Drawing Out the Everyday Hyper-[In]Securities of Digital Identity

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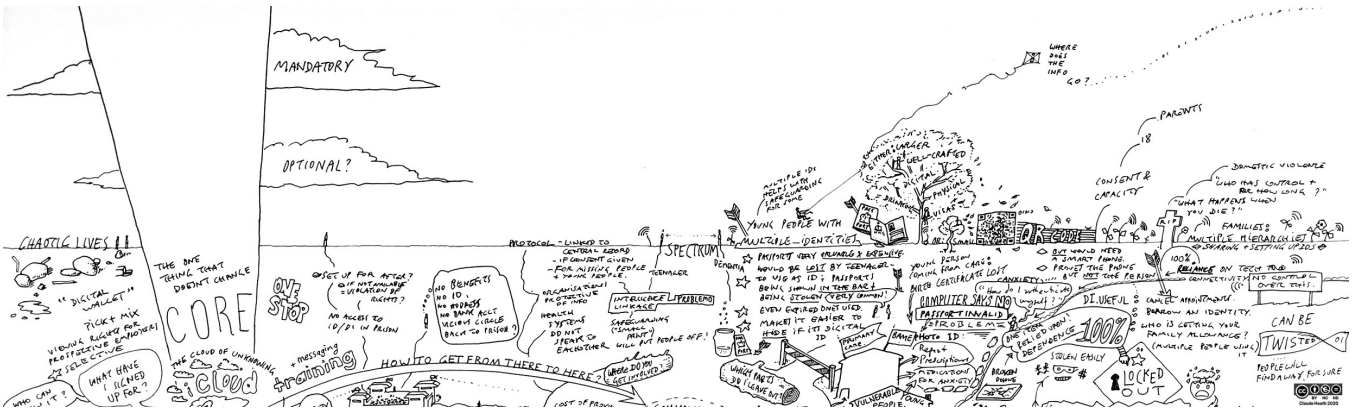

Figure 1: A detail from one of the drawings made during our remote engagement sessions held on Zoom. As topics were discussed they were added to the drawing, across a 'landscape' where spoken metaphors were captured in visual form. (The full image is reproduced in the paper). Ink on board, 51 x 73 cms, 2020.

ABSTRACT

In a study of everyday digital identity, a set of primary drawings were made by researchers in online focus group settings as a way to capture our participants' spoken narratives of hyper-[in]security in the usages of digital identity. In a second stage of work, key extracts from the drawings were collaged using the method described in the paper, allowing an exploratory qualitative cartography of hyper-[in]security to be constructed. These secondary collages group the [in]securities thematically without losing essential contextual information. Samples of our data are given, to illustrate the contribution of the method to experience-centred design, with special reference to security from the perspective of marginalised and underserved communities. We discuss our method as a step towards multidimensional cognitive mapping of the salient features of our participants' narratives about hyper-[in]security, potentially paving the way for further world building explorations of digital identity futures.

CCS CONCEPTS

• **Security and privacy** → *Social aspects of security and privacy*; • **Human-centered computing** → *User studies.*

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1 INTRODUCTION

In this paper we examine the role of drawings made by researchers in online focus group settings. We ground this examination in a study of digital identity use by marginalised and underserved communities as part of digital access to everyday essential services in the UK [11]. The study contributed to a digital identity consultation led by the UK government's Department for Digital, Culture, Media and Sport. The researchers used drawing and collage as one of the main methods of data collection and analysis, and this paper examines the roles such drawings play in the data analysis. In particular, this paper contributes to and extends our understanding of creative methods as part of the study of human computer interaction. Creative methods of engagement and data collection are growing in use within HCI studies that focus on digital interactions within marginalised and underserved groups [24]. Such groups often experience various forms of digital exclusion which increase the pressure associated with trying to access essential everyday digital services. These pressures often intersect with each other to create compounded forms of insecurity, or *hyper-[in]securities*, as we refer to them in this paper.

Through our findings and discussion, we argue that line drawings can capture the sequencing of and key relationships between concepts utilised by our focus groups, and can record the verbal quality and complexity of the reports we were being given by groups, while avoiding the imposition of any pre-ordained structure upon them. By adding a spatial aspect to the montage method, and enhancing the thematic analysis of our data, we further argue that it is possible to tease apart people's experiences of digital identities without disconnecting the different parts of the experience. In doing so, researchers are able to both identify more precisely where hyper-[in]security occurs, and to tentatively speculate on causation by examining the connections between actions and the emotions that are generated by pressures and tensions in this landscape. In our discussion we further reflect to what extent the drawing method can prepare the way for a more comprehensive representation of these landscapes, pulling the separate strands from each into a combined rich picture, and potentially to extend the collage method into what might be described as an exercise in early phase 'world building'.

This paper makes its contribution by presenting a novel methodology for working with line drawings to be used to map out the often densely packed and jumbled 'landscapes'. These are spaces in which hyper-[in]securities are experienced by marginalised and underserved communities as particular combinations of compounded circumstances that shape the access and use of digital services and digital identity.

2 THE LITERATURE

The work presented in this paper contributes to the use of creative methods in HCI to study digital service and product access for marginalised and underserved groups [22, 24, 51]. The term 'underserved' denotes groups that experience social inequalities due to economic, societal and environmental constraints [24]. The importance of working with such groups has grown as societies increasingly rely on a digital-by-default approach to deliver essential everyday services in sectors such as welfare, housing, education, health, food and finance. A digital-by-default approach must work not only for those who have the capabilities to use digital services with ease, but also for those living in conditions of economic, social and political insecurity. These conditions combine to form hyper-[in]securities that shape how technology is experienced on the ground, and that also shapes how security can be experienced [17, 28, 58].

Digital identity is a key component of the digital-by-default architecture. Secure and inclusive access to the set-up, maintenance and use of digital identity is central to a secure digital experience. Our exploration of drawing as a method of data gathering and analysis is grounded in a study of digital identity via technologies acting as gateways to essential, everyday digital services. Those more severely affected by economic, social, and/or political insecurities often have reduced capacity to derive benefit from these security principles [12, 40]. The literature review set out below reflects this backdrop by bringing together literature on creative engagements in HCI, digital identity and inclusive and accessible interaction with digital identity technologies.

2.1 Literature Overview

Our contribution is located at the intersection of the following three canons of literature:

- Creative engagements and HCI: Where we point to an extensive tradition of drawing upon the creative arts and humanities as part of HCI study design.
- Digital identity: Where we plot the different traditions of digital identity research.
- Inclusive and accessible interactions with digital identity technologies: Where we set out how the digital divide relates to digital identity and the main avenues of research that have considered inclusive and accessible forms of digital identity in order to reduce the divide.

We first set out the literature on creative methods and engagements in HCI. We then sketch out the issues surrounding digital identity and digital inclusion to set out the terrain in which we are using a creative approach. We then draw on the digital identity and inclusion literature to create a frame through which to direct our analysis through collage.

2.2 Creative Engagements in HCI

Eliciting and exploring the challenges of digital identity in hard-to-reach spaces, and speaking with communities who are experiencing profoundly challenging circumstances, is methodologically difficult. Traditional research methods such as interviews, focus groups, surveys and ethnographic study are not always suitable or well-received by the participant groups. In response to this, there has been a steadily growing number of studies that draw on the creative arts to shape and inform research methods. Some approaches apply creative engagement techniques to better understand the social, economic and political context in which digital technologies are used, while others conceptually evaluate, critique and challenge digital approaches. Creative methods which draw on approaches from the arts and humanities bring the focus of engagements into forms of playful yet thoughtful critique [57]. Many of these methods are designed to navigate the politics of technology use while widening the participation in community engagement. They seek to foreground the voices, concerns and rich cultural narratives from groups that have been termed as being on the forgotten margins, by design scholar, Harrington [24]. Such methods are often folded into experience-centered design [22, 64] as well as being central to research that strives to work with groups to create conditions for community empowerment in civic settings [9].

Collard and Briggs surveyed the use of creative engagement techniques to study trust, identity, privacy and security issues related to digital technology [14]. They undertook a desk review of different types of toolkit that deploy creative engagement techniques and methods. Their evaluation highlights how such techniques often draw on participatory design approaches, deploy visualisation and other forms of creative practice, and create a playful, highly exploratory form of interaction. In line with this, Dunphy et al.'s presentation of creative engagement studies [19] illustrates Collard and Briggs's analysis of the different categories of approach.

Creative engagement approaches have resulted in the use of different types of analytical techniques. For example, the visual analysis methodologies set out by cultural geographer Gillian Rose [44]

have been used in studies related to the use of mobile phones by refugees [13]. It has also resulted in the creation of new ways of conducting interdisciplinary analysis. In one example, a shared 'analysis wall' is set up where visual, text and audio is converted into physical form to be co-analysed by an interdisciplinary research team, who physically establish research themes by grouping and sorting the physical representations of the data on a wall [30].

Creative engagement approaches have also transformed the way that data is elicited from people. For example, Vines et al. created a pre-paid cheque book that was used to elicit detailed understandings of how and why the over-eighties use cheques and what that transaction means to them [56]. This understanding provided valuable input into new designs of digital forms of payment that are better aligned to the needs of those over the age of eighty. Creative engagements often produce design interventions. For example, Thieme et al. developed three interventions to support vulnerable women by helping them to engage with mindfulness practices [52]. Creative engagements are not only conducted through design and other forms of visual creation, but also through enactment. For example, Elsden et al. developed three different types of performative enactment that encourage speculative activities exploring how people will remember their lives with data [20].

Kimbell notes that there has been "an important shift away from designing objects towards [designing] interactions, experiences, services and changed behaviours," and suggests that this be grounded in theories of the social and theories of practice in particular. These "describe how practices are carried by individuals in their routinized or mundane ways of understanding and moving through the world, knowing how to do things, the objects they desire and do things with, how it feels, and the structures that are (re)produced in day-to-day action" [33]. This has a deep resonance with cognitive mapping methodologies, including collaborative sketching, which, for Johansson, is a method for "co-authoring future scenarios with bits and pieces of ethnography" (in this case, by using short video files made by participants) [31]. Sanders and Stappers describe a framework covering three main types of creative engagement approaches: probes, toolkits and prototypes. They look at "designing with" ("user as partner"), as opposed to "designing for" ("user as subject") [45]. These recent developments in HCI creative engagement methodologies encourage design at different timescales, design fictions, design of publics [16], interaction design and design of future practices. These approaches have the potential to be aimed at policy and decision-making processes relevant to the design of digital identity technologies.

The move towards creative engagements diversifies what HCI is and who HCI researchers are, further encouraging researchers to work across disciplines and co-create research methods with art practitioners, performers, media artists and creative technologists. Such a turn also encourages the development of fundamental visual literacy, as well as capabilities for drawing within the HCI community [36]. Such a turn is augmented by discourses from the study of 'cognitive mapping' [29], which is defined as: "How we think about space, and how those thoughts are used and reflected in human behaviour", studied by looking at how primary experiences are structured, and can include the study of secondary media such as maps drawn by participants [34]. An aim of this type of research is to understand "how people communicate spatial information effectively to people in spaces with which they are unfamiliar." This is clearly applicable to the experiences of digital identity and hyper-[in]security. The term cognitive mapping has been adopted in management studies where 'thematic maps' are made with participants, carrying out spacing, clustering and grouping of themes and spaces as part of a general method for problem structuring [15]. Cognitive mapping or 'cognitive sketching' across the multitude of ethnographic 'bits and pieces' participant contributions [31] aims to construct a valid secondary meta-representations of primary data.

As the scholarship on digital identity set out in the following section reveals, digital identity is not only complex but often contested and politically-charged. Creative methods offer a means of drawing out these tensions and revealing the intersections between issues that give rise to the complexities that shape digital identity use in the context of everyday essential digital services.

2.3 Digital Identity

Digital identity technologies enable people to express or present something about themselves. Whilst often presented as a form of identification, they are often more accurately described as part of an authentication process [60]. Digital identities arose as a *functional response* to gaining access to a digital resource [4]. Initially, digital identity was thought of as a means to regulating digital access and was a study domain of security technologists and researchers. From this perspective, a digital identity was conceptualised as a *set of permanent or long-lived temporal attributes associated with an entity* [8]. A digital identity is typically a pairing of:

- Identifier - distinguishing a given entity in a specific category of entities. For example, the name of an individual person.
- Attribute - a characteristic that can be used to describe an entity. For example, the address or National Insurance number of that person.

As digital technologies have evolved, digital identity has come to encompass the information we digitally present and curate about ourselves. This has introduced scholarship that uses a psychological or sociological grounding [7, 47]. Such scholarship has demonstrated that the notion of identity is directly related to social, cultural and historical contexts [47], and reflects why such technology is not simple to incorporate as part of public policy [60]. Acknowledging this evolution, in 2018 the World Bank identified three categories of digital identity technology [4]:

- Technologies linked to credentials such as biometrics.
- Technologies related to trust and authentication frameworks such as blockchain.
- Technologies linked to analytics such as predictive analytics.

Whilst the World Bank focused on new classes of technology, the evolution of everyday technology and services also extends the possibilities by which someone might be identified. For example, the smartphone has become a ubiquitous means through which people can be identified to everyday essential services [55]. Smart phones are increasingly common, and in addition the most recent phones come with enhanced security to protect identity and support different levels of self-disclosure. Whilst this form of digital identity might be convenient for some, it poses uncomfortable questions around inclusion. What happens to those who do not have a recently

issued smartphone, either by choice or due to economic and/or cultural reasons? Does this mean they lose the ability to identify themselves and therefore lose access to digital services that are essential in day-to-day life?

In 2014, the Secure Identity Alliance [2] published a paper that envisioned future digital identities for 2020. In that paper, a digitalised society delivers essential and everyday services using a secure digital identity architecture. The vision is one in which digital identity enables the personalisation of digital services and empowers the individual. 2020 did in fact become the year that digital identity became core to everyday existence for many, due to the COVID-19 pandemic. Whilst the pandemic enabled the use of digital identity to come of age, it also shone a light on data privacy concerns related to its use [4]. The Secure Identity Alliance also argued for the root of the digital identity structure to be managed by the government. The challenge of placing government at the heart of identity, whilst still ensuring the privacy of the individual, is a dominant theme in digital identity research. Whitley et al. [61] describe the UK government's attempt to implement a national identity card that uses a wide range of biometric data. A central theme of Whitley et al.'s analysis is the lack of public trust in the identity scheme and the need for privacy by design to overcome these public trust issues. Beduschi [4] has set out the following framework to address these privacy concerns:

- *Digital identity systems should incorporate data privacy by design and by default.*
- *Data protection impact assessments should support the development of digital identity systems.*
- *Data privacy should guide the implementation and evaluation of digital identity systems.*

Whilst privacy in the context of digital identity has long been argued for [61], as governments increasingly deliver essential everyday services by default, we move to a position of digital identity by necessity. In this context, privacy requirements are essential to ensure fair and equitable access to services so that people are not dis-benefited or barred from accessing a service because of attributes associated with that identity. As a result, the topic of accessible and inclusive interactions with digital identity technologies has been the subject of a certain amount of scrutiny.

2.4 Inclusive and Accessible Interactions with Digital Identity

In a society that is largely digital-by-default, the need for an inclusive and accessible approach to digital identity (that also protects the privacy and security of the individual) becomes particularly pressing. This requires that we consider forms of safer digital inclusion that enable safer access to essential services [12, 51]. These forms of safer digital inclusion are found in the social practices and collaborations that form around the use of digital services and technology as much as they are in the design of the technology itself.

Digital identity introduces large scale systems that have the potential to make the positions of the vulnerable even more precarious by collecting personal information and using it in such in a way that marginalises these groups still further [47]. This leads to complex trade-offs between access to essential services and privacy [50]. In her policy work on digital identity post-COVID-19, Beduschi [4] identifies three human rights matters that also need to be taken into account when designing a digital identity system that is to be used by default for access to everyday services:

- *Digital identity should not exacerbate pre-existing inequalities.*
- *Digital identity systems should enshrine accountability.*
- *Digital identity frameworks should encompass mechanisms for the adjudication of grievances.*

There is a growing canon of literature that describes the inequity and unfairness of existing digital identity systems. For example, critical STS scholars in [5] highlight how humanitarian agencies increasingly collect biometric data that not only has the stated and overt healthcare purpose but also serves a security purpose feeding into counter terrorism controls. Bellanova et al. catalogue a range of cases where digital identity is used to increase the force of algorithmic controls and pressure on individuals and groups as a form of algorithmic violence [5]. Hundal and Chaudhuri [27] describe how the use of biometric forms of digital identity, as part of welfare delivery in India, has resulted in the emergence of new forms of social exclusion through fraudulent uses of digital identities by third parties, with limitations in the digital identity design, making the technology incompatible with the ways people live and work, and with exclusion from welfare due to failures in the processes around issuing digital identities.

Despite the harms and insecurities that digital identity can cause, if designed well with the needs of vulnerable communities at the core of the design, then digital identity has the potential to make society more equitable [38, 59]. As a result, HCI scholarship has much to offer when it comes to envisaging positive futures for digital identity. In recent instances, HCI scholarship in the area of digital identity has worked with marginalised and underserved communities to examine what digital identity means to these communities, looking at where current implementations of digital identity can be seen to disadvantage those communities, and at how digital identity designs might be improved to better support marginalised and underserved people. For example, in 2015 Briggs and Thomas [7] undertook a study to identify what inclusive digital identity design might look like and to develop a road-map for this. This is one of the first studies of its type and these HCI scholars highlight that the principles of inclusive design are clear and are as much about value-sensitive design as about ethics and fairness. Briggs and Thomas set out universal principles for digital identity, and then identify particular points at which the requirements of individual communities might need to be considered. This follows a so-called "two factor" approach to value-sensitive design.

Through a feminist HCI lens, Schoemaker et al. [47] proposes a set of qualities to inform inclusive digital identity design. Schoemaker derived these qualities from Bardzell's proposal for feminist qualities for HCI [3]. In deriving these qualities, Schoemaker adapted them for digital identity and arrived at a framework comprised of the following six design qualities (the explanations for each term can be found in Bardzell [3]):

- Pluralism: *"The quality of pluralism refers to design artifacts that resist any single, totalizing, or universal point of view."*
- Ecology: *"The quality of ecology in feminist interaction design integrates an awareness of design artifacts' effects in their*

broadest contexts and awareness of the widest range of stakeholders throughout design reasoning, decision-making, and evaluation."

- Embodiment: *"The quality of embodiment, needs to push embodiment in the direction of gender commonalities and differences, gender identity, human sexuality, pleasure and desire, and emotion."*
- Self-disclosure: *"The quality of self-disclosure refers to the extent to which the software renders visible the ways in which it effects us as subjects."*
- Advocacy: *"the quality of advocacy engages seriously with the ethical dilemma that designer faces when they advocate on behalf of a community with whom they are designing but also consider the potential harmful impacts of their advocacy."*
- Participation: *"the quality of participation refers to valuing participatory processes that lead to the creation and evaluation of design prototypes."*

Schoemaker et al. used these qualities to make sense of the refugee identity systems that they encountered in refugee camps in Uganda, Lebanon and Jordan.

The study of digital identity from the perspective of human computer interaction raises challenging questions about how we characterise and portray the users of digital products. It also raises fundamental questions about how the framing of identity as part of technology design empowers or disempowers an individual. Therefore critical HCI scholarship in this space will also contribute to our understanding intersectionality and its roles in HCI research [6, 21, 46].

It is important to note that HCI scholarship in this area not only proposes new technology designs, but also examines how groups organise around existing digital identity technologies to re-purpose them to work better for those groups. In a notable example, a study of Rohingya refugees in Bangladesh describes how Bangladeshi people help Rohingya refugees to access identity documentation as an act of solidarity [28], a type of re-purposing and combination of technologies and resources in unexpected ways. Such an approach to managing insecurity is sometimes referred to as 'infrastructuring' [16, 25]. Such studies serve to highlight the breadth and significance of HCI work in this area. In the study set out below, we explore how drawing and collaging as techniques might serve to help researchers and practitioners draw out the nuances of digital identity practice and create an understanding of why certain practices come into being.

3 STUDY DESIGN

The study was conducted by two researchers who have worked together for 10 years bringing together drawing, storytelling and collage. By background, one of the researchers is a visual artist specialising in drawing (Heath) and the other has specialised in the use of creative engagements, and in particular collage, to bring community narratives to light (Coles-Kemp). These skills are reflected in the design of the study.

The study is broken into primary and secondary stages. The primary stage is the original study of digital identity use as part of everyday essential digital services [11]. We include this to show where the data came from and the initial roles that drawing played in this study. The secondary stage is the collaging and analysis performed on the primary stage data, and which forms the main contribution of this paper. We use this secondary analysis to reveal where the collisions and intersections between hyper-[in]security and digital identity can be seen in visual form (Figure. 2, 5, and 6) and show how this approach enables a contextualised form of data analysis. In the primary stage, drawings provide us with a mapping of the salient features of participant stories and their key touch-points. Following on from this primary stage of data capture, and to deepen the analytical power that drawing offers us, we have devised a secondary stage analytical mapping, using a visual collage method, where selected clippings from the primary drawings, made during the online sessions, are arranged in particular relationships to one another. This secondary stage of analysis is both a means of representing complex qualitative data, and also enables a discussion of those key intersections, landmarks and touch-points, where a variety of [in]securities interact and collide with everyday digital identity technologies.

The study was registered using the academic institution's ethics process and was conducted following the institution's ethics policy. We also took precautions in recruitment and in the study design to reduce the nature and amount of personal data that was collected. These precautions included: aggregating and anonymising comments and input as they were made, recruiting participants who had support from and were closely affiliated to the participating groups, and capturing the digital identity experiences as a form of generalised narrative.

3.1 Primary Stage: Participation

In the original study we engaged with a total of 21 participants in six community groups known to have day-to-day experience of using digital identity technologies and supporting other people to use digital identity technologies. Five of the six community groups are voluntary and third sector organisations located across England. An additional participant group (intergenerational women) was recruited through a social network with an interest in social welfare. Two of the community groups were known to the lead researcher. The remaining community groups were recruited by referral (a light form of snowball sampling). Participants were not compensated for their time because the main goal for participating organisations was to document and communicate their views on the development of digital identities to policymakers. All participating groups expressed an interest and willingness to discuss the impact of digital identity technologies in their work and everyday lives and in the lives of the communities they represent.

The participation is broken down into a table for the reader below (see Table 1). The participants from the community groups were a mixture of those from the represented communities and community workers engaging directly with the represented communities on a day to day basis. The community workers had direct and detailed experience of supporting community members to manage their digital identities. The participants in the intergenerational group were those with direct day to day experience of using and supporting others to use digital identity technologies to access essential everyday digital services.

Participant group	Participants	Communities represented
Charity supporting refugee resettlement and asylum seekers in northern England.	Chief executive officer and 3 volunteers.	Refugees and asylum seekers.
Intergenerational group.	4 women aged 38-68.	A cross-section of digital identity use.
Individuals supporting disabled siblings.	9 participants from the community.	Those who support disabled siblings to access essential digital services.
Umbrella organisation representing three charities in northern England.	4 community workers.	Those working in community health, youth work and support for people with autism.

Table 1: Participation across the online sessions: 21 individuals from 6 organisations.

3.2 Primary Stage: Session Structure and Process

The study was designed as follows:

(1) A pre-study exploration of what the term *digital identity* can mean in the proposed community settings.
(2) Five 90-minute engagements were conducted via Zoom with a total of six different community groups.
(3) Notes were written up, and a rich picture line drawing which was made during the sessions was finalised.

It should be noted that in one session, two community groups took part in a focus group. In the remaining sessions, a focus group was held for each community group. A pre-study consultation was conducted as part of the study design process and took the form of discussions by email and phone. Initially the scope was agreed by discussing different scenarios where the groups had experience of supporting people who need to provide a digital identity to access essential services. Next, an information sheet was produced for the study and this was reviewed by the two participating organisations, ensuring that the scope, tone and format of the sessions was accessible and relatable for the participating groups and communities. This pre-study phase resulted in the following definition for digital identity which was incorporated into the information sheet used in the sessions themselves:

> *"Digital identity in this case means proving who you are on-line so that you can access your bank account, pension, welfare, health, housing and other essential services. A digital identity scheme covers both an on-line process to initially prove who you are to set-up access to the service and then a digital identifier and a password for on-going access."*

Due to COVID restrictions, the sessions were held remotely via Zoom. Given the constraint on using an online medium, and the abstract nature of the topic, it was agreed that the design of the sessions would need to be streamlined as far as possible. An inherent risk with running a remote session is that the consultation might not be able to access or may lose sight of the everyday details and complexities into which the digital identity technologies are inserted. As a result, it was agreed that one of the researchers (Heath) would make visual note-taking drawings in parallel with the remote discussions, to create a visual record of the session, and so that these could afterwards be made available to the groups in order for them to provide feedback about their factual points and the characterisation of the engagement discussions.

The structure of each session was as follows:

- Introduction to the consultation and re-statement of consultation goals (already in the information sheet).
- Statement of the ethics policy and re-statement of the agreement to participate.
- A semi-structured group discussion.

When consulting with the community groups during the pre-study, researchers were strongly advised to make the structure of the sessions as clear and as simple as possible. During the pre-study discussions, the following structure for the focus group sessions was agreed:

(1) A discussion of everyday experiences of digital identity and the challenges faced when managing digital identity.
(2) A discussion of the potential requirements for future digital identity schemes.

A number of verbal prompts were used during the sessions to help provide clarity and structure during the sessions. These prompts included:

- "Can you describe specific examples of digital identity in your groups, or where you have supported people to apply for a digital identity, and observed barriers and challenges?"
- "Can you run through any additional scenarios of where digital identity might be used?"
- "Can you discuss the potential benefits and challenges of having a singular and comprehensive digital identity?"

Our data was therefore captured in two forms: i) notes, and ii) visual notes produced as a drawing. Notes were written up after each session and sent to all session participants, along with photographs of the drawings, for comments and review. The research team followed up with the participant groups within 7 days.

3.3 Data Collection and Analysis Methods

We conducted the following analytical approach with the data that we collected. Our analytical approach is explained for both primary and secondary stages and includes the session handwritten notes.

Primary drawings made in parallel with sessions. As topics were discussed they were added to the drawing. The drawings aimed to capture the layout and intersections of key ideas and topics in everyday digital identity use. As far as possible, the drawings record the words and phrases used by participants, and develop upon any imagery that was employed verbally, in order to capture the collective and individual voice of each group, and in order to capture key fragments of the stories shared with us. After each session, the drawing was finalised in any areas where time had

not allowed for certain details to be completed. Additional notes and imagery were added immediately after the session to complete the record made of the exchanges between participants and the researchers. The participants were later invited by email to review an initial report, containing the notes and a high-resolution image of the primary drawing, and provide feedback to us. In a typical email correspondence, one participant provided feedback that "the 'mindmap' seems astonishingly clear and to have grasped the key concepts," and in a small number of cases potentially sensitive information was removed from the images at the request of the groups and before publication.

Illustrated here, the first drawing made with the groups was pencilled with a number of perspective lines beforehand, to introduce an open space to be drawn into with ink pens during the sessions (Figure. 2). These pencil lines suggest a vanishing point at above the horizon which is placed at approximately three-quarters height up the sheet. This perspective is a simplified graphical construct that suggests a flattened landscape spread out before an elevated viewer like a map lying on a table. These pencil guidelines were later erased once the drawings were finished in ink, and did not dictate where drawn elements should be placed, and this division of the drawing surface did not place undue emphasis on any one area, and was the basis for the division of the drawing into three bands, ranging from near-foreground to middle distance, to furthest distance.

Session notes. The session notes were then lightly analysed by grouping the notes into themes and cross-checking these themes with the unedited line drawing rich pictures. The themes were written up as a short report, ensuring that any specific feedback and factual corrections received from the groups were incorporated into a final version of the report to be shared with the groups. This full set of notes was not shared directly with the groups, but were the basis for the initial reporting offered to them. Clippings from the primary visual sketches were used in these reports to animate and draw attention to the particular themes that emerged during the sessions. These clippings highlight what the "particularly" means in the phrase "particularly dependent on digital identity," because they show what happens when digital identity processes do not work as expected, when they are inaccessible or unusable or do not align well with the circumstances of digital identity usage in which people find themselves. After participant feedback was received, we then proceeded to the next phase of analysis, described below.

Secondary stage collages, combined with insights from session notes. After each focus group and the production of an initial drawing, the data was then further analysed by assembling collections of selected visual elements (or clippings) from the drawings, grouping these according to the themes that emerged during the primary stage, and relating this back to the session notes and initial prompts for the sessions. This process of thematic visual collaging involves trying out various combinations of different segments, set apart or adjacent to one another, and assessing the resonances this has, or does not have, with the themes presented by each group. In order to make these collages, a digital template was devised to hold the collaged elements, which were individually imported and arranged in a Photoshop document (Figure 3). This template followed a similar approach to subdividing the drawing space as was used for the primary drawings (apart from an upright orientation, better suited to publication). The process also considered how this thematic treatment works across all of the groups (as shown in Fig 4).

It was not possible to arrange participant feedback on the montages, given the difficulties and constraints of continuing the remotely held consultations with the six groups. As a result, the rich picture analysis method described here is confined to being a refinement of the data gathered, rather than as a continuation of the discovery phase. Nevertheless, in different contexts and with different focus groups the method would be viable as a means to carry the consultation process forward, and this is discussed towards the end of this paper.

Our approach to the analysis of combined textual and visual data can be compared to the notion of the 'analysis wall' used in HCI creative engagements [10], and also to 'affinity diagramming' or 'card sorting' data analysis techniques which are used to help elicit the natural and intuitive relationships between concepts that exist for stakeholders [32, 49]. Our methodology explores the supposition that the spatial relations between elements is as important as the content of those elements. This is also the case with 'dimensional analysis' used in grounded theory [35]. The act of grouping and sorting a combination of visual and textual data in this way allows us as researchers to first establish, and then convey, meaningful patterns found in rich picture data, which would otherwise require a visual abstraction or a textual means of being communicated.

Mid-stage thematic studies were also made in preparation for the data analysis collages. For this, photographs and screenshots of thematically relevant parts of the drawings were made, and these were brought into one image. Below each of these elements a short 'Post-It' style note text was created to summarise the elements in each clippings that demonstrate a bearing on digital identity and hyper-[in]security. Each row relates to a different drawing, allowing for thematic comparisons across the data corpus, and to identify the topical variations between them. The image shown here is a pre-collage study around the theme of digital identity futures as conceived by the groups (Figure 4). Similar mid-stage preparatory studies for the collages were made around other themes, such as 'family' and 'carers', containing a substantial number of clippings and notes. These collages and the schema used to construct and interpret them are described in the following sections.

3.4 Interpreting the Secondary Collages

Once we had produced the collage, we not only thematically analysed the collage but also (using the notion of spatial regions) paid close attention to the spaces in which insecurities were compounded to form hyper-[in]securities. This formed the secondary analysis to our study and drew on a synthesis of the three bodies of literature set out in the literature review.

To achieve this spatial analysis, we used Schoemaker et al.'s [47] adaptation of Bardzell's qualities of a feminist HCI [3] as inspiration to establish three broad spatial regions as follows:

- *Pluralism*, reinterpreted as the *background* to the scene depicted in the data. This is a portion of the landscape comprised of a variety of goals (sometimes conflicting), responsibilities, obligations, and pressures felt by the groups collectively; at this level of the collective scene, the elements

Figure 2: A drawing made during two remote engagement sessions held remotely with two different focus groups. As topics were discussed they were added to the drawing. Additional notes were referenced immediately after the session to complete the record made. The discussion related to how refugees have been assisted with digital identity when resettling in a northern city in the UK, and also how those with autism but without a learning disability such as dyslexia need assistance. At left, a digital identity possible future is sketched out around the notion of a "core" digital identity.

are visible but are out of the direct reach of an individual or group. As our drawings show, the backgrounds differ from person to person and from group to group, generating a plurality of meanings for universal forms of digital identity technology.

- *Ecology*, interpreted as the *middle-ground* to the scene, the characteristics that constitute the immediate context and surroundings where digital artefacts are part of a much wider social, economic, and political complex. It is in this middle-ground that the pressures, goals and responsibilities are felt as being exerted in the everyday. Particular combinations of pressuring factors lead to the forming of responses to pressures, and seek to accommodate to them through the 'infrastructuring' [25] of these middle-ground surroundings. In contrast to the wider pluralism background, this zone is closer-to-hand and is therefore more accessible to an individual or group.
- *Embodiment*, interpreted as the *foreground*, in which the everyday is embodied within the in-hand everyday digital identity tasks. It is this embodiment that brings the everyday feelings and emotions, stresses and anxieties into contact with the digital identity technologies and that shapes the experiences of those technologies.

Schoemaker et al.'s 3 remaining design qualities, *Self-disclosure, Advocacy and Participation*, are also engaged with in two ways. They are woven into the participatory nature of the study, the ethical principles under which the study was conducted and the use of the rich picture to stimulate self-disclosure. They are also qualities that the different groups also referred to when looking at how to bring digital identity systems into a wider ecology.

As pressures from different areas of the background coincide and interact with one another in the closer ecology of our groups, they are compounded, and become points of frustration and stress in the embodied foreground. The following section describes this using examples from our data.

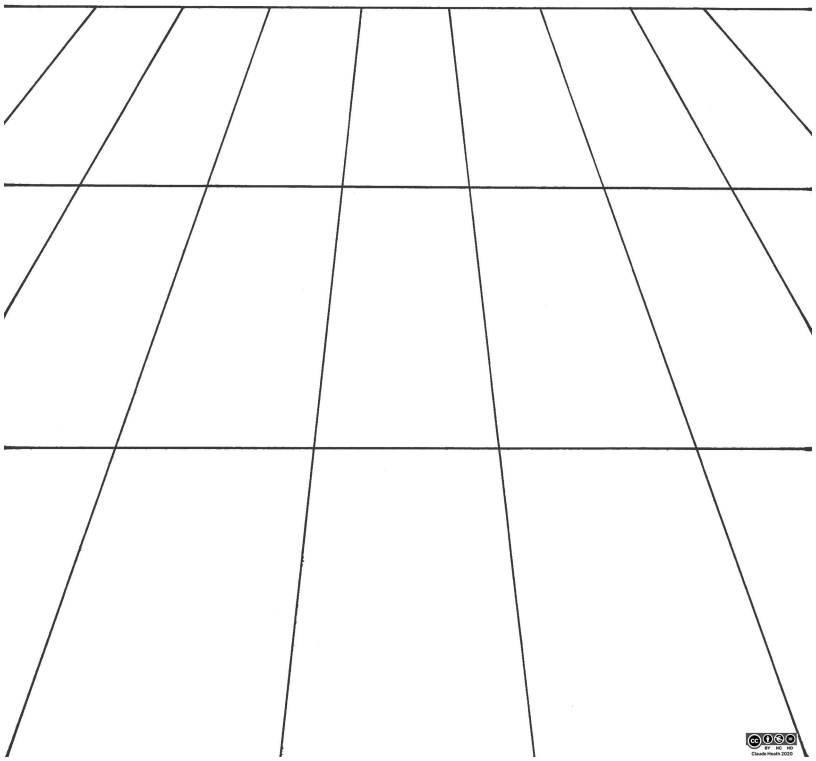


Figure 3: This image shows the template for secondary collaging of the clippings from the primary sessions drawings. It comprises of an elongated grid leading up to a horizon line at three-quarters height of the page. This was drawn in pen and scanned for use in Photoshop. In portrait format at A4 size.

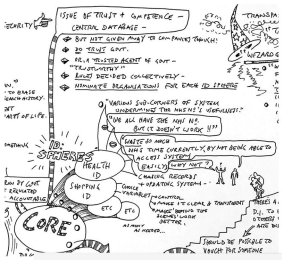
4 FINDINGS FROM THE SECONDARY ANALYSIS

In this section, we show how the collaging technique can be used to identify points at which hyper-[in]securities emerge in the landscape of everyday digital identity described by participants, and describe how thematic analysis can be augmented with cognitive mapping onto distinct spatial zones. We present two collages from our study that show how groups have organised around and repurposed existing digital identity technologies. While multiple security intersections can be observed in our data, for the purposes of explication we converge on two topic areas featured in all of the sessions we ran with our groups: 1). Families managing digital identity, and 2). Care settings and digital identity. These areas serve to illustrate the highly intertwined and compound nature of digital identity and everyday infrastructured responses to this landscape.

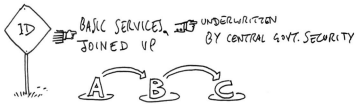
4.1 Everyday Experiences of Digital Identity: Exploding Laptops, Broken Phones, and Repeat Prescriptions

In our first sample from the data (Figure 5) the experience of everyday digital identity in the family is shaped by background pressures (seen at the top) and infrastructuring responses that cope with this (seen in the middle-ground). These background forces include trust relations and hierarchies within the family unit, relationships to

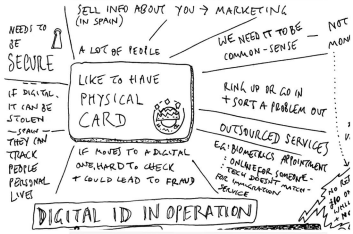
I. Identity futures- Core digital identity, levels from basic to complex addressing different challenges for different groups, one-stop shop, digital wallet, state benefits, homelessness, prison



III. Identity futures- ID spheres for health, retail, ringfenced central database, govt or trusted agent of govt, collective rule-based, integrated and fully updated ID service



II. Identity futures- joined up basic identity, underwritten by central govt security, regulated, accountable



IV. Identity futures- option to have physical card, common-sensical, secure against ID theft, supported by good tech and good support at low cost to user, outsourced biometrics, immigration

Figure 4: A mid-stage visual study on the theme of digital identity futures. The clippings are taken from the primary drawings made during the participatory sessions discussing the requirements for a future systems. Each row contains extracts from a different drawing; the second row has two clippings from one drawing while the others have one. Typed notes summarise how the theme breaks down into sub-themes and touchpoints. This is in preparation for secondary digital collages. Other themes were examined in a similar way in separate studies. Digital collage, 2021.

authority, and to wider support networks of the family. At this level, there is an awareness that older people within the family are more at risk of "being conned" by "scammers" due, in part, to a perceived tendency to give respect to authority figures and a desire to follow technologically delivered instructions. In one scenario, a participant's 91 year-old grandmother was called and told to enter her password into a portal: "Your laptop will explode if you don't enter your password", she was told, fraudulently. Through all of these concerns, the scene is set for the framing of everyday trust relations in the family, where support of, and support by the different family members is constantly under negotiation.

The middle-ground responses to this background are many and varied, and typically revolve around the sharing of identities and devices within the family and support network. The sharing and setting up of digital identities is one negotiated area where often a "young person sets up digital IDs" for older people in the family. They may use their own smart phones to manage these digital identities, in preference to the "basic" devices owned by older people (and said to often be Android). Young people may then login to primary care health systems using these smart devices, in order to "cancel appointments" for family members for instance. Young people could be 17 years-old, it was said, with full digital

Figure 5: A secondary stage thematic analysis collage on the theme of family and digital identity. The perspective template lies behind the assembled clippings from across from all of the primary drawings related to this theme, and visualises the zones of hyper-[in]security formed from this. Ranging from near foreground to middle-ground and then deep background, these items are teased apart but can be read as clusters of thematically related information around this topic. Includes infrastructured strategies for identity sharing, and intergenerational support within families and their networks. Digital collage, 2021.

access "children acting on parents' behalf" as brokers of digital identity, helping when families members are locked out of devices or when migrating from one device to another. They may "borrow an identity", or share one "siblings always share things, and they sometimes look like peas in pod, so they share ID". In the event of devices being broken or stolen, the "100 percent reliance on tech and connectivity" is highlighted as a point of family vulnerability: "Can be twisted, people will find a way, for sure." For example, a household's data allowance might be being used by multiple people in the family; or access to devices and data may be under tight control in abusive scenarios. It was noted that young people will also often "sit outside fast-food outlets to access their free WiFi" and a "teenager will login on a different phone because they've run out of data" using different identities, and as such, phones and the identities associated with them can act as "currency" in this regard, and hence this form of digital identity is said to "prove the phone but not the person."

Foregrounded actions and tasks in this data sample include those areas where control over data and identity is felt to be secured: it was said that one of the benefits of remote working or accessing digital identities online was "I can get my papers, as I'm at home" and being able to speak with government agencies on Zoom for instance. Another participant celebrated the withdrawal of self-disclosure, having successfully controlled search engine histories and automatic tracking of her activities online: "Hooray! Google thought I lived in Lincoln and it doesn't know what I am interested in!" During our discussions, this reluctance to being tracked and "spoon-fed" information was expressly linked to privacy by the groups.

Foreground family digital identity requirements noted by the groups included the needs of access to devices, access to power, system information, the storing of critical information, an appropriate environment for all of this, and the need to recall passwords; but it was noted that "this is not always available to everyone." *Participation* is thus linked to having the ability to control levels of *self-disclosure*, a key dimensions of digital identity in Schoemaker et al.'s design qualities. Our data shows how the groups thought about the apparatus that affords this, the levels of intergenerational support needed to achieve this, and shows how families construct their own infrastructure responses.

4.2 Assisting Others to Manage a Digital Identity: Money, Impersonation and Merry-Go-Rounds

The second sample relates to carers - those who care for relatives or partners with special needs and/or health conditions. This may be for siblings who are unable to execute routine self-care, including the organising of typical household and monetary responsibilities. Or it may be a case of a spouse with dementia or other health issues who finds it hard to carry out routine tasks. In these cases, it falls to family or professional carers to take on and manage these responsibilities on their behalf, allowing for the cared-for to continue to be housed and live as they do, and to help manage the digital identities required to fulfil these tasks.

Figure 6 shows a selection of everyday digital identity carer's experiences. At the top level, we can see the background concerns covering three main areas: (1). Banking on behalf of the cared-for, which often requires the unravelling and solving of access issues and the tracking of funds: "when something goes wrong this is a full time job"; (2). Advocacy, and having "no clear route" towards managing this for those with special needs; an example was given of a sister and the working assumption made by various essential services that she is able to self-advocate at all points. However, "If she is involved it makes it very complex", and moreover each interaction around her care will require different identity proofs; (3). Problems with accessing technology, passwords, information retrieval, and basic infrastructure; which causes stress "for people with health and other conditions" and "magnifies the problems that people may have."

Seen in the centre of Figure 6 are the middle-ground responses and "workarounds" to these challenges: 1). Two-factor authentication will allow "1 app per secure key only", meaning that while digital identity makes some aspects of care easier, it also creates "security issues" which may require access to be gained through the "ordeal" and anxiety of jointly answering security questions; 2). Use of shared bank accounts where possible; in one case a carer is able to manage funds for their mother via a joint account, but is unable to do so for her own sibling; 3) Where shared accounts are not possible, and where systems cannot cope with two identities or addresses being associated, online care tasks may be avoided, with the exception of banking; other responses include impersonation: "I changed his phone number to be mine, so that I could do the [online] shopping", and, "my other brother pretends to be him sometimes"; The carer may be "logged in as him, so I can't even access my own GP doctor"; 4) Visiting cash points with a carer is another "workaround", however, this creates potential problems with the relationship to professional carers, who do not see this as their responsibility and who see the sharing of PIN numbers as opening up the possibility of fraud. Other areas mentioned in this middle-ground were utilities, leisure, travel, and health, all areas where the use of systems is "not set up for multiple people". For example, where government support in the form of PIP payments for a sibling with autism have to be transferred to a second bank account in order to meet savings capping requirements, so that, as far as the government agency is concerned, "it looks like I'm taking his money."

At the bottom of the image we see the foreground actions and tasks of carers. For example, the task of contacting a bank and setting up a new bank account for the cared-for, which in one case has taken six months to arrange; routine dealings with utility companies in order to access proof-of-identity statements, and a frustrating "merry-go-round" of "confusing and ridiculous" contradictory rules and regulations that follows: utility bills "cannot be self-printed", request new statements from utility provider, "need my partners name on it", "send his ID in", and back to the start again. Where problems occur, says one participant, "I have to resort to making complaints on Twitter to get things done."

The tangle of issues for carers seen here relates centrally to the *advocacy* dimension of digital identity design, as set out by Schoemaker et al.[47]. Our sample data demonstrates how advocacy is associated with the stress, anxiety and workload of managing digital identity, caused by the limitations of digital identity technologies

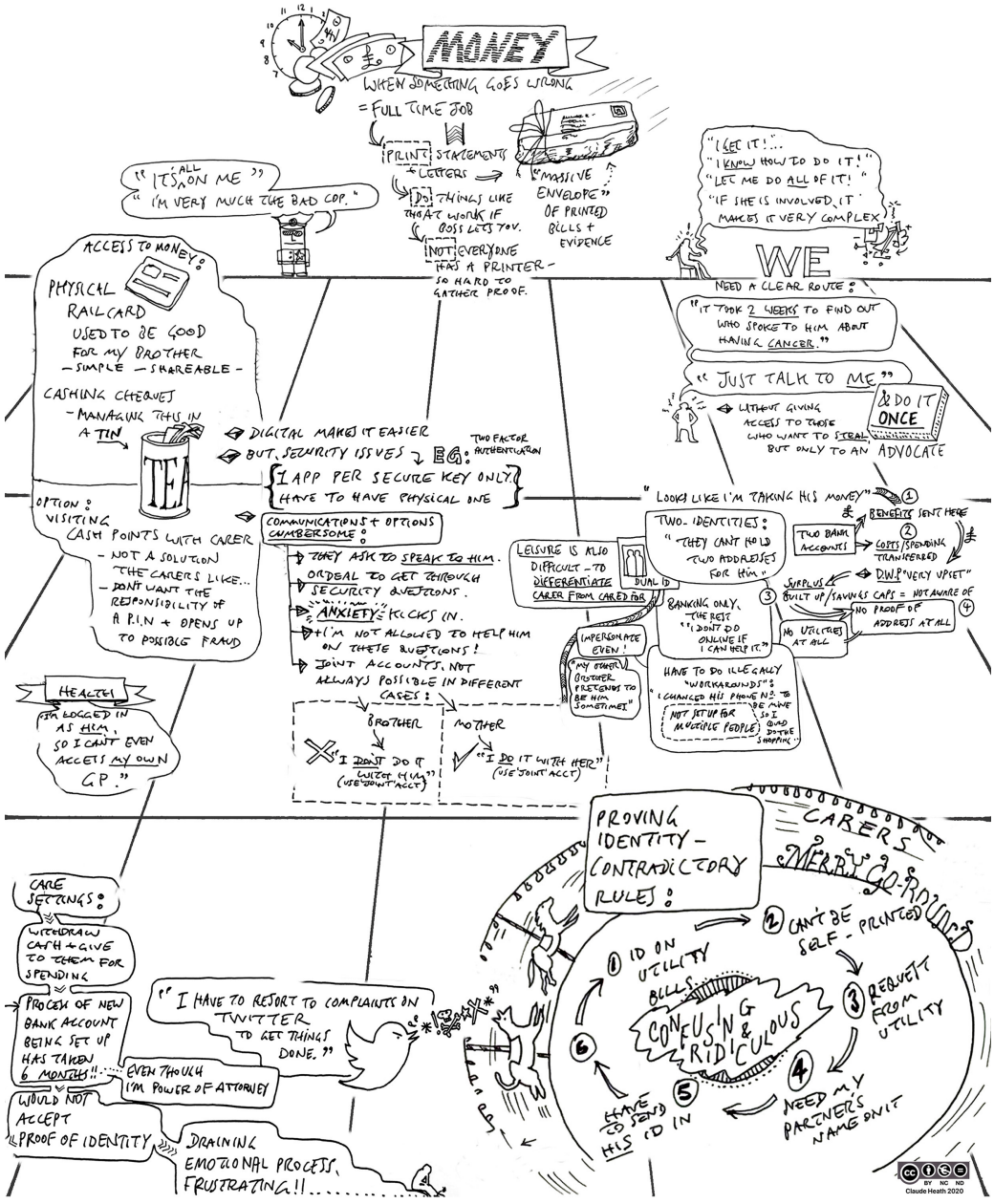


Figure 6: Another secondary stage thematic analysis collage, this time on the theme of carers and digital identity. The near-to-far perspective collects data clippings from all of the primary drawings related to this theme, and visualises the zones of hyper-[in]security formed from this. Infrastructured responses to pressures (from above and below) are collected in the middle band, and include everyday money management, plus authentication strategies such as the use of impersonation to circumvent the inflexibility of digital identity systems. Digital collage, 2021.

in these scenarios, and the repeated need to prove identity and to prove the relevance and legality of users requests at every step.

In contrast to this tangled present, and by thinking about how a desirable future might look, in order to 'back-cast' or work backwards from there to the present, the groups were able to disentangle a vision of how the close future for digital identity design might be conceived. In one example, a "minimum viable product" ("MVP") for digital identity system design posited three "levels" (Figure 4):

- Basic: for use with emails, phone contracts, utility bills, gyms and leisure, bus passes, and GP appointments.
- Intermediate: for travellers, gamers, and others.
- Complex: for use in some of the cases we have described above that have not been met by current systems.

This system would be "one-stop", but have "different entry points", and would be founded on different challenges for different groups of people. The end result would be to protect "the one thing that doesn't change", a "core" identity that is transparent in terms of allowing "viewing rights" to only those who need the information, such as prospective employers, and informing users in a clear way about where this information is stored.

5 DISCUSSION

Giving our primary drawings a suggestion of real space through the use of a simple perspective layout, and doing the same for the secondary collages that follow on from this, makes it possible to anatomise how people report their various and sometimes challenging experiences with digital identities. During this process care is taken to maintain the key relationships between the different parts of their lived experiences, within one visual artefact. In doing so, researchers are able to identify more precisely where hyper-[in]security occurs, and also to tentatively speculate on causation by examining the connections between actions and the emotions that are generated by pressures and tensions. For example, there is noticeable sense of frustration with managing the existing constraints on digital identity on behalf of someone who is more vulnerable. This can be traced back to the different pressures that an assisting individual is experiencing. It shows how those pressures shape the responses of an individual, and the ways in which digital identity is set-up and managed. It also explains why, at what times, and in what ways actions break or bend the policies and regulations surrounding a service. Our methodology provides a first move towards representing nuanced stories of people's compounded frustrations in the use of digital identity.

In theory, an enhanced interactive tertiary stage of *hyper-collaging* would be useful for a return to working with these same groups, and would allow them to develop an overview of how digital identity was discussed across all the groups. The overarching final report shared with the participating groups and the commissioning policymakers, which included images of the primary drawings, goes some way towards attaining an overview. However, a PDF report lacks the potential for groups to further interact with and shape the data for a continuing discussion of the future of digital identity. The use of collaged drawings enables a deeper understanding of the emerging themes by presenting them graphically, encapsulating the perspectives of participants and comparing these thematically. Potentially, it is possible to create any number of merged thematic collages where the results are created from a separate interpretive pass on the data. For example, to collect specific elements from the 'family' and 'carers' collages, and to realign these elements around interpretations of viable future digital identity systems.

The line drawing methodology described in this paper can be considered as a proof-of-concept for gathering data from a programme of remote engagements and for extending remote engagements methodologically. Collaborative online workspaces, such as Padlet and Miro, offer the potential for the collaging methods described in this paper to be applied to real-time shared use, once the primary drawings and notes have been collected there by researchers.

Cognitive Mapping. As noted in Section 2, our secondary collages can be situated in a tradition of cognitive "sketch mapping" that began with Lynch, who used this approach to elucidate tacit knowledge about place from city-dwellers [37]. Our contribution develops upon the terms used in cognitive mapping, to argue that our hyper-collage method can be described as a metaphorical or "analogical device" to capture social practices, in a way that is "functionally equivalent to a map", and that it is a way to "communicate information about unfamiliar or discomfiting spaces through a spatial construct" [34].

There is a peripatetic aspect to cognitive mapping research which lends support to our research aim, which is to develop techniques to map the everyday activities and social practices related to managing digital identity and the problems specific groups have with this, and to understand where and when these problems occur. In one early cognitive mapping text ('A Walk Around the Block') it was asked, what does the ordinary individual perceive in their landscape, what makes the strongest impression, and what is the reaction to it? [63]. Wood used a thematic 'content analysis' to look at how cognitive maps of localities changed over time based on people's growing familiarity with an area. From working on many such maps, he found patterns: "Several proximate grid lines, the result of two environmentally distant features being placed next to one another, can be understood to represent a steep slope or cliff. Consideration of these grid lines as a perceptual or cognitive cliff gives us a handle on this phenomenon" of apparent cognitive closeness despite physical separation [62]. In the case of digital identity hyper-[in]securities, we have argued that it should be possible to perform similar analytic operations on qualitative participatory data derived from remotely held focus groups. With sufficient primary and secondary sources gathered over time, it should not only be possible to map areas of uncertainty in regard to digital identity, but also to map how groups develop their responses to this over time.

Cognitive mapping not only offers significant analytical opportunities for our work, as described above, but also offers a visual and thematic richness and flexibility of approach that can be compared to works of art and design in other fields. A close neighbour to cognitive mapping can be found in the graphical works of Saul Steinberg, whose drawing 'View of the World from 9th Avenue' (March 29, 1976 cover of *The New Yorker*), has been described as "one work within a parade of [Steinberg's] images that harness the graphic device of the map to visualise more than geography", that is, to present perceptions of relative value, relative importance

and relative orientation [23]. Steinberg's choice of an elevated visual perspective affords us a view of everyday architecture and walkways in the foreground (9th and 10th Avenue, the Hudson River), and a glimpse of distant continents (China, Japan, Russia). In between is a band of middle-distance locations (Jersey, Kansas City, Nebraska). The effect is to telescope the far distance into a proximity with the everyday texture of lived experience.

Our methodology allows us to locate and map our participants' perceptions as to which are the points of greatest tensions, sharpest contrasts, most uncertain and uncomfortable terrains, between thematic areas that are least related but placed in closest proximity to one another. The outlines of this approach can be seen in the two data samples described in Section 4 above. For example, in Figure 6 the sharpest contrasts observed are between a carer stating that to the bank or government "it looks like I'm taking his money," and, a carer asking for essential services to support a streamlined advocacy system with the plea to "Just talk to me!" In the same collage, the topic of carers access to money for everyday uses is uncomfortably close to the background statement that the carer is made to feel that "I'm very much the bad cop." In Figure 5 the greatest tensions are between the background issue of trust in the family, on the one hand, and the middle-ground issue of "100 percent reliance on tech" on the other. In the foreground looms an ominous pairing of "Control" and "Stress"; also the observed proximity between children with access to managing the digital identities of older family members, on the one hand, and the gaming of search engines to maintain privacy on the other.

World building and back-casting. World building approaches lend themselves to extending thematic visual mapping into new digital forms for HCI creative engagement. World building is a multidisciplinary practice in media arts aimed at generating integrated worlds that support and help generate stories, and that can operate at all levels of detail, from local to global, nation, city, community, family, individual and locality. McDowell defines world building in terms of constructing a highly enriched picture. It is "a philosophy and a practice that exploits a rich collaboration of design and emergent technologies to create visceral narrative spaces - passive or interactive, virtual or real - through story logic, design process, and user experience." "The stories we tell, and the worlds these stories inhabit", McDowell says, fulfil "a primal need to return to the power of story worlds to create navigational maps of multidimensional and extremely unfamiliar terrain" [39].

As a contemporary practice, World building has its origins in production design for film, TV, and gaming, and is established as an educational specialism in the media industry [48, 53]. Associated with it is a new generation of world builders [65] and a variety of digital 3D and other spatial and temporal modelling techniques [26, 54]. These offer great potential as a way to develop new HCI creative engagement techniques. World building has an affinity to design fictions based on the real world, and can, for example, be leveraged through anticipation studies [41], and 'transition design': "Designing for a transition towards a preferred state" [66]. Allied to transition design and linking it to world building is 'backcasting', the technique of working backwards from a desired future to the present in order to determine the feasibility of that future and to identify what policy measures would be necessary to attain that future state [18]. In the area of energy policy for instance, backcasting can lead to the discovery of "soft" "policy paths" [43]. 'Second generation' backcasting involves a desired future not determined in advance but is instead an emergent property of engaging with stakeholders [42].

The non-linear and highly collaborative activity of world building is comparable to a research process where researchers are working with participants to collaboratively make sense of the worlds that participants have described. The process involves a shuttling back and forth between researchers and participants to develop understanding from these worlds. By using collaging techniques, researchers can show participants what they understand to be the drivers and causes of hyper-[in]security, not just describing it as a simple phenomenon, but to reflect on and carry out a response to that understanding. In our secondary collages, we have developed upon the theme of "pressure landscapes," and used the different spatial dimensions of the collages to both capture and explore a sense of the routinised "looping" back and pushing forward of frustrations into identity management responses.

Informing policy. Drawings allow researchers and policy makers to more readily identify and understand the intersections between different challenges and stresses, and form a clearer picture of how these come together to create extreme forms of insecurity, and from there, how future technologies and policies might help to mitigate and reduce these insecurities. In this study the method presented is framed as a means to enable ways to be more specific as to where to place interventions and what sort of interventions should be deployed. This is key when identifying how i) digital identity management and schemes might be used in the future, and ii) what limits their take up now. Such an approach is able to illustrate for policy makers the differences in adoption of technologies and the reasons why the rates and types of adoption differs from group to group. Regardless of how technologies are designed, if the context in which they are deployed is not fully understood, nor the complex interplay between resource constraint, insecurity and technology, then there is a risk that digital identity futures will look much like the present. Our methodology provides for an inclusive, collaborative policy making agenda for digital identity futures.

Collaging also presents considerable possibilities from a policy point of view, as we can be general and specific at the same time about technology use. In particular, policy discussions can be led towards the ways in which hyper-[in]securities might arise, in a way that is both simple and discursive. The secondary collages also reveal the complexity and difficulties that can arise in what are seen by many policy makers as mundane everyday tasks and enable researchers to provide detail in a format that can be easily understood. As can be seen from the drawings, the digital identity technologies are not new but hark back to some of the original challenges around usernames and passwords and the difficulties of managing relatively simple digital identity technologies. Before moving onto new digital identity technologies, the challenges around what are seen as 'old' technologies need to be understood, as these are the technologies used in legacy systems and are the systems our participants are faced with. The feelings of frustration that arise from working with digital identity systems that are not fit for purpose, and that serve to increase the feelings of pressure in an already

pressurised situation, will not disappear quickly. For example, the need to juggle bank accounts and the demands of work around technical barriers and constraints increases the sense of pressure that can put up substantial barriers to engaging with new digital identity technologies. The collages give an indication of where new technologies might be deployed and how they might be positioned to help with that transition from old to new.

Practicing experience-centred design. Experience-centred designers and researchers concerned with finding out more about the perspectives of marginalised and underserved communities may like to consider using the method described here. For instance, a community group or third sector organisation could employ it to reflect on how they might re-organise or scale-up certain types of support for the use of digital identities. This might be in order to reduce the pressures felt at key security touch-points where hyper-[in]securities associated with digital identity require sensitive management.

The contribution of this collaging method, is to extend the creative engagement approach. It does so by recasting the source focus group data in such a way that it retains its original context and can more easily connect with world building and other holistic design approaches that serve to highlight the perspectives of these communities. The hyper-collage method described in this paper can be considered as an outline of a general workflow used in a variety of creative tools. For example, designers who are constructing narratives via world building might work with modelling and other tools to build out from the central themes and touchpoints of initial collaging using the approach and methods set out in this paper. The collages might provide a number of the key moments of a story (sometimes referred to by filmmakers Pixar as the story 'beats' [1]) while fleshing out the relations between them spatially and conceptually. There might also be occasion to develop new spatial templates to suit new problem spaces.

Limitations and extensions. Our method is designed to deal with complex qualitative relational data and is motivated by the desire to build upon traditional 2D analogue drawing processes in order to create a version of creative engagement suitable for working with communities remotely. The decision to make drawings in parallel with the focus groups, but not to have view of the drawings during the discussions, suited the particular practical constraints of working with these focus groups. However, there are possible variants of this method where participants could be engaged in directing drawing or in contributing to drawings via remote collaboration platforms, wherever the characteristics of the groups and topic of discussion allow this.

It is not always possible (or desirable) to separate out the individual elements of the narratives, due to being so intertwined. For example, a number of everyday tasks and actions will be found in middle-ground activities, where infrastructured responses often originate from. Likewise, a number of middle-ground (ecology) activities will inevitably lead to adjustments in the background (pluralism). Each secondary collage is a static perspective with its own commitments to what constitutes the range from foreground to background. A fully multi-perspectival and multidimensional approach, as in the case of building a richly described world that carries a narrative, would function as a way to collect and place a number of such perspectives in relation to one another.

The notion of pressure landscapes has been identified as a way to convey a qualitative perspective, narrative or story emerging from a community. Particular pressures and responses to these pressures are placed into one of three zones: foreground, mid-ground and background. These zones are connected by a logic created by the narrative that spans them. While the collaging method is inherently spatial, in the sense that these zones are referred to as being adjacent, the method can either treat these spatial relations as somewhat flattened and diagrammatic, or, this can be the leaping off point for a fleshed out version of these relationships, replete with neigbouring parts of the world to help bring out the meaning of the stories. In this way, a narrative about the management of digital identity from an underserved community can be used to build a clearer picture of the world that has created these pressures, and to design a more effective response to the pressures felt there.

6 CONCLUSION

As we move towards a world where digital identity is gathered and shared in increasingly diverse ways, understanding where points of exclusion, conflict and security-making arise is going to become harder to identify. There will be a greater distance between technology user and technology provider, and the interfaces between people and technology will become more sophisticated and complex. Visual thematic mapping techniques, as described here, can be used to not only engage with the user experience but also to develop a deeper understanding of the forces that shape those experiences - thus offering opportunities for more targeted responses and the possibility of greater digital inclusion.

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