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Dataslip: Into the Present and Future(s) of Personal Data

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ABSTRACT
Most people are entangled with an ever-growing trail of data that results from their daily interactions with products and services. Yet, they are hardly aware of the nature and characteristics of the data within this trail. We design dataslip, a provocative artifact that materializes the personal data trail into a receipt and aims to elicit creepiness. We demonstrate dataslip at two events in Delft, The Netherlands. Dataslip is a starting point to foster conversations with local community members about the underlying challenges and potential alternatives to personal data collection and use. We use these as prompts for further speculation through a collaborative futuring exercise with children, where we part from challenges towards hopeful and empowering futures. We contribute with an artifact that invites individuals to interrogate the current personal data practices they are embedded in and a set of five speculative design scenarios that suggest hopeful and empowering alternatives.

Authors Keywords
Personal Data; Prototyping; Speculative Design; Futuring

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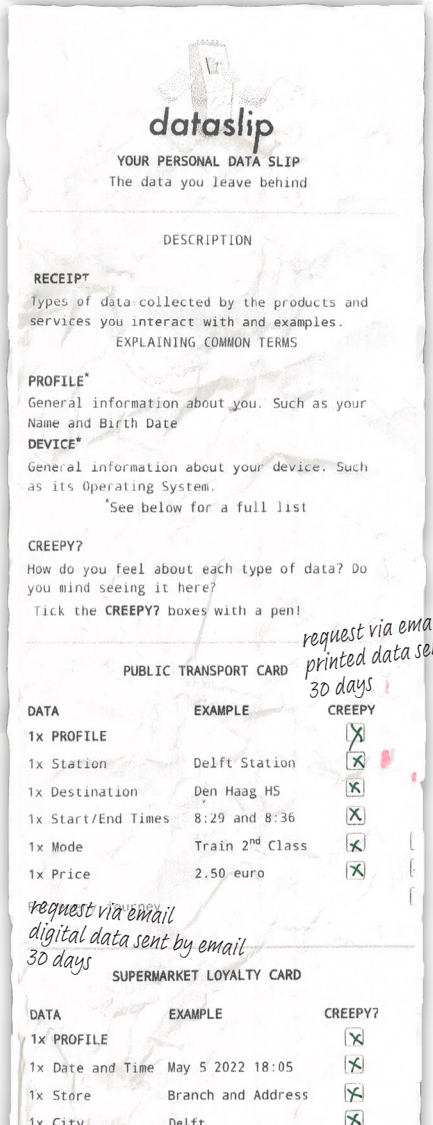
INTRODUCTION
Most people routinely interact with products and services that collect and indefinitely store personal data; at the same time, they are unaware of the nature and vastness of these data. For example, when a person registers for a loyalty card at the supermarket, she is aware that she is volunteering personal information, such as her name, address, and email [1, 2]. When she uses the card to get a discount on her purchases, it's less clear that personal data from this interaction is being collected and even more, exactly what (types of) data. Thus, there is a misalignment between people's understanding and expectations of their data and their actual collection and use by product and service providers. It hampers people's rational understanding of their data and even more, of what data feels like [3, 4, 5, 6]. What data feels like has been the focus of Data Epics, which aim to challenge how data are imagined and represented through fiction and speculation [6, 7].

Many factors contribute to people's lack of awareness, including the pervasive nature of data collection [8, 2], the abstract nature of data and the terminology commonly used to refer to them (e.g., the cloud) [9, 10], and the often unclear [11, 12] or misleading [13, 14] terms of service and privacy policies. With it, also comes a sense of disempowerment with respect to the power imbalance between individuals and private companies or public services collecting, storing, and benefiting from data about them [15, 16]. Shklovski and colleagues [3, 5] argue for eliciting visceral reactions such as creepiness and discomfort that enable people to feel their data to underline these issues. Yet, feelings that stem



from increased awareness do not lead people to stop using the products and services that trigger them. Instead, people often choose to ignore or forget about them and move on, by continuing to engage and interact with products and services with creepy data collection practices. Hence, people tend to close themselves off in the face of the creepy powerlessness regarding personal data collection. Yet, being closed off means they often shy away from being involved in shaping the future, which further disempowers them.

In this pictorial, we materialize the creepiness of personal data collection as a starting point to envision alternative futures. We designed dataslip, an interactive and provocative artifact that promotes awareness and invites people to feel and interrogate the creepiness of their personal data trails (i.e., the collection of data left behind from each interaction with a digital product or service) through a tangible representation in the form of a receipt. We use dataslip in two activities. First, during a local community event, where the creepiness of the receipt prompted attendees to reflect on challenges and concerns around personal data collection and their current approaches to mitigate them. Second, during a workshop with primary school children, where we used dataslip as a co-speculator to co-create alternative and hopeful futures that stem from the challenges identified during the first activity.

Our contribution is twofold. First, we demonstrate dataslip, an artifact that promotes awareness and invites people to feel and interrogate their personal data trail [17, 18] through a tangible representation. Second, we propose five speculative design proposals co-created with community members that respond to their experiences with dataslip through hope and empowerment. We discuss our approach and conclude by reflecting on the benefits and limitations of moving from creepiness toward hopefulness and empowerment.

Creepy Personal Data

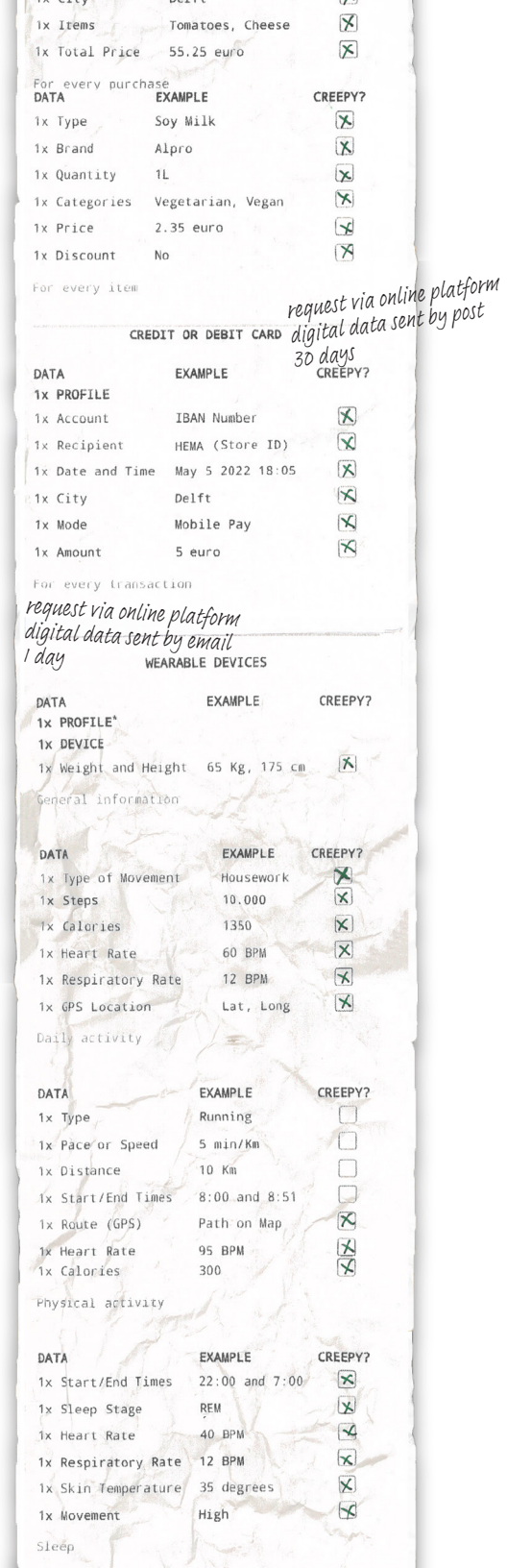
Personal data are defined in the European General Data Protection Regulation (GDPR) as any information through which a person can be directly or indirectly identified (Art. 4, [19]). Examples include a person's phone number or email address, directly associated with her, as well as the WiFi access points she connects to through her mobile device, indirectly associated with her. Whether directly or indirectly, individuals have the right to be informed (Art.13-14, [19]) about the collection and use of their personal data. Yet, they are often informed through lengthy documents, such as privacy policies, or short statements, such as cookie pop-ups, which are hardly effective [20, 21].

For this reason, when it comes to personal data collection and use, most of us "don't know what we don't know" [22]; meaning personal data collection and use are opaque. Moreover, personal data collection is so entangled with our day-to-day, and our interactions with digital products and services that data themselves are opaque and unknown [4, 3]. They contain several fragments and types of personal information, and it is difficult to account for their length and depth. Even if individuals go one step further, for instance, by requesting a copy of their data (e.g., browsing history logs) from a data controller (e.g., Google), data are returned in files and formats that are hard to manipulate and understand [15, 23, 24]. Thus, even here, when data are in a person's hands (or device), they remain opaque and unknown.

In most cases, people are surprised when they become aware of the data collection practices of the products and services they interact with. This includes: (1) realizing that the data was being collected in the first place [3, 25], (2) understanding what types of data are being collected [25, 4], and (3) discovering all the information that can be inferred from the data [4, 26]. For this reason, becoming aware, and realizing data are, and reveal, more than they seem generates discomfort or creepiness [3, 5]. Yet, creepiness is temporary. Even if they are creeped out by the data collection practices of a specific product or service, most people continue to use it as they normally would. Shklovski and colleagues [3] argue that emotional visceral reactions, such as creepiness, point to important underlying issues and suggest provoking and confronting the creepy nature of digital technologies head-on.

Futuring and Design Fiction

Since Dunne and Raby's Speculative Everything [27] was published, 10 years ago, speculative design and futuring have become a common item in the toolkit of researchers and designers. They serve to elicit open discussion and



debate about a wide range of topics and subjects [28, 29]. More recently, these approaches have been reflected on more extensively, leading to a distinction of the different modes of reflection in futuring [30]:

1. *Designerly formgiving, its specificity, and experiential qualities:* how a specific artifact to imagine one specific future can 'close down' on thinking about certain futures, while 'opening up' to think about and focus on one future in detail.
2. *Attending to temporal representations:* how engaging with temporality, as culturally situated can underline assumptions around the conceptualization of futures (e.g., linearity of time).
3. *Positionality, futuring from somewhere:* how researchers and designers can more thoughtfully and intentionally consider their own positionality and privilege.
4. *Engaging with the real world and the public:* How design futuring projects can engage with real-world gaps, issues, and opportunities and foster more open debates.
5. *How design futuring generates new knowledge:* how design futuring projects can connect or build upon other(s') design futuring works.

Coulton and Lindley observed two common approaches to futuring: (1) that of Vapourworlds and (2) that of design fiction. Vapourworlds propose industry-driven technocratic utopias, while design fictions are produced as critical, technology-averse dystopias [31]. Previous research underlines a need to close the gap between utopian and dystopian futures thinking [30, 32, 33]. For this reason, the pioneers of speculative design practice are actively working towards closing the loop by taking speculative work from the art gallery into everyday life [30]. One approach to this could be to design for Ustopia - or the interaction between utopia and dystopia - instead [34]. In response, with this work we strive to critique current data practices while also providing a positive outlook towards the future, to emphasize that the future is not inevitable and that consumers can play a role in how they use their data and how it is used by others.

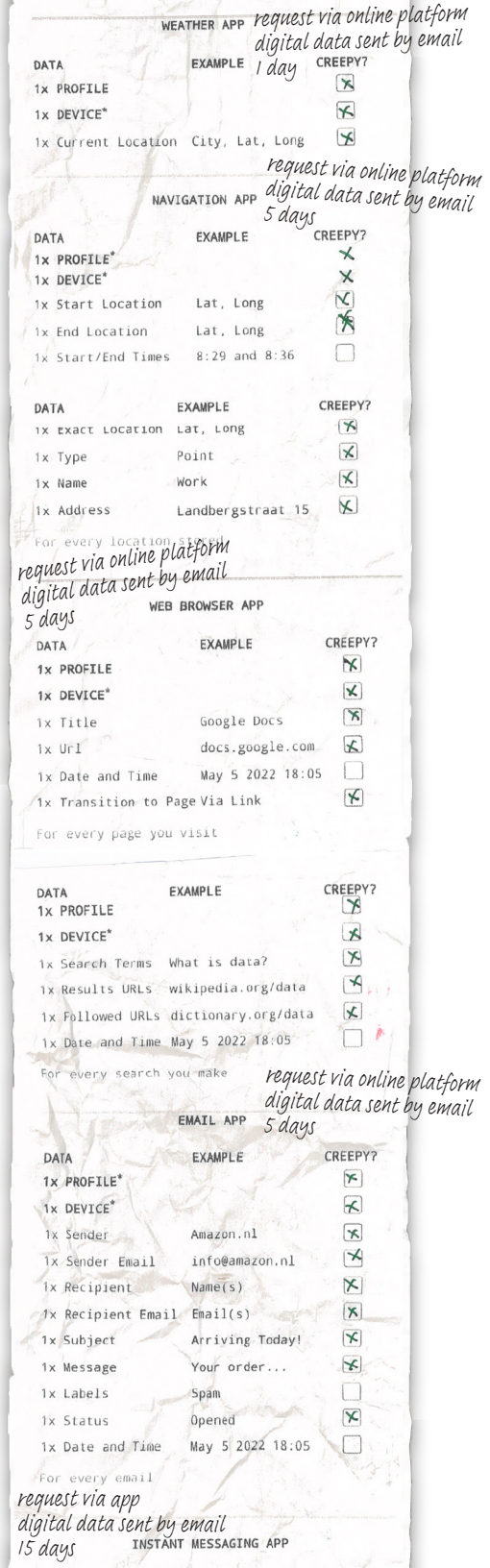
METHOD

Designing Dataslip

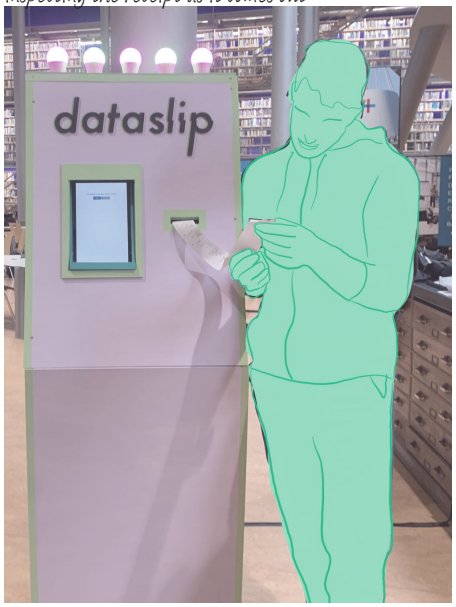
Dataslip is an interactive installation that emulates an Automated Teller Machine (ATM). It alludes to the *"data is the new gold"* [35] narrative, where data is equivalated to a valuable currency, but valuable to whom? Similar to an ATM, it consists of a touchscreen and a printer. We designed dataslip with the following goals: (1) to promote awareness of personal data collection and invite people to reflect on the value of data to them, (2) to bring materiality to the abstract notion of personal data, and (3) to elicit anticipation, confrontation, and the visceral emotional reaction of creepiness by enabling people to feel their data [3, 5].

The interaction with dataslip emulates that of an ATM. People interact with a touchscreen where they answer five simple yes/no questions, based on their routine interactions with digital products and services. Here, we focused on a range of products and services that people encounter daily: (1) personalized public transport cards, (2) supermarket loyalty cards, (3) credit and debit cards, (4) wearables, including smartwatches and smart rings, and (5) mobile apps, including weather, navigation, web browser, email, instant messaging, music, social media, dating, and period tracking apps. After answering the questions, people obtain a receipt, slowly generated by a thermal printer to build up anticipation and implicitly foster creepiness – on average it takes 1:30 minutes for the receipt to print. It contains a comprehensive list of the data that is collected and indefinitely stored as people interact with different products and services. It includes short but detailed examples to help people interpret the data and a checkbox that explicitly invites them to reflect upon and indicate the perceived creepiness. The receipt physicalizes the personal data trail. Its length conveys a type of data in itself, how much data is collected.

To populate the receipt with accurate information and examples, we made use of our rights of access and data portability in the GDPR [19] and requested a copy of our personal data from the different data controllers listed above. In total, Alejandra made 28 data portability requests. Alejandra reached out individually to each data controller, as indicated in their privacy policy. She is based in The Netherlands,



inspecting the receipt as it comes out



comparing the length of the receipt

wearing the receipt as a scarf

comparing the receipt and their height

hence four of the requests were made to companies operating primarily in this country; the public transport company (1 request), the supermarkets (2 requests), and the bank (1 request). The information on the receipt corresponding to these three entities is limited to the Dutch context and might not translate to other contexts and countries. The other twenty-four requests were made to companies operating in an international context.

For Alejandra, requesting and obtaining a copy of her data was a lengthy, confronting, and overwhelming process. Especially when the data was delivered digitally (i.e., a USB) and physically (i.e., printed files) by mail to her home address. The receipt aims to create a similar experience for dataslip users, by confronting them with the length and depth of their personal data.

Reacting to Dataslip

We demonstrated dataslip for two consecutive days at the Maker Faire in Delft, a local event open to community members of all ages. In doing so, we aimed to investigate individuals' practices, expectations, and concerns around personal data collection. During the event, we invited attendees who approached dataslip organically to interact with it and obtain their receipts. Then, we prompted them to record (1) their feelings or reactions to their receipts and (2) what they would like to do with data from the slip on a post-it note. Similar to [5], we found this set-up created conditions for discussion and exploration. The event was advertised locally to residents of Delft and the surrounding area through flyers and social media posts. During the event, we informed attendees about our research and they consented verbally to participate by recording their thoughts on post-it notes. This activity was reviewed and approved by our institution's Human Research Ethics Committee. Due to the set-up of the event, we did not collect any demographic or personally identifiable information from attendees.

About one hundred attendees obtained their receipts over the two-day event, and fifty-five left us post-it notes (A1-A55). After the event, Alejandra and Renee digitalized each post-it note and used clustering and visual mapping techniques to outline the main practices and challenges in the online whiteboard tool Miro.

DATA	EXAMPLE	CREEPY?
1x PROFILE*		☒
1x DEVICE*		☒
1x Status	'Offline	☒
1x Last Active Time	Nov 5 2022 4:11	☒
1x Online Since	Nov 5 2022 4:11	☒

DATA	EXAMPLE	CREEPY?
1x Full Name	Alejandra Gomez	☒
1x Phone Number	+310655244095	☒

For every contact

DATA	EXAMPLE	CREEPY?
1x Name	Familiy :)	☒
1x Contact(s)	Family Members	☒

For every group

request via online platform
digital data sent by email
10 days

MUSIC APP

DATA	EXAMPLE	CREEPY?
1x PROFILE*		☒
1x DEVICE*		☒
1x Type of Content	Song	☐
1x Artist	Shakira	☐
1x Transition	Previous Finished	☐
1x Date and Time	May 5 2022 18:05	☐
1x Time Played	500 ms	☐
1x Content Skipped	True	☐
1x Shuffle Mode	False	☐

Every time you stream content

DATA	EXAMPLE	CREEPY?
1x Playlist Name	Latin Karaoke	☐
1x Song(s)	Hips Don't Lie	☐
1x Artist(s)	Shakira	☐
1x Last Modified	May 5 2022 18:05	☐
1x Description	None	☐
1x Followers	300	☐

For every playlist

DATA	EXAMPLE	CREEPY?
1x Query	Songs to Focus	☒
1x Search Results	List of Results	☒
1x Interactions	Clicked Results	☒

For every search

DATA	EXAMPLE	CREEPY?
1x Liked Content(s)	RadioLab Podcast	☐
1x Liked Artist(s)	Shakira	☐
1x People you Follow	Shakira	☐
1x Your Followers	Mom	☐

Your library

request via online platform
digital data sent by email
10 days on average

SOCIAL MEDIA nkedIn, Instagram, Twitter, and TikTok

DATA	EXAMPLE	CREEPY?
1x PROFILE*		☒
1x DEVICE*		☒

Reactions to Dataslip

The majority of attendees expressed a sense of bewilderment while obtaining their receipt; *"OMG. It's too much!!! I feel uncomfortable because I don't know how to get out"* (A1). It was cultivated by the anticipation and waiting for a receipt that kept printing and printing. Similarly, a recurring reaction from attendees after inspecting their receipt was concern about potentially exposing their hidden secrets.

For most attendees, the information on the receipt was new, crazy, and scary. *"My [receipt] is a scary way to look at how much information I am sharing with every click."* (A45) Nonetheless, some attendees were already familiar with the data collection and storage practices of digital product and service providers, yet they found the receipt format telling. *"It is not new to me, but seeing it in a receipt makes it different."* (A28).

Practices and Expectations

Although most of the attendees expressed concern about the length of their receipts, some saw it as valuable and reflected on the potential of using such data. For example, to learn more about themselves or to make their daily routine more convenient, "*I would like to use my data to automate my house, for instance, open my garage when I'm getting close."* (A32). In fact, some attendees already use some of the data from their receipts to gain personal insights and make data-informed decisions. *"I use my data to categorize my spending and get an overview."* (A2). Another potential application that attendees identified is to use personal data as proof or evidence that they were involved in certain activity during a specific time, "*I can use it as proof that something happened, that I was in the supermarket for instance."* (A12). In this way, the pervasive and timestamped nature of personal data is perceived as beneficial as it could serve as evidence in court or with the relevant authorities if necessary.

Some attendees also challenged the information on their receipt based on their current practices, for instance, "*I use fake birthdates and I have many profiles of myself."* (A40). Here, using different profiles and settings meant having different fragments of data associated with different versions of themselves, and therefore, fragmented across multiple receipts.

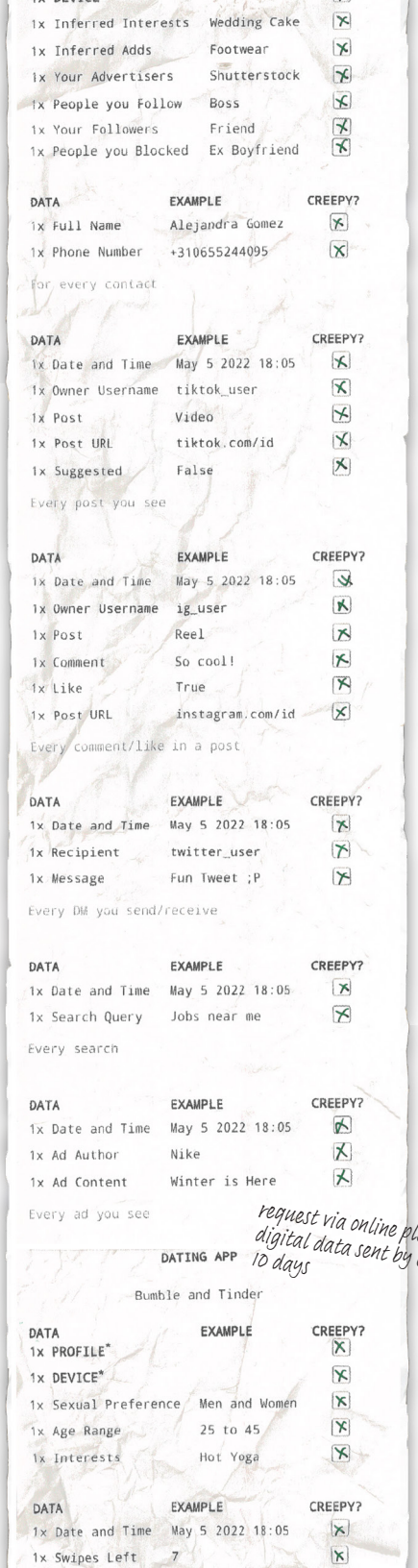
Challenges and Concerns

Through clustering the different post-it notes we identified the following challenges and concerns:

1. *Privacy trade-off:* Attendees recognized a trade-off between (protecting) their privacy and using products and services that are convenient (e.g., personalized public transport card) or necessary for everyday activities (e.g., credit or debit cards). *"I try to protect my data but at the same time I use many apps, it is scary!"* (A8).
2. *Transparency:* What do we say yes to when we agree to use a digital product or service? Why do digital product and service providers need data? Attendees underlined the lack of adequate information about these aspects; essential for making informed decisions. *"I would like to know what I'm saying yes to, with things like cookies. What is a cookie?"* (A17).
3. *Unbalanced Distribution of Benefits:* Who benefits from the collection of personal data? Mostly private companies and public services. However, attendees expressed their willingness to benefit as well. *"I want to trade my data for money!!!"* (A6).
4. *Temporality and Permanence:* Attendees questioned the permanence of personal data. It is continuously collected, and indefinitely stored. *"Why do they need to keep my data forever?"* (A23) It is constantly growing and it is not necessarily easy to stop it from growing by deleting it or requesting to be forgotten.
5. *Having a Choice:* Attendees expressed a need for agency and autonomy when it comes to the distribution of their personal data. *"I would like to be able to choose what to share and what not."* (A39).

Speculating with Dataslip

To continue the conversations and debate that were triggered by the initial interactions with dataslip, we aimed to further contextualize those conversations and make a more hopeful



and explicit contribution to the future practices around the collection and use of personal data. In doing so, we specifically respond to the first of Kozubaev et al's [30] modes of reflection: to imagine one specific future to *close down* other possible futures and *open up* conversations about that future in detail. We also respond to the fourth and fifth modes of reflection, by engaging with the current situation and further involving the community, and building upon earlier speculation, by involving dataslip as a co-speculator in the futuring exercise.

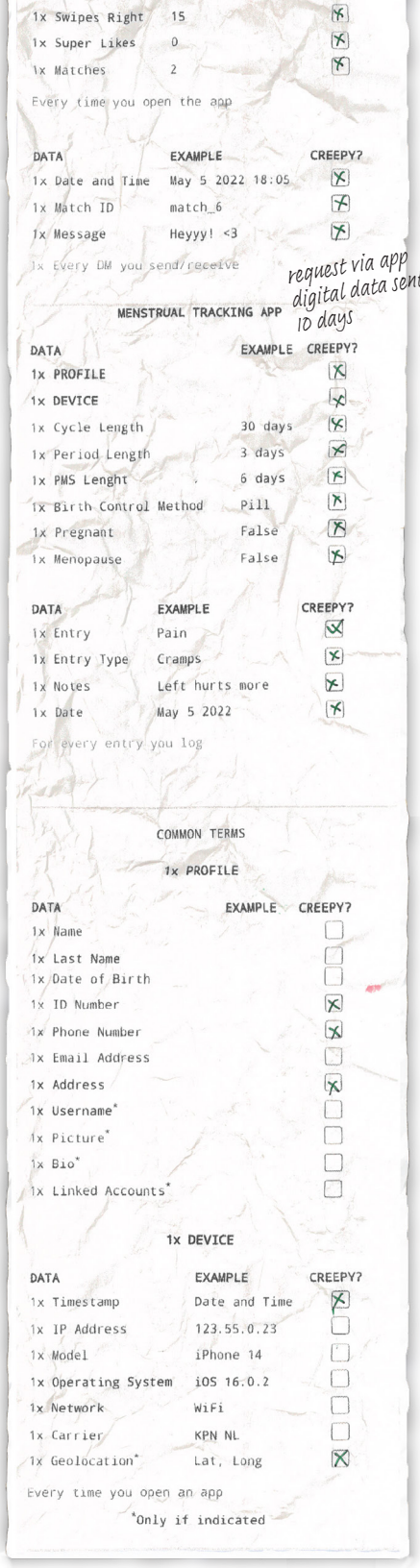
For this activity, we used the challenges and concerns identified above as prompts for further speculation. We involved primary school students, as their generation is an inherent stakeholder in the personal data practices of the future. Hence, it is valuable and important that they are involved in shaping that future. Additionally, we considered the unfiltered creativity of primary school children an inspiring resource for the further continuation of the project. We conducted two creative workshops (W1-2), each with 20 primary school students aged 10-12. The workshops were held in this context as the school was running a special curriculum on data, the internet, and online behavior at the time and invited us to participate with dataslip. Both the students and their parents or guardians consented and assented to their participation in the workshops. This activity was reviewed and approved by our institution's Human Research Ethics Committee.

The workshops were structured through three activities. First, we gave a short introduction to personal data and online behavior. Second, we invited students to interact with dataslip and obtain their receipts. Third, we invited students to form groups of 4-5 (G1-5) people and propose a solution to one of the five challenges identified above (See Challenges and Concerns). For this activity, we provided the groups of students with an A3 paper sheet with a challenge statement, briefly summarizing each challenge, and creative material, including post-its, colors, and markers. Some of the potential solutions proposed by the groups of students included:

- *"You can have an app that is safer and configures your privacy settings."* (W1, G1)
- *"Creating a warning that comes up whenever data is going to be collected about you."* (W1, G2)
- *"A one-day limit to personal data storage."* (W1, G5)
- *"Getting money every time you give websites your data."* (W2, G4)
- *"An automatic sorter for things people want and don't want to share."* (W2, G3)

After the workshop sessions, Alejandra and Renee analyzed the results and clustered the outcomes according to the topics that the children came up with. The goal of our analysis was to distill future prospects and positive, utopian scenarios to bring up to future dataslip users to counterbalance the creepy, dystopian feeling they were left with after interacting with it. We wanted to help them understand that the future is not inevitable and that there is still a lot that we, as researchers, designers, and users of personal data technologies, can do to shape the future.

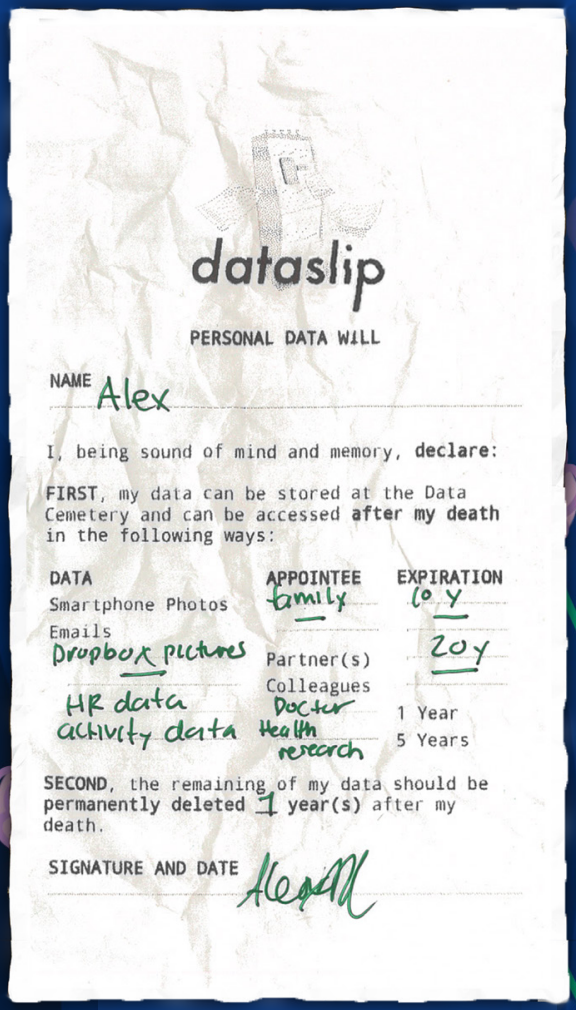
For each cluster, we then selected one idea to further develop into a future scenario. The selection criteria included perceived feasibility and relevance to future practices around personal data collection and use. Additionally, we related each idea to the current practices that were described by community members in the earlier interactions with dataslip. Hence, we further polished the ideas so that they conceptually responded to the themes that came out of the earlier discussions. To keep them easy to digest, each of the scenarios was translated into a postcard, with an image that illustrated the concept on the front, and a more detailed explanation of the scenario on the back. These postcards were then printed to be brought along to future dataslip events and exhibitions. To further close down the scenarios in order to open up thinking about them critically and to make a stronger connection to the initial dataslip interaction, each scenario also comes with a specific form that can be printed as a receipt through the dataslip and filled in by the participant to further personalize and contextualize their interaction. The five scenarios and their corresponding receipts are presented on the next pages.



DATA CEMETERY

A future where data doesn't have to live forever

In this future, when you die, your data dies with you, and your online identities are removed. Before you die, you can decide to leave part of your data in the Data Cemetery so it stays accessible for your loved ones. They can then visit the cemetery to bring back memories with your data and to look up important information. All the data is stored locally and securely at the cemetery so your data doesn't start living its own life when your life ends. Making use of the Data Cemetery is optional, in the end, you decide what you share and with whom!



dataslip

PERSONAL DATA WILL

NAME Alex

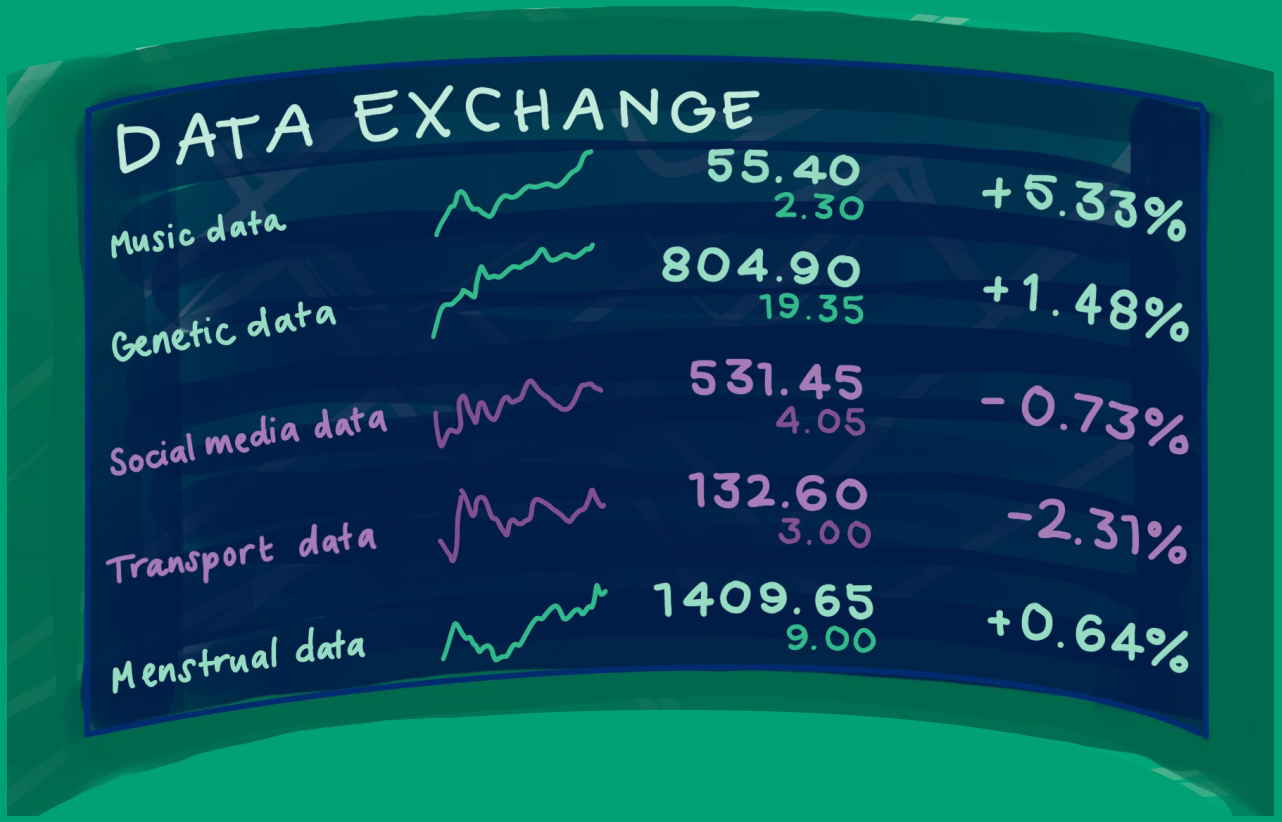
I, being sound of mind and memory, **declare:**

FIRST, my data can be stored at the Data Cemetery and can be accessed **after my death** in the following ways:

DATA	APPOINTEE	EXPIRATION
Smartphone Photos	family	10 y
Emails		
Dropbox pictures	Partner(s)	20 y
	Colleagues	
HR data	Doctor	1 Year
activity data	health research	5 Years

SECOND, the remaining of my data should be **permanently deleted** 1 **year(s)** after my death.

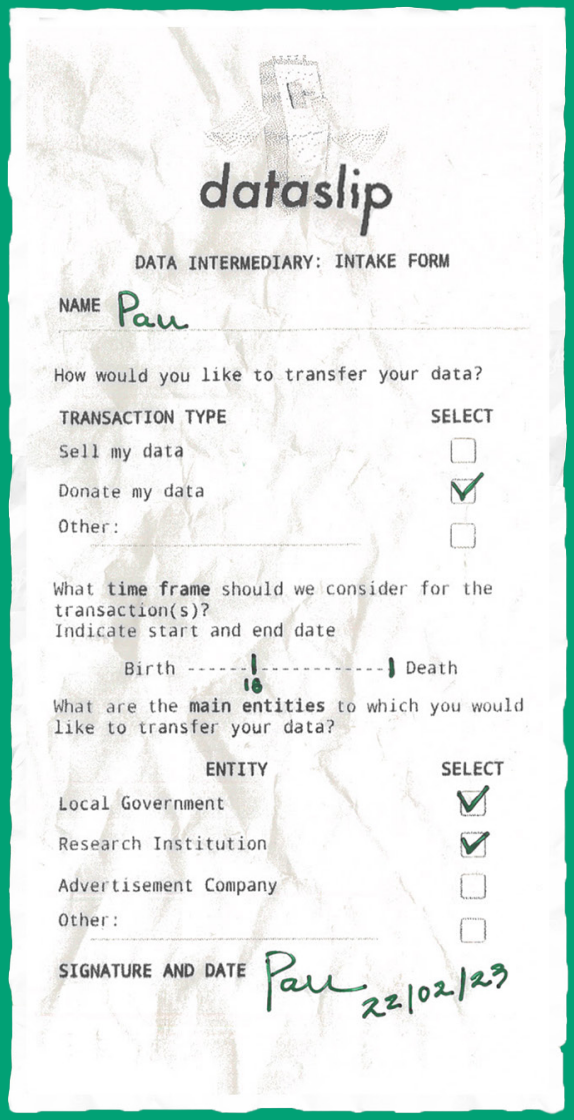
SIGNATURE AND DATE Alex



DATA INTERMEDIARY

A future where allowing access to your data brings you value

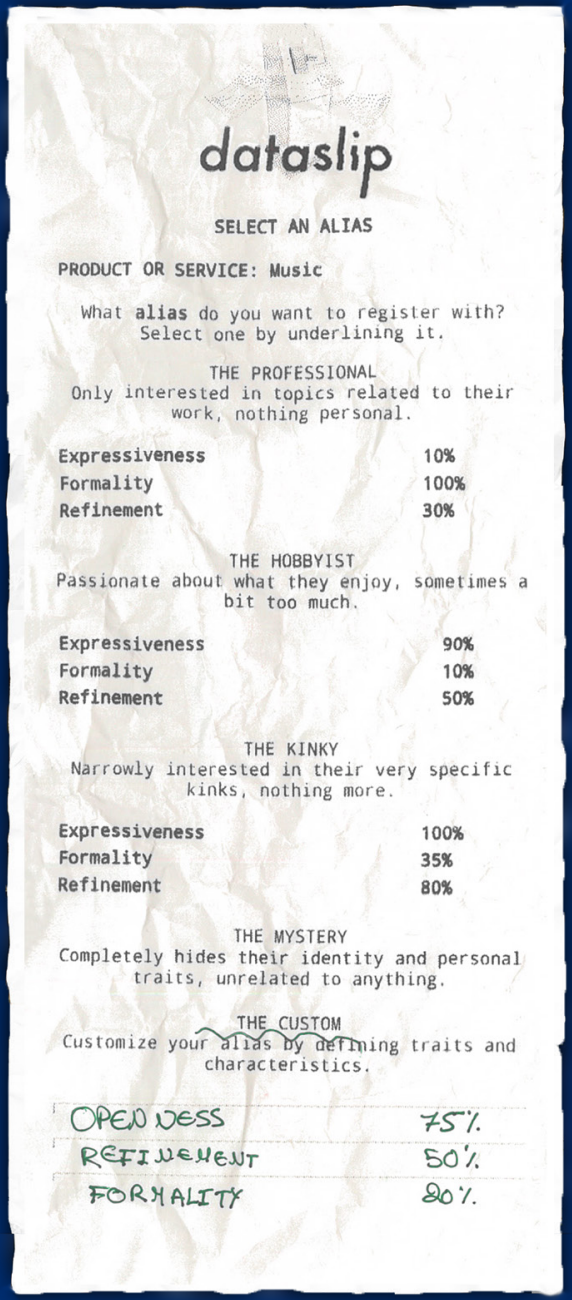
In this future, you have your own data intermediary who manages who has access to your personal data. After an initial intake conversation where you explain your personal values with regard to data sharing, the intermediary invests with your data in the data exchange market. Using this service means you can make some profit off your data and contribute it to the causes that you find important, such as clinical trials or marketing research. Your intermediary will update you regularly so you can decide whether you are still happy with the course of the investment.



DATA ALIAS

A future where you decide what data best suits you

In this future, you can switch between different social profiles in your online life as easily as in real life. You can use your fully personal profile while using a dating app, and switch to your professional profile when applying for a mortgage. They are completely separated, so you will no longer get ads for pregnancy tests while looking something up for work, and your colleagues don't have to know about your geeky gamer side if you don't want them to. A work-life balance dream come true!

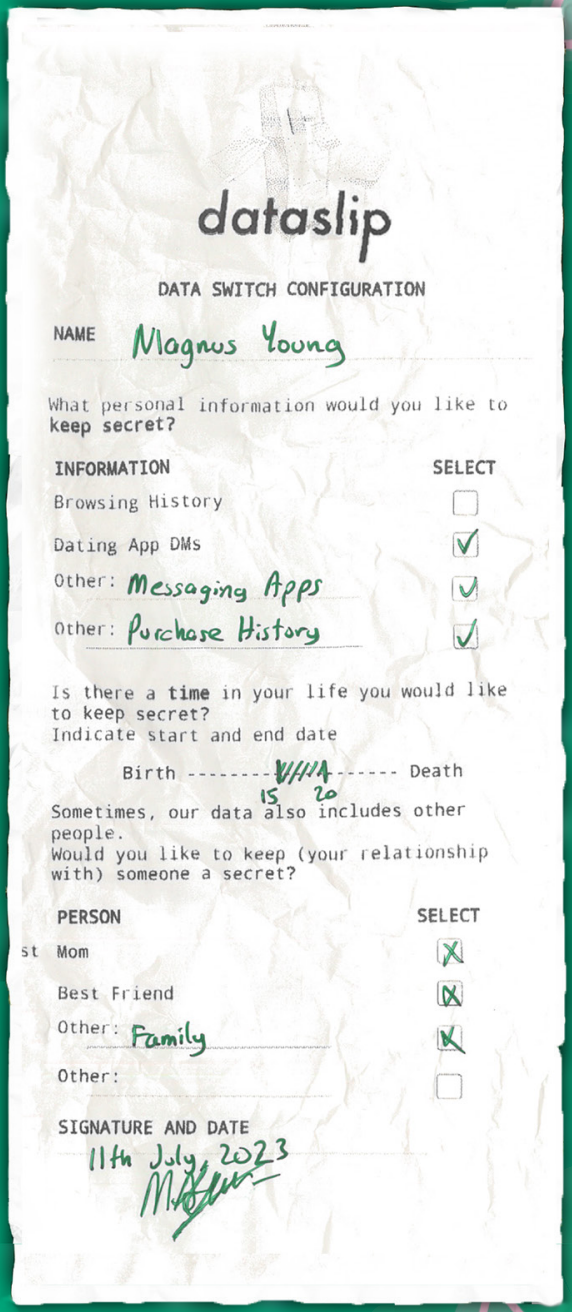


DATA SWITCH

A future where you set boundaries to protect your data and secrets

In this future, setting your preferences with every product and service you use is something from the past. You set your personal boundaries about data collection and storage once and decide which secrets you never wish to reveal. Whenever you use a product or service, your preferences are configured automatically.

If you try to use a product that collects data you would never share, you will receive a warning. The warning explains which of your boundaries is being violated and it is up to you to decide what to do: proceed with caution, change your values, or file a complaint?



dataslip

DATA SWITCH CONFIGURATION

NAME Magnus Young

What personal information would you like to keep secret?

INFORMATION	SELECT
Browsing History	☐
Dating App DMs	☑
Other: Messaging Apps	☑
Other: Purchase History	☑

Is there a time in your life you would like to keep secret?
Indicate start and end date

Birth --------15---N/A---20------ Death

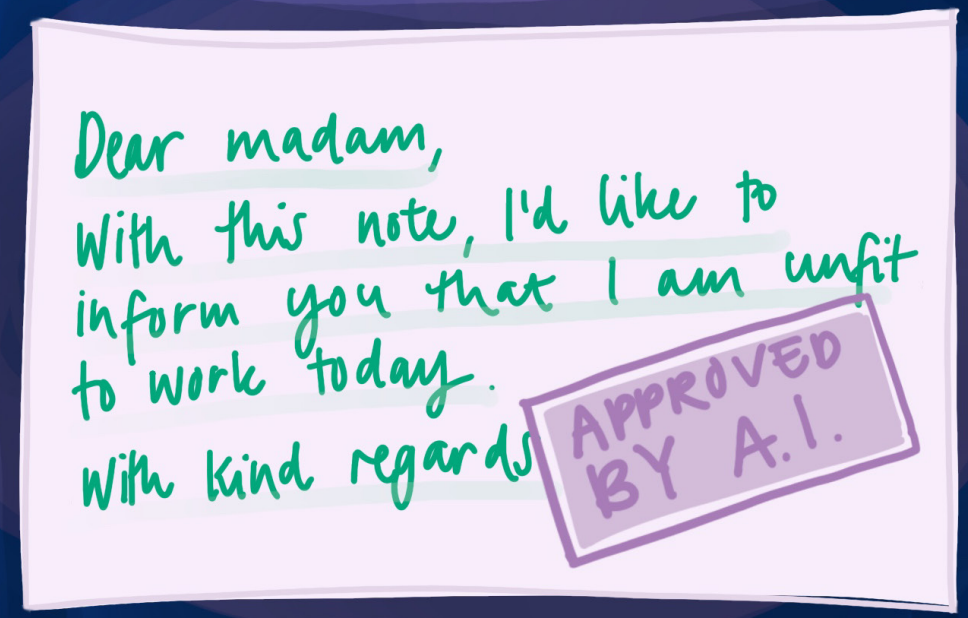
Sometimes, our data also includes other people.
Would you like to keep (your relationship with) someone a secret?

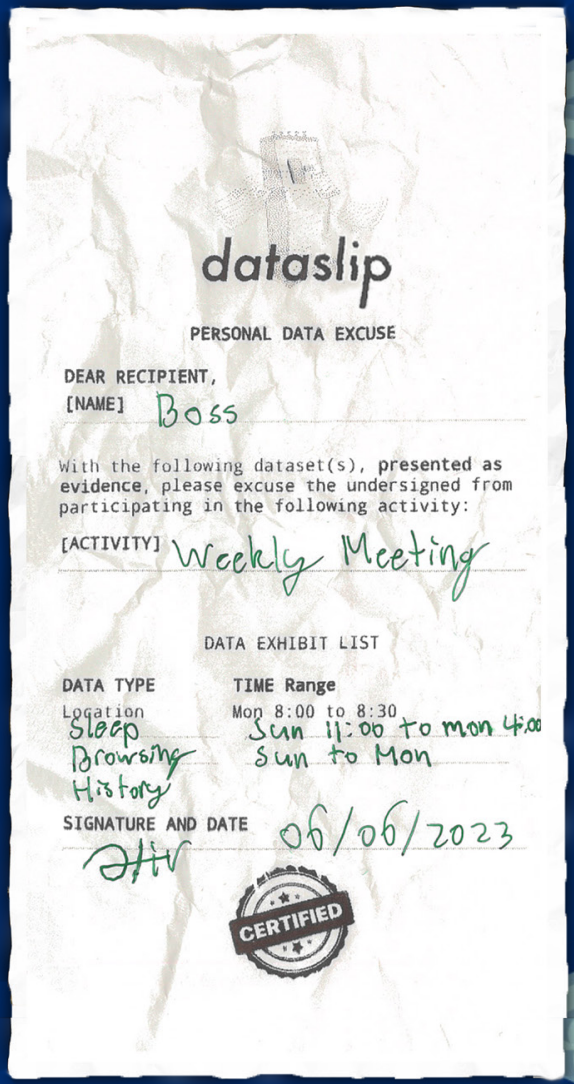
PERSON	SELECT
st Mom	☒
Best Friend	☒
Other: Family	☒
Other:	☐

SIGNATURE AND DATE

11th July 2023

M. Young





DATA JURISDICTION

A future where data serves as evidence

In this future, you can use your personal data as official evidence to protect yourself in diverse situations. The Data Jurisdictor can interpret diverse sources of data and present them as evidence. For example, you might be having painful menstrual cramps but your boss doesn't believe that justifies you staying home. In this case, the Data Jurisdiction software can write a sick note for you, based on your menstrual tracking data. Start using your data to demand justice now!

DISCUSSION AND CONCLUSION

With the design of dataslip, we provided attendees with a tangible representation of their personal data trail. The tangibility of the receipt allowed attendees to engage with their personal data in different ways; inspecting every single line, sharing it with their friends and family, comparing the length with their own height or someone else's receipt, or wearing it as a hat or scarf. In the receipt, we added a checkbox, explicitly prompting participants to reflect on the creepiness of each type of data. Further, to implicitly foster creepiness, we used a thermal printer, that slowly printed every line on the receipt, building up anticipation and confrontation. Even if and when attendees were expecting their receipts to be long, they never expected it to be *that* long.

Similar to [3,5], we found that creepiness is powerful but temporary. *"What now?", "What should I do then?"* were some of the reactions of attendees during the community event. We engage with creepiness as a starting point for reflection and speculation. Yet, we move from creepiness towards empowerment and hopefulness. This is evidenced by the five future scenarios: (1) in the data cemetery, data could allow our loved ones to re-live us; (2) with the data intermediary, we could direct our data towards causes that matter because of our values or fair monetary compensation; (3) with the data alias, data could be used to conveniently inform automated tools – as long as they align with our preferred roles; (4) with the data switch, data could serve as a defense mechanism to protect our privacy, by helping us define and control our personal boundaries; and (5) with the data jurisdiction, data could help us convince others.

We note that some of the challenges that our five scenarios respond to have been extensively approached and discussed in previous literature across various domains, including philosophy of technology, law, human-computer interaction, and computer science (e.g., underlining the power imbalances [36, 16], fostering transparency [21, 25], and supporting privacy and personal boundaries [37, 38, 39]). Although these challenges might not be considered "novel" they underline that, when it comes to personal data, individuals are the main parties involved; "data are people" [40]. They have valid and informed concerns and already rely on innovative practices to address them. Our participatory approach involving community members of all ages realizes the importance of engaging with the real world and the public in futuring and overall research. Thus, we invite and encourage researchers across these domains to creatively involve members of the public in their projects and activities.

Our research and practice can support individuals not only to become aware but also to envision and demand change and benefit from their data. In our case, by making the creepiness of personal data tangible and experiential we empowered individuals to reflect upon the potential value of their personal data. In line with the utopian and dystopian mindsets that we discussed in the introduction, we see this dual experience as a way to shed light on both sides of the story. The experience with the dataslip underlines and criticizes current practices, and the future scenarios suggest alternative ways in which we might overcome the current issues. This participatory approach may be relevant in other creepy contexts, such as climate change where the overwhelmedness and the creepiness of the current situation is often perceived as disempowering.

Through our research approach, we initiate and maintain a two-way conversation with community members; where they interacted with and responded to dataslip, and we, as design researchers, responded to their responses. Similarly, by presenting dataslip and the accompanying future scenarios in detail in this pictorial, we wish to respond to Kozubaev et al.'s call for more continuous futuring in their fifth mode of reflection [30]. First, by describing how we used attendees' responses to their interactions with dataslip in the workshops and future scenarios that followed, we present a process of iteration and call and response between the participants and ourselves. Secondly, we hope that by presenting dataslip and the scenarios in detail, others will also be able to continue building on these future scenarios and help us to mature the ideas represented by these. In terms of our own future work, we will use the scenarios to collect new feedback and input from new participants to close down and further specify the future personal data practices that we want to see to open up discussion.

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REFERENCES

[1] U.S. Chamber of Commerce Foundation, "The Future of Data-Driven Innovation," 2014.

[2] J. Wiese, S. Das, J. I. Hong and J. Zimmerman, "Evolving the Ecosystem of Personal Behavioral Data," Human-Computer Interaction: The Lived Experience of Personal Informatics, vol. 32, no. 5-6, 2017.

[3] I. Shklovski, S. D. Mainwaring, H. H. Skúladóttir and H. Borgthorsson, "Leakiness and creepiness in app space: perceptions of privacy and mobile app use," in In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '14), 2014.

[4] A. Gómez Ortega, J. Bourgeois and G. Kortuem', "What is Sensitive About (Sensitive) Data? Characterizing Sensitivity and Intimacy with Google Assistant Users," in In Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (CHI '23), 2023.

[5] I. Shklovski and E. Grönvall, "CreepyLeaks: Participatory Speculation Through Demos," in 11th Nordic Conference on Human-Computer Interaction: Shaping Experiences, Shaping Society (NordiCHI'20), Tallinn, Estonia, 2020.

[6] A. Desjardins and R. B. Heidi, "Data Epics: Embarking on Literary Journeys of Home Internet of Things Data," in Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (CHI'21), 2021.

[7] G. Benabdallah, M. A. Kaneko and A. Desjardins, "A Notebook of Data Imaginaries," in In Proceedings of the 2023 ACM Designing Interactive Systems Conference (DIS '23)., New York, NY, 223.

[8] P. Dourish and G. Bell, Divining a Digital Future: Mess and Mythology in Ubiquitous Computing, MIT Press, 2014.

[9] K. Williams, A. Bigelow and K. E. Isaacs, "Data Abstraction Elephants: The Initial Diversity of Data Representations and Mental Models," in In Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (CHI '23), 2023.

[10] S. Gabriele and S. Chiasson, "Understanding Fitness Tracker Users' Security and Privacy Knowledge, Attitudes and Behaviours," in In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20), 2020.

[11] E. Luger, "Consent reconsidered; reframing consent for ubiquitous computing systems," in In Proceedings of the 2012 ACM Conference on Ubiquitous Computing (UbiComp '12), 2012.

[12] E. Luger, S. Moran and T. Rodden, "Consent for all: revealing the hidden complexity of terms and conditions," in In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '13), 2013.

[13] C. M. Gray, C. Santos, N. Bielova, M. Toth and D. Clifford, "ark Patterns and the Legal Requirements of Consent Banners: An Interaction Criticism Perspective," in In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (CHI '21), 2021.

[14] K. Bongard-Blanchy, A. Rossi, S. Rivas, S. Doublet, V. Koenig and G. Lenzini, ""I am Definitely Manipulated, Even When I am Aware of it. It's Ridiculous!" - Dark Patterns from the End-User Perspective," in In Proceedings of the 2021 ACM Designing Interactive Systems Conference (DIS '21), 2021.

[15] A. Bowyer, J. Holt, J. G. Jefferies, R. Wilson, D. Kirk and J. D. Smeddinck, "Human-GDPR Interaction: Practical Experiences of Accessing Personal Data," in In Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22), 2022.

[16] B. Prainsack, "Data Donation: How to Resist the iLeviathan," in The Ethics of Medical Data Donation, Springer Open, 2019.

[17] R. Mortier, H. haddadi, T. Henderson, D. McAuley and J. Crowcroft, "Human-Data Interaction: The Human Face of the Data-Driven Society," SSN, 2014.

[18] A. H. Khan, S. Snow, S. Heiner and B. Matthews, "Disconnecting: Towards a Semiotic Framework for Personal Data Trails," in In Proceedings of the 2020 ACM Designing Interactive Systems Conference (DIS '20), 2020.

[19] General Data Protection Regulation, 2018.

[20] C. Utz, M. Degeling, S. Fahl, F. Schaub and T. Holz, "(Un)informed Consent: Studying GDPR Consent Notices in the Field," in n Proceedings of the 2019 ACM SIGSAC Conference on Computer and Communications Security (CCS '19),

2019.

[21] m. Degeling, C. Utz, C. Lentzsch, H. Hosseini, F. Schaub and T. Holz, “We Value Your Privacy ... Now Take Some Cookies,” Informatik Spektrum, 2018.

[22] K. H. Jones, “Incongruities and Dilemmas in Data Donation: Juggling Our 1s and 0s,” in The Ethics of Medical Data Donation, Springer Open, 2019.

[23] F. Alizadeh, T. Jakobi, J. Boldt and G. Stevens, “GDPR-Reality Check on the Right to Access Data: Claiming and Investigating Personally Identifiable Data from Companies,” in In Proceedings of Mensch und Computer 2019 (MuC’19), 2019.

[24] A. Gómez Ortega, J. Bourgeois, W. T. Hutiri and G. Kortuem, “Beyond Data Transactions: A Framework for Meaningfully Informed Data Donation,” Ai&Society, 2023.

[25] T. J. A. B. Dominik Pins, F. Alizadeh and V. Wulf, “Alexa, We Need to Talk: A Data Literacy Approach on Voice Assistants,” in In Proceedings of the 2021 ACM Designing Interactive Systems Conference (DIS ‘21), 2021.

[26] L. Lee, J. Lee, S. Egelman and D. Wagner, “Information Disclosure Concerns in The Age of Wearable Computing,” in Proceedings of the NDSS Workshop on Usable Security (USEC ’16), 2016.

[27] A. Dunne and F. Raby, Speculative Everything: Design, Fiction, and Social Dreaming, MIT Press, 2013.

[28] J. Hanna, “An Overview of Contemporary Speculative Practive,” SpeculativeEdu, 2019.

[29] M. Blythe and E. Encinas, “The Co-ordinates of Design Fiction: Extrapolation, Irony, Ambiguity and Magic,” in In Proceedings of the 2016 ACM International Conference on Supporting Group Work (GROUP ‘16), 2016.

[30] S. Kozubaev, C. Elsden, N. Howell, M. L. J. Søndergaard, N. Merrill, B. Schulte and R. Y. Wong, “Expanding Modes of Reflection in Design Futuring,” in In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI ‘20), 2020.

[31] P. Colton and J. Lindley, “Vapourworlds and Design Fiction: The Role of Intentionality,” The Design Journal: Design for Next Thinking, vol. 20, 2017.

[32] C. Tonkinwise, “How We Intend to Future: Review of Anthony Dunne and Fiona Raby, Speculative Everything: Design, Fiction, and Social Dreaming,” Design Philosophy Papers, vol. 12, no. 2, 2014.

[33] M. Ward, “Critical about Critical and Speculative Design,” SpeculativeEdu, 2019.

[34] R. Noortman, M. Funk, K. Andersen and B. Eggen, “What Would Margaret Atwood Do? Designing for Ustopia in HCI,” in In Proceedings of the 24th International Academic Mindtrek Conference (Academic Mindtrek ‘21), 2021.

[35] S. Shubladze, “How To Make Use Of The New Gold: Data,” Forbes, 27 07 2023. [Online]. Available: https://www.forbes.com/sites/forbestechcouncil/2023/03/27/how-to-make-use-of-the-new-gold-data/?sh=1e958e552bbf. [Accessed 25 10 2023].

[36] C. D’Ignazio and L. F. Klein, Data Feminism, MIT Press, 2020.

[37] H. Nissenbaum, “Privacy as Contextual Integrity,” Washington Law Review, vol. 79, no. 1, 2004.

[38] S. Petronio, “Communication privacy management theory,” in The International Encyclopedia of Communication Theory and Philosophy, 2016.

[39] A. Crabtree, P. Tolmie and W. Knight, “Repacking ‘Privacy’ for a Networked World,” Computer Supported Cooperative Work (CSCW), 2017.

[40] M. Zook, S. Barocas, d. boyd, K. Crawford, E. Keller, S. P. Gangadharan, A. Goodman, R. Hollander, B. A. Koenig, J. Metcalf, A. Narayanan, A. Nelson and F. Pasquale, “Ten simple rules for responsible big data research,” PLOS Computational Biology, 2017.