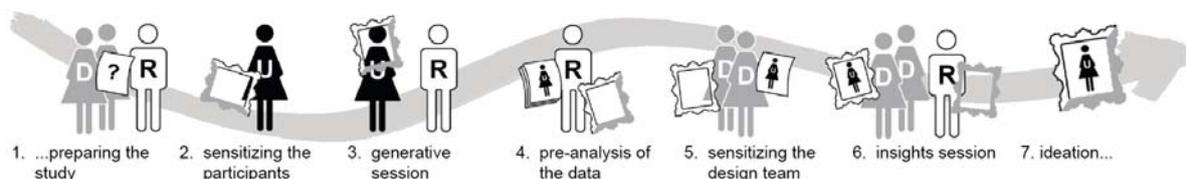

Figure 1. Outline of the process followed in the baby care project
As there was no direct contact between the design team (D) and the users (U), the people researcher (R) mediated with help of representations (frames), which is the case in many projects in industrial design practice.

In participatory design and critical design [7] several tools and techniques have been developed that support the process of establishing creative understanding in people-centered design. Examples of such tools and techniques are cultural probes [2] [8], generative tools [3], experience prototyping [9], and placebo objects [10]. In design research literature, approaches involving such tools and techniques often suggest designers taking over the role of people researcher, gaining information, empathy, and

inspiration by directly interacting with users themselves. Wright and McCarthy call this form of interaction between users and designers – two parties – 'dialogue' [4]. In this paper, we use Wright and McCarthy's approach to explore the tri-partied interaction between users, people researchers and designers.

In industrial design practice, direct interaction between users and all members of a design team is not always evident. Often the interaction between users and the design team is mediated by a third party performing the people research – an external company, or experienced people researchers from within the company, who are either or not part of the design team. In these cases, the rich user experience data gathered in people research needs to be conveyed to the design team in ways that enable the design team to establish creative understandings of users. The framework of trialogue may support design practitioners and design researchers in developing these ways.

In this paper, we use Wright and McCarthy's concept of dialogue to develop that of trialogue. Using Bakhtin's analysis of the polyphonic novel as metaphor, Wright and McCarthy identify four important requirements for establishing creative understanding in dialogue. These requirements will be used as basis in unraveling trialogue as a framework for communicating user experience data in people-centered design. The paper is concluded with a set of guidelines for communicating user experience data in trialogue that we identified and structured using the framework.

Figure 2. Generative session
In the generative session, the parents explained their completed probes (left), created a map of their baby's bedtime routine (center), and showed us around in their baby's bedroom (right).

Figure 3. Insights session
Preceding the insights session, the design team members worked on probes individually (left). During the insights session, the design team members and people researchers discussed the probes and their observations and findings, and created maps of the parents' current situations on a poster (center and right).

Where appropriate, we draw examples from a project about baby care at Philips Research Europe in which one design team member and the first author participated in the role of people researcher. The aim of this project was to develop products for baby care based on a deep understanding of the life of parents with babies. The design team consisted of nine members with backgrounds in electrical engineering, marketing, psychology and industrial design. Six couples with babies aged between 3 and 6 months old participated in the people research.

An outline of the process that we followed is shown in Figure 1. First the design team and the people researchers planned the study together and developed materials such as probes and generative tools. Probes are packages of tools and small playful exercises that are designed to evoke inspirational responses for designers. The parents worked on the probes individually over five days. Then they participated in a generative session, facilitated by the people researchers (see Figure 2). During the session the parents explained what they created in their probes, mapped their baby's bedtime routine on a poster, and showed us around in their baby's bedroom.

We elicited inspirational responses from the parents and obtained rich user experience data regarding the care for their babies in the form of video recordings, completed probes, photos, and posters. The people researchers pre-structured and pre-analyzed the data, and then developed probes for communicating the data to the design team. These probes contained small chunks of raw data – quotes, photos, audio fragments –, the researchers' initial findings, and small exercises (see Figure 3). In the exercises the design team members were asked to reflect on- and compare their own situation to the participants' situations. The design team members worked on the probes individually over five days. Then they participated in a joint insights session. The aim of this session was to exchange observations and findings, and to establish shared understandings about the parents and what caring for their babies means to them. During the session maps of the parents and their current situations were created on posters, structuring the raw data and the observations and findings (see Figure 3). These maps were used as a starting point for thinking about the parents' possible future situations in ideation.

2   THE CONCEPT OF TRIALOGUE

In our framework we propose two modes of trialogue as shown in Figure 4. In both modes of trialogue the people researcher organizes the communication between users and the design team, and representations represent one party – either the users or the design team.

Note that our conception of the role of representations in dialogue and trialogue is different from Wright and McCarthy's. Wright and McCarthy see representations as tools that mediate dialogue [4], while we see representations as participants in dialogue. Like Schön views sketching as a dialogue between the designer and what a sketch represents – a reflective conversation in which the sketch is read, interpreted, explained and rephrased [11] [12] – we view processes such as cultural probing as dialogue between the user and the exercises of the probe.

The first mode is what most people, including us, would call the actual people research. In this mode people researchers gather user experience data in interaction with users and with tools that have been developed by or with the design team, e.g. cultural probes or generative tools. Examples of this mode of trialogue are the generative sessions that we conducted with parents in the baby care project (see Figure 2). During these sessions, the parents and the people researchers, among other things, together created a poster on which they mapped the baby's bedtime ritual, using materials that had been developed in consultation with the design team.

The second mode is what we call the communication of user experience data. In this mode the user experience data gathered in people research is read, explained, interpreted and represented by people researchers and the design team, interacting with (part of) the data or representations of the data, e.g. personas or scenarios.

An example of the second mode of trialogue is the insights session that we organized in the baby care project (see Figure 3). During this session, the people researchers and the design team members together created three profiles of parents in the form of maps, based on a selection of raw data, i.e. photos, quotes, completed probe exercises, and audio fragments, from the parents.

The two modes of trialogue alternate throughout the people research and the design process and sometimes run in parallel. For purposes of clarity, Figure 4 shows an ideal situation of trialogue. In industrial design practice, trialogue is usually more complicated as the roles of people researcher and

designer – i.e. the person, or persons who translate the user experience data into products and services – may shift over time, and different people may be involved in different phases of the design process. We focus on the second mode of trialogue. In the remainder of this paper, we discuss the framework of trialogue in light of Wright and McCarthy's four requirements for establishing creative understanding in dialogue, and we draw implications for developing techniques and tools for communicating user experience data in trialogue.
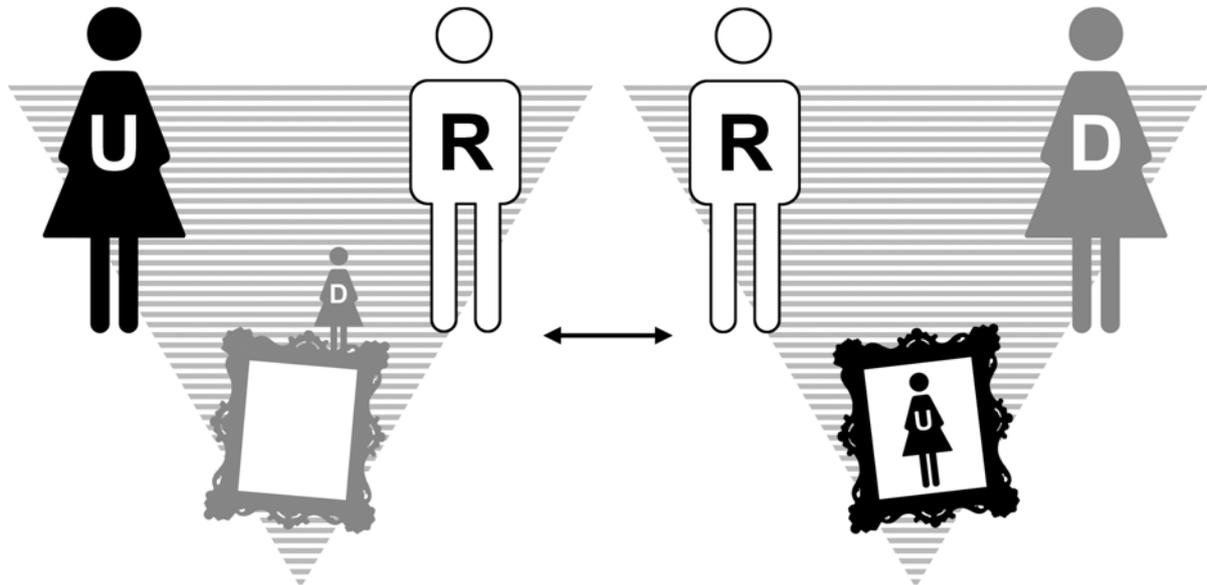

Figure 4. Model of trialogue
The left triangle: Mode 1 – People research (e.g. generative session). People researchers (R) and users (U) interact with tools, such as cultural probes, that have been developed by or with the design team (grey frame). The right triangle: Mode 2 – Communication of user experience data (e.g. insights session). People researchers (R) and design team members (D) together read, explain, interpret and (re-)represent user experience data gathered in people research, interacting with (part of) the data or representations of the data (black frame). The two modes alternate, and may run in parallel, throughout the people research and the design process.

3   FOUR REQUIREMENTS FOR TRIALOGUE

To gain a sense of *how* creative understanding evolves in the course of dialogue, we find it helpful to think of creative understanding evolving in a similar fashion as we think empathy does. In 'Empathy and experience in HCI', Wright and McCarthy nicely describe this process:

> "*Empathy evolves in the context of ongoing relationships wherein one person learns about the needs of the other by responding empathically, sometimes getting it right sometimes not, and then attuning future empathic responses. Without this communicative, relational framing of empathy, each person has only their own emotional responses upon which to base their emotional response.*" [6]

Thus in dialogue with others over time, one's range of understandings of others' experiences in different contexts, or '*empathic horizon*' [13], is extended. Designers' creative understanding of users may grow in a similar process; through creative response in dialogue or trialogue, attuning future creative responses as the response (e.g. a storyboard of a product concept) does, or does not, resonate with the users. In this view, empathy and creative understanding are self-referential as one uses his/her own abilities and understandings as references in empathic- and creative response. People-centered design – as well as empathic design – then is in fact *informed ego-design*, or 'design for the informed self'. Note that in context of establishing creative understanding (and empathy), the term 'ego-design' does not deserve its popular negative connotation of 'blind towards the other'.

Applying Bakhtin's analysis of the polyphonic novel as metaphor, Wright and McCarthy identify four requirements for establishing creative understanding in dialogue: outsideness, surplus of meaning, addressive surplus, and two-way communication [4]. We see these requirements as principles for trialogue that may guide the development of techniques and tools for communicating user experience data.

The first principle is 'outsideness'. According to Wright and McCarthy, the dialogical approach requires each person to engage from his/her own perspective, bringing his/her own sets of value and meaning.

> *"In an empathic relationship the 'designer' does not relinquish his/her position to 'become the user', a position from which nothing new can be created, rather the designer responds to what they see as the user's world from their own perspective as designer."* [4]

This may seem at odds with people-centered design techniques, such as role-playing and experience prototyping, where the designer tries to approximate the user's experience, in order to obtain an understanding of the user's perspective [9]. Yet, like we view representations of users' experiences as participants in trialogue, we may view role-playing and experience prototyping as dialogues between designers and imaginary users or imaginary user experiences, in which the designer participates from his/her own perspective and imagines the user's perspective.

Meeting the requirement of outsideness in trialogue implies that people researchers and designers should not try to 'become the user', nor should we try to turn users into designers. Instead, in communicating user experience data in trialogue, people researchers and designers should use their own perspectives in reading, interpreting, explaining and (re-) representing the user's perspective.

The second principle is 'surplus of meaning'. Surplus of meaning is people's expertise in terms of knowledge and skills, but also their experiences from the past, and ideas about the future. Surplus of meaning is a relative notion: One has surplus of meaning *vis-à-vis* the other. When people exchange their expertise in dialogue or trialogue their surpluses of meaning decrease, and their potential surpluses of meaning increase, i.e. their expertise grows.

Wright and McCarthy argue that establishing creative understanding in dialogue requires each participant to have surplus of meaning [4]. Thus each participant, including the user, is his/her own expert in dialogue. In our case of trialogue this means that representations of users' experiences, such as personas or scenarios, should reflect users' surpluses of meaning, or users' perspectives.

The third principle is 'addressive surplus'. Addressive surplus is the attitude of a good listener towards another person that motivates the listener to listen to-, and understand the other in dialogue (or trialogue). Showing addressive surplus stimulates the other to, as Wright and McCarthy say, "*give voice to creative response*" [4]. Drawing out creative response in trialogue means (1) encouraging users to reflect on- and express their needs, feelings and experiences, and (2) encouraging designers and people researchers to read, interpret, explain and (re-) represent the user experience data.

Everyone has, to a greater or lesser extent, the potency of addressive surplus. For establishing creative understanding in dialogue, Wright and McCarthy argue, each participant needs to take on this attitude. This means that in communicating user experience data in trialogue, representations of the user's perspective should have addressive surplus as well, encouraging others, e.g. designers and people researchers, to respond creatively, developing their own interpretations and representations of the user data.

The final principle is 'two-way communication'. The idea of two-way communication is that each participant, i.e. user, designer and researcher, "*enters into dialogue as differently placed equals with the expectation that they will learn and change their ideas as a result of the dialogue and thus experience genuine surprise*" [4]. Two-way communication in trialogue means that designers' creative responses – embodied in representations of the user's perspective and/or concept designs –, "*need to be continually nourished and checked by reality [...] through encounters and exchanges with real people*" [1]. Thus, as we explained earlier, the mode of people research and the mode of communicating user experience data should alternate throughout the people research and the design process.

4   IMPLICATIONS OF THE REQUIREMENTS FOR PRACTICE

So far we briefly discussed the four principles of establishing creative understanding in trialogue. The question remains how these principles can be put into practice. In this section, we present seven guidelines for communicating user experience data in trialogue. The concept of trialogue can be

applied to communication at the tools and techniques level, or to organize and structure existing guidelines for communication, such as those presented by Goodman et al. [14], Sleeswijk Visser et al. [15], or Pruitt and Grudin [16]. Each of the seven guidelines is discussed in a subsection below.

4.1.   Make designers and people researchers aware of their own perspectives

The requirement of outsideness states that each participant in trialogue should keep his/her own perspective. Losing outsideness occurs when designers and/or people researchers relate so strongly to the user's perspective, or each other's perspective, that they forget about their own perspective [1]. This danger is inherent to people-centered design, in situations of dialogue as well as trialogue. Tools and techniques in trialogue may obviate this problem by making designers and people researchers not only aware of users' perspectives, but also of their own perspectives. For example in the baby care project not every team member was a parent. So we decided to develop cultural probes in which the design team members were asked to reflect on-, and compare their own situation as a small child to the babies' situations captured in the people research. For example, in one exercise the team members were asked to compare the things that used to help them fall asleep to the things that helped the baby fall asleep. Doing the exercises turned out to be rather difficult and sometimes confusing as the situations of small children and babies are very different – which is of course obvious in hindsight. But the exercises succeeded in making the team members think about their own perspectives in relation to the parents' and babies' perspectives. Being sensitized towards both their own and the participants' perspectives supported the team in reading, interpreting and explaining the user experience data from different perspectives in the insights session.

4.2.   Balance the design team's outsideness

A question that the requirement of outsideness raises is how outside one should be. Creative understanding requires both empathy and inspiration. On one hand, it is more likely one will understand and empathize with the other when the others' experiences resonate with one's own. On the other hand, experiences unlike one's own are more likely to trigger one's creativity and inspiration. In 'Experience Prototyping', Buchenau and Fulton Suri propose a technique called experience prototyping, which aims to address this "*paradox*", by using prototyping in a way that allows designers to engage in situations that are similar to users' situations [9] [1].

We experienced that a mixture of team members who are more outsided and team members who are less outsided worked very well. In the baby care project, the design team was composed of team members who were parents – both parents with very young children and parents with older children –, and team members who were not parents. The members who were not parents questioned what appeared to be the 'obvious', members with young children helped to clarify findings and put findings into perspective, and members with older children identified trends by comparing their situations in the past to parents' situations now.

4.3.   Balance users' perspectives and people researchers' perspectives, considering the purpose of the communication effort, needs and preferences of the design team, and resources.

Establishing creative understanding in dialogue requires each participant to have surplus of meaning – expertise and/or experiences significantly different from the other participants. For trialogue this means that representations of users' experiences should reflect users' surpluses of meaning.

The raw user experience data gathered in people research may represent the user's surplus of meaning. But in industrial practice, just offering design teams an extensive set of unstructured rich user data is usually not a solution, as limited resources, such as time and research skills, simply do not allow the design team to go through all the data that has been gathered in people research. Nor would a situation in which the people researcher just passes all the gathered user experience data to the design team – refraining the design team from the people researcher's surplus of meaning – be a desirable situation. *"Simply replaying the detail [...] an ethnographer* [or 'people researcher', ed.] *would be nothing better than a window through which designers might access such detail.",* Diggins and Tolmie argue [17]. And "*the aim is to create an understanding to assist design*", Koskinen explains, "*not to push the audience into a sea of meaningless details – up to a point at which the designer misses the forest for the trees*" [18].

Offering design teams solely the people researcher's conceptualizations of the user experience data in the form of, e.g. models, insights and findings, is not a solution either, because these conceptualizations represent the people researcher's surplus of meaning, which is valuable as such and should be included in trialogue, but cannot replace the user's surplus of meaning.

Hence, in communicating user experience data in trialogue, a balance needs to be found between communicating the user's perspective and communicating the people researcher's perspective; between providing raw user experience data and providing conceptualizations of the data, between providing detail and providing overview.

In the design research literature, several authors recognize and discuss the issue of finding 'the right balance' between the user's perspective and the researcher's perspective. Three main factors that determine where this balance lies may be identified from their lines of argument. The first factor is the purpose of the communication effort. Creative understanding involves all three qualities: inspiration, empathy and information. But the main point of the communication effort may shift between empathy and inspiration for design and informed argumentation for decision-making; between creativity and ambiguity and 'getting it right' [19]. The former implies a focus on raw data, i.e. the user's perspective, the latter a focus on interpretation of the raw data, which is usually the people researcher's perspective [18] [20] [15].

The second factor is the expectations, needs and preferences of the design team members. The team members' needs may be different for different phases of the design process [14], but expectations, needs and preferences may also be different for individual team members: Some designers prefer raw data, because raw data – as opposed to conceptualizations of raw data – gives them the freedom to form their own concepts of users. Others prefer people researchers' interpretations of the raw data, as they feel that an emphasis on raw data may leave the design team heading in the wrong direction [14] [21] [15]. Similarly, some designers want to be actively involved in the people research, whereas others consider the people research to be the job of the people researcher. The third factor is the resources of the design team. Resources such as time, budget as well as research skills – not every designer is a people researcher – may limit the involvement of design team members in people research [14] [15]. When communicating user experience data in trialogue, each of these three factors should be taken into account in order to find 'the right balance' between communicating the user's perspective and communicating the researcher's perspective.

4.4. Engage designers and people researchers in reading, interpreting, explaining and (re-) representing the user experience data

Designers' and people researchers' creative understandings of users grow through creative response in trialogue. Drawing out their creative responses in trialogue means encouraging them to read, interpret, explain and (re-) represent the user experience data.

In people-centered design literature, inviting designers to actively participate in interpreting and representing the user experience data is considered to be a successful approach for several reasons: Firstly, this approach may increase designers' acceptance and use of the user data, e.g. [22] [1] [15]. Similarly "*people find it easier to buy into the design when they have contributed to it, and the contributions themselves improve the design*" [22]. Secondly, interpreting and representing user experience data is part of establishing creative understanding of the user, just like "*stories and storyboarding serve not just as a tool for communication but as a methodology for design*" [21]. Developing stories, Gruen et al. conclude, is "*a way of designing the offering itself*". Thirdly, actively participating in interpreting and re-representing the user experience data allows designers to see what parts of the user data are relevant in the contexts of their designs and discover significant issues. And fourthly, several authors claim that participating in this process familiarizes the designers with the user experience data and allows them to make the data their own [22] [9] [19]. Thus it is important that techniques and tools for communicating user experience data engage researchers and designers in interpreting and representing the data, or as Sleeswijk Visser et al. argue "*participatory design needs participatory communication*" [15].

4.5. Create representations that are open-ended and that fit designers' and people researchers' practices and cultures

Establishing creative understanding in dialogue requires each participant to have addressive surplus – an attitude that encourages other participants to respond creatively. For trialogue this means that

representations of users' experiences should have addressive surplus as well, encouraging designers and people researchers to develop their own interpretations and representations of the user data.

Representations that have addressive surplus are representations that are open-ended – finalized representations "*tend to close off dialogue*" [4] –, and that fit into designers' and researchers' practices and cultures, for example, the ways they communicate and the kinds of representations they are familiar with. The latter does not necessarily imply adopting the same tools and techniques that the designers and researchers already use in creating, communicating and using the representations. One may deliberately choose to slightly 'challenge' established practices and cultures to, for example, raise the design team's curiosity and interest. Pruitt and Adlin provide a set of questions and points of attention for observing and reflecting on the practices and culture of one's own organization, which is helpful in considering what tools and techniques fit the organization or project best [23].

Open-endedness can be established by playing with the balance between the user's perspective and the people researcher's perspective mentioned before, or by providing 'multiplicity'. By multiplicity we mean (1) multiple interpretations of the user data – in the baby care project, having worked on the cultural probes, some team members considered Nadia and Friso to have an authorative parenting style, whereas others considered their parenting style to be more indulgent –, (2) multiple frames of analysis – the small chunks of raw data in the cultural probes were selected around five themes, such as 'bedtime ritual', 'division of (caring) roles', and 'community of parenting' –, (3) multiple sources of (user) information – data obtained from the generative sessions with the parents was combined with market data and data from socio-cultural research –, and (4) applying multiple tools and techniques for user-centered design. When working with multiple sources of (user) information, tools and techniques for communicating user experience data should either incorporate data from multiple sources, or fit the use of data from multiple sources. When proposing to combine multiple tools and techniques for people-centered design, it should be explained *how* the tools and techniques can be used in conjunction with one another. In literature, it is often recommended to combine different tools and techniques for people-centered design, but an explanation of how the tools and techniques can be combined is remarkably often forgotten.

Multiplicity is not only useful as a technique for encouraging creative response: Multiple interpretations may trigger new ways of thinking, providing inspiration for design. Multiplicity can be a form of triangulation as having multiple perspectives makes explicit the strengths and weaknesses of each perspective, and the assumptions and preconceptions of the perspective takers [1] [24]. And providing multiple views shows the richness of the user experience data, stimulating the design team to look beyond the representation of the data, avoiding fixation and over-simplification of the user's world [17].

4.6. Support design team members and project stakeholders in sharing their creative understandings of users in durable ways

An identical creative understanding of the user among members of the design team should not be necessary, and considering the above-mentioned assets of multiplicity would not even be desirable in people-centered design. But for collaboration and decision-making in the often-iterative design process, different understandings of the user's perspective do need to be shared among team members and stakeholders, as these understandings are the backbones of the product or service design.

Beyer and Holtzblatt suggest an approach in which design team members establish a shared understanding of the user's perspective by interpreting the user data together in '*interpretation sessions*' [22]. When choosing for such an event-based approach, the design team should anticipate to the consequences of design team members leaving the team, and new team members joining in over time. In the baby care project, for example, two new team members and eight guest members joined the team when ideation started. The new members and guests had not been part of the insights session, and thus did not share the understandings of the user's perspective that the 'old' team members shared. This made it difficult to together translate the understandings of the user's perspective into product ideas in a one-afternoon ideation session.

4.7. Evolve representations in the course of trialogue

The requirement of two-way communication implies that in situations of trialogue, people research and communication of user experience data alternate throughout people research and the design process. Two-way communication enables the design team to gradually develop its creative

understandings of the user, and enables the user to gradually develop his/her creative understanding of the design team. This means that in communicating user experience data in trialogue, representations of the user's experience should evolve in the course of trialogue as well. This idea is strongly supported by many authors in the area of user-centered design, who – borrowing ideas from anthropology – argue that users' experiences do not afford being captured in finite representations, if users' experiences afford being captured at all, e.g. [25] [26]. Wright and McCarthy, for example, argue that there is "*[…] no thing to be captured at all, rather some thing constructed and created*" [4]. An advantage of representations changing and developing over time, Diggins and Tolmie explain, is that it may also stimulate researchers and designers to look beyond a representation, avoiding representations *"to have too great a significance and become constraints on further interrogation of the fieldwork and thinking about the design space"* in a similar fashion as multiplicity does [17].

In discussing the personas technique, Grudin and Pruitt refer to how characters in popular TV series are revealed over time, becoming more complex and realistic as they change and develop in the course of the series. They argue that the communication of personas should be alike: "*on-going and progressively unfolding*" [16]. A similar approach may be adopted in communicating rich user experience data in trialogue, being different from the approach of TV series and many persona efforts in that (1) the people researchers and designers both fulfill the role of audience, as well as the roles of producer and director, and (2) real people are revealed, not caricatures.

5   CONCLUSION

In this paper we presented trialogue as a framework for communicating rich user experience data in industrial design practice. Based on the framework, we identified seven guidelines aiming to support design practitioners and researchers in developing ways of communicating rich user experience data that support design teams in establishing creative understandings of users and their contexts.

Important to note is that the guidelines are part of the framework and as such strongly related: A representation that reflects users' 'surpluses of meaning' but has no 'addressive surplus' may not be very effective in establishing creative understanding. Moreover, the list of guidelines is not exhaustive. Applying the framework in their own practices and research, others may find different and/or additional guidelines. Used in this manner trialogue functions as a thinking tool in developing tools and technique for communicating user experience data. This is what distinguishes trialogue from most other communication guidelines and models presented in design research literature that are evaluative rather than generative.

In this paper we focused on *how* we can communicate rich user experience data to design teams. Follow-up research may focus on what user experience data should be communicated in situations of trialogue. Nielsen's work on personas and character-driven scenarios may be a stepping stone in this regard [27].

6   ACKNOWLEDGEMENTS

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