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Atmosphere in Participatory Design

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Abstract

The relationship between democracy and design has been the topic of significant discussion in the design community. It is also at the core of participatory design that relies on the principle of genuine participation. According to this, users are not mere informants but legitimate participants in the design process. A great deal of participatory design, however, is driven by instrumental logics rather than participatory and democratic principles. In analysing these power relations, science and technology studies (STS) provides the starting point to introduce the concepts of ‘engineering an atmosphere’ (i.e. the process) and ‘engineered atmosphere’ (i.e. the outcome). These concepts problematise the principles and modes of participatory design, highlighting the tensions between economic and social agendas and top-down and bottom-up interactions. This problematic can be shown in the way that new technologies are targeted at older populations, necessitating an interrogation of the processes underpinning the design and development of technological products and devices. It is important to reflect on who is included and who is excluded from technological design and innovation, which is always, and necessarily so, a fluid process.

Keywords: Atmosphere, Configuring, Design, Participation, Script.

Introduction

At the beginning of March 2017, the DESIS network (Design for Social Innovation and Sustainability) circulated an open letter to the design community emphasising the principle of ‘design as democracy’. The promoters stated that ‘the design community should take a stand, speak out, and act: practitioners, researchers, theorists, students, journalists, publishers and curators – all who are professionally involved in design-related activities’ (Manzini and Margolin, 2017). The letter stressed that participatory design needs to be reinvigorated ‘so that diverse actors can shape our present and future worlds in fair and inclusive ways’. This letter was an important restatement of the principles of participatory design, which are based on supporting people in conceiving and enhancing their own life collaboratively.

These issues are, of course, older than the DESIS initiative. Bonsiepe (2006), for instance, reflects upon the relationship between democracy and design by arguing that “‘democracy’ in the sense of participation’ (p. 29) is today hindered by imbalanced power relationships mainly governed by market. Similarly, Björgvinsson *et al.* (2010) discuss the relevance of ‘democratising innovation’ in line with the original values of participatory design, and highlight a ‘reorientation towards everyday life and the public sphere [...] due to the condition that user driven innovation has become widespread’ (p. 42).

Today, the design community recognises that design orientation is a consequence of technological ubiquity in public and private life. For participatory designers, this means having a social role as mediators and facilitators between people and organisations involved in design activities (Manzini and Rizzo, 2011). However, businesses, public sector organisations, research institutions, and civil society can have different views of what participatory design means, as recently discussed by Cozza *et al.* (2018) with

reference to the priorities of these diverse actors in designing technologies for older people.

Referring to participatory designers, Star and Strauss (1999) say that these professionals aim to give voice to all the people involved in the design process and to mediate the power relations in that process as much as possible with the goal of ‘genuine participation’ (Bødker *et al.*, 2004). Here, genuine participation is considered to be ‘the fundamental transcendence of the users’ role *from* being merely informants *to* being legitimate and acknowledged participants in the design process’ (Robertson and Simonsen, 2013, p. 5). As such genuine participation is meant to underpin the democratic principles in participatory design, although this is not always the case.

In this article, we analyse an attempt to democratise relations between various participants in a design project called SUITCASEⁱ (SUstainable, Integrated and Territorial CAre SErvices). One author (Michela Cozza) was involved as a member of the research team that sought to integrate participatory design in this project. The researchers were appointed to collect data in order to develop and test a set of technologies for the well-being of older people (65+). The main output of the SUITCASE project was a technological platform called Service Dispatcher. It was designed according to the Service Oriented Architecture principles and aimed to act as an empowered contact centreⁱⁱ. The platform had a key role in the project: it was linked to a number of devices in order to carry out its function, and it mediated the relations of participants and professionals involved in the project.

The SUITCASE project was a pre-commercial public procurement project, and the sponsor’s ambition was to apply a participatory design approach for marketing purposes. Notably, participatory design generally faces difficulties when applied in commercial settings. Participatory design projects usually require significant resources

(i.e. time and money), while private companies are, instead, focused on the efficient use of resources according to a goal-oriented rationality that minimises such costs (see Kensing, 2000; Mogensen and Wollsen, 2014).

Building on the SUITCASE case-study, we aim to answer the following research questions: (RQ1) What is the difference between principles of genuine participatory design and design processes governed by power relationships that lead to non-democratic forms of participation? (RQ2) How can such power relationships be reconfigured in a way to engender a more democratic and participatory design process?

In order to address these questions, we introduce the concepts of ‘engineering an atmosphere’ and ‘engineered atmosphere’ as a way to analyse how participatory design principles are side-lined in technological development. An engineered atmosphere *is the outcome* of a process – namely the process of ‘engineering’ – that develops according to several conditions. Each condition has specific characteristics that refer to the power unequally held by those taking decisions, those executing them, and those subjected to the decisions. In the SUITCASE project, the sponsor and business partners (i.e. those taking decisions) had a key role in setting up the conditions in which the design researchers were to work (i.e. those executing) and the end-users meant to participate (i.e. those subjected to the decisions).

Our main argument is that a closed and inflexible process, of the kind that market-driven principles promote, hinders genuine participation (cf. RQ1). However, it is still a fluid process since an engineered atmosphere might be reconfigured by end-users. Our empirical study shows that relationships between people, as well as between them and objects and technologies, can be reconfigured and democratised (cf. RQ2).

We start by outlining the concept of ‘engineered atmosphere’ and position it within wider discussions in design studies and science and technology studies (STS)

(Section 2). We then discuss the methods (Section 3) and case study (Section 4), before analysing the empirical material (Section 5). We draw upon the conceptual frame in the discussion on the empirical results (Section 6). Finally, we conclude by discussing the need to reinvigorate the foundations of participatory design, starting from a critical reflection about its enactment. New analytical tools, such as the concepts of ‘engineering an atmosphere’ and ‘engineered atmosphere’ help in this regard.

Analytical Perspectives

As a research discipline and field of design practice, participatory design has been developing since the 1960s and 70s especially among social, political, and civil rights movements (Robertson and Simonsen, 2013). The concept of genuine participation reflects the idea of design as democracy (Manzini and Margolin, 2017). According to Kensing and Greenbaum (2013), genuine participation is not a one-way data-gathering approach. It is certainly not a process unilaterally controlled by decision-makers, whoever they are. Rather, it is a collaborative process driven by the participation of the persons who will be affected by the output that is being designed. In short, participatory design aims to promote inclusive and democratic processes of developing solutions by enhancing participation of users.

The link between participation and democracy has driven the participatory design practice until the present (Robertson and Simonsen, 2013). What we increasingly notice today, however, is a growing use of participatory design (at least in terms of narrative in the projects’ proposals) to legitimise research projects and initiatives that are actually driven by a logic other than a participatory one (Nieusma, 2004). When it comes to an actual design process, what *results* from such an appropriation is a complex situation that we call an ‘engineered atmosphere’. In using this terminology, we do not refer to the earth’s atmosphere discussed by geography, physics or chemistry. We use the concept

metaphorically to describe *the outcome of a process* that involves multiple and heterogeneous actors. We call such a process ‘engineering an atmosphere’. An engineered atmosphere – that is the result of the engineering process – is fluid and cannot be isolated. It is generated by different actors – human beings and technologies, objects, and other nonhuman actors – during their interaction with each other.

Given its fluid feature, an engineered atmosphere affects actors variably but is most detrimental to those who are powerless as they are subjected to others’ intentionality (Philippopoulos-Mihalopoulos, 2014). ‘Intentionality’ is a concept used in philosophy of mind and it exclusively refers to mental states that are ‘direct[ed] toward something’ (McIntyre and Woodruff, 1989). In order to overcome the limits of such a cognitive approach that is focused on mental states, we propose the concepts of engineering an atmosphere and engineered atmosphere that, however, retain the idea of ‘directing’ (here, the process of engineering) and being directed’ (hence, ‘an engineered atmosphere’). Through them we stress how differently the actors are affected either when they are directing or when they are directed by others.

The broader concept of atmosphere emerged in philosophy and architecture (Böhme, 1995; Zumthor, 2012) but it is now present in such various domains as organisation management, public art, and law (Bachmann and Beyes, 2013; Borch, 2014; Cusinato, 2015; Philippopoulos-Mihalopoulos, 2014; Sloterdijk, 2005). Of course, different disciplines have used it in different ways. Yet, they all understand it as an emergence that lies beyond the human subject and involves the environment in ways that the human cannot always control. In Peter Sloterdijk’s (2005) immunitarian atmospherics, for example, atmosphere is used as an isolation mechanism that offers the illusion or sometimes even reality of immunisation against the undesired outside world. In Christian Borch’s (2014) treatment, engineering of atmospheres reached a pinnacle in

Nazi Germany. In Philippopoulos-Mihalopoulos's (2014) perspective, who has introduced the specific terminology of engineered atmosphere in the discourse, an atmosphere bypasses the conscious perception of the ones that participate and targets a preconscious, pre-discursive level of desire (to belong, to obey, to feel accepted).

The concepts of 'engineering an atmosphere' and 'engineered atmosphere' can renew the discussion on participatory design by rendering visible the ways in which manipulation of participants takes place on a preconscious level. They also contribute to STS discourses that focused on power relations embedded in the processes of configuring and scripting the user (van den Scott *et al.*, 2017). It is noteworthy that, while configuring and scripting have been conceived and discussed in STS as two distinct processes respectively focused on users and objects, here they are interpreted as part of an overarching process of engineering an atmosphere. Such an absorption does not overlook their specificities but allows to stress even more their epistemological function of highlighting power relations.

From Configuring the User to Engineering the Atmosphere

The idea of directing and being directed, respectively embedded in the concepts of engineering an atmosphere and engineered atmosphere, has a notable forerunner in the STS' construct of 'configuring the user' developed by Woolgar (1991). While discussing the emergence of microcomputers, Woolgar claims that 'by setting parameters for the user's actions, the evolving machine effectively attempts to *configure* the user' (p. 61). His focus is on power and the related ordering effects that position people and objects differently. As Suchman (2007) highlights, the sense of configuring in Woolgar's work 'is not of the user as an individual actor, but rather the incorporation of the user into the sociomaterial assemblage that comprises a functioning machine' (p. 190). 'The user'

stands as a proxy for user as outsider who is not actively involved in the definition either of the machine or of the overall design process. Suchman reconnects Woolgar's argument on configuring the user with Akrich's (1992) notion of 'script'.

Akrich (1992) maintains that designers 'define actors with specific tastes, competences, motives, aspirations, political prejudices' (p. 208). Designers not only configure users – as Woolgar said with reference to a wider group of professionals involved in developing technologies – but also script use, meaning that they project their vision of the world – who the users are and what their needs are – in the technical content of a new object. On the one hand, such processes of configuring and scripting are expressions of power and may cause dynamics of exclusion or marginalisations of users in the design process. On the other hand, a bottom-up process of 're-configuring' (Mackay, 2000) can be enacted by the users as a reaction to a perceived sense of constriction, broadly meant. In this way, users actively contribute to turning their involvement into a less passive positioning.

Fairhurst (1999) and more recently Cozza *et al.* (2015; 2017) elaborated on how stereotypical ideas around the needs of older people, not only shape the design process and become manifest in environments and technologies, but constrain the ways in which older people are forced to use them. Similarly, Östlund *et al.* (2015) applied STS to the design of technologies for older people to discuss designers' and engineers' power and influence over the technology. By mobilising what they called a design inspired by STS, Östlund *et al.* argued that,

Considering that older people are affected downstream by technology but not involved in its design or development means that they not only are neglected as users in their everyday context but also is disconnected from the development.

The *configuration* of them as users as well as their living environment is the object for negotiations between others than themselves, i.e. between researchers, caregivers, welfare planners and other actors shaping the life of older people. (Östlund *et al.*, 2015, p. 84; emphasis added)

An engineered atmosphere depends on social and material conditions in which a specific purpose (e.g. genuine participation) is *dissimulated* and a power imbalance consolidated instead. The concept of engineered atmosphere enables to interrogate the effects of participatory design and its core-concept of genuine participation, rather than assuming it acritically.

Many STS scholars have investigated the details of how technologies, broadly speaking, are shaped by professional designers and how they exercise direct control over the process (for an overview, see *Design Issues*, 20(3), 2004, on STS and the Social Shaping of Design). STS scholars generally agree in saying that such a shaping cannot be attributed only to people, and a better explanation requires conceptual tools that allow to think systematically about the role that technologies have in causing a specific course of events (Woodhouse and Patton, 2004). This is relevant to the case study because the technological devices along with human beings have played a central role in the engineering of the atmosphere. Such a note can be reconnected with a classic Latourian example (Latour, 1994) according to which a gun is neither neutral nor what cause people to kill each other. In the same way, the technological devices involved in the SUITCASE project were neither neutral nor what compromised the participatory process. To demonstrate this, we introduce the conditions in which an atmosphere is engineered.

Engineering an Atmosphere

The articulation of the following conditions is meant as *an invitation critically to address* these very conditions and promote possible participatory agendas (cf. RQ2) starting from the recognition of what a participatory design *is not* (cf. RQ1). Thus, the identification of the conditions *for* engineering an atmosphere must not be intended as an encouragement to accomplish such a process but rather to recognise it and consequently deal with it.

First, for an atmosphere to be engineered, it should *appear* as an emergent (not engineered) situation, namely a not predetermined consequence of the *relationships with users*. It might be difficult to dissimulate the fact that a specific design idea is the product of business interests instead of being something emerging from the users' participation; yet this is exactly what should happen. The atmosphere should not appear forced, unidirectional or oppressive in any way, for otherwise the power imbalance will become too evident and might cause unwanted reactions (for example, involved users might decide to boycott the product or withdraw from the process in which they are involved). Thus, the engineering should develop in a way that its actual purposes are not explicit but dissimulated under the claim for a genuine participation and collaboration.

Second, the process of engineering should create a *necessity* (for a product, an idea, a practice) according to which several tests are conducted. The design idea or product in question is configured as the solution to the need. However, the importance of this solution should be emphasised and other options should be compared and finally discounted as impractical, too expensive, too complex, or unreliable. For example, while the ageing population is increasing, the technology – in its various forms – is claimed to be the solution both for older people (indeed, technologies are often portrayed as the solution to health and wellbeing issues) and public organisations that strive to reduce the cost of care services. Thus, the engineering should develop in a way that competing options are excluded, especially those that are not in line with the purposes.

Third, the power relationships should be underplayed by *persuading* participants that they are playing the leading role, thereby feeding their initial conscious desire to be part of the project and their unconscious desire to be part of the atmosphere at large. In commercial settings that adopt participatory design, the fact that a business actor has actually more power than the participants in determining whether the design will be implemented or not, should be dissimulated. Participants should be persuaded that they are indispensable and that they play a central role *in decision-making overall*. Only in this way will the participants carry on being part of the atmosphere and reinforcing it by their continuing presence. Indeed, we all experience on a daily base the rhetoric of the ‘client first’ solutions, which rely on a marketing strategy, generally uninterested in actually engaging with users. Thus, the engineering should develop according to this rhetoric.

Finally, the possibility to have an open discussion on the design idea or product should be at least *insinuated* if not actually applied. Thus, participants have a feeling of being truly taken into consideration *in the final decision-making process*. Sporadic contacts with the users (e.g. through focus group) and discursive practices such as ‘your-opinion-matter-to-us’, which is quite common in the market research for designing new products or innovating the existing versions, fulfil this condition. Thus, the engineering should dissimulate a participatory approach instead of actually embedding it.

The emergence of an engineered atmosphere (i.e. the result of the engineering process) depends on the actualisation of all these conditions that enact a specific and differentiated access to power. Yet, although the atmosphere can be engineered to pervade the relationships between the actors involved, several forms of resistance might materialise as well (c.f RQ2) as we show below.

Method

The mandate of the authors (henceforth ‘researchers’) was to support the SUITCASE project in different phases by involving a group of older people in testing and assessing the Smart Home solution. Participants were identified and contacted through local associations active on ageing and involved in the project.ⁱⁱⁱ

Key to the SUITCASE project was the assessment of the Smart Home devices installed at the users’ home. The researchers were initially asked to employ usability testing that consists in measuring users’ performances in controlled settings (e.g. measuring time to complete a task or the number and type of errors per tasks) (e.g. Rogers *et al.*, 2014).

However, the researchers negotiated with the business management the possibility to use contextual interview techniques instead of usability testing, in order to lessen people’s stress, which could have altered the results. This marked the beginning of multiple negotiations between the participatory-oriented researchers and the business managers. The suggestion to conduct contextual interviews was meant as a way to generate more interactive relationships with participants, assuming a more social role. The contextual interviews, however, did not alleviate the consequences of the engineering the atmosphere process that was already in place before the research activities. However, the researchers were aware of the possibility that they would assume the role of ‘*triggers* making new initiatives happen’ (Manzini and Rizzo, 2011, p. 211), rather than conforming to the circumstances.

A contextual interview (Rogers *et al.*, 2014) relies on four principles: context (heightened importance of going *in situ* and seeing first-hand what happens), partnership (researchers and users engage in a mutual-understanding and cooperation), interpretation (observations are interpreted cooperatively, with participants) and focus (data gathering is focused on goals).

Eight contextual interviews^{iv} were conducted by the two researchers in participants' homes equipped with the Smart Home solution. A first group of five users^v (Adele, Diana, Franca, Giulietta, Tommaso; average: 81.6 years old; total time: 4h22m12s) provided feedback on the initial prototype leading to a number of changes which were implemented and evaluated by a second group of three users (Folco, Margherita, Paride; average 71.3 years old; total time: 1h33m16s). The researchers worked in tandem, swapping observations and facilitating tasks as necessary. Participants were asked to simulate a use session of the Smart Home devices. The researchers watched the persons while they interacted with the prototype, and they asked what the participants were experiencing. The overall time spent at the various homes amounts to around 15 hours. A recap of the SUITCASE project and a further explanation of the specific research activity preceded the interview. After the interview, the researchers stayed with interviewees to answer possible questions, collect further comments, or simply converse with the participants. Such a 'hanging out' activity (Bernard, 1994), that is the process of meeting and conversing with participants, was important for gaining trust and establishing a friendly rapport with people (Kawulich, 2005).

The contextual interviews grounded the participation in the context of use, and increased reciprocal involvement. People's consent enabled researchers to collect data in the form of notes, audio recording, and photos. The audio was later fully transcribed, anonymised, and analysed using thematic analysis (Silverman, 2014).

A pre-analysis code-generation consisted of allocating a code to similar textual occurrences regarding knowledge of devices' functioning; availability of the product manual; perceived usefulness of the product manual; participants' trust in the functioning of the devices; participants' trust in the SUITCASE project services; participants' reaction to the infrastructural interventions at home; participants' reaction to the position

of the devices at home; participants' aesthetic assessment of the devices; influence of the technical complexity on the effective use of the devices; participants' interaction with the technical language; and design problems to solve. A second step consisted of sorting the different codes into potential themes, and collating all the relevant coded data extracts within the identified themes. A phase of reviewing and refining themes, first, and then a phase of defining and naming them led to the final analysis.

Case Study

The SUITCASE project (duration: 2013-2016)^{vi} was conducted in Italy by a group of researchers and business partners, sponsored by a public institute working on innovation programmes. The main purpose was to develop a set of networked technologies that corresponded to different services for the health and wellbeing of autonomous people aged 65 and more. The core outcome of the SUITCASE project was a technological platform, called Service Dispatcher, through which various services would be delivered: it was expected to work as a support for promptly identifying emergencies or risky situations occurring at older people's home (e.g. falls, gas and water leakages, smoke, intrusions). It was also aimed to generate a more comprehensive view of the assisted people's needs in order to identify them more accurately and manage them before they arise. Moreover, it was designed to detect physical, cognitive, and affective deteriorations, by collecting events transmitted by professional caregivers and sensor networks used by older people. Public sector organisations and institutions were involved in gathering the data to improve the platform.

The sponsor was aiming to commercialise the devices connected to Service Dispatcher after three years of research and trials. Following a cost-saving decision, instead of developing in-house devices, already available devices on the market were acquired and adapted to the requirements identified by the recruited researchers.

A group of researchers was asked to collaborate by planning and conducting a few ‘participatory’ activities along with the requirement analysis. The research work overall was subordinated to financial priorities and marketing strategies. None of the interventions was true to the original participatory design tradition, which should have followed a bottom-up approach, namely a user-controlled process (Robertson and Simonsen, 2013). Researchers became aware of these constraints along the process. The original project was developed along genuine participatory lines that, however, progressively vanished and replaced by the impositions of economic priorities and marketing strategies.

The ‘Smart Home’ solution – a specific technological module of the Service Dispatcher – is the main device implicated in the process of engineering the atmosphere. The Smart Home solution was a wireless-environmental-sensors network in contact with a ‘smart box’, an Android set-top box, which in turn was connected to ADSL and TV. The smart box was designed to collect and process incoming data from the environment where it was installed. For example, if the alert thresholds for a certain event (e.g. the carbon monoxide level) exceeded a certain limit, the system was set to trigger pre-defined operating procedures. Beyond the environmental monitoring and alerting, the smart box was designed to enable older people to contact the operators of Service Dispatcher through a video-call. Environmental sensors and video-call were both mediated by the smart box. (Figure 1).

(Figure 1 about here)

The Smart Home was developed for monitoring, alerting, enabling social networking, and for mediating the evaluation of customer satisfaction. To increase its

attractiveness and user attachment, the Smart Home solution was provided for free to participants for the duration of the project. When joining the project, the older people agreed to have their home equipped with this technology, they were provided a brief training session in situ, and were supplied with a one-page manual. A toll-free number was at the disposal for questions or doubts.

The various activities the researchers were asked to conduct can be interpreted as a dissimulation of the business orientation of the SUITCASE project even though the researchers were not aligned with such a perspective (first condition). The Smart Home was presented by the management as ‘the’ solution to older people’s needs and described as a ‘complete’ solution compared to others on the market, which activate lesser or only one process at a time (second condition). The relationships between the business managers, researchers, and participants were unbalanced, in favor of the first ones (third condition). Both the devices and the researchers’ role were scripted in order to persuade users to have a key role meaning that both of them were directed by the management that was also leading the SUITCASE project (fourth condition).

Empirical Analysis

Configuring and incorporating the user into sociomaterial assemblages made of humans and nonhuman actors (Woolgar, 1991) are meant as top-down processes in this project, and contributed to engineering the atmosphere of the interactions between people, and between them and technologies. This ‘engineering’ process and then its outcome (i.e. the engineered atmosphere) explicitly embodied the power relations scripted (Akrich, 1992; van den Scott *et al.*, 2017) in the Smart Home solution as well as in the relationships between the business partners, researchers, users, and the devices. However, our research

activity also highlighted a bottom-up process of ‘re-configuring’ (Mackay, 2000) enacted by the users, proving that possible resistances can change the dynamics between the actors involved. The re-configuring can be interpreted as a form of active involvement whose emergence was facilitated by the contextual interviews. They correspond to the researchers’ intention of re-opening up the design process to participants (Kensing and Greenbaum, 2013; Manzini and Rizzo, 2011), even though within the constraints of an atmosphere engineered (Philippopoulos-Mihalopoulos, 2014).

Configuring

The data made clear the distinction between the imagined user, as configured by business managers, and the actual participants. The imagined user was a person familiar with technologies and technical language, often English (which was not the participants’ mother tongue, nor a language familiar to them), able to interact with new devices or ready to test them, even in the presence of scarce experience and information. A successful use of the video-call also called for the ability to articulate different interfaces such as those of a personal TV and remote, with the connected smart-box and its specific remote. This profile was completely detached from that of the actual user, and the interviewees stressed this point. Giulietta (78 years old) said:

Researcher: What do you think about this system?

Giulietta: Well, oh god! ... we need time, also to learn how to use a computer, it’s impossible at once because I’ve just got to get the hang of it. All the children are ‘ti-ti-ti’ [onomatopoeia for referring to the younger people’s velocity in using IT devices]. But at a certain age ...

Imma (73 years old), Tommaso's (82 years old) wife who attended the interview,^{vii} took a proactive role by suggesting a way to support the older people's learning process. This proactivity is notable in terms of legitimised participation that the contextual interview was aimed to stimulate. Imma recommended writing a simple guide to be circulated between users because she complained about a lack of clear and tailored informative support about the functioning of services.

Imma: Think about older people! Write these passages and what we have at our disposal [the devices]. You could print out an enlarged image of the remote and then put on paper the first, the second, the third, the fourth ... [passages]

For an effective video-call, users were also required to co-ordinate their cognitive performance (accomplishing the required technical tasks), body (staying in the right position, in front of the TV, to be visible to the operator on screen) and voice (speaking loud enough to be audible). Contextual interviews made the researchers aware of the configuring process that, quoting Woolgar (1991), was 'setting parameters for the user's actions' (p. 61). This exchange between Giulietta and the operator exemplifies a possible situation to handle in the everyday life when using the Smart Home devices:

Giulietta: I see you now!

Operator: Do you see me *big* [on the TV screen]?

Giulietta: Yes

Operator: I see you with your head *cut off*, but it's all the same

Giulietta: Wait, I will sit. Without head? No! We have to learn this stuff

Operator: You need to practice

Giulietta: Yes, the cursor [on the screen] runs like mad. It is half-run. I have to practice.

Configuring the users was intertwined with the configuring of their domestic space. In addition to the infrastructural changes needed for installing the technologies at home, the influence of Smart Home devices on the participants' habits and social interactions needed to be configured. In other words, the atmosphere in line with the business perspective materialised and became all the more evident in the context of use (i.e. the participants' home), with specific regards to the script (Akrich, 1992) of the environmental sensors network of the Smart Home solution. Franca's (91 years old) story is a prime example.

Franca: I told her [the operator] about their job, there [she is referring to a sawmill close to home. She points to the piles of sawdust]. You should see what happens with the wind! (...) The sawdust comes here and I have to clean the window every three-four days. Now it's hot [it was July] and I keep the window open: it is my right to air! So, this morning that [the operator] phoned and said to me: "you should try to keep the window closed when it's windy, and you can open it when it isn't ... but open just a little, so that we can see remotely [what the sensors measure]", I replied: "Excuse me, can I not open the windows in my own home?!"

The spatial configuration was connected to a temporal one. By influencing the people's interaction with their domestic space, the SUITCASE project influenced also the temporal distribution of people's routines, habitus, and daily practices. From this point of

view the original concept of configuring (Woolgar, 1991), limited to users, is expanded to include space and time. In particular, the installation of devices and the frequent interventions for repairing malfunctioning of prototypes, demanded of the participants a surplus availability. Folco (76 years old) and Margherita (61 years old)^{viii} describe the configuring of user's time:

Folco: [On the day of installation] she [the technician] video-called and talked with her colleagues, and it looked like...well, then, later... the day after, she came to change something; three days later to give us something else.

Margherita: I hope that other people's devices work, because I think that going to an older person's home every day to repair something is not acceptable! Every older person has his/her own schedule, probably needs to go out in the morning, so, he/she cannot waste the whole morning. Time is short, we are heading towards a certain kind of life. If they [the technicians] take a chunk of my time too, even though I like meeting people, they [the technicians] take up my valuable time.

Folco and Margherita used a different tone in talking with the researchers about their user-experience: while Folco was accommodating and gentle in describing more critical aspects of the project, Margherita emphatically showed her annoyance. This distinction displays the poles of a more nuanced trajectory of participants' attitude towards the project. These diversified behaviours emerged during the contextual interviews that were aimed at democratically enabling all participants to feel legitimated in expressing also their criticism and disappointment (Bødker *et al.*, 2004).

Re-configuring

Contextual interviews proved to be a valuable methodological tool for reinvigorating the participatory design leveraging on the participatory process they activated. This is manifested in the fact that participants interpreted and re-configured (Mackay, 2000) their involvement in the SUITCASE project on the occasion of the contextual interviews. They expressed their point of view and verbalised their own understanding of user-experience.

Margherita and Diana (75 years old) exemplified the more common and diversified users' stances. While Margherita expressed the intention to withdraw, Diana emphasised her willingness to collaborate further. They felt comfortable in talking with the researchers about both matters of concern and satisfaction. A space for genuine participation was temporarily created by the researchers and took up in earnest by the older people as participants, instead of as mere information-providers and data-sources.

Margherita: When they invited me, I thought it was an interesting project, but I didn't think it would be so complicated. I imagined it would already be at a good point of its development. I expected to monitor my home [through sensors], and given that I only spend a short time at home, I'm almost never here... I expected a sort of surveillance (...). On the contrary, I found slowness (...) Video-call? It doesn't even exist for me. I have quite a busy social life beyond that door, I don't limit my life at home (...). I'm not segregated (...). [I expected to have internet, but] there isn't internet, the box doesn't work, there aren't data, so I cannot say I am satisfied (...). I know it is an experimental phase, but I expected it differently.

Diana: Environmental sensors make me secure. They [the operators] phoned me the day before yesterday (...), even if alarms [that trigger the phone calls] are unnecessary on the one hand, they seem to work on the other hand (...). I'm satisfied, not annoyed at all (...). I hope to complete [the process], I hope so (...). The possibility to see each other [through the video-call], above all when one is sick, to see one's expression, it's helpful to me (...). I hope that the project continues and new ideas arise from it.

Furthermore, the contextual interviews enabled the researchers to observe (Kawulich, 2005) how participants were re-configuring their experience as users, on the one hand, and how participants re-appropriated time and space of being and doing in everyday life, on the other.

For instance, Margherita experienced annoyance and irritability due to the light of the smart box beside the TV in the living room. This situation intensified her annoyance with the SUITCASE project overall. She thought of a solution to protect her peace of mind, given that she spends part of her leisure time in that room. She decided to dissimulate the smart box in a pleasing way with more familiar items, such as a flower vase and a table-top calendar. She domesticated the technology by spatially marking her detachment about it and she thereby reconfigured the engineered atmosphere through an affective relationship with objects. In fact, by putting the objects in front of the smart box, she implicitly but consciously compromised the proper functioning of the video-call. The vase and the calendar – familiar objects – acted as concrete obstacles to the communication between the remote and the smart box and, at the same time, they mediated the material and affective reappropriation of the domestic sphere.

Compromising the technical connection between the devices was not a matter of concern for Margherita because “the video-call doesn’t exist”, as quoted.

In contrast, Diana accepted the presence of Smart Home device, and accommodated them near the old ones – which were familiar objects like Margherita’s vase and calendar. Diana gave them a suitable position for a prompt use (Figure 2).

(Figure 2 about here)

Regarding the general position of environmental sensors in the domestic space, imaginative alternatives were discouraged by the project’s aim of monitoring values produced in the kitchen (script) (Akrich, 1992). Indeed, the Smart Home solution was a wireless-environmental-sensors network aimed at monitoring, preventing or alerting for risky situations, with a particular attention to those occurring in the kitchen, for example, gas and water leakages.

For Margherita, it was important to re-configure and re-make as familiar her domestic space by hiding the sensors case behind the table, while for Diana it was not similarly necessary, or at least not with the same motivations. She improved the functioning of the sensors by putting a small wooden board under the sensors-case, in this way both guaranteeing their stability and avoiding a more invasive infrastructural intervention (i.e. make a hole on the piece of furniture). She said: “Necessity sharpens wits” (Figure 3).

(Figure 3 about here)

Overall, in different ways, users reacted to the engineering of the atmosphere by re-configuring and re-appropriating the domestic space according to their preferences, needs, and routines. The contextual interviews enabled the researchers to accomplish their social role in enabling the re-configuring process to emerge (Manzini and Rizzo, 2011), which altered the conditions settled by the management for engineering the atmosphere.

Discussion

Why is an engineered atmosphere not fit for genuine participation? (RQ1)

When referring to an engineered atmosphere, we describe the result of an overarching process of engineering – to which configuring and scripting contribute – governed by unidirectional power relations that are closed to unforeseen questions and unpredictable solutions. An engineered atmosphere implies participation only to the extent that it confirms and contributes to maintaining established power relations. A participatory approach relies on different premises: ‘those affected by design should have a say in the design process’ (Ehn, 2008, p. 94). Here, the design activities are conceptualised as ‘arenas of voice’ (Star and Strauss, 1999) where specific groups or communities ‘are heard in decision-making processes that will affect them’ (Robertson and Simonsen, 2013, p. 6).

When the engineering of an atmosphere takes place in order to favour specific interests, the complexity of real life is reduced to a set of linear relationships (in this case study, business managers > researchers > users) and objectified purposes (e.g. the Smart Home for scaling-up a business). Likewise, participation is not a spontaneous process and needs to be stimulated and set-up. However, compared to the process of atmospheric engineering, a participatory process is open and flexible, involving users as co-designers.

From this point of view, there is not a (pre-)configuring intended to consolidate existing power relations (cf. first condition).

We borrow Akrich's (1992) words to say that in a participatory process there is a differently distributed 'geography of responsibilities' that enables a continually, more democratic negotiation of *how* actors should participate and to *what* purpose. In the SUITCASE project, contextual interviews enabled such a process and the emergence of users' point of view, to a degree. Akrich (1992) elaborates,

If we are interested in technical objects and not in chimera, we cannot be satisfied methodologically with the designer's or user's point of view alone. Instead we have to go back and forth continually between the designer and the user, between the designer's projected user and the real user, between *the world inscribed in the object* and *the world described by its displacement*. (Akrich, 1992, pp. 208-209)

This is epistemologically relevant because the participatory design meant to produce both the material world of objects and technologies, and new knowledge about this world (Ehn, 1993) by generating the conditions for going back and forth between designer and user and leveraging on their different contributions as key to a 'non-chimeric' result.

Imma's call for a customised guide ("an enlarged image") based on a more realistic idea of older people needs ("think about older people!"), and Franca's astonishment regarding the constraints to which she was subjected ("can I not open the windows in my own home?!") are meaningful examples of the reasons why to involve potential users before ending up with unpopular solutions (cf. second condition). The principle of a genuine participation in design has a pragmatic rationale.

Users need knowledge of potential technological options as well as of how the options can be provided. Designers are the source of this knowledge, as well as of relevant design expertise. The designers need knowledge about users, their practices and the use situation. (Robertson and Simonsen, 2013, p. 6).

From this point of view, participants are crucial for a successful design process, and their involvement is key to the decision-making (cf. third condition).

The potential objection that a participatory approach engineers an atmosphere too, can be addressed at a different epistemological and methodological level. An engineered atmosphere, if any, is already there, engineered before involving users (meaning that it is beyond the users' control); it is engineered on the basis of existing conditions and aims, and closed to differential developments. Atmospheric engineering includes but is not exhausted either in the configuring or in scripting: it is an overarching logic that governs a design process in an all-inclusive, all-determining, risk-averse manner.

There are doubtlessly some components in a participatory design that might be defined as 'engineered' since they are the product of experts' decisions, such as the range of design techniques (e.g. the contextual interview). But it would seem that they are there 'to support participants working together to develop detailed accounts of other representations of both current and desired future practices' (Robertson and Simonsen, 2013, p. 7). Furthermore, the decision on which participatory methods to be used is open to changes resulting from adaptation to different contexts and people. The discussion on the design idea or product is not predetermined or set up with particular aims in mind: rather, it is constitutive of a genuine democratic idea of collaboration (cf. fourth condition).

How can an engineered atmosphere be re-configured? (RQ2)

The participatory research activities served different intentions. The researchers' adhesion to a participatory design thinking contributed to the disguise of the overarching business intent. This was the consequence of the researchers' attitude that, against their will, was also influenced by the dominant view driving the SUITCASE project. In fact, they worked as a sort of friendly interface with the participants whose reactions to the engineering process – while it was taking place – were mitigated by the positive relationships with the researchers. It is worth noting that the researchers were not double-dealing but simply acting in a way that was unaligned with the overarching business rationale. Accordingly, the researchers' effort to reinvigorate the older people's participation generated empathy and collaboration with them, even though far too limited to inscribe the SUITCASE project into the tradition of participatory design.

A specific even though residual methodological choice, such as the limited number of contextual interviews conducted in the SUITCASE project, showed that even a careful attempt to engineer an atmosphere is not foolproof. Indeed, even a seemingly well-engineered atmosphere can never fully prevent some of the participants from re-configuring it, at least partially. There might be opportunities, however small, to resist an atmosphere, but this is rarely an isolated, individual phenomenon.

This implies that the process of re-configuring in favour of a genuine participation calls for collaboration between individuals as well as for the presence of people that will facilitate such an inversion and allow it room to emerge. For example, in meeting with participants and reporting their views to the business partners, the researchers assumed the role of '*triggers making new initiatives happen*' (Manzini and Rizzo, 2011, p. 211), instead of limiting their action to the functional and executive one, which was scripted in

their role. From the researchers' point of view, the older people acted as legitimate and acknowledged participants instead of mere data-providers.

This means that even in the context of an engineering process, several re-configuring practices might emerge spontaneously or even be facilitated. This might happen when people responsible for configuring (like the business partners in the SUITCASE project) fail to consider fully the complexity of a process that claims to rely on the involvement of different professionals and users. (Mackay, 2000). This also might happen when an oversimplified conceptualisation of users dominates the engineering process and overlooks the users' ability to re-configure an atmosphere that does not conform to their needs, expectations or viewpoints^{ix}.

When, for example, Margherita used familiar objects to cover up the piece of technology that irritated her, she reacted to the atmosphere that was engineered through persuasion, compliance, and technological engagement, and she chose to return to a domestic familiarity instead. She was not reacting to one specific aspect per se: the light of the smart box combined with the awareness of participating in an experimentation – with all the uncertainties that such an involvement implies – rendered the reality of directing and being directed too explicit for her. We might say that the light of the smart box was like a scapegoat^x embodied in one among many other scripted objects involved in engineering the atmosphere. Margherita broke with the atmosphere that was serving the ultimate business goal, because it was “not for her”, as quoted. Likewise, the denial of her need for a video call system, and the concurrent confirmation of her social life (which can be interpreted as “I do not need technology to mediate between me and my contacts, friends, family etc.”) are examples of re-configuring practices. Margherita displayed her critical approach to the project, she embodied the distance between actual

users and an imagined (compliant) one, and she appropriated the research activity for expressing her disappointment.

Folco did the same when he realised that the SUITCASE project was configuring his freedom– which made it clear to him that his actual needs were not the priority when compared to the commercialisation of a working Smart Home solution.

Conclusion

The concepts of engineering an atmosphere and engineered atmosphere can be adopted to study the fluid relational dynamics, and the sociomaterial features of the interactions between heterogeneous actors, including objects and technologies.

The SUITCASE project analysed in this paper was a pre-commercial public procurement aimed at developing a set of networked technologies for the health and wellbeing of autonomous people aged 65 and over. The researchers' role in the project was to plan and conduct a few participatory activities to involve users. The main outcome of this project was a technological platform called Service Dispatcher to which a Smart Home solution – a specific technological module – was connected. These technologies, along with a wider network of sensors, have been framed as examples for analysing the processes of configuring (Woolgar, 1991), and scripting (Akrich, 1992) that contribute to the engineering of the atmosphere. Such concepts are useful to pinpoint the power positions and the related ordering effects that differentiate between actors (directing others *vs* directed by others). Concerning the SUITCASE project, the main power imbalance refers to the influence exercised by the business partners over the users, through the process of engineering the conditions of participation.

Compared to the original concepts of configuring and scripting, the concept of engineering an atmosphere retains the idea of 'setting parameters for' (Woolgar, 1991)

and 'defining' actors (Akrich, 1992). Furthermore, it highlights that such a directive process is much more fluid, it is indeed 'atmospheric'. As such, it cannot be isolated or associated with one specific cause, space or time. It is the continual combination of social and material, spatial and temporal circumstances that affect, with varying effects, the actors involved.

The case at issue has allowed the identification of the conditions of engineering an atmosphere as a process that compromise the possibility of democratic participation to design. To be engineered, an atmosphere should not appear forced in spite of its unidirectionality (in this case, from the business managers to the potential users, through the researchers). It should be linked to a necessity (in this case, the technological platform for ageing well at home) in spite of a possible lack of real needs. It should persuade users of believing that they play a central role and that they *want* to be involved in an open discussion, in spite of a decision-making process closed to unforeseen developments (in this case, a market-driven process aimed to commercialise a technological product). Pinpointing these conditions is an invitation to critically address them when occurring. To be aware of how an engineered atmosphere is generated and what its implications are, corresponds to the possibility of opening up the development of technologies to alternative agendas that are democratic in so far as they allow genuine participation.

The forced and, to some extent, oppressive feature of an engineered atmosphere can be compared to a more open and flexible configuration of the relationships taking place in a participatory design process (RQ1). Such a comparison reinvigorates the political and pragmatic rationale of the participatory design tradition, as well as its epistemological and methodological foundations.

The reconfiguration process accomplished by the participants shows that users might have an active role if appropriately supported and facilitated (RQ2). They re-

appropriate time and space populated by objects and technologies which they did not contribute to design, but to which they were asked to adapt. Contextual interviews worked as design tools for letting the re-configuring process emerge via participants' voices and acts.

The SUITCASE project is just an example to foster a critical reflection on participatory design. Stimulated by the call to stand up for democracy as participation (Manzini and Margolin, 2017), we have conducted our analysis by applying and expanding some of the most relevant concepts in STS [such as those of configuring \(Woolgar, 1991\) and scripting \(Akrich, 1992\)](#). The introduction of a new vocabulary – here represented by the concepts of engineering an atmosphere (the process) and engineered atmosphere (the outcome) – can be eventually linked with the invitation formulated by John Law several years ago: “We need a way of talking that helps us to recognise and treat with the fluidities” (2004, p. 41). The atmospheric vocabulary serves this purpose and acknowledges and reflects on the nuances of participation, in design.

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ⁱ <https://www.smartcrowds.net/suitcase-c1yo9>

ⁱⁱ The description of the technological aspects is beyond the scope of this paper. We limit to details that allow the reader to grasp the complexity of the project's intended outcome.

ⁱⁱⁱ Due to the procedures followed by the associations, we do not have data about how many people they contacted, and how many of them rejected the invitation to be involved.

^{iv} Most participatory design projects are small-scale initiatives as well as ethnographic research to which the contextual interview technique can be linked (Blomberg and Karasti, 2013).

^v For privacy reasons, we will refer to participants by using pseudonyms.

^{vi} The project has been stopped at the beginning of the second year, due to a structural change within the sponsor-institution.

^{vii} The researchers accepted the presence of Imma who was involved in the SUITCASE project as reference person of one local association active on ageing issues. This was an exception to the rule of meeting the interviewee alone.

^{viii} Margherita's involvement has been decided by the business managers. After the contextual interview, the researchers recommended to contact older people (cutoff 65+ years) for being aligned with the scientific literature. Even though a definition is somewhat arbitrary, most

developed world countries have accepted the chronological age of 65+ years as a definition of older person (World Health Organization, 2015).

^{ix} There is always the possibility of another atmosphere working alongside the engineered atmosphere. In that case, we could talk about conflict of atmospheres. While this discussion eschews the ambit of this article, for more analysis on this see Philippopoulos-Mihalopoulos (2014).

^x Actually, we would like to define it as ‘agential-scapegoat’ to highlight the agency of the technology we are referring to and the fact that unintended consequences can also be paid by non-humans. Such a reasoning would imply rethinking the ethics of humans-non humans relationships according to a post-human onto-epistemology. However, post-humanism is not the framework on which we built this contribution.