# **Submission Template for ACM Papers**

Everyday Data and Everyday Publics Implications for Design and for Policy-making

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This short paper presents initial findings of a multiannual research on the impact of Voice Assistant technologies in people's everyday lives. Drawing on the project findings, the paper aims to explore the question of how technology design and relevant policies can better inform and coordinate with each other in order to generate safe, inclusive and sustainable new technologies. The paper will start with a short introduction of the VA-PEPR research project and its methodology and will then reflect on the impact of a 'everyday' lens to address the questions of digitalisation and data. It will conclude by advancing three initial proposals for discussion about the role of design research and designer in shaping technologies and policies simultaneously.

CCS CONCEPTS • Designing Software • Computing Technology /Policy • Human Computer Interaction (HCI)

Additional Keywords and Phrases: Voice Assistants Technology, Everyday Data, Anthropology of Technologies, Design Theory, Design for Policy Making

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## **1 INTRODUCTION**

This paper is a short presentation of an ethnographic research about the use of Voice Assistant technology in the homes. As voice assistants and smart speaker technologies are increasingly widespread, scholars have started talking about the

phenomenon of 'platformisation of the household' (Pridmore et al 2019), which raises questions of possible commodification of familial and social spaces. The home has been described as '[a] perpetual battleground for ideas of labour, gender, privacy and family' and as 'the design object par excellence to consider how we live today.' (Steierhoffer and McGuirk, 2019). Digital technologies are finding their way into every corner of our homes: the living room, bathroom, the children's room, the bedroom and the kitchen and their use in domestic settings is impacting social dynamics, practices and routines in the everyday. These always-present and discrete objects are becoming increasingly better at listening and understanding what people say and always better designed so that people even forget to have them in their home.

This paper draws on the initial finding from a multiannual research project to respond to the timely question asked by the workshop 'Designing Platform Technology and Policy Simultaneously' and more specifically reflects on how technology design and relevant policies could better inform and coordinate with each other in order to generate safe, inclusive and sustainable new technologies.

### 1.1 Voice Assistants: People, Experience, Practices and Routines

The research project VA-PEPR (which stands for Voice Assistants – People, Experience, Practices and Routines) is a multiannual study into the societal impact of voice assistants technologies in the household. The project is an interdisciplinary study of how people shape and organise their domestic lives in the presence of voice assistants (VAs) in their household. On the back of many studies on the impact of VA in the home that have been designed and run by private corporations and consultants (Hofstetter and Farner, 2018; Olson and Kemery, 2019), our study aimed at exploring more critically the impact of these technologies on everyday lives and to better understand what measures users can take to 'cope' with these devices and for instance protect themselves against the unwanted listening and transmission of personal information.

More specifically, the project aimed to explore the role of designers in contributing to design VA technologies that could make more transparent certain characteristics of the technology itself and better *afford* its users to advance their safety and privacy. VA-PEPR also aimed to use these findings to ultimately reflect on how civil society, authorities and governmental bodies could play a role to ensure better political and individual freedoms.

In our study we defined a VA as a digital assistant which gives access to a dynamically extensible range of services and to which a user can talk in natural language (VA-PEPR Workbook I, upcoming). This definition focuses on the abilities of the system and decouples it from its physical design (e.g., the kind of hardware that makes the VA accessible to the user). According to this definition therefore a VA may have a dedicated physical representation (e.g. a smart speaker) or may be an add-on function of a multi-purpose device (e.g., smartphone, smart TV, navigation system, etc.). In our project, we looked at digital assistants in the context of a household only. This mainly included smart speakers like Alexa, Google etc. but it could also include for instance the usage of Siri on a smartphone as long as that was happening within the home and not when travelling.

The in-home ethnographic study included the involvement and observation of the use of VAs in 31 households from the German speaking part of Switzerland. Divided into 4 groups, participants self-documented their experiences with VAs for 4 weeks via Indeemo Mobile Diary App, and joined weekly interviews, from March to May 2021.



Figure 1: A screenshot from the Indeemo dashboard showing the data collected through the diary app.

The data collected through the diary study (see Figure 1) supplemented the weekly 15-min Zoom interviews. Through content analysis, emerging themes were identified. 3 and 6 months after the ethnographic study ended, follow-up interviews were conducted to find out long-term changes around routines and practices.

## 2 EVERYDAY DATA AND EVERYDAY PUBLICS

The main goal of the VA-PEPR study is to achieve an in-depth understanding of the impact that VAs have on everyday practices and routines as well as on the interaction and social relationships between the members of a household. It was based on the understanding that mapping how people use the VA technology in their everyday, and in turn how this impacts and changes their daily routines and practices, will provide valuable insights into the implications, challenges and opportunities for the design and use of VA more in general and the applications of the Internet of Things (IoT) in everyday life.

Few studies (Newman, 2018; Ammari et al. 2019; Terzopoulos and Satratzemi, 2020) have taken an ethnographic approach to explore the impact of VA technologies on people's everyday lives. Previous studies on technology adoption in private households (Hessler, 2001; Sackmann and Weymann, 1994) have mainly focused on technology acceptance or have offered a critical appraisal of VA focusing on the need to translate abstract values (such as trust and privacy) into comprehensible digital artefact (Rogers et al., 2019). The everyday is therefore still a missing component to understand the impact of technologies and one that policy-makers and regulators are increasingly paying more attention to (Kennedy,

et al, 2022). Everyday experience and encounters with digital technologies and data can also offer key insights to understand the potentially discriminatory impacts of different technologies in order to be able to overcome them.

'Everyday data cultures' (Burgess et al, 2022) is an emerging framework for studying the impact of data and digitalisation on the everyday, which pays increased attention to the datafication of everyday lives, the way in which people develop intimate relationship with and through data and digital tools, as well as the mechanisms that they develop to cope, resist and better control digital technologies used in their lives. These research methodologies – so called 'from below' (Miller et al, 2021) – focus on how ordinary people live with technology and develop their own creative and ingenious ways of using the technologies to deal with issues they face (e.g. from ageing, to health care and nurturing social relations).

The focus on the everyday is central to move beyond the implicit universalizing epistemology about data (Douglas-Jones, Walford and Seaver, 2021) and to attend to data as particular and contextual. Through an everyday lens, the experiences of people in their mundane use of technologies (for instance in the everyday practices in the home) become central in at least three ways: i) as the main terrain where technologies are used and have impact; ii) as a source for new insights for research that puts people's lives at the centre; iii) as a site to demystify the technological determinism that sees technology as introduced and used everywhere in the same way.

## 2.1 Everyday Use of VA

Through the ethnographic study, the team discovered a lot about people's everyday encounters and use of VA technologies. We learned about their expectation and why they wanted to buy a VA in the first place. We learned about their struggles, if they had already smart technologies in the house to integrate the newly arrived smart speaker with existing systems at home, and how the wrong choice of incompatible operating systems could damage the experience of use from the start. For those who are more 'technology savvy', installing and integrating the VA with other IoT devices can be a stimulating challenge and can become a new 'hobby' to tinker with the VA in order to maximise the satisfaction of use. Interestingly, we learned that this group of users shows more patience and 'empathy' with the VA and to understand that it might not always perform as expected. Location and the social environment of where the VA is installed do influence its usage. Where and with whom a VA 'sits'—whether in a single-family household, in a co-habitation arrangement, whether kids are around or not—does shape social relationships and collective ways of using it. The home study has shown that VA can have neutral, negative and positive effects on living together. Through their use, new roles in the household can develop. For example, often a person takes responsibility for installation, (password) control and maintenance.

These everyday ordinary dynamics are, within an everyday data culture framework, the central site for knowledge production as well as the sites for the development of collective mundane data intimacy (Burgess et al, 2022, p49). As people learn, use, have fun, cope or boycott their own VA technologies in the home, we learn about their practice of what Burgess and colleagues again have called the 'vernacular creativity' and 'mundane resistance' (2022, p32). Finally, and perhaps most importantly, it is through everyday interaction with intimate technologies that people develop 'everyday data literacy' (idem, 2022, p83) as they learn through daily interactions and paying attention to simple feedback loops how the technology works and how to 'game it'. This is a bespoke form of digital literacy based on folk expertise that, although does not protect people from the data-driven business models of technology companies or the unanticipated negative consequences deriving from the devices these companies produce, still supports people in living everyday with technologies in their lives and in their homes.

## **3** DESIGN FOR TECHNOLOGIES AND FOR POLITICS: ELEMENTS FOR DISCUSSION

VA-PEPR had the overall ambition to do two things: i) to work with designers to propose innovative design responses to the challenges identified through the ethnographic research; as well as ii) to contribute to guidelines and policy recommendations concerning the development, design and deployment of VAs. Therefore, the project had from the start the ambition to connect both the design of technologies and the design of policies, so that these could better inform and coordinate with each other in designing new technologies that can benefit society for the long-term. The unspoken assumption was a certain understanding of design as a practice and theory 'in between', that could speak and play a role in designing the technologies and that is increasingly seen as playing a role in policy-making as a way to re-orient public policies and organisations around people (Junginger, 2017).

Designers are becoming more aware of their power and responsibilities in accounting for the unanticipated negative consequences of emerging technologies. Dealing with the design of these technologies cannot be done naïvely, since through the technological development phases ethical issues are translated into context specific, actionable practices and routines through design choices (Peters et al. 2020).

In the attempt to provide open statements for discussion, we conclude this short research paper by highlighting three possible ways in which design could advance the design of technologies and policies simultaneously: firstly, by making technology and its future possible implications intelligible to a general public and to policy makers; secondly, by inviting the public to participate in exploring the collective implications of emerging technologies as well as imagining how these technologies could be built differently to promote autonomy, control and agency of its users; finally, by designing these alternative and more just technologies so that they can be used today and could provide a practical inspiration for policy making of what technology for the public good might look like.

#### 3.1 Revealing

The immateriality of cloud-based VA technology (and of digital technologies more broadly) might be one of the reasons why people (including policy-makers and regulators) seem to be struggling to understand the true implications of these devices and to develop their autonomous ways of using them, controlling them and perhaps resisting them now and in the future. Wallace and colleagues (2018) talk for instance of a technological capacity on the inside of these devices that far exceeds our perceptions of the object from the outside. Finding ways to make that technological capacity visible is an important task for design.

When it comes to explore ways for revealing and making visible certain immaterial characteristics of technological objects, design has a lot to offer from its tradition of speculative design and the use of fictions. In the VA-PEPR project, the team developed a series of 'provotypes' (Shorter et al, 2022) to materialise the immaterial and through provocative and speculative design features to generate a debate on potential use, misuse, opportunities and boundaries for a safer and more graspable VA technology.

	1. Super Hearing This provotype (voice skill) explores what it could mean if our voice assistants could hear and make sense of more than just the spoken word		5. Constant Transcriber This provotype (3D print + electronics) prints out everything it can hear - or rather what it thinks it can hear		9. Data Flow Customisation This provotype (mock app) explores what it might be like to be able to customise a VAs 'smartness', and what it means for the functionality of the device
	2. Take Me To Church This provotype (video) explores what it might be like to treat a VA as an emotional support device		6. Data Value Monitor This provotype (mock app) explores what it might be like if we could see the value of data our VA was collection on us		10. VA Everything This provotype (3D print and stickers) explores what it would mean if we could turn everyday objects into a VA simply by placing a sticker on it
	<ol> <li>VA Everywhere</li> <li>This provotype (3D printed phone case) explores what it might be like to have a VA in your pocket at all times</li> </ol>	-	7. Microphone not Speaker This prototype (3D printed prop) explores what it would be like if the form of a VA resembled a microphone than than a speaker	6	11. Extra Control Dial This provotype (3D printed dial) explores what it mean if there was an extra control dial that you could stick onto a VA allowing users to turn 'something' up or down
	4. Data Control Services This provotype (flyer) explores a future where we need a specialist service to fix home data problems such as data leaks, data infections, Al bias and data fraud		8. VA Confessional This provotype (wooden prop) is a playful provocation that asks people to imagine what it might be like to be able to interrogate an AI, like a confessional session with a priest	15	12. Data Packet Viewer This provotype (image) explores what it might be like if we could see and touch data packets moving from one device to another within our homes.

Figure 2: Series of Provotypes that were developed and used to spark conversations around potential use and misuse of VAs.

The figure above showcases the 12 provotypes that were built and used to stimulate a conversation on what VAs do, what they should not be allowed to do and what might be designed better.

These or similar design objects and provocations can also perform an educative task, which is a precondition for the public to form an opinion and take more control over the future of these emerging technologies. By increasing people's understanding of the technology 'by design', designers can therefore support policy-makers in advancing 'critical digital literacy' (Ragnedda, 2018). This form of literacy should be framed as going beyond the simple understanding of how to better use digital technologies, and towards understanding the socio-technological outcomes they produce.

## 3.2 Making 'Everyday Publics'

The role of design to '*make publics*' has been mainly addressed within the participatory design scholarly tradition (Le Dantec, 2016; Di Salvo, 2009) and it usually frames design as a process of inquiry that can critique and reformulate social and political norms by practicing alternative ways of doing politics and making political and shared issues visible (Hansson et al, 2018).

'Everyday publics' approaches aim to confirm the importance of putting people at the center; both of policy-making and of the design of new emerging technologies and digitally mediated practices. Putting people at the centre, for instance by getting to know and understand technology through their everyday story and use, is a key step to address the question of the asymmetry of power that see tech-corporations as the main dominant actors. As Zuboff illustrated, in fact, the take of power from these corporations over the State did not happen through a 'coup d'État' but interestingly through what she calls a 'coup des genes':

"It is a form of tyranny that feed on people but is not of the people. In a surreal paradox, this coup is celebrated as 'personalization,' although it defies, ignores, overrides, and displaces everything about you and me that is personal." (Zuboff 2019, 513).

Making the everyday public emerge around digital technologies could therefore carve an important role for a design practice that could: first, materialise the potential and future unexpected consequences that are embedded in all technological developments; second, learn from the lived experience of everyday people to build a collective public that can demand and imagine different ways of designing technologies that advance digital rights, inclusion and people's agency; finally (and this is the last point that this paper aims to present), bring these more just digital solutions to fruition in the everyday.

## 3.3 A Design Justice Approach

Next to broader discourses on 'data justice' (Taylor, 2017) or digital justice (Katch and Rabinovich-Einy, 2017) that have been going on already for some time, design is finally introducing the dimension of 'justice' in its own practice. Within design justice practices (Costanza-Chock, 2020), the designer's role becomes an active one in countering more deterministic technology-driven perspectives which are still prevalent in the design of technologies. Design justice is a framework for an active and anti-discriminatory design practice that aims to become more intentional on how design distributes benefits and burdens between various groups of people. It involves awareness and intentionally in accounting for who is involved in the process of designing, who benefits and who might be harmed by it.

In a recent project that explored citizens voices on issues of digitalisation and digital rights (Pierri and Wiltshire, 2021), citizens from 4 cities in Europe highlighted the difficulties for those people who are worried about their privacy and want to protect their data to do so, as most people feel they have no alternatives to the use of certain tools and platforms (e.g. for leisure, for accessing services or for staying in touch with family and friends). Despite their dissatisfaction with the way these platforms and devices are built, the lack of transparency and accountability regarding for instance data use and storage, these people feel they have no equivalent alternative at hand. Providing just designed alternative is the final and hopefully stimulating challenge that this paper aimed to raise for designers that want to make technologies that respect and advance digital rights and good policies. Such 'just technologies' may produce the changes in public opinion that policy-makers are also keen to see, such as greater control, autonomy and confidence in digital and data uses.

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