



# Digital Rituals in Performance: Transitions to Internet of Things Trust and Security

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## ABSTRACT

Most HCI studies are WEIRD – they focus on participants from White, Educated, Industrialized, Rich and Democratic countries. This paper presents a case study of a participant named Chitra from the city of Kahani in India as a non-western perspective of ubiquitous technology in an oppressive political context. We identify digital rituals as talismanic responses to mistrust in ubiquitous computing environments. Findings from the case study show how digital rituals open up transformative states, allowing transitions from mistrust in the digital to feelings of trust, security and comfort. Through the identification and discussion of digital rituals in performance we open up a new design space around the transformative potential of digital rituals in the ubiquitous Internet of Things.

## CCS CONCEPTS

• Human and societal aspect of Security and Privacy;; • Human Computer Interaction(HCI); • Ubiquitous and mobile computing;

## KEYWORDS

Trust, Security, Internet of Things, Older people, Ritual, Drawing

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## 1 INTRODUCTION

In December 2021, Dutch authorities confiscated a series of radioactive ‘anti-5G’ necklaces that claimed to protect people from the harmful health effects of 5G networks [1]. In the past few years there have been a spate of similar anti-5G objects including USB sticks, anti-radiation stickers and EMF (Electromagnetic Field) blocking hats. Anti-radiation underwear is also now available online. While most anti-EMF products have been found to be useless in preventing the so-called negative effects of 5G radiation, they do appear to be popular [1]. One EMF sticker has over two hundred reviews on

a popular e-commerce site. Reviews includes comments such as “In my trials they work for me and other friends.” Or “Definitely helps! Recommend” These strange anti-EMF objects seem to offer feelings of well-being and protection in an invisible and ubiquitous digital world that is not trusted. Fetishes are objects that are believed to have magical or talismanic powers. Bruno Latour notes that the term ‘fetishism’ was popularized by Charles de Brosses in 1760 who linked it with ‘fatum’, or destiny, the source of the French noun fée, ‘fairy’ and of the adjective form in the noun phrase object fée, “fairy object” [27]. Latour tells a fable of European colonialists encountering indigenous people as two groups of people “covered with amulets”[27] scoffing at one another. Latour blends the words fact and fetish in the neologism “factish” [27] to indicate “the robust certainty that allows practice to pass into action without the practitioner ever believing in the difference between construction and reality” [27]. Latour’s notion of the factish helps describe objects like anti-EMF stickers, things that work on scientific principles but behave more like fetishes. Anthony Dunne and Fiona Raby’s Placebo Project [20] investigated similar factish stories about electronic life through a series of prototypes including a stool that drains energy from the body and a table with an array of compasses that twitch in response to electromagnetic fields. HCI has been criticized for simplifying problems to fit technological solutions [12, 23, 28, 31]. Dunne and Raby’s Placebo Project presents an anti-solutionist perspective on technology, asserting that some devices might exist simply for their magical, talismanic or factish properties and that the ways that technologies might pass from construction to reality might be through factishes.

Old anxieties about pervasive electronic fields and all-encompassing hertzian spaces [21] have morphed into new anxieties about omnipresent WIFI networks, always-on smart speakers, shadowy browser cookies, creepy fitness trackers and ubiquitous video-conferencing apps [25, 34, 35, 52]. IoT (Internet of Things) devices such as Smart Speakers, Connected Doorbells and Face-Recognition enabled CCTV Cameras capture intimate details about our lives, transmitting and storing vast amounts of data via the internet. IoT devices continue to expand ubiquitous digital space, simultaneously expanding feelings of creepiness, anxiety, suspicion, and paranoia [34, 35]. However, technology companies and manufacturers continue to adopt a solutionist ideology [12, 23, 28, 31] with regards to the IoT, often portraying seductive visions of functional futures in the form of Smart Fridges, Smart Homes, Smart Cars, Smart Cities, and hundreds of other ways in which the IoT will make our lives easier, faster, and simpler. While the IoT will no doubt have an impact on many aspects of our lives, a focus on seductive solutions ignores the complex socio-cultural, political,

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economic, environmental, and ethical effects of these new technologies, over-simplifies problems and over-emphasises the positive effects of technology in favour of less-desirable consequences [31].

HCI studies of IoT technology are primarily WEIRD [42], that is they focus on participants from White, Educated, Industrialized, Rich and Democratic countries, neglecting to investigate the possible socio-cultural, political and ethical consequences of ubiquitous computing on non-WEIRD participants. IoT technologies for older people often focus on accidents and falls, health monitoring, assistance and tracking or personal care [10, 49]. Design Fiction [19, 22, 43] has been put forward as a method to resist solutionism [13] by engaging with the socio-cultural and political consequences of technology development. A previous design fiction study called “Curious Rituals” [32] that looks at how curious digital rituals might evolve around emerging technologies does so primarily from a Western perspective while focusing on ironic and amusing digital interactions from an imagined near future. Design Fiction has been criticized for being privileged- taking as its subject matter white, western, rich and educated contexts, with less study of the consequences of technology on marginalised people [36, 37]. It is argued that Design Fiction has paid more attention to irony while underexploring magical, ambiguous, and talismanic aspects of human-technology interaction [14].

This paper contributes an anti-solutionist perspective to the study of the IoT and ubiquitous technology by investigating under-explored talismanic and factish responses to digital anxieties. With a call to move beyond the focus on IoT artefacts as solutions, this paper uses a fictional IoT device to elicit multiple meanings and open a new design space around digital rituals. We identify and define digital rituals as factish behaviours that allow transitions from states of anxiety around digital technology to states of trust and comfort. We discuss the positive effects of factish behaviours around digital technologies such as the potential of factish rituals to provide transitions to trust and point out the negative implications of factish digital rituals as a barrier to preventing real control over digital devices by providing short-circuit or quick-fix solutions to digital anxieties. By situating design fiction in the context of a non-western participant, describing her life in a developing country, this paper nudges design fiction away from a privileged western lens to focus on subjects that have been marginalised within HCI and Design Fiction. Taking as its key subject an older participant, whose identity is defined by her political activities as much as her age, this paper contributes a non-stereotypical understanding to older people’s use of digital technologies, within a non-western context of IoT use.

## 2 METHODS

### 2.1 Design Fiction: Inviting Multiple Meanings

To investigate Internet of Things anxieties, we created our own factish IoT device called a Data Gate. A Data Gate is a fictional technology that is used to hide from nearby IoT devices. Available in different form factors like rings, badges, necklaces and stickers, a Data Gate can protect its user from IoT surveillance. For example, concerns are growing about the ‘always on’ nature of smart speakers in the home. Speakers are often embedded in home IoT devices such as TVs, fridges and other appliances leading to a sense

of anxiety around being listened to at home [25]. While speakers in home IoT devices provide functions that we may want, there may be times when we would not want to be listened to. Wearing a Data Gate necklace would deactivate all the smart speakers in the room giving one a sense of privacy and security that one’s private conversations were not being recorded by IoT devices. All mobile phones have GPS sensors that track our location and are always on, leading many people to be uncomfortable about being constantly ‘followed’. Wearing a Data Gate ring could make you invisible to GPS sensors in your mobile phone, allowing you to hide your location from trackers. Our initial concepts of the Data Gates were quite functional in descriptions and focused on attempts to control and restrict the physical sensors in IoT objects. However, functional descriptions of technologies do not capture ‘felt-life’ [9] aspects of technology use. Felt-life is “life as lived, sensed and experienced” [30] that, within HCI, implies a focus on the emotional and the sensual parts of human-technology interactions. The functionality and technical details of the Data Gates became of less importance to us in comparison to how the Data Gates might make people feel about their digital interactions. If Data Gates were produced and deployed in the real world, how would they be used? What would the impacts of the new technology be on people’s lives?

### 2.2 Recruitment

Four participants were recruited from diverse backgrounds. The sample group consisted of two female and two male participants. Participants were primarily an opportunity sample recruited by circulating a participant recruitment flyer to colleagues and friends via email and by approaching friends, family, and acquaintances. Eight people expressed interest in the research of which six signed up while four participants actively engaged with the comic books and agreed to be interviewed. Of the four participants, one emerged as a key informant. The participants were sampled from three different age groups (20-35, 35-50 and 60+), reflecting diversity of generational and age-related contexts of technology use. Three of the four participants were from non-WEIRD countries, and one was from a WEIRD context. Two of the non-WEIRD participants in the 20-35 and 25-50 age group were currently living in the UK for their studies but had spent most of their life in a non-WEIRD country in the global south. The non-WEIRD participant in the 60+ age group originated from and resided in a non-WEIRD country which contributed to her selection as a key informant. To protect the identity of the participants, apart from the key informant, we have chosen not to reveal the specific countries of the other three participants due to the sensitive socio-cultural and political issues discussed in some of the conversations. For the key informant, we have mentioned that she is from India but have kept the name of her city anonymous to protect her identity due to the sensitive political nature of the conversations and her involvement in political activism which might make her vulnerable to threats or attacks.

### 2.3 Research Overview

The research followed a mixed approach consisting of comic strips, interviews and co-creation exercises. Participants were sent a series of comic strips depicting Pastiche Scenarios [9]. The participants were asked to go through the comics and complete a creative task.

The task asked participants to write, draw or narrate a short scenario in which a fictional character of their choice uses the Data Gates. Participants were given one to two weeks to go through the probe kit. The participants were then contacted by the researcher and asked to do interviews. Semi-structured interviews (face-to-face, online) were conducted with the four participants. During the interviews, the researcher had open-ended discussions about contexts of use for the Data Gates in the participant's daily lives and in the fictional scenarios written by the participants. One of the participants described how he would use the Data Gates to stop his wife, who lived in his home non-WEIRD country, from using his credit card while he was studying in the UK. Another participant, who lived in a WEIRD context described using the Data Gate as a magic ring to prevent his employer from tracking his drinking habits. The third participant talked about how her non-WEIRD background made her distrust the government and that she would use a Data Gate to stop the government from collecting her data. Of the four participants who were interviewed, one was selected as a key informant [33]. In ethnography, a key informant is a participant who becomes central to the research due to several reasons [33]. One participant, Chitra, became a key informant because her responses to the comics were rich and meaningful, her interviews were extensive, and she had interesting contexts and life experiences to share, was open in discussing intimate details of her life and developed a rapport with the researcher. The other three respondents engaged with the scenarios and shared interesting details, but we found the conversations and the context of the key informant much richer and productive than the other participants. The interviews of the key informant were open coded [18] to derive categories and themes and her stories, interviews, photographs, and WhatsApp messages became the basis of a set of drawings that captured digital rituals from the participant's life. The key informant's interviews, images, messages, and responses to the scenarios were analysed and interpreted to evolve a new space of inquiry around digital rituals and talismanic understandings of digital technology in a non-WEIRD context of use.

## 2.4 Pastiche Scenarios

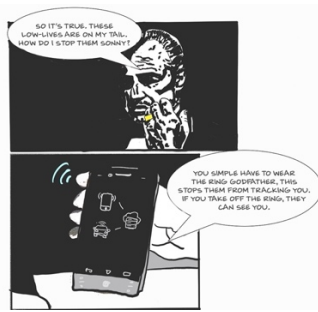
Pastiche Scenarios use fictional characters to explore the 'felt-life' [9] aspects of technology use. HCI and UX researchers often create personas to explore users of technology. However, personas can lack some of the richness and depth that comes with real users of technology [9]. Well known fictional characters possess rich descriptions, back stories, personality and a wealth of situations and contexts to draw on [9]. Fictional characters allow the designer to avoid stereotypes around age, gender and social class by allowing the character to drive the use of the technology instead of relying on known or learnt biases. In the investigation of contexts of use of the fictional technology Data Gates, three pastiche scenarios were created and presented as comics. The comics explored scenarios such as how Data Gates might be misused by criminal entities, how digital talismans might be used in domestic relationships and how the Data Gates might be used as amulets to control creepy IoT devices. The themes developed through the creation of the scenarios and were guided by the characters' traits, backstories, and situations. Pastiche Scenarios are a kind of thought experiment that



**Figure 1: Comic book depicting Amy and Sheldon from The Big Bang Theory. Amy uses her Data Gate to stop Sheldon from tracking her Menstrual Cycle. Authors' Image.**

can be used in Design Research to help think through the impacts of emerging technologies by constructing narrative scenarios around the use or misuse of technologies [15]. Thought experiments are narrative devices used to think about the real world through imagined scenarios and have long been used in science, mathematics, ethics, literature and philosophy [15, 16]. Famous works such as George Orwell's 1984, about a dystopian surveillance society and Aldous Huxley's Brave New World, imagining the effects of genetic technology on humans, are literary thought experiments [16, 45] that build worlds around socio-cultural investigation of specific technologies. The construction of thought experiments around the Data Gates allowed new concepts, questions, and consequences to emerge as lines of inquiry. Data Gates might be worn as a brooch, an item of jewellery [51] that could be seen to have personal, protective, emotional, aesthetic, and cultural significance rather than simply a functional purpose. Domestic relationships are sites of negotiated trust and shared digital spaces open the door for tracking a partner's location on a fitness app or their food habits say, on a smart fridge [53]. The Big Bang Theory is a popular sitcom which revolves around a series of domestic relationships between the central characters. Sheldon is a highly intelligent research scientist but has a limited capacity for empathy and few social skills [5], much of the comedy arises when his partner Amy must explain basic social conventions and how he is making other people feel. A Sheldon and Amy scenario revealed how data boundaries might be negotiated in domestic relationships using physical objects that behave like Talismans or Amulets. Figure one shows Amy telling Sheldon that if he uses his tracking app to track her menstrual cycle, she will shut down "this whole experiment – I mean relationship".

A second pastiche scenario featured the criminal mob-leader from the film The Godfather. Here the Data Gate takes the form of a golden ring and is misused for criminal purposes. Such a scenario makes it possible to think through the implications of personal privacy control, questioning the ambiguous and contentious nature of privacy itself. The Data Gate is a kind of protective talisman that protects the Godfather in digital space. He uses the Data Gates to stop the government from tracking his location, to plant a false location trail and evade arrest. The misuse case serves as a thought experiment, asking the question, what if a criminal had access to the kind of technology described by the Data Gates? How would he use the Data Gates and what form would they take? The Godfather's



**Figure 2: Comic book depicting the criminal character The Godfather. The Godfather uses a Data Gate ring to hide his location from the government. Author's Image.**



**Figure 3: The comic book depicting Scrooge bargaining with a Smart Fridge. Author's Image.**

Data Gate takes the form of a golden ring, given to him by a friend as a gift. The world in which the Data Gate becomes an object of resistance is within an already existing surveillance state.

One of the characters explored as a user of the Data Gates was 'Ebenezer Scrooge' – the Christmas-hating miser from Charles Dicken's 'A Christmas Carol'. We wanted to investigate concepts around data, memory and money in the IoT and Scrooge's personality offered an interesting set of scenarios to explore. Computing infrastructure today has the almost haunting effect of Dickens' ghosts- bringing up our past and divining our futures in ways that can be creepy. Scrooge's personality as 'the miser' and a person who is confronted by a past he fears helped explore what data might cost. One of the short scenarios describes Scrooge's encounter with a Smart Fridge. The Smart Fridge in question can playback and delete memories of Scrooge's past, but only for a price. Scrooge finds the cost to high and has a heated argument with the device. The scenario with Scrooge helped unpack how the Data Gates technology might fit in to new economic models for IoT technology. What effect would the Fridge have on Scrooge if he was forced to confront his past self because it was too expensive to delete the stored memories?

## 2.5 Beyond WEIRD Users

While the Pastiche Scenarios served to open multiple meanings, they still placed the Data Gates in a western context, with scenarios, places and characters drawn from European and American popular

culture. When studying the implications of a speculative technology, like the Data Gates, we were conscious that socio-cultural and political environments could have an impact on how the technology was interpreted. We were interested in studying the Data Gates in non-WEIRD contexts to challenge stereotypical and western perspectives of IoT technology use and to understand how the Data Gates might be used in alternate political and socio-cultural environments. To explore alternative socio-cultural and political environments, we focused attention on non-WEIRD participants with non-WEIRD backgrounds and steered interviews towards discussing the participants' personal non-WEIRD experiences. Participants were sent the comic books along with a creative task asking them to write or narrate a scenario in which a fictional character uses the Data Gates. To spark conversations around diverse cultural contexts, the comic-books were discussed in interviews with the participants along with their responses to the task. All four participants engaged with the scenarios and had interesting details to offer but the key informant was one that we felt needed the most focus as it was embedded in a rich non-WEIRD context. The key informant in the study, Chitra, incorporated descriptions of visuals and text into a short scenario. Chitra's scenario recounts a fictionalized version of her own experience in which a text message on her phone led her to believe that her debit card had been hacked. In her scenario, Chitra described Data Gates as a watchdog, a gatekeeper and a protective object that can be stuck on her phone, on a laptop or on an ATM to prevent her digital devices from being hacked by criminals:

Scenario 1

Pic-1

Warning against hacking flashes on screen. User immediately discontinues procedure. Shuts phone.

Phones Bank to Block Account immediately.

Messages appear on screen. Your [online shopping site] transaction for [amount] has failed.

Phone user speaking to herself, "but I didn't order anything from [online shopping site] "!!

Messages her sister. . .Have not made any transactions Ignore messages. Account BLOCKED!

Sister messages back. Why the panic?

Phone user: The hackers can clean out all the cash in seconds! They work in GANGS!

Phone user: There should be a way to prevent this. . .What if I had missed the warning message? I would be penniless right now?!?!? DATA GATES? (Chitra)

Chitra's response to the Pastiche Scenarios opened conversations about her socio-cultural context, leading into discussions about her experiences with mobile phone hacking, her fear of criminal gangs and her anxiety around ATMs. Chitra's response showed that her anxieties around digital technology were permeated by a fear of crime and a 'factish' understanding of how digital devices worked. Fuelled by fake news and viral messages, Chitra's scenario led to discussions about how her fears around digital devices led to behaviours and rituals that helped soothe her digital anxieties. The Pastiche Scenarios acted as jumping off points that allowed Chitra to begin to speak about her experiences in fictionalized terms, transitioning into more open-ended discussion about her lived realities in a non-WEIRD country. Starting with discussions

of Chitra's scenario, the interview and subsequent conversations slowly began to transition to stories about Chitra, her identity, the social and political situation in her city and the use of digital devices in her daily life.

## 2.6 About the Key Informant - The Story of Chitra from Kahani

Chitra is a senior citizen who works for a prominent left-wing political party in the Indian city of Kahani. Chitra and Kahani are pseudonyms that have been used to protect the identity of the participant. Due to the volatile political situation in which the participant was active there would be danger to her safety were she to be identified. We therefore are not going to compromise her identity in any way by revealing details that could identify her. The name Chitra comes from the Hindi word meaning photograph, drawing or image, in reference to the way that her story is revealed through the drawings in this paper. Kahani, meaning story, is the name of the fictional city in Salman Rushdie's novel *Haroun and the Sea of Stories* [38]. Described as "a sad city, the saddest of cities, a city so ruinously sad it had forgotten its name" [38], the city of Kahani is said to be the source of all stories. Chitra describes Kahani as a lawless and frightening place, reeling under the oppression of a surveillance state, an epidemic of hatemongering, fake news, and digital crime, with apathetic citizens who incarcerate, ignore, and exclude older people. A fear of criminal gangs haunts Chitra's digital relationships – from her mobile phone to her laptop and the ATM, no digital device is considered safe from the criminals who operate in gangs, who place devices on the ATM, who hack into bank accounts through mobile phone viruses, who hatemonger and spread political propaganda online. Chitra describes these criminals as unemployed youth trying to make a quick buck, supporters of the oppressive state who roam about physical and digital spaces in a lawless way, committing crimes and acts of aggression against innocent citizens. Chitra comments about the unemployed youngsters:

Think about the youth. They are becoming the goons. They are jobless. Someone gives you fifty bucks and says go and beat that one up. One day they will refuse, the next day you will refuse but eventually you will succumb, It's a very big thing. (Chitra)

As part of her work as a political activist, Chitra spends much of her time on social media, posting political messages on WhatsApp, Facebook and Twitter, managing the party's social media accounts and engaging in meetings and discussions. On social media, she is confronted by a constant stream of hate messages, viral videos, fake news and forwards. Chitra comments that "These people are sending in these, what are they called? To hack, what is it? Viruses, via numbers, via WhatsApp messages so they are sending these viruses" and that the hackers "pay people to generate hate messages on twitter" and that "The hatemongering is leading to crime." The infiltration of hate messages creates an environment of fear, anxiety and nervousness around technology. Chitra reflects on the effect that the hate messages are having on her commenting that "It's very serious. These are things of the mind. These ideas infiltrate the mind." (Chitra). One day, A text message on Chitra's phone leads her to believe that her bank account has been hacked, viral videos

about gangs hacking into ATMs makes her develop a fear of ATM machines. Chitra recounts her experience of mobile phone hacking:

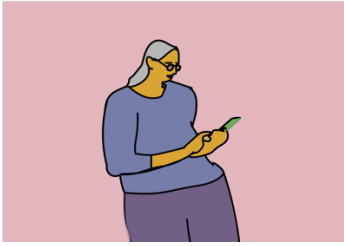
My phone was hacked. I had to umm. Block my account. So ever since I have been nervous about using the ATM and giving my pin into the ATM because what if the ATM is hacked? There have been cases where the ATM has been hacked. They stick, they put all kinds of things into the ATM and that copies your pin number. (Chitra)

The phone hacking incident prompts a mistrust of digital devices that permeates all Chitra's technological interactions as she observes how her age makes her vulnerable to digital crime. Chitra forwards me a news article that reads 'Fraudsters target the elderly, late adopters of technology,' and her age makes her fear the consequences of a criminal stealing her bank account details. Chitra experiences a sense of stress and loss at the bank. She describes feeling nervous every time she is in front of an ATM. She is unable to operate the ATM machine and observes another elderly couple who seem to be struggling with the same thing. She expresses feelings of helplessness in the fact that "there is nobody to help" (Chitra), even though the bank was not understaffed. She speaks of a sense of betrayal and incarceration by society, technology and the youth, of being left behind and completely alone. Chitra comments on how the ATMs are not made for senior citizens, because "They say, conceal the number while accessing it, you conceal your fingers, what do you call it? The keyboard. So you have got your walking stick and you are punching and you want me to conceal it also?" (Chitra). A series of news stories about senior citizen activists like herself being incarcerated by the opposition party brings Chitra to question how her digital devices might open possibilities of government spying. She voices her concerns about the potential for her phone and laptop to be hacked by state authorities, commenting:

Among those who have been incarcerated, many of them are senior citizens. It has been found out that their computers were hacked. Once you can enter a device, private space, you can change the truth, no? You can fake the facts. (Chitra)

The feeling of incarceration extends to a sense of being left out of society, excluded and alienated. Chitra feels betrayed by society, technology and the youth, commenting that "they are forgetting, the senior citizen is definitely being left behind." (Chitra). For her, technology is too complicated, overpowering, upsetting and she find herself totally illiterate in the digital realm while the youth want new software, it excites them, she says. For her, the youth are having a great time and they are "completely glued to tech" (Chitra) while senior citizens are incarcerated by society and technology.

Chitra's story within the socio-cultural context of Kahani offered a unique and rich case study to apply and test the concept of Data Gates. Chitra's job in a political party and her extensive engagement with activism on social media were as important as her age in defining her identity, reflecting how older people are not a homogenous group [10, 49]. Her work as an activist and member of a prominent political organization provided an uncommon setting with the potential to disrupt expectations of technology use by older adults. Chitra was open in discussing the intimate details of her life and developed a strong rapport with the researcher. As the research study was fully remote due to restrictions caused by the Covid-19 pandemic, Chitra's extensive engagement with digital technology, social media and in particular WhatsApp allowed her



**Figure 4: Chitra holding her phone far from her face due to her poor eyesight. Authors' Image.**

to participate actively in the research. For these reasons, Chitra became a key informant in the research study.

## 2.7 Drawing as a method

Drawing is a good way to maintain the anonymity of participants while still capturing ethnographic data visually [24, 26]. We stitched together scenes and scenarios based on descriptions of events such as Chitra's experience of using an ATM machine. Rich descriptions from interviews have been used to construct images of events, devices, interactions, places and people in the participant's life. The semiologist Roland Barthes argued that everything we make contains traces of narrative— texts, photographs, advertisements, paintings, products, myths, folklore, comic strips and conversation [4]. While ethnographic transcripts and field notes capture meanings from the field in the form of text, ethnographic sketches encode symbolic meaning in the form of drawings.

Elements of the picture – from the colour of the participant's skin to the body postures and the technologies are symbols that stand in for meanings about the participant's lifeworld, social and cultural contexts and their relationship to technology. The images of Chitra were annotated with observations. Both the drawings and annotations were used as a reflective tool to think through Chitra's interactions and helped distil findings and discussions about the role of digital rituals in Chitra's life. The conversation continued as Chitra began sending pictures from her life and her environment taken by her as well as pictures of herself with various digital devices taken by her family, friends and domestic help.

Due to the restrictions caused by Covid-19, it was not possible to meet Chitra in person or conduct traditional field research. However, the images sent by Chitra provided a glimpse into her life, the devices she used and her interactions with digital technology. Some of the real images of Chitra, such as of her at the mobile phone repair shop, were translated into drawings, shared with the research team and used as conversation and discussion pieces. Other images, such as the drawing of Chitra at the ATM and the drawing of her using her phone or the passwords attacking her at night were a mix of reality and fiction, woven with observations from video calls and descriptions narrated by Chitra.

Chitra's positive reactions to the drawings helped develop a trusting and close relationship between participant and researcher. After seeing the first illustration of herself holding her phone Chitra offered suggestions for more drawings. The scenarios described by Chitra wove real-life personal experiences with fiction and magical realism. For example, one of the 'magical' scenarios describes her



**Figure 5: Chitra being attacked by incorrect passwords in her sleep. Authors' Image.**

digital instructions attacking her like a rainstorm in bed at night. Chitra comments:

Liked your illustrations. . . Very evocative.

If that old lady is at the ATM, bending over a stick in one hand & holding a grocery bag in the other, you don't need any caption!

One scenario can have her lying in bed at night, with the digital instructions attacking her, like a rainstorm!

Aloneness plus Alienation from the rushed pace & the bewildering design for daily living! (Chitra)

On showing Chitra some more illustrations of her at the ATM and, she replied saying that "Your VISUALS are excellent! Lang has become a barrier in communication. . . illustrations like yours, make an instant connect." (Chitra).

Older people, seen through youthful eyes, are often othered, homogenised or stereotyped, enhancing negative views of the elderly, already marginalised and excluded from modern technology [8, 29, 46]. Negative stereotypes of older people include words such as 'ugly', 'unattractive', 'inflexible' and 'boring' [44]. In response to a 2019 exhibition of digital drawings focusing on the passage of time, David Hockney's long time muse Celia Bertwell recoiled in horror at a painting of herself as an older woman, exclaiming "It's horrible!" [18]. She dubbed the final room of the exhibition, where her sepia portrait was displayed, "The cruel room" [17]. Hockney's portrait of Celia reflects a long tradition in art where bright colours are seldom used when drawing the elderly and paintings and photographs of the elderly draw attention to the features of aging – wrinkles, saggy skin, hair loss, what John Berger calls "utter truth" [6]. Older people are often depicted as grotesque in images which can be distressing and alienating [11, 17]. Our sketches of Chitra use bright colours and cartoon-style flat design to create a playful atmosphere.

The drawings helped further understandings of Chitra's socio-cultural context by acting as a talking point for the research team and acted as conversation starters to prompt dialogue between researcher and participant [26]. Co-creation is a creative experience that is shared between both researcher and participant and refers to collective creativity [39]. We would show Chitra our drawings and she would reply with comments and reactions and most often descriptions of new scenarios, events and encounters to be drawn. She became eager to share more stories, suggesting poses, incidents and emotions to draw from. In this way, the images of Chitra were dialogic [26], acting as a conversation piece for co-creation [39].



**Figure 6: Chitra alone at the ATM, hiding the PIN pad. Authors' Image.**

### 3 FINDINGS

#### 3.1 Digital Rituals in performance

Chitra's interactions with the digital world show that factish behaviours form in her ubiquitous computing environment and that these behaviours often take the form of digital rituals – repetitive actions that create a soothing effect.

*3.1.1 Digital Rituals in Public Space.* The ATM is an object of immense anxiety, nervousness, and mistrust for Chitra [49, 50]. During our conversations, Chitra recounted an incident when a text message on her phone led her to believe that her bank account has been hacked. The incident with her phone coupled with viral videos about gangs hacking into ATMs made her develop a fear of ATM machines [48, 50]. Chitra develops a ritual of covering the PIN Pad at the ATM to prevent potential criminals from stealing her ATM PIN. The ritual of covering the PIN Pad allows Chitra to transform her emotional state from one of anxiousness, nervousness and insecurity to pacification and security. Chitra comments that the ATM was empty except for another elderly couple. While there is apparent meaninglessness in the hiding of a PIN Pad when there is nobody around to see her PIN, the ritual nevertheless enables a transformation in Chitra's emotional state.

*3.1.2 Digital Rites of Passage.* Chitra goes to a local mobile phone repair shop whenever she encounters a technical issue with one of her several digital devices. An example of two messages from Chitra convey panic followed by a visit to the shop and a series of actions that leave Chitra feeling reassured. She often leaves the store having purchased new accessories and devices such as a new tablet stand, a mobile phone cover or a power bank, contributing to her state of satisfaction upon exit. The salespeople at the mobile repair shop at times repair Chitra's broken down devices or help her with digital issues such as logging into her Facebook account but on most occasions Chitra described in her interviews and messages, rather than fixing her technical difficulties, the salespeople would sell her new accessories like a mobile phone cover, a tablet stand or a phone charger. The new products sometimes did not practically work, such as the tablet stand that was unsteady and kept falling over but provided a talismanic effect, leaving Chitra with a reassurance that the new product would help fix her digital problems. The repair shop allows the creation of what Louise Amoore calls 'liminal space' [2] where both Chitra and her devices are transformed. Liminal spaces, like Airports [2], are ambiguous and disorienting, they can be both the sites of ritual and also rites of passage.



**Figure 7: A salesman at the mobile repair shop selling Chitra a tablet stand. Authors' Image.**



**Figure 8: Chitra using her tablet at her digital altar. Authors' Image.**

Liminal spaces feature in many rituals and rites of passage [40] they are spaces where transformations can occur [2]. The ritual visit to the busy, bustling and disorienting mobile repair shop opens a transformative liminal space that outlines distinct 'before' states – anxiety, discomfort, mistrust, insecurity and 'after' states – reassurance, comfort, trust and security. The text message from Chitra below discloses her panic at finding her phone touch screen disabled. She could not log on to FB (Facebook), a visit to the repair shop, however, leaves her reassured and she comments that there is nothing urgent. She writes :

My phone touch screen was suddenly disabled, this morning!

Panic! Imp Fb LIVE Tom.

Had this tab, transferred Data, bought the stand.

The Whole day vanished!

Couldn't get the repair store guy to log on to FB!

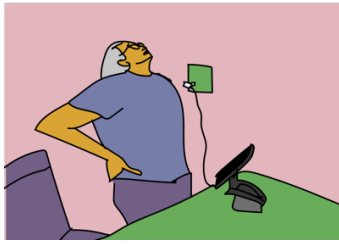
SERVER IS DOWN

He's called me tom.

Anyway nothing urgent on FB right now

Got my updates from Twitter/ Insta. (Chitra)

At home, Chitra's tablet stand is held down by a model Egyptian pyramid from a trip to Egypt. The tablet stand was unstable - initially, the pyramid was placed to stop the stand from falling over. Now, the shrine has evolved, and the pyramid gives it a talismanic appearance. The stand is arranged carefully on a piece of lace cloth, surrounded by pictures of flowers, butterflies, and trees. Chitra mentions that she wants to expand the sacred space to include her other digital devices. The creation of sacred space provides Chitra a place where she can be transformed by her digital devices.



**Figure 9: Chitra stretching near her tablet. Authors' Image.**

**3.1.3 Digital Rituals as Metamorphosis.** A text message from Chitra suggests we read “The Metamorphosis” by Franz Kafka, a story in which the protagonist, Gregor Samsa turns into an insect [7]:

Just remembered a book which you might find relevant to your work. . .

The title is Metamorphoses

Author: Franz Kafka.

Enjoy! (Chitra)

Kafka’s story implies that transformation can be a response to alienation as it forces the transformed to observe their situation from a new vantage point [7]. Kafka’s protagonist Gregor’s last name, Samsa, in Czech translates to ‘I am alone’ [7]. Gregor’s alienation from society, his rejection of his job and family, force him to transform into a new identity and through his transformed self, as an insect, Gregor can look at his existence from outside it. Kafka’s metamorphosis shows how physical transformations are responses that cope with alienation from social and cultural realities. Alienation is a common feature of Chitra’s technological interactions. She finds technology, oppressive, exclusionary towards older people like her [8]. According to Chitra, technology is not designed for older people [8] and her digital interactions often incarcerate her for her mistakes. She describes ATM machines that contort her body by forcing her to juggle shopping bags, walking sticks and debit cards. Prolonged use of a tablet cause neck pains and stiffness. Chitra’s body is contorted into strange postures [32], constructed by the constraints of digital devices.

Reading text on a small screen or plugging in an invisible charging cable force her body into awkward postures, sometimes for prolonged periods of time. Bodily contortions are often accompanied by anxiety, the charging cable that won’t fit and the tweet text that’s too small to read. Regular stretching must be performed to relieve body aches, to unentangle the body and calm the mind. The embodied aspects of her interactions are emphasised in the drawings which distort hand and head size to stress the ways that Chitra has to stretch or contract herself to fit the technology. Chitra adopts a series of ritual stretching postures that act as a coping mechanism for the alienation and anxiety inflicted upon her by her devices. These stretches allow her to reset and step back and emerge with feelings of comfort and reassurance.

**3.1.4 Digital Border Control Rituals.** Chitra is often locked out of her devices and social media accounts due to her inability to remember PINs, IDs and passwords. Forgetting her ATM PIN number makes it impossible for her to withdraw money. The ATM refuses to comply and finally, after three failed attempts at entering her PIN,

she is locked out of the machine. Cryptic messages from her devices do little to explain the situation. In one instance, she is asked to wait exactly 10 hours and 2 minutes before reattempting a login. Digital border cultures are ‘creative, chaotic, liminal’ [2] spaces and “at the border you ‘play’ yourself and hope you are convincing” [2]. Gatekeepers of access to digital realms - the liminal spaces of login-in screens, present familiar rituals. Mandatory declarations of ‘I am not a robot’, identifying streetlamps and bicycles, agreeing to privacy policies seem sardonic but necessary to establish the appearance of security. Digital Border control rituals delineate the secure from the insecure, the hacker from the honest user [2]. They also create and sustain identities, in Chitra’s case, digital border cultures make her aware of her age, as someone who can’t remember passwords and to whom access is denied due to her inability to complete the border rituals. Victor Turner describes rituals as a process of transition from one state to another [47]. Digital border control rituals open transition spaces through which feelings of security are enacted through the performance of repetitive and absurd tasks. And so, sacred spaces, sacred objects and sacred actions coalesce into a framework of activities that provide Chitra solace in a digital world that she mistrusts.

Chitra forwarded a message about fraudsters targeting older adults in digital crimes. In response to her message, we sent Chitra a drawing of her wearing a Data Gate as an amulet to protect her from internet fraudsters, accompanied by the following message

News story - fraudsters targeting senior citizens....

Reaction - You put on a Data Gate necklace. The Data Gate detects and removes viruses. The necklace glows to show that your device is safe from fraudsters. How do you feel? (First Author)

Chitra replied with the following message:

Great idea!

Maybe the chain should be longer?

No harmful radiation emitted? (Chitra)

When we tried to address Chitra’s anxieties about fraudsters, it seems we had created new anxieties about the Data Gates. Chitra was afraid that the glowing necklace might emit harmful radiation. Solutions to technological problems usually create problems of their own and in this case, the factish solution to one problem had resulted in factish concerns of its own. Ultimately, Chitra’s reply to the concept of the Data Gates necklace reiterated the fact that states of trust would require designing for factish and ritualistic understandings of the digital world.

## 4 DISCUSSION

A large majority of HCI case studies focus on WEIRD (Western, Educated, Industrialized, Rich, and Democratic) participants [42]. The story of Chitra from Kahani in India contributes a counter-narrative that has been marginalized in HCI studies- a non-western participant living under what she describes as an oppressive state. There is a wealth of knowledge to be gained from studying diverse socio-cultural contexts of digital technology use as is apparent from the understandings of ritual that evolved from Chitra’s case study. Misinformation, fake news and viral videos are increasingly impacting the way that digital technology is consumed, perceived and used in India [3] and Chitra’s case study shed insight into how factish environments can fuel factish relationships with digital



technology. Additionally, studies of digital wellbeing amongst older adults tend to focus on age as the key feature of older people's identity, often viewing older people as a homogenous group [8, 10], centred around care homes, age-related diseases and disabilities or monitoring devices for falls and accidents. Although stereotypes are not meaningless, their meanings are predictable [10]. It is therefore important to study non-stereotypical older people to defamiliarize meanings about old age [8, 10]. Chitra's political activism, her extensive use of social media and her work for her political party offer new descriptions of how older people engage with digital devices. She is an older woman who is able, mobile, digitally literate, embedded in social media cultures and to whom digital devices are central to her work as a political activist. The way Chitra responds to and copes with the anxieties of the digital world, therefore, are not only focused on age-related issues such as accessibility and usability but also on her identity as a political activist in a socio-cultural context that amplifies misinformation.

The case study with Chitra identified the presence of factish and superstitious behaviours that present around anxieties caused by her ubiquitous digital world. The digital rituals we identified in Chitra's daily life were the act of covering the ATM PIN as a factish ritual, even when no one was watching her, visiting the mobile repair shop as a source of trust and reassurance, stretching as a ritual to transition to a state of comfort, the creation of a ritualistic altar space for her devices and her experience of passwords and login screens as digital border control rituals that restrict her access to digital services in factish ways. Digital rituals are used to cope with mistrust, insecurity, surveillance, and alienation, transforming Chitra's emotional state towards feelings of trust, comfort, security, and reassurance. Schechner suggests that rituals are "short-circuit solutions to impossible problems" [40]. The impossible problem in Chitra's case, feelings of anxiety, nervousness, mistrust, and insecurity around digital technology, is assuaged by the performance of quick, repetitive actions. The objective of ritual is to replace ordinary experience with a hyper-experience and in this way, rituals have a soothing effect [40]. Findings reveal how digital rituals open transformative liminal spaces that outline distinct 'before' states – anxiety, discomfort, mistrust, insecurity and 'after' states – reassurance, comfort, trust, and security.

Rituals create performative spaces that are 'ludic, 'extraordinary', 'transformative' and 'unsettling' [2] While initial concepts of the Data Gates were functional in their approach to controlling and restricting ubiquitous space, the insights from Chitra's study indicate that a more factish approach to designing the Data Gates might be necessary. As Dunne and Raby said of the Placebo Project,

We are not interested in whether these stories are true or scientific, we are interested in the narratives people develop to explain and relate to electronic technologies. [20]

The complexities of reality can translate and dislocate objects from their original construction by attributing fetishised or talismanic properties to things. In this way, talismans and factish objects allow technology to pass from construction into practice embedded in highly complex socio-cultural contexts [27]. Talismanic objects like, Dunne and Raby's Compass Table and digital rituals like Chitra's visit to the mobile repair shop work because they transform mental and emotional states, not simply because of any specific

aspect of its construction such as technical functionality or embedded electronics. The case study with Chitra opens a design space for factish objects and rituals in the Internet of Things that could provide such transformative encounters. A Data Gate could be worn as an amulet or talisman to offer protection from face recognition cameras or prying smart speakers near one's body. The wearing of a Data Gate talisman could become a ritual that allows a transition into states of trust and security. Rituals often coalesce around border controls, presenting as performative theatrical spectacles [2]. Airport security rituals create such transformative spaces where one is ushered through a series of repetitive actions that culminate in a feeling of security [2]. Internet websites now present their own border rituals in the form of privacy policies, login screens and image recognition tasks.

As the IoT gains shape and digital space becomes ever more ubiquitous and homogenous, the delineation of digital borders and the rituals of access control become increasingly important. How will we come to distinguish secure space from insecure space, a trusted device from an untrusted device, an area of surveillance from non-surveilled space? How will we be ushered through ubiquitous digital space with feelings of trust, security, privacy and comfort? Acting as border control mechanisms, forming and sustaining digital borders, gatekeepers and border control rituals could be established using technologies such as Data Gates. Rather than focusing on technical or profane solutions to establishing trust, a factish design space would focus on the felt life, the talismanic and transformational potential of ritual actions, ritual spaces and ritual objects. However, we noted that in identifying rituals as having calming, anxiety relieving effects when engaging with technologies, rituals and factish talismans have the potential to mask rather than to confront the concerns that people have, hence allowing the continual invasion of privacy and other unwelcome impacts of ubiquitous technology to continue unchallenged. By creating a soothing effect, rituals can become a quick-fix solution that protects us from confronting directly the problems with ubiquitous technology. Factishes may have negative consequences but are critical in understanding how technologies come to be embedded in socio-cultural realities. The study of digital rituals and factish responses to digital technology are therefore not an alternative to solutionism but rather an acknowledgement of the complexity of our technological interactions.

The concept of Data Gates and the study of Chitra's context did not offer any solutions but rather opened new possibilities. The Data Gates technology remains open to interpretation [41] both at the beginning and the end of the study and, without fixing a specific 'use' of the technology, we create around it a new design space for factish and talismanic responses to the growing effect of a ubiquitous IoT. We invite researchers to contribute to the 'felt-life' aspects of IoT trust by studying emerging digital rituals and factish objects, particularly in non-WEIRD contexts.

## 5 CONCLUSION

This paper used a multi method approach to explore a design concept called Data Gates in the context of the daily life of Chitra, an older woman from the city of Kahani in India. Interviews and

conversations that emerged resulted in series of drawings that capture the performance of digital rituals in Chitra's life. The value of drawing is discussed as a method for supporting co-creation between researcher and participant. Findings identified the presence of factish behaviours in Chitra's response to ubiquitous computing environments, revealing how digital rituals allow a transition from states of mistrust, insecurity and anxiety towards trust, security and reassurance. The case study is discussed as a contribution to non-WEIRD research into digital technology. Findings from the paper open up a new design space for digital rituals and factish behaviours as transitions to trust and security in the Internet of Things.

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