

# **Infrastructure Justice and Humanitarianism: Blockchain's Promises in Practice**

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الجنة تحت أقدام الأمهات

*Al-jannatu tahta aqdaamil ummahaat*

Paradise lies beneath the feet of mothers

(a Muslim saying attributed to the Prophet Muhammad)

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## Table of Contents

الجنة تحت أقدام الأمهات .....	2
<b><u>ACKNOWLEDGEMENTS .....</u></b>	<b>3</b>
<b><u>ABSTRACT.....</u></b>	<b>9</b>
<b><u>ABBREVIATIONS.....</u></b>	<b>11</b>
<b><u>FIGURES.....</u></b>	<b>12</b>
<b><u>CHAPTER 1: INTRODUCTION.....</u></b>	<b>14</b>
1.1. BLOCKCHAIN REVOLUTION? .....	14
1.2. THESIS SUMMARY .....	21
<b><u>CHAPTER 2: CONTEXTUAL BACKGROUND.....</u></b>	<b>27</b>
2.1. THE LINKS PROJECT .....	27
2.2. WHAT IS/ARE BLOCKCHAIN(S)? .....	38
2.3. BLOCKCHAIN IN AID .....	45
<b><u>CHAPTER 3: INFRASTRUCTURE JUSTICE .....</u></b>	<b>52</b>
3.1. BLOCKCHAIN AS INFRASTRUCTURE .....	52
3.2. TOWARDS <i>INFRASTRUCTURE JUSTICE</i> .....	64
3.3. THEORETICAL BACKGROUND.....	68
3.3.1. HUMANITARIAN GOVERNANCE.....	69
3.3.2. LOCAL AID WORK.....	87
3.3.3. REFUGEE WOMEN’S EMPOWERMENT .....	94
3.3. RESEARCH QUESTIONS .....	100
<b><u>CHAPTER 4: METHODOLOGY.....</u></b>	<b>103</b>
4.1. RESEARCH ETHICS.....	105
4.2. RESEARCH DESIGN SUMMARY .....	106
4.3. INTER-STAKEHOLDER DYNAMICS: ETHNOGRAPHY ACROSS COMMUNITIES .....	109
4.4. INTRA-STAKEHOLDER DYNAMICS: COMMUNITY-SPECIFIC CONCERNS .....	123
4.5. CONCLUSION.....	162
<b><u>CHAPTER 5: TRUST, POWER, AND PRIVACY: HUMANITARIAN GOVERNANCE AFTER BLOCKCHAIN .....</u></b>	<b>164</b>

5.1. TRUSTLESS TRUST .....	165
5.2. DECENTRALISATION .....	178
5.3. TRANSPARENT PRIVACY .....	189
5.4. FAITH AND INFRASTRUCTURE .....	204
5.5. CONCLUSION.....	211

**CHAPTER 6: AID WORK, BLOCKCHAIN, AND LABOUR..... 218**

6.1. THE POLITICS OF LIQUIDITY .....	222
6.2. THE RHYTHMS OF DATA WORK .....	229
6.3. BLOCKCHAIN HIERARCHY: THE DELEGATION OF AUTHORITY .....	232
6.4. THE POLITICS OF IGNORANCE AND COLONIALITY.....	237
6.5. CONCLUSION.....	249

**CHAPTER 7: FAITH AND FAILURE: REFUGEES’ CULTURAL CONTESTATIONS  
..... 253**

7.1. WHAT IS THE IMPACT OF INVISIBLE INFRASTRUCTURE? .....	253
7.2. MONEY, GENDER, AND SPACE.....	259
7.3. DO MUSLIM WOMEN REALLY NEED BIOMETRICS?.....	269
7.4. UNSETTLED MATTERS: MONEY TECHNOLOGIES AND ACCOUNTING .....	278
7.5. TOWARDS <i>BARAKEH</i> AID? .....	292

**CHAPTER 8: DISCUSSION AND CONCLUSION ..... 297**

8.1. JUSTICE IN THE VALUING OF SUBJECTIVITIES .....	300
8.2. JUSTICE IN THE REGULATION OF TIMESCAPES .....	305
8.3. JUSTICE IN THE MATERIAL DISTRIBUTION OF RESOURCES, LABOUR, AND AUTHORITY ....	308
8.4. POLICY DIRECTIONS .....	311
8.5. REFLECTIONS ON THE STUDY .....	316
8.6. FUTURE RESEARCH.....	318

**BIBLIOGRAPHY ..... 321**

**APPENDIX I..... 348**

MAY 2018 SURVEY (ENGLISH).....	348
MAY 2018 SURVEY (ARABIC).....	352

**APPENDIX II..... 357**

DECEMBER 2019 FOCUS GROUP FACILITATION GUIDE (ENGLISH) .....	357
DECEMBER 2019 FOCUS GROUP FACILITATION GUIDE (ARABIC) .....	360



# Abstract

Proponents of the decentralised database technology blockchain suggest it will revolutionise the aid sector by allowing money and data to be exchanged more equitably, efficiently, transparently, and securely. Blockchain is widely expected to improve refugee identification, cross-border remittances, supply chain management and more. However, humanitarian blockchain projects are nascent and there is a lack of critical scholarship on how the promises for blockchain are playing out in practice. This thesis provides the first comprehensive, theoretically informed, empirically grounded case study of the use of blockchain in humanitarianism. I investigate the imaginaries, uses and effects of blockchain in anthropological terms, based on close-up work with the key stakeholder communities connected to a pilot project in Jordan's refugee camps, which in 2019 began using blockchain to deliver financial aid to Syrian refugee women. Drawing together a range of perspectives on the same project, I show how the aspirations for this new technology materialise, in support of some priorities—those of UN donors, agencies and their corporate and government partners—at the expense of others—aid workers and refugees.

Building on critical data studies, infrastructure studies, and aid and migration studies, I put forward the theoretical frame of *infrastructure justice*. With this, I advance scholarship on socio-economic injustices and political hegemonies in the digital age. I argue that injustices are experienced, extended, and contested through three interlocking dimensions of infrastructure: subjectivities, timescapes, and materialities. I demonstrate how strongly affective cultural and subjective experiences with blockchain—involving suspicion, ignorance, mystification, and faith—connect with the asymmetrical regulation of information, material resources and strategic interests over space and time. This thesis gives fresh insight into how radical, emergent

technology implemented at socio-economic margins both challenges and is incorporated into the structures of global governance, and in particular how it is experienced by its presumed beneficiaries.

# Abbreviations

\* Certain entities have been pseudonymised. See Chapter 4, section 4.4.3.

AML	Anti-Money Laundering regulation
ATM	Automated Teller Machine
*BASS	United Nations Basic Assistance
*BEN	Beneficiary Database (used by GEN)
CaLP	Cash Learning Partnership
COVID-19	Coronavirus Disease 2019
CUREC	The Central University Research Ethics Committee
DAO	Decentralised Autonomous Organisation
DLT	Distributed Ledger Technology
ESRC	Economic and Social Research Council
EU	European Union
*GEN	United Nations Gender
IASC	United Nations Inter-Agency Standing Committee
ICT	Information and Communication Technologies
ICRC	International Committee of the Red Cross
ID	Identity Document
IFRC	International Federation of Red Cross and Red Crescent Societies
JD	Jordanian Dinars
KPI	Key Performance Indicator
KYC	Know Your Customer regulation
LGBTQ	Lesbian, Gay, Bisexual, Transgender, and Queer
NGO	Non-Governmental Organisation
ODI	Overseas Development Institute
OII	Oxford Internet Institute
PII	Personally Identifiable Information
SOP	Standard Operating Procedure
SRAD	The Syrian Refugee Affairs Directorate of the Jordanian Government
STS	Science and Technology Studies
*TIME	Timesheet Database (used by GEN)
UN	United Nations
UNCDF	UN Capital Development Fund
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNHCR	United Nations High Commissioner for Refugees
UNICC	United Nations International Computing Centre
UNICEF	United Nations Children’s Fund
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
UNOPS	United Nations Operations
UN SDG	United Nations Sustainable Development Goal
W3C	The World Wide Web Consortium

# Figures

Figure 1: A non-exhaustive chronology of key developments in the Bedrock project and some major points in my research	31
Figures 2 & 3: The most recent maps of Zaatari and Azraq refugee camps produced by the UNHCR	34
Figure 4: The major actors with a stake in and influencing the Bedrock project in Jordan	37
Figure 5: The structure of centralised, decentralised, and distributed networks	42
Figures 6, 7 & 8: Setting the scene: the women’s cash-for-work centres (the Wahat) in Zaatari and Azraq	124
Figure 9: Tapestry by Wahat workers	127
Figures 10 & 11: Two different caravans we used for focus groups in December 2019	136
Figure 12: My eye displayed on the cashier’s screen at the supermarket in Zaatari, December 2018	140
Figure 13: Two discussion groups completing the baseline survey in the largest women’s centre in Zaatari, May 2018	142
Figure 14: Base camp for humanitarian organisations in Zaatari, December 2019	144
Figure 15: Example notes from group brainstorm with GEN aid workers and the monitoring and evaluation team in December 2019	146
Figure 16: Representatives from different stakeholder groups present visual depictions of what a successful blockchain pilot would look like, June 2019	151
Figure 17: Model depicting early construction work and food delivery in Zaatari camp, BASS Jordan office	155
Figure 18: Visualisation of ‘what success looks like’ for GEN’s blockchain pilot project	186
Figure 19: UN GEN workers’ paper timesheets, December 2019	215
Figure 20: Laptop screen shows TIME dataset, i.e., the Excel sheets GEN camp staff enter the beneficiary labour data into	216
Figure 21: Laptop displaying GEN’s Bedrock interface for camp staff	217
Figure 22: Flow chart: monthly salary distribution pre-blockchain pilot	223
Figure 23: Flow chart: the salary distribution process in GEN’s blockchain pilot	224
Figure 24: Diagram of how camp staff trigger the financial transfers	230

Figure 25: Hierarchy diagram of data processing by users of the GEN blockchain platform	235
Figure 26: The bleak view between one district and another in Azraq, December 2018	260
Figure 27: A Wahat worker about to have her iris scanned by the cashier	266
Figure 28: Outside Zaatari's Tazweed supermarket	269
Figure 29: Workers query information on their receipts at the checkout in Tazweed supermarket, Zaatari camp, 6th December 2019	287

# Chapter 1: Introduction

## 1.1. Blockchain revolution?

‘Blockchain makes it possible to solve inequality at its root’  
*The Washington Post*, 2018

‘[Blockchain] technology could help millions of refugees, by solving some  
of the most critical problems they face’  
World Economic Forum, 2018

‘For the United Nations to deliver better on our mandate in the digital age,  
we need to embrace technologies like blockchain that can help accelerate  
the achievement of Sustainable Development Goals’  
UN Secretary General António Guterres in *Forbes*, 2019

I first heard of blockchain in 2016 at a big international conference at the United Nations headquarters. The conference was convened by a project called ID2020, which was established to address the UN Sustainable Development Goal 16.9 (ID2020, 2016). They proposed that to achieve universal social and economic inclusion, everyone in the world should have access to a legal identity, including birth registration, by 2030. At the event, the most-discussed potential means of achieving this goal was blockchain. This type of database technology was touted as the decentralised commons resource that would secure global identity records. Participants from the technology, finance and aid industries alike promoted blockchain as a beacon of hope for marginalised and undocumented people. As a student of anthropology working on the digital practices and needs of refugees, I was perplexed. It was difficult to understand what blockchain was, and how it was different to a shared database, or even just digitalisation. All the explanations I found seemed abstract and highly technical. It was not obvious how exactly blockchain could help people access asylum after fleeing conflict, resist the dispossession of their land and property rights, or mitigate global inequalities.

With some digging, it became clear that blockchain has captured imaginations since its rise to fame in 2009 as the digital infrastructure underpinning the cryptocurrency Bitcoin. Invented by a mysterious cryptographer going by the pseudonym Satoshi Nakamoto, blockchain allows digital transactions to happen pseudonymously, across borders, and outside the mechanisms of institutions like banks, payment processors and states. With blockchain in place, transactions can be reconciled using algorithms instead of centralised authorities. It has been linked with the radical libertarianism of cyberpunks and crypto-anarchists. In other words, the technology's invention was rooted in political ideals about free markets, free speech, and, in response to the institutional failures in the global financial crisis of 2007-8, a strong distrust of intermediaries of any kind (Baym, Swartz, & Alarcon, 2019).

However, in the last few years, the politics of blockchain has become slippery. It is now no longer only a niche, subversive technology, but a major protagonist alongside artificial intelligence, cloud computing and robotics in debates about the future of human societies (Schwab, 2018). Blockchain has gone mainstream. It is widely expected to disrupt the established infrastructures of governance and finance, allowing money and data to be exchanged in more decentralised and equitable, efficient and trackable, secure and privacy-protecting ways (Del Castillo, 2021; Mulligan, 2020; OECD, 2020). Different sorts of blockchains have emerged since Bitcoin, enabling a great variety of blockchain-based projects, from the ambitious to the humdrum. For example, some blockchain initiatives focus on cutting corruptible or powerful centralised parties out of the fabric of socio-economic relations, from voting machines, marriage authorities, and insurance companies to Facebook (now Meta) and Amazon (Frederik, 2020). Others are focused on mundane administrative tasks like companies' internal bookkeeping and

audit (Swartz, 2017). A litany of putative benefits<sup>1</sup> are now promoted by a broad range of actors with different sorts of motivations and agendas. Ironically, many of these actors are the intermediaries the technology was invented to circumvent, such as major banks, companies, and governments. This includes Meta (with their global financial inclusion project, the payment platform Diem), PayPal (who are funding a project which allows financial institutions to securely share customer identity checks), and governments around the globe (UK ministries are exploring how blockchains can be used to deliver benefits payments and secure digital evidence in the justice system; the Chinese state has declared blockchain a national priority for industrial development). New institutions have even been formed to reckon with the implications of this new technology. For example, the European Commission has set up a Blockchain Observatory and an International Association of Trusted Blockchain Applications, the OECD now hosts a major yearly Global Blockchain Policy Forum, and the new academic journal, *Frontiers in Blockchain*, approaches blockchain not as a sub-topic but as an entire discipline.

This thesis is motivated in part by an urge to understand how and why a type of database technology can come to be linked with such divergent political visions and such high hopes—and whether any of them are to be believed. As illustrated in the pronouncements quoted above, blockchain is anticipated to provide the conditions for the prosperity of the world’s most marginalised populations. In international aid, the technology is expected to serve a variety of roles. A central aspiration for humanitarian organisations is that it will enable the transparent, secure, and effective coordination, monitoring and delivery of activities. Major aid organisations have examined blockchain’s potential in enhancing the accountability, safety, and efficiency of

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<sup>1</sup> See Section 2.2. ‘What is/are blockchain(s)?’.

processes such as supply chain tracking, cash transfers, and refugee identification. Novel concepts have also emerged such as borderless cost-free remittances and ‘self-sovereign’ digital identity, which are soon expected to empower refugees and ‘unbanked’ populations in the Global South<sup>2</sup> (Cheesman, 2020). In 2022, blockchain continues to receive considerable attention and resource investment. New blockchain-focused reports, funding streams, jobs, projects, and coalitions have been set up by the International Red Cross and Red Crescent Movement, United Nations agencies, World Vision, Save the Children, the WEF, Oxfam, international donors, and many other key aid industry actors, in concert with technology companies and start-ups.

My research since 2016 has closely followed the field of humanitarian blockchains as it has emerged. Claims about blockchain are mostly vague, contested and rapidly shifting. Despite the hype, only a few tangible implementations exist in practice. A study of 43 use cases found a proliferation of articles and whitepapers about the technology’s potential benefits in aid, but no in-practice analysis or lessons learned, such as tend to be available for other technologies (Burg, Murphy, & Pétraud, 2018). The dearth of empirical investigations of the examples that do exist on-the-ground has been noted as a significant knowledge gap (Coppi & Fast, 2019; L. W. McDonald & Fast, 2019). More humanitarian blockchain initiatives are coming into existence. Little is known concretely about what impact blockchain is having on established aid institutions and humanitarian subjects alike.

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<sup>2</sup> I use the term Global South not as a strict geographic descriptor nor as a vague signifier like Third World or Developing World, but as a dynamic, plural construct that invites critique of structural relations of domination, discrimination, and dispossession as well as engagement with people’s resistances, alterities, and subversions (Carpi, 2019; Milan & Treré, 2019; Prashad, 2014).

The lack of clarity, evidence, or coherence around what blockchain can do or is doing, for whom, and how, has not gone unnoticed. Indeed, even more than the emancipatory claims, what has piqued my interest in blockchain is the heightened controversy and strongly affective responses around it. Depending on the interlocutor, it can be considered a revolutionary, emancipatory, awe-inspiring, bullshit, over-hyped, or confusing technology. The negatives now tend to outweigh the positives. Proponents and vendors of blockchain are now often scoffed at in academia and aid as, over the last several years, it has become a satirical subject with meme-like standing. For example, in the tech industry, the sarcastic refrain ‘put it on a blockchain!’ became emblematic of popular resistance to techno-solutionism and hype (Wired, 2018). At the major international summit on human rights in the digital age, RightsCon, a whole panel discussion was entitled ‘If you keep suggesting blockchain, I swear to God I will f-ing scream’ (RightsCon, 2019). The fear of missing out (‘FOMO’) has been identified as a perverse driving factor in the uptake of blockchain (Swartz, 2017). The technology has been likened to snake oil or magic beans as a poorly understood panacea unequipped to solve all the problems it is set up for (Gerard, 2017). Suspicion surrounds a number of projects which mysteriously invoke the name of blockchain but do not actually require or even use it, or any other form of distributed ledger technology (the generic technical term) (Frederik, 2020). By the same token, some projects do use blockchain but shy away from associating with the technology in their branding (X. Wang, 2020, p. 49). Blockchain is associated with misguided speculation, especially since many investors in cryptocurrency schemes made significant financial losses in recent years. There are also very concrete concerns around the implementation of blockchains: problems and misunderstandings around how they are governed (DuPont, 2018; Lehdonvirta, 2016; Sclavounis, 2017), whether they can be sufficiently regulated and comply with rules around data

protection, freedom of expression, and the right to be forgotten (Article 19, 2019; Finck, 2017; Renieris, 2019), the wasteful energy consumption some distributed systems require (Sedlmeir, Buhl, Fridgen, & Keller, 2020), and in general whether they are mature, tested and scalable enough to warrant widespread use (Renieris, 2020).

Some have suggested that the term blockchain is so ill-defined, overused and misunderstood that it has become totally meaningless (Jeffries, 2018). By contrast, I argue that blockchain is immensely meaningful. As I will elaborate, it is more than a technology. Blockchain is a *socio-technical infrastructure* animated by strongly affective dimensions, imaginaries, and rationalities. It is a thinking tool in debates about contemporary challenges and alternative possible societies and a discursive device used to extend techno-political agendas, drum up investment and reputational advantages. Technologies have long been revered and reviled in human culture, enrolled in mythic thinking and conflicting social visions (Pfaffenberger, 1988). Technological dreams and fetishes do not simply indicate false thinking. They are ‘social contracts in material form’ central in institutional and socio-cultural change (Graeber, 2005; Thomas, Nafus, & Sherman, 2018, p. 1). The aid industry has always been especially prone to fetishising new technologies as miraculous cures to the most complex and pressing of social problems like hunger and poverty (Scott-Smith, 2013, 2016, 2020). Technological objects are implicated in contemporary ideals about human progress and modernity and how they are imagined and commodified tells us much about the fields, systems, and institutions in which they are put to work, for example the international humanitarian system (ibid). The thorny debates around blockchain are enmeshed with and intervene in some of the biggest anxieties of our time, especially around the uneven distribution of information, power, and capital in the age of big

data, and how that is embroiled in systemic socio-economic inequalities, institutional failure, racial capitalism, and so-called refugee crises. The logics, practices, and outcomes around blockchain—especially for refugees—demand close critical examination.

In this thesis I ask: has blockchain lived up to its promises? I tackle the aspirations for blockchain and the suspicion, ignorance, and confusion around it as topics worth examining. I investigate the imaginaries, uses and effects of blockchain in humanitarianism through the study of a notable experimental pilot project in Jordan. I examine how this deeply political, shape-shifting, and contested technology has been interpreted, made, and experienced by the key stakeholders of the pilot: aid organisations and refugee end-users. I advance research on the digitalisation of humanitarianism by putting forward an ethnographically informed and justice-oriented approach to socio-technical infrastructure. In conjunction with **(i) Subjectivities:** the range of affective, embodied, and culturally situated rationales and responses connected with blockchain, I examine **(ii) Timescapes:** the temporal and spatial regimes and routines blockchain disrupts and co-creates, and **(iii) Materialities:** the material practices, processes, and architectures that are established and maintained with blockchain infrastructure. This three-pronged conceptual approach to infrastructure offers a framework for apprehending issues of *infrastructure justice*—the uneven benefits which socio-technical systems instantiate.

## 1.2. Thesis summary

As I describe in more detail below, the pilot project I study is a collaboration in Jordan's refugee camps between two United Nations agencies, the UN Basic Assistance (BASS) and UN Gender (GEN).<sup>3</sup> The pilot's objectives are plural. By using and maintaining a shared blockchain—what I call the Links platform—instead of proprietary database systems, these agencies aim to foster greater coordination, accountability, and effectiveness. The pilot project creates the infrastructure for delivering and monitoring the two agencies' activities in Zaatari and Azraq refugee camps, but BASS plans to extend the Links network globally as a resource for all aid organisations. The pilot is not just about proving that organisations can use a shared blockchain. It entails GEN changing how they deliver financial aid to the refugee women who participate in their cash-for-work scheme. By transforming the salary delivery from a cash-in-hand system to a blockchain-based digital wallet system, accessed through biometric iris scans, the aim is to streamline GEN's salary delivery process. Another declared aim of the pilot is to empower refugee women by providing them with a sophisticated and independent saving tool. These are the starting assumptions that I examine.

Based on ethnographic work with the key stakeholders of the project—communities with a genuine and legitimate interest in its outcomes (Eversole, 2018)—this thesis examines how the pilot project is imagined, made, managed, and negotiated. I draw on close ethnographic engagement with the pilot and the main communities designing, using, and shaping it: (1) the

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<sup>3</sup> As I discuss in the Methodology chapter (Chapter 4), I have used pseudonyms for the United Nations agencies and the shared blockchain project as a good-willed effort to address our research agreement and their reputational concerns.

network of Links' strategic staff in international and digitally mediated settings, (2) the GEN aid practitioners operating locally in Jordan, and (3) the women refugees in Zaatari and Azraq camps. The thesis contributes critical insight about how the humanitarian promises for blockchain are being made and playing out in practice. **The central argument of the thesis** is that socio-economic injustices are extended, contested, and experienced through three interlocking dimensions of infrastructure: subjectivities, timescapes, and materialities.

In the **Contextual Background (Chapter 2)**, I provide information about the case study and the Jordanian refugee camp contexts in which it operates. I provide a detailed overview of the key concepts and debates surrounding blockchain technology. Then, I outline the landscape of studies on blockchain projects in aid, and the major conceptual, methodological, and empirical learnings and limitations.

**Chapter 3** puts forward the theoretical frame of *infrastructure justice*. With this, I forge the conceptual tools to understand the implications of humanitarian blockchains by situating the topic at the intersection of approaches from critical data studies, infrastructure studies, and aid and migration studies. I argue that blockchain is socio-technical infrastructure, comprising 3 interconnected elements: (i) Subjectivities, (ii) Timescapes, (iii) Materialities. The *infrastructure justice* lens evaluates the imaginaries and rationalities and material practices and architectures of infrastructure in space and time. I show that this theoretical frame contributes to the critical research agenda on digital humanitarianism by illuminating the socio-economic justice concerns relating to payment, datafication, and global governance from an ethnographic perspective.

**Chapter 4** discusses the research design underpinning this thesis. My research comprises a multi-stakeholder, networked ethnography. I draw on extended fieldwork with several communities connected to the Links project. This involves a mixture of complementary methods—including focus groups, participatory workshops, interviews, and digitally-mediated research—each of which involve distinct contextual issues such as obtaining and maintaining access to securitised and sensitive refugee camp settings as well as risk-averse international organisations. The chapter examines key issues around access, ethics, and power relations in conducting fieldwork. I discuss how I approached and designed the research, tackled the research questions, and negotiated challenges such as learning and collaborating in Arabic, and legal disputes with organisations about academic freedom.

**Chapter 5** examines the transformations that discourses and implementations of blockchain helps to shape. The UN Basic Assistance (BASS) Links team promote blockchain as a means of transforming both the coordination of aid agencies and the governance of aid beneficiaries. They suggest that blockchain facilitates: (i) trustless trust, (ii) decentralisation, and (iii) transparent privacy. Firstly, I show that Links is underpinned by a belief in technocratic consensus which neglects the complex sociality of trust and established structures of authority and data management at the UN. Secondly, I unpick the ambivalent political implications of decentralisation. BASS promote Links as a commons resource for humanitarian agencies which circumvents extractive financial middlemen. At the same time, the blockchain infrastructure provides a steady material foothold for profit-driven companies in humanitarianism. Thirdly, I examine the colonial timescape of Links: the project is intended to be an authoritative platform that captures aid activities across international territories. Blockchain is associated with

cryptographic privacy, but this conflicts with the BASS team's notion of a singular, authoritative digital identity for each beneficiary—which can be used to control their access to resources and ultimately their mobility. The strongly cultural and affective dynamics of governance, cooperation, and social trust—which the technocratic project downplays—prevent the network from scaling up. Nevertheless, Links proposes to extend dynamics of infrastructure (in)justice in aid through its neoliberal,<sup>4</sup> surveillant management of material resources and colonialist timescape.

Based on ethnographic research with UN Gender (GEN) in Jordan, **Chapter 6** investigates how the imaginaries, goals, and emergent outcomes of the Links pilot project develop through interactions with humanitarian staff and their existing forms of knowledge and ways of working. In concert with BASS, technology companies, and supermarket companies, GEN staff in Jordan design the pilot and its benefits for refugee women. They are also intended to be beneficiaries of blockchain. The blockchain infrastructure is supposed to streamline humanitarian action, saving aid workers time, money, and labour by cutting out the intermediaries and bureaucracy involved in cash assistance. In this chapter, I extend my analysis of infrastructure injustices as constituted around material, temporal, and subjective concerns. Firstly, the pilot eroded the reliability of aid infrastructure through the re-distribution of material resources and responsibilities (principally, liquidity) to non-humanitarian actors. Secondly, the pilot imposed an administrative timeline on aid workers which was incompatible with the rhythm of their work, and infrastructure maintenance depended on aid workers' adaptive and mitigative strategies. Thirdly, in contrast

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<sup>4</sup> Neoliberalism refers to the hollowing out of substantive social welfare, education, healthcare, and support in favour of private capital and market-led approaches. Neoliberalism takes plural forms in international settings, but in general, it is a political-economic approach that meets social problems with private, individualised, financialised solutions.

with claims about decentralised power, authority over data was encoded in the structure of GEN's blockchain node in a way that entrenched existing organisational hierarchies. Lastly, affects of confusion, ignorance, and mystification around blockchain and the blockchain pilot were accessed and deployed to extend the epistemic hegemonies and strategic interests of aid institutions, donors, and partners. To promote the pilot as a successful product, BASS adopted a paternalistic role in GEN's pilot. GEN staff were both subjected to and participated in epistemic injustice—the denial of women refugees' and aid workers' subjectivities as participants in rather than objects of socio-technical change. While the pilot saved GEN time and money overall, this did not strictly require blockchain technology. The rhetoric of streamlined automation glossed over how the pilot extended existing labour inequalities and dynamics of neoliberalism, paternalism, and coloniality, and gave rise to multiple frictions and contestations.

**Chapter 7** offers an analysis of refugee women's responses to the blockchain pilot based on fieldwork at women's centres in Jordan's Azraq and Zaatari camps. Drawing on findings from ethnographic research, focus groups and a survey, I examine how women experienced, negotiated, and contested this innovative socio-technical system. The blockchain pilot is intended by UN agencies to empower Syria's refugee women with high-tech, secure, independently owned digital wallets. Following an anti-colonial and intersectional feminist approach, I critique the logic of empowerment in this project and unpick the use and effects of the blockchain pilot in practice, from the women's perspectives. Central to my analysis is the spiritual, Islamic lens through which women evaluate the new system. The digital mode of storing and collecting money is repeatedly referred to as *mish barakeh*—not blessed, or more specifically, not consistent, substantial, or dependable. The religious concept *barakeh*

(بركة) opens up blockchain to new realms of critique as a system that restructures the rhythm and materiality of aid. Using blockchain requires infrastructure reconfiguration; the pilot entails specific new arrangements of institutions, people and things in time and space. I show that the reconfiguration is disruptive and misaligned with women's priorities and needs; it burdens them with new labours of waiting, checking, and accounting, and extends their experiences of precarity as refugees. While trust is the dominant concept in scholarly and policy debates about digital infrastructure, I argue that faith offers an important analytic frame which can help us both dismantle sweeping assumptions about blockchain-enabled socio-economic transformation and re-centre discussion around the spirit of humanitarian giving.

The final chapter integrates and summarises the findings of the three empirical chapters. I bring together my analysis to address **the overarching research question: what promises are made with blockchain, and are they met in practice?** Synthesising findings from this first ethnographic study of blockchain in aid, the chapter ties together novel insights from multiple and previously ignored perspectives. This provides a grounded position from which to evaluate which needs and logics are being prioritised or suppressed in implementations of blockchain, and what that suggests about contemporary humanitarianism. I summarise how, with the theoretical lens of *infrastructure justice*, we can uncover how the bureaucratic production of global inequalities is shifting along with the rise of digitalisation and big data. This has significant implications for research and policy on blockchain governance and innovation in contexts of forced migration, but also more broadly for critical work on digital infrastructures, subaltern rights, and socio-economic and institutional change.

## Chapter 2: Contextual background

### 2.1. The Links Project

#### 2.1.1. Blockchain meets humanitarian cash assistance in Jordan

Since 2016, BASS has used biometric iris scanning machines to deliver food to residents of Jordan's Zaatari and Azraq refugee camps. Every month, each household receives an SMS notification that their digital payment has come through. Camp residents do their shopping at the supermarket and go to pay at the checkout, where the cashier uses a machine to scan their eye to authorise the transaction. This novel use of biometrics was justified by BASS and UNHCR<sup>5</sup> on the grounds that it reduced fraud, enhanced operational efficiency and was more convenient for refugees than the alternatives (bank cards or coupons), which could be lost or stolen.

However, as the Links project founders saw it, this cash assistance process still had some problems which could be mitigated with blockchain (whether the problems or the solution were identified first is a question I will tackle in the empirical chapters). The process previously depended on financial intermediaries (principally banks, who charge fees), risks (funds and beneficiary information were advanced to the bank upfront, which BASS suggest involved the potential for bankruptcy, fraud, and data security issues) and inefficiencies (the bank had to verify every transaction, settle with retailers, and produce account summaries). After testing the technology in Pakistan in 2017, the first stage of Links involved putting the household accounts of all Zaatari and Azraq camp residents (over 100,000 of Syria's refugees) onto a private,

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<sup>5</sup> The UN High Commissioner for Refugees is the agency responsible for identifying, registering, and protecting refugees.

permissioned blockchain. BASS suggests that this did not directly affect refugees as it did not change their experience of cash assistance. Rather, it was a shift in backend infrastructure which has reportedly saved BASS \$40,000 per month. Promotional materials celebrate the savings on transaction fees (now nearly zero) and improved accountability and data security: with Links, BASS can settle with the supermarkets directly and manage its own real-time record of transactions. In the future, BASS is keen to develop blockchain-enabled mobile money options where refugees can keep track of their household accounts. The pilot was originally scheduled to end in 2017 but was extended indefinitely.

Links is in operation in Jordan but has global ambitions. The overarching, long-term aim is to create a shared, open-source platform that all international aid agencies can use. The idea is that using one blockchain platform—a distributed ledger of digital transactions—could facilitate the coordination, streamlining and accountability of humanitarian activities. Humanitarian agencies generally use proprietary, centralised database systems tailored to their own use cases (S. McDonald, 2016, p. 13). These systems have centralised points of failure and do not easily facilitate coordinated action—but ‘It is practically easier and financially beneficial for humanitarian organizations to develop their own information systems, instead of focusing on building functional communication sharing.’ (Ibid, p. 14). Blockchain, BASS suggests, would resolve these challenges by facilitating ‘trustless’ coordination between agencies. By using a shared blockchain, agencies would still manage their own aid programs and budgets but use the same underlying infrastructure to record data. Links would provide an authoritative view of humanitarian operations and data analysis could help with planning and targeting services worldwide. Sensitive beneficiary information would be secured using cryptography; data

security would be robust thanks to the distributed architecture. Beyond use cases in cash assistance and mobile money, the project's proponents suggest, this could include anything from health and education services to identity and supply chain management. BASS has begun to set up partnerships with other aid agencies, and GEN is the first. This research examines the BASS-GEN pilot project in Jordan, the first international example of an inter-agency humanitarian blockchain.

### 2.1.2. Piloting blockchain in GEN's Wahat

UN Gender (GEN) indicated interest in using blockchain in 2017, when they organised a hackathon at their headquarters to develop potential case studies to be 'piloted'. At GEN's hackathon, Jordan was put forward as a viable setting for a blockchain pilot project. As Macias notes, the longevity of the Syrian refugee crisis has meant that the camps in Jordan are becoming spaces for longer term social development projects, not merely emergency aid (Macias, 2020). Like BASS, GEN operates in Zaatari and Azraq camps. It runs the *Marakat al Wahat* (oasis or sanctuary centres), which are women's centres offering a cash-for-work scheme. GEN offers this scheme to women in the camps in the aim of supporting gender equality and women's empowerment. Refugee women employed by GEN go to the Wahat each day to undertake jobs such as cleaning, weaving, embroidery, teaching and childcare, for which they receive a small monthly salary.

Before the blockchain pilot project, women workers' salaries were delivered to each individual as cash in hand. This involved hiring the logistical agency UNOPS to bring bags of physical cash

into the camps, and bureaucracy for GEN staff in organising worker queueing times, checking individuals' IDs and salary amounts, and delivering cash envelopes one at a time. As of the pilot's launch in Zaatari and Azraq Wahat in 2019, these processes have been cut out. Just over 100 refugee women workers now have a 'digital wallet' for their salary, in addition to their household's digital account for food with BASS. The digital wallet for the Wahat salary is expected to empower them by enabling greater financial independence, security, and ability to save. Refugee workers access the money in the same way as the BASS cash assistance: with a biometric eye scan at the camp supermarket. The official camp supermarkets are the only retail outlets refugees can use in this system. All transactions are verified and recorded by both GEN and BASS nodes in the Links network. In contrast to the initial stage of Links, the pilot directly changes refugees' and GEN aid practitioners' experiences. As I explain in more detail in the methods chapter, I follow how this Wahat pilot plays out, from design and governance to everyday management and use.

		<b>Chronology of the Links project</b>	<b>Chronology of my research</b>
2016	January	Links project established by finance experts at UN BASS HQ.	
	July	Launch of the BASS Disrupt Programme, an innovation lab which supports Links.	
2017	January	Field simulation: BASS test the Links platform for delivering cash assistance to ~100 people over several days.	
	May	Links pilot project launches in Jordan. BASS use blockchain to authenticate and record digital financial transfers to over 10,000 refugees in Zaatari and Azraq camps.	My first call with Links project manager.
	July	UN GEN HQ organise a blockchain hackathon where GEN Jordan is put forward as potential implementers.	
	July		I co-organise aid industry blockchain conference and invite Links team.
	November		Meeting with Links project manager to agree on research collaboration.
2018	January-April	GEN begin developing their own pilot project in Jordan in partnership with BASS.	Through BASS, my collaboration with GEN Jordan begins.
	May		My first Jordan fieldwork period. 2 weeks research in camps; workshop at BASS country office with 7 senior BASS and GEN staff.
	June-Nov		I share and discuss my first field report with GEN and BASS.
	December		Second Jordan fieldwork period. 2 weeks camp research. Workshop with 11 representatives from UN and partners.
2019	Jan-May	BASS begin work with blockchain consultants on the Links governance.	I share and discuss my second field report with GEN and BASS, based on research in the camps.
	June	GEN Jordan launches their pilot project, which uses Links to deliver cash to ~500 refugee women.	
	June-August	Blockchain Taskforce launched by multiple UN agencies in Jordan.	Third fieldwork period. Half-day workshops with GEN internal staff and one with 7 representatives from stakeholder groups.
	Sept-Nov		Rounds of discussion and feedback with BASS and partners on their Links governance plans.
	December		Fourth fieldwork period. 2 weeks in the camps. Workshops with 20 stakeholder representatives, including BASS, GEN, UNHCR, and private vendors
2020	Jan-Feb	GEN produces pilot evaluation report. Jordan Blockchain Taskforce workshops and report, published by the BASS Disrupt Programme.	Share and discuss my third field report with GEN and BASS.

Figure 1: A non-exhaustive chronology of key developments in the Links project and some major points in my research.

### 2.1.3. Situating the pilot: Zaatari and Azraq refugee camps

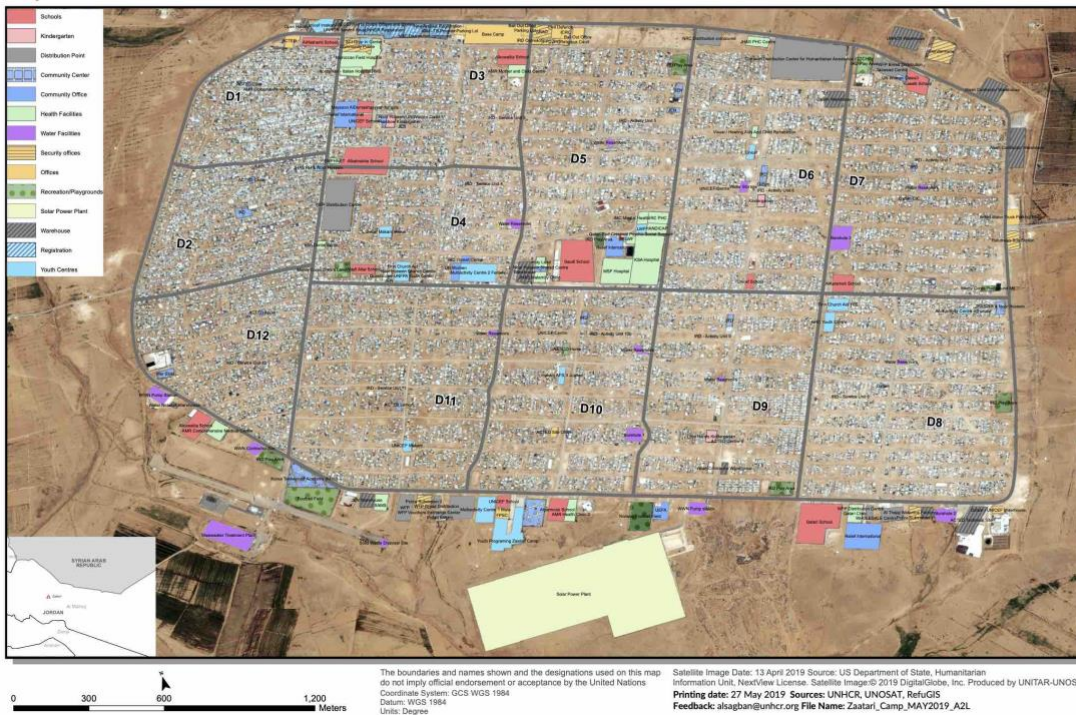
With the onset of Syrian conflict, the Jordanian government opened Za'atari refugee camp in July 2012 as part of a UN-sponsored response to mass displacement (Ledwith, 2014). Initially, the camp comprised provisional tents and basic emergency response infrastructure, built on an old military base about 12 kilometres from the border with Southern Syria. It soon became one of the largest population centres in the country ('Jordan's fourth biggest city') and is now a permanent settlement for over 80,000 refugees, with 12 districts, myriad international NGOs and companies providing infrastructure, services and schemes, and a bustling informal marketplace (Hackl, 2013; Oxfam, 2017). A 45-kilometre journey from Jordan's capital, Amman, Zaatari's dense, expansive hodgepodge of zinco structures is visible from the approaching road. After driving past the vast stretch of dry gravel terrain where army tanks are strategically positioned, visitors reach the security checkpoint where the Jordanian authorities' Syrian Refugee Affairs Directorate (SRAD) examine your papers and your vehicle. While Zaatari is heavily securitised and mobility is strictly controlled, its borders have become more porous over the years as residents and visitors bring goods in and out and exchange with the nearby town of Mafraq and beyond.

The second main refugee camp in Jordan and field site in this research is Azraq, which has around 36,000 residents (Jauhiainen & Vorobeva, 2017). Azraq camp was opened in 2014 when Zaatari began to expand beyond capacity, and its development involved more careful advance planning (Huynh, 2015). Accordingly, it is held up as a best practice case study and considerably less chaotic than Zaatari (Jordan Times, 2014). Azraq's districts are spread out sparsely, giving

an air of emptiness and dereliction. Caravans are fixed to the ground rather than adaptable. Because of the sparseness it is difficult for residents to gather, and no transport infrastructure is permitted. In both camps operations are managed jointly by the Jordanian SRAD and the UNHCR, plus a host of partners such as government agencies, national and international NGOs, and United Nations organisations. However, while everyday operations in Zaatari rely more heavily on humanitarian initiatives, the presence of the SRAD, government ministries and the police in Azraq is more overt. Azraq is where illegal refugees are sent to be vetted by the Jordanian authorities: whole families are sent to live in the even more carceral, prison-like District 5 and undergo checks. In the East of Jordan nearer Saudi Arabia, the camp is surrounded by little else than miles of arid desert, and residents rarely leave.

## Zaatari Refugee Camp - Infrastructure and Facilities

May 2019



## Azraq Refugee Camp: Camp Infrastructure and Facilities

As of June 2018



Figures 2 and 3: These are the most recent maps of Zaatari and Azraq produced by the UNHCR.

#### 2.1.4. Controlling care: Infrastructure in Zaatari and Azraq

Zaatari camp can be considered a ‘hot field’: diplomatic and press visits abound, celebrating the solar panels, the circus academy, and refugees’ entrepreneurialism (Rozakou, 2017). At the same time, Zaatari is understood as an example of camp planning failure: residents resisted the prescribed grid layout, adapted the caravan arrangements and set up communal infrastructures, including electricity and markets (Dalal, Darweesh, Misselwitz, & Steigemann, 2018; Fawaz, Gharbieh, Harb, & Salame, 2018). By contrast, Azraq is uniform and organised, with more consistent, stable infrastructural provisions like electricity and sewerage networks, but especially security measures like barbed wire fences, armoured vehicles, and checkpoints. However, it has been critiqued as a ‘well-intentioned high modernist catastrophe’ and an oppressive ‘vision of hell’ where economic and social activity is restricted to the extremes (Betts & Collier, 2017, p. 140). Hoffman quotes a UN field security adviser: ‘if the refugees start a demonstration, they will need one and a half hours walking to get to the base camp!’ (Hoffmann, 2017, p. 106). While Azraq seems a more oppressive environment than Zaatari, scholars have observed that both camps are managed with acute practices of securitisation, paternalism and control that are characteristic of encampment, as curated by the state authorities in conjunction with humanitarian agencies, international donors, and other stakeholders (Gatter, 2018, 2021; Wall, Otis Campbell, & Janbek, 2017).

Critical scholars in aid and refugee studies have made the important observation that techniques of humanitarian care are inextricable from those of population control. There are deep connections between the politics of pity and the politics of risk (Aradau, 2004), between

compassion and repression (Fassin, 2005; Iazzolino, 2020), care and control (Agier, 2011), protection and securitisation (Hoffmann, 2017). The infrastructural contexts of Zaatari and Azraq strongly demonstrate these dialectics. The material conditions in both camps allow for the provision of basic services (cash, healthcare, nutrition, energy, water, education) at a large scale, but they also cater to the permanent surveillance and economic and mobility control of refugees. For example, Internet infrastructure is restricted reportedly due to the Jordanian state's strategy to minimise the potential for radicalisation (Macias, 2020, p. 339). The authorities monitor communications in order to police refugees, routinely cut off mobile data connections out of putative security concerns, and ensure no Wi-Fi is available in the camp jurisdictions (Wall et al., 2017). Electricity and water is also rationed and controlled by camp management authorities (Gatter, 2018). Moreover, legal infrastructures—or the lack thereof—severely limit refugee residents' rights and civil liberties in Zaatari and Azraq. There is no democratic humanitarian government for refugee camp residents. Jordan has not signed the 1951 Refugee Convention, which recognises refugees' right to work and mobility. Even in countries that have signed the Convention, refugees are almost universally denied these rights as well as others, for example regarding property ownership. There are no data protection laws in Jordan to counteract the authoritarian state's surveillance practices (Access Now, 2021b). National security interests dominate technology development and policy (ibid:7). It is important to understand the broader infrastructural and socio-economic justice contexts of the Jordanian refugee camps: the empirical outcomes and theoretical lessons from the UN blockchain pilot must be unpicked against this backdrop.

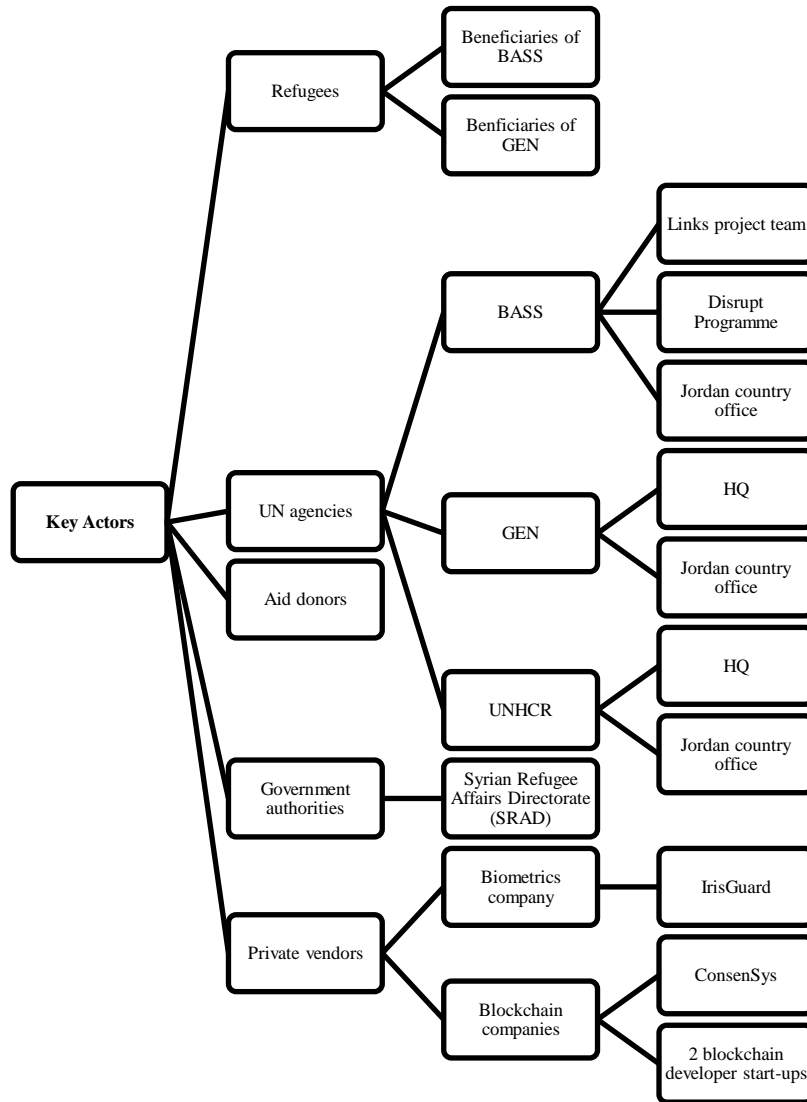


Figure 4: The major actors with a stake in and influencing the Links project in Jordan.

## 2.2. What is/are blockchain(s)?

In everyday parlance, *blockchain* is most discussed and indeed fetishised as a unified, singular concept or thing. In practice, *blockchains* are an assortment of different possible database technologies which have very different implications. Throughout this thesis, I often use the singular ‘blockchain’ even though the family of technologies would more accurately be described as ‘blockchains’, ‘blockchain technologies’, ‘shared ledger technologies’ or ‘distributed ledger technologies’. I use the singular when I want to emphasise the popular, imaginative dimensions of blockchain. It is important to acknowledge emic approaches in this way because it signals how blockchain is more than a technology: it is a lively discourse and symbolic cultural phenomenon. Vendors, advocates and other optimistic commentators tend to associate it with specific benefits and inherent characteristics, despite the fact that different types of blockchains have different properties (Walch, 2017a). Going well beyond the famous Bitcoin blockchain (a.k.a. ‘The Blockchain’), they incorporate different types of algorithms and protocols and include not only public, open access, peer-to-peer networks (as with Bitcoin, where anyone can view and edit code without the permission of an authority) but also private and permissioned systems. Permissioned blockchains involve a predefined set of known entities which can process transactions. While they offer cryptographic auditability, some would argue they resemble traditional proprietary databases and so prompt the question; do you really need a blockchain? Nonetheless, across different interpretations and approaches to blockchains in scholarly and policy debates, they are consistently associated with (1) decentralisation and ‘trustless trust’, (2) privacy and security, and (3) immutability and truth.

**(1) Decentralisation and ‘trustless trust’:** Blockchains are all *distributed ledger technologies* (DLT). This means they are types of shared databases which do not rely on a central point of control but, rather, distribute authority across a network of nodes (see Figure 5). The nodes all maintain a continuously updated ledger (a set of records) which transparently details every transaction that takes place. The records are not necessarily financial: they can include any unit of value, from transactions of cryptocurrency to medical or identity information or votes. All distributed nodes within a network share the same *consensus algorithm*. These are designed to allow transactions to be completed and information to be synced, even if the actors in the network do not trust each other. This feature is referred to as ‘trustless trust’ (Becker & Bodo, 2020).<sup>6</sup> Different blockchains deploy algorithmic decision-making to different extents—no blockchain could be 100% algorithmic. However, despite this, blockchains are widely presumed to replace the need for trusted human intermediaries, organisations, and social processes with ‘neutral’ technocratic consensus, governance by algorithms, and trust-in-the-code (Zook & Blankenship, 2018). Uncritical academic work emphasises the ‘end of trust’ and centralised authority, framing blockchain as a sophisticated non-human governance system, an algorithm-based subset of law, and even a new and improved kind of institution (Davidson, Filippi, & Potts, 2018; De Filippi & Hassan, 2016; Swan, 2015). More critical social science interrogates assumptions about the erasure of social trust. It also examines the social construction of consensus algorithms and the various ways in which ‘trustless trust’, algorithmic governance, and ‘decentralisation’ are interpreted by

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<sup>6</sup> ‘Trustless’ in the sense that trust is distributed across network rather than attributed to social entities, and ‘trust’ in the sense that the infrastructure is seen as trustworthy.

specific communities and play out in practice (Cheesman, 2020; Cheesman & Slavin, 2021; Lustig, 2018; Walch, 2019; Zook & Blankenship, 2018).

**(2) Privacy and security:** Blockchains deploy cryptographic techniques in order to authenticate and secure information in a way that maximises its confidentiality, anonymity and integrity (DuPont, 2019, p. 30). These techniques include *public and private keys*, pairs of long numbers associated with the identity of each user which are deployed to authorise transactions, and *hashes*, mathematical ways of creating and uniquely identifying blocks of transaction data, which are then chained together to create the records (ibid). Blockchains are largely seen as means of tracking information transparently in a way that supports privacy and mitigates surveillance. There is a growing body of computer science and engineering research that examines the efficacy of blockchain technology and cryptography alongside quantum computing, artificial intelligence, and other technical solutions to extractive data practices and privacy invasions by governments and US platforms like Facebook and Google (Swartz, 2017, p. 90; Zyskind, Nathan, & Pentland, 2015). The implications of this are understudied in social science. Recent research suggests that blockchains are not all privacy-enhanced technology in and of themselves. For example, anonymity is not failsafe, and surveillant entities can still assert control, especially in permissioned/private networks (Bohr & Bashir, 2014; Orcutt, 2018; The Royal Society, 2019).

**(3) Immutability and truth:** Blockchains eat their own tails: each block contains the previous block's unique hash. Cryptographic techniques like this and the distributed

architecture mean that once data are written on a blockchain, they are shared by all computers on the network and almost impossible to alter. Blockchains have therefore come to be understood as a tamper-proof way of making immutable, permanent records. Like Big Data before it (Boyd & Crawford, 2012), blockchain is associated with objectivity, accuracy, and truth. Even though blockchains may share the same garbage-in-garbage-out issues as any database, they are commonly seen as achieving greater accuracy, authenticity, and veracity in record-keeping. This is linked to the putative accountability benefits of using blockchains, since they allow records to be transparently copied and synced among the network. Anthropologists of finance and law have led critical research on this subject by examining blockchain as an accounting technology. This work helpfully situates blockchain within a genealogy of accounting systems associated with honest, risk-proof record-keeping and therefore ‘moral uplift’, such as ancient Mesopotamian clay tablets, Moore’s Modern Methods ruled ledger sheets in the 19th century, or the *Compte Rendu* of 18th century France (Dupont & Maurer, 2015; Maurer, 2015b, 2016, p. 85). This work points to the political function of accounting systems: moralistic ideals about perfectible methods for keeping track of people and things are instrumental in techniques of governance.

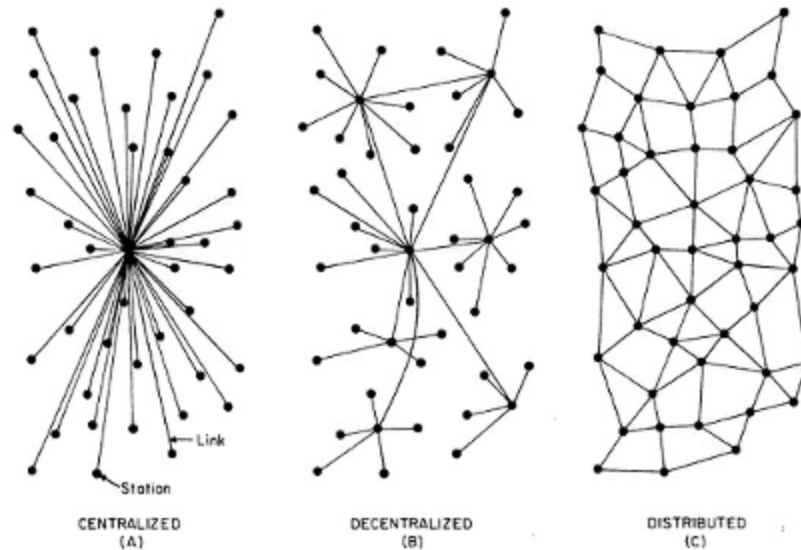


Figure 5 depicts the structure of centralised, decentralised, and distributed networks. It originates from research prepared in 1962 for the US Air Force in relation to distributed governmental and military telecommunications networks (Baran, 1964, p. 2). The visualisation has become a popular explanatory resource in discussions about blockchains and distributed ledger technologies.

### 2.2.1. The political ideologies of blockchain(s)

Any discussion of blockchain's core characteristics is enmeshed in political debates about knowledge, power, and accountability in the information age. Blockchain emerged with the cryptocurrency Bitcoin and has been closely associated with the crypto-anarchist libertarian ideologies around it. Recalling the stories of Ayn Rand, these political ideologies emphasise the self-realisation of the entrepreneurial individual. They involve utopian 'cypherpunk' visions of friction-free capitalism, digital freedom and individual self-determination, surveillance-resistance, and the end of trust in authorities (Hütten, 2018; Swartz, 2017). Such visions stretch back to the libertarian dreams of autonomy and decentralisation that came along with the personal computer, the free open-source software movement, and the early Internet (Kelty, 2008; Perry Barlow, 2018), but they crystallised with the invention of the first 'multi-purpose' blockchain, the Ethereum blockchain, in 2013 (Hütten, 2018). Some argue that the Ethereum

blockchain is the new ‘world computer’, presenting an alternative infrastructure to the Internet, which has become centralised and profitable for corporate gatekeepers, rife with targeted advertising, fake news, and privacy breaches (Abra, 2020). It demonstrated that blockchain technology could be used for a variety of applications beyond cryptocurrency and potentially realize cypherpunk utopias involving self-executing ‘smart contracts’, and the disaggregation of institutions into ‘millions of microsocial obligations backed by computerized contracts’ (Swartz, 2017, p. 88) and ‘decentralised autonomous organisations’ (DAO).

The once niche political domain of blockchains has grown. It is important to tease out the now variegated ideologies that blockchain has come to be associated with since its invention just over a decade ago. Husain et al helpfully outline a typology of blockchain projects and the political values underpinning them (Husain, Franklin, & Roep, 2020). Within the realm of anarchist blockchain proponents, there are libertarians, who privilege free-market ideals and an individualistic political economy. Some blockchain libertarians espouse hyper-individualistic right-wing conservative values (Golumbia, 2016). However, there are also ‘commonists’, who are more inspired by goals of collective-driven decentralisation, community, solidarity, and social justice. Indeed, it is important to note that many blockchain proponents seek to develop new modes of cooperation beyond states and markets, often with socialist, egalitarian, and communitarian commitments (Huckle & White, 2016; Rozas, Tenorio-Fornés, Díaz-Molina, & Hassan, 2018; Scott, 2016). Then, as Husain et al alongside Swartz (2016) and others have pointed out, an ‘institutionalist’ camp of blockchain ideologues has strongly emerged. Some institutionalists remain committed to centralised state governance and a state-regulated free market economy, while others (‘collaborativists’) favour partial decentralisation and devolved

approaches to governance. For example, various public actors and institutions view blockchain as a remedy to issues with the neoliberal state (O'Dwyer, 2019b, p. 1). So, while blockchain anarchists are more likely to be committed to radical transformations in the political-economic order (e.g., displacing the international banking system or the centralised authorities controlling the Internet), blockchain institutionalists may incorporate the technology into traditional structures, institutions, and business-as-usual bureaucratic processes (e.g., verifying internal records or facilitating payments).

While cypherpunk-style blockchain proponents are closely associated with Silicon Valley 'Californian ideology' (Hütten, 2018), which combines New Left liberal anarchism, New Right capitalist entrepreneurialism, and utopian faith in the emancipatory power of technology and automation (Barbrook & Cameron, 1996; Neff, 2012; F. Turner, 2006), it has become clear that wider blockchain proponents occupy diverse ideological positions. Therefore, any examination of blockchain's intervention into new domains must attend to the range of possible political-economic starting points. My work demonstrates how competing logics about political power and markets characterise the debates surrounding new decentralised technologies in the aid industry (Cheesman, 2020). Blockchain potentially challenges the dominance of market-centric, anti-authoritarian Californian ideology in digital humanitarianism (Scott-Smith, 2016). The task is now to explore how the diverse politics of blockchain are being translated into concrete implementations by UN organisations, and what is at stake for humanitarian governance, aid work, and refugees.

## 2.3. Blockchain in aid

There is a growing body of blockchain initiatives seeking to operate in humanitarian contexts, though few have launched concrete pilots as large scale as Links. Over sixty different pilot projects are being developed by UN agencies, international NGOs, non-profit agencies, and other humanitarian and development aid actors across international contexts, including South-East Asia, Latin America, the Pacific, African countries, and the Middle East. Illustrative examples involve supply chain tracking (from cocoa to pigs) (UNDP, 2019a; UNECE, 2020; World Food Programme, 2021b); personal records systems (for medical records or educational certificates across borders) (Gallagher, 2021; UNICC, 2021; UNICEF, 2020); self-sovereign identity schemes for refugees (Jha, 2019; Noor, 2018; Srivastava, 2019); alternative currencies (UNDP, 2019b; World Food Programme, 2021a; Zhu, 2020); cash transfer and remittance projects (CARE International, 2021; Oxfam, 2021; UNCDF, 2021; World Vision International, 2018); and cryptocurrency funds for aid donations (Action Against Hunger, 2021; CARE International, 2020; UNICEF, 2019).

In the Introduction, I indicated the impetus behind this doctoral research: not only has there been little empirical investigation of the outcomes blockchain is having in humanitarianism, but also scholarly and policy discourses in aid and migration studies have not yet seriously tackled, in-depth and in-context, the specific imaginaries and ideologies associated with blockchain. The discussion of blockchain in studies of digital humanitarianism has been limited and polarised between highly optimistic and highly sceptical accounts. Indeed, while it raises some important concerns, a significant portion of the social science research to-date takes a broadly uncritical view of blockchain. Scholars have adopted normative, sanguine positions which evaluate the

‘barriers and enablers’ to blockchain’s adoption in aid, give credence to vendors’ assumptions about the technology’s promise for transforming refugee identification or disaster relief coordination, and optimistically frame it as a singular force with the potential to revolutionise the sector (Dubey, Altay, & Blome, 2019; Dubey, Gunasekaran, Bryde, Dwivedi, & Papadopoulos, 2020; Manski & Bauwens, 2020; Rugeviciute & Mehrpouya, 2019; F. Wang & De Filippi, 2020; Zwitter & Boisse-Despiaux, 2018). Within these literatures, some pressing procedural concerns are raised: the indeterminacy around regulatory and infrastructural requirements, the necessary technical expertise for using blockchain, the pitfalls of techno-solutionism, and the technology’s uncertain compatibility with legacy data systems in humanitarian contexts. However, this body of work lacks detailed discussion of refugee contexts and issues or empirical investigation of techno-solutionist assumptions. Several authors ultimately advocate for the common adoption of blockchain by aid organisations. These studies all reveal the need for a more analytical approach to the entanglement of data, technology, and society, one that is capable of tackling the political economy of refugee governance regimes.

This need is met by a set of more critical works, which apply critical data studies approaches to interrogate the power structures blockchain is enrolled in by aid industry actors. Power-critical research analyses relations and dynamics of authority and control between aid agencies, governments, tech companies, and refugees. Importantly, this work does not discuss blockchain as a revolutionary force in isolation, but rather as part of the established trends in a political economy of profit, mobility control, and surveillance based on the datafication of refugees’ everyday lives. For example, Macias (2020) and Leurs (2020) mention blockchain in passing as a component of the expanding knowledge production apparatus in the humanitarian sector (Leurs,

2020, p. 1; Macias, 2020, p. 342). They situate applications of blockchain alongside the expanding array of data practices—including maps, surveys, reports, smart city approaches, biometric iris scanning, and mobile payments—deployed to manage and control migrant populations. Both raise concerns about the risky implications of new experimental data practices, which in the hands of nefarious state and corporate actors may undermine the protection of marginalised people and instead be used to profile, target, restrict, and discriminate against them. This research gives blockchain cursory treatment and so opens space for more detailed engagement with the specific political ideologies, data practices, and social effects around it.

Madianou gives blockchain more detailed discussion, situating it as part of a set of data technologies used by aid organisations and their state and corporate collaborators to surveill, control, and extract value from refugees (Madianou, 2019b). In this well-cited piece, blockchain sits in a wider ‘biometric assemblage’ whereby different techniques of population management and information capitalism are being brought into convergence. However, in arguing that ‘it is impossible to separate biometrics from AI, machine learning, big data, and additional developments such as blockchain’ (p. 584), Madianou neglects the specific role blockchain plays in this assemblage. While the assemblage approach helpfully counters the idea that blockchain is a singular transformative force, it also collapses blockchain into a fuzzy combination of technologies as a largely indistinct element. Blockchain projects do not always involve biometrics. Madianou outlines a set of logics underpinning this assemblage: audit, accountability, capitalism, techno-solutionism, and securitisation. This captures essential dynamics in the aid industry, especially the drive towards transparency and tracking, which blockchain proposes to complement. Yet the analysis fails to capture the political background

and popular characteristics of blockchain, which in fact potentially complicate Madianou's logics. As I have outlined, some of the central associations of blockchain are about countering surveillance with cryptographic privacy, decentralising power with peer-to-peer structures, and potentially circumventing mechanisms of capitalist and state surveillance and control.

Madianou's suggestion that the 'biometric assemblage' may ultimately pose risks to the security, privacy and dignity of refugees is important, but it needs to be backed up by evidence on the ground, especially from refugees' perspectives. Based on desk research and interviews with aid industry actors, this work points to the need for fine-grained research, with a wider range of stakeholders, bringing to life the specific promises and practices associated with blockchain in situ.

Haioty and Lemberg-Pedersen (2020) and Jutel (2021) provide further critical accounts of the profit-driven and surveillant aid industry 'data craving' (Jutel, 2021; Lemberg-Pedersen & Haioty, 2020). By discussing indicative blockchain case studies based on interviews and desk research, they critique the contracting of aid sector payment systems to technology companies and financial service providers, who facilitate and profit from the marketisation of beneficiaries' data. Jutel suggests this is realised in ways that echo US imperialism in the Pacific, for example. Usefully, both works emphasise the significance of blockchain as a technology intervening not merely in processes of refugee identification (as per Madianou, Macias, and Leurs), but also in humanitarian financing and cash transfers. A significant proportion of the blockchain projects being developed in aid industry settings relate to cash. The question of how blockchain is instrumentalised within the problematic refugee financial inclusion agenda is an important, neglected aspect of its entrance into humanitarian domains, which I elaborate later. However, as

with the other works, the authors do not account for the techno-political and ethnographic specificity of blockchain. By this I mean the nitty gritty logics and practices by which it is designed and maintained, which may very well not be easily simplified as ‘extractive marketisation’ or population control by ‘Blockchain Imperialism’. Blockchain must be located within the concerning backdrop of humanitarian datafication, but it is necessary to unpick how exactly this novel technology connects with established capitalist and surveillance strategies *in practice*.

Overall, research on blockchain and humanitarianism has raised (by the optimists) pertinent practical considerations about the technology’s implementation and (by the sceptics) concerns about its political and economic function in migration governance regimes, which make refugees increasingly visible, manageable, and profitable via digital data. However, there are three major limitations in the research to date which my work seeks to address:

- (1) **The literatures lack in-depth empirical engagement with the communities making and using blockchain in humanitarian contexts.** They do not trace in detail how aid professionals design, manage, and adapt blockchain projects, nor do they examine the socio-material configurations by which blockchain is translated into an everyday data system used by aid workers. Most of all, research with affected populations such as refugees has been extremely limited. Accordingly, the issues raised about the implications of blockchain for refugees come from assumed priorities (privacy, surveillance, informed consent) rather than emic concerns rooted in detailed descriptions of people’s socio-economic lives. Likewise, how blockchain interfaces with the diverse

priorities and practices of aid professionals—especially the data workers maintaining the system—is not discussed with nuance. This is crucial if we are to gain a detailed understanding of the workings of domination and oppression through digital data. The primary contribution this thesis makes is in providing a close-up, long-term, ethnographic account, from multiple stakeholder perspectives, including refugee women and humanitarian aid workers in Jordan’s camps. In the next section, I put forward a defence of anthropological approaches to digital media and suggest that ground-up theoretical insights gained from ethnographic research allow for a more fine-grained analysis that goes beyond the sterile optimist-vs-sceptic terrain.

(2) **The existing research either optimistically buys into or largely ignores the key blockchain concepts such as decentralisation and cryptographic privacy.** While the optimistic accounts leave the logics and agendas motivating humanitarian blockchain projects largely unquestioned, the more critical approaches do not locate blockchain within its own techno-political background. They neglect the literatures (mainly social studies of finance and law which I discuss above) that have traced the complex debates around the emergence and governance of blockchains, such as studies of notable examples like Bitcoin and Ethereum. By contrast, my thesis documents the precise ways in which socio-technical visions about blockchain have been made, connected to debates and developments from a wider blockchain industry. I avoid subsuming blockchain into knee-jerk analytical positions. Rather, building on my previous work (Cheesman, 2020), I tackle the full range of assumptions and ideologies driving the aid industry’s adoption of blockchain within the backdrop of an increasingly data-driven political economy.

(3) **Theoretical approaches to blockchain are imprecise.** Techno-optimist literatures tend towards weak framings of blockchain as a singular, revolutionary technological force, to which the dominant counter-analytic is the socio-technical ‘assemblage’. This is useful in getting at how an unstable and interconnected set of technologies and technical, social and material practices must be understood in relation to one another (Madianou, 2019b, p. 585). However, this provides too loose and imprecise a frame. We need a theoretical approach that captures the specific role blockchain plays in humanitarian socio-technical assemblages. Blockchain is not another type of device, technology, or interface. It is a database system which re-structures the distribution of information, underpinning and facilitating all kinds of transactions. The structural, systemic nature of blockchain is common across implementations of it. We therefore need a better way of tracing how blockchain is intervening in the material railroads and rituals of humanitarian economies. In particular, how it is used by and affecting refugees as a payment infrastructure. With regard to studies of blockchain in general, a more fruitful and precise theoretical approach will also help us apprehend the strong affective dimensions, political-economic promises, and range of subjective experiences with blockchain. This thesis offers *infrastructure justice* as such a theoretical frame.

# Chapter 3: Infrastructure Justice

## 3.1. Blockchain as infrastructure

### 3.1.1. The anthropology of infrastructure

My research is guided by the anthropological imperative, which is that ‘the devil is in the details’ (Coleman, 2010, p. 497). Anthropology posits culture as the critical variable in human behaviour. Studies in digital anthropology grew from the seedbed of material culture studies, which has long attended to the banal ways in which technologies and techniques are incorporated into everyday social life (Horst & Miller, 2012). Through participant observation and rich descriptions, this work has explained much about technology in human cultures, from how technological choices (like which types of lasso Finnish reindeermen choose) are bound up in political considerations not just functional ones (Ingold, 1993, p. 124), to how digital media co-constitute particular cultural practices like ‘economic exchange, financial markets, and religious worship.’(Coleman, 2010, p. 488). The anthropological imperative is connected to an ethnographic sensibility, which prioritises understanding the lived experiences and local contexts of digital cultures—especially subaltern perspectives, for example, from indigenous groups, diasporic communities, or disabled people (ibid). The anthropological prerogative is connected to postcolonial theory in that it ‘provincialises’ (Chakrabarty, 2000), linked to work in human geography and critical development studies which attends to how inequalities operate at non-western global margins (Friederici, Ojanperä, & Graham, 2017; Graham, 2019). The focus on

details and prosaics risks narrow, descriptive parochialism. But at its best, anthropological approaches to digital data, technologies and infrastructures can undercut universalising or dematerialising presumptions about socio-technical change while at the same time generating grounded theories about how and why digital media matter, culturally and globally (Douglas-Jones, Walford, & Seaver, 2021; Knox & Nafus, 2019; Miller, 2021, p. 4).

This thesis draws on literatures from anthropology and STS to propose to frame blockchain conceptually as *socio-technical infrastructure*. Infrastructures are systems that connect, enable, and sustain social action, underpinning the production and circulation of people and things, resources and capital, knowledge and ideas (Larkin, 2013; Star, 1999). Ethnographies of infrastructural development—from roads, canals, railway and sewerage pipes to electricity networks, information systems and the Internet—have attended to seemingly mundane substrates as a way of illuminating social complexities and power relations (Harvey, Jensen, & Morita, 2017). For example, studies of water supply in Mumbai or electricity in Russia have shown that political subjectivities are made and contested through interactions with socio-technical systems (Anand, 2011; Collier, 2011); demonstrating the social effects of classification, Bowker and Star (1999) have shown how information infrastructures yield suffering or advantage. Infrastructures produce uneven benefits (Harvey et al., 2017, p. 9). They are not merely technical or functional, nor benign or objective. As Caliskan puts it, ‘It would be problematic to categorically propose that infrastructures are primary frameworks that give birth to secondary social behaviour or “the action”.’ (Caliskan, 2020, p. 3). The socio-technical approach to infrastructures emphasises how they do not merely sit alongside culture or politics, they *are* culture and politics, and they raise

pressing questions about access and exclusion, transparency and accountability, labour and maintenance, ownership and control (G. Bowker & Star, 1999b).

As a back-end system of distributing, recording and exchanging information and/or value, which always incorporates a constellation of actors, connections, practices, ideologies, databases, servers, techniques, (and ‘codes, mistakes, cables, malfeasance, machines, electricity and capital’ (Zook & Blankenship, 2018, p. 251)), blockchain is well suited to the infrastructural analytic. Seen as socio-technical infrastructure, blockchain can no longer be discussed as a singular, fixed, revolutionary entity. Studies of infrastructure highlight their ‘productive instability’ as a unit of research (Larkin, 2013, p. 339). Infrastructures do not spring into action fully formed. Just as ‘optical fibers run along old railroad lines’ (Star, 1999, p. 382) or mobile money rides the rails of retail outlets (Maurer, Nelms, & Rea, 2013) or aid industry information systems intermingle messily with legacy clerical systems (Jensen & Winthereik, 2013), blockchain will be embedded in genealogies of infrastructure used by humanitarian organisations and refugees. Infrastructures ‘create channels and connections that link separate points, facilitating movement between them’ (Mitchell, 2018a)—they are not isolated technologies or groups of technologies, nor external change agents, but co-constructed systems (Burrell, 2018). The infrastructure analytic helps us follow the specific socio-material architecture blockchain instantiates as a system of databases. This brings us away from the dominant framings of blockchain as an indeterminate part of a humanitarian ‘biometric assemblage’ (Madianou 2019) towards a fuller understanding of its structural role in (re)organising the data—and therefore socio-economic relations—in that assemblage. Situating blockchain within infrastructure studies roots discussion about the

putatively transformative new ‘distributed ledger technology’ in longer conversations about databases, distributive justice, and the material structuring of power.

### 3.1.2. Three components of infrastructure

I advance a conceptual approach to infrastructure that incorporates perspectives from infrastructure studies in STS and anthropology but also geography and critical development studies. I put the spotlight on 3 interconnected elements: (i) Subjectivities, (ii) Timescapes, and (iii) Materialities.

#### **i. Subjectivities**

Perhaps more than any other sub-field, infrastructure studies have attended to the subjective experience of socio-technological change and infrastructure’s particular affects, imaginaries, enchantments, and promises (Anand, Gupta, & Appel, 2018; Harvey & Knox, 2012; Hetherington, 2016; Larkin, 2013). Subjectivities are ‘the ensemble of modes of perception, affect, thought, desire, fear, and so forth that animate acting subjects’ (Ortner, 2005, p. 37). In other words, people’s lived experiences and mindsets. Anthropological work on subjectivities and affects is about ‘getting to the bottom of things: to the forces that compel, attract, and provoke’ for those living ‘in other bodies and other worlds’ (Rutherford, 2016, p. 296). In contrast to the objective, definitive, or proven, I use the notion of subjectivity to capture the tacit or emergent assumptions, beliefs, and rationales about infrastructure, and situated experiences and perceptions of it. Examining subjectivities is not necessarily individualised or

psychologicistic; it invites analysis of the socio-cultural formations that organise, shape, and generate ways of thinking, knowing, feeling, and being (Ortner, 2005, p. 37).

Infrastructures are animated and maintained by embodied, affective work. For example, the functioning of the Internet requires not just technical systems, hardware and software, but also the attention, time, and energy of the communities and individuals that use and make it (Terranova, 2004). Infrastructures shape how people collectively reason, think and decide (Kornberger et al., 2019). Myriad moods, dispositions and sensations can be generated in people's encounters with infrastructural sites or processes. For example, when new grain-handling systems bring frustration and social isolation to farmers on the Canadian prairies, who valued the social interactions afforded by outdated systems' inefficiencies, or when the development of new roads in Peru brings new urban connections and moments of uneasiness and worry (Barney, 2011; Harvey & Knox, 2012; Parks, 2014). Anthropological research demonstrates how these subjective experiences are excluded in dominant narratives like policymaking and engineering, but they play a dominant role in the everyday functions and political implications of infrastructure.

Blockchain has strongly affective dimensions which are largely downplayed in academic literature. It is associated with a range of socio-economic and political dreams, imaginaries, and metaphors (Faustino, 2019; Swartz, 2017, 2018), some utopian and celebratory, but also a great deal of suspicion, dread, and confusion, as I indicated in the Introduction. Carefully tracing the affective dimensions of infrastructure will reveal their interlinking with wider patterns of political contestation and labour (Ramakrishnan, O'Reilly, & Budds, 2020, p. 2). Like other

socio-technical infrastructures, blockchain is conceptually unruly (Star 1999): as I have shown, it can be associated with divergent affective responses, techno-utopian logics, and political ideologies, and is variously discussed as a unified concept or thing ('blockchain') but also an assortment of different types of things ('blockchains'). I see blockchain as socio-technical infrastructure relying on not just administrative and material systems and techniques in space and time, but also various, specific imaginaries and rationalities.

'Socio-technical imaginaries'—or the dreams, promises, logics, and ideas about technology and society—are not mutually exclusive from material forms: they are constructed, stabilised and performed alongside socio-technical systems, and vice versa (Jasanoff & Kim, 2015). As Harvey and Knox put it (2012, p. 524), 'More than just discursive categories, [...] promises play a central role in bringing the state and its infrastructures into being.' Critical postcolonial research on pre-digital international development has traced the interlinking of concrete political forms and techno-political imaginaries, for example, about modernity or the state (Mitchell, 2002, 2018b). Mark Graham's work has shown how contemporary deployments of socio-technological imaginaries do similar work to historical ones, for example, in shaping how connectivity is enacted, from railways to fibre optic cables (Graham, Andersen, & Mann, 2015). In the field of humanitarianism and refugee management, data practices involve the imaginative work of enacting—not simply representing—migrants and migration. Imaginative work does not just influence humanitarian and state institutions, their border maintenance policies, and the differential, racialised categories of humanity they rely on; it *co-constitutes* them (Scheel et al 2019; Bourne, Johnson, and Lisle 2015; Axster et al 2021:18). My approach to infrastructural subjectivities is inspired by feminist and postcolonial work which has unveiled how concrete

forms of power and subordination operate through the denial or suppression of some individual and group subjectivities and the dominance of others (Abu-Lughod, 1993, 2013; Casilli, 2017, p. 3947; Mahmood, 2005a).

The thesis sets out to excavate the promises made with blockchain in humanitarianism and the ‘structures of feeling’ generated by encounters with it (Parks, 2014; Williams, 1977, p. 128).

Within the theoretical lens of socio-technical infrastructure, the subjectivities optic allows me to examine the entanglement of affective enchantments, promises, and imaginaries around blockchain infrastructure with concrete material forms and outcomes, for humanitarian institutions but especially for refugees.

## **ii. Timescapes**

By timescapes, I refer to how infrastructure and the practices, technologies, and bureaucracies it incorporates mediate the very construction of time and space (Anwar, 2021; Bear, 2014; Graham, 2013, 2020; Walford, 2013). Infrastructure projects follow temporal trajectories and set spatial scopes. Aspirations and dreams for infrastructure always operate in specific tenses (Anand et al., 2018; Harvey & Knox, 2012). Infrastructures make the future; they organise the courses and narratives of human progress and modernity (Edwards, 2004; Hetherington, 2016; Hetherington & Campbell, 2014). For example, critical development studies scholars have highlighted the tensions between (democratic, progressive) temporal claims made on behalf of off-grid energy infrastructures and the messy contexts of their design, use, and maintenance (Cross, 2017); the Grand Visions of internet connectivity and their uneven benefits in practice (Friederici et al., 2017); assumptions about the datafication of water supply and their problematic

implications for the future of citizenship (Taylor and Richter 2017). Ge Zhang refers to the concept of ‘dromological progress’ (from the Greek *gromos*, to race) to theorise the logics underpinning expansions in China’s digital infrastructure (Ge Zhang, 2021, p. 185). This work demonstrates the strong links between concepts of speed and space, technological (and military) advancement, and political domination over peoples and territories.

Indeed, examining the timescapes of infrastructure projects helps us investigate structures of political authority—or ‘power geometries’ (Massey, 1993, 2005). Infrastructures organise (neo)colonial regimes by syncing societies up with dominant constructs of space-time. For example, linear, Western, Enlightenment ideas of time have throughout history been equated with proximity to so-called civilisation (Mayblin & Turner, 2021, p. 30). The discursive management of space is central to the administrative formation of colonial subjects (Shetty & Bellamy, 2000, p. 30). Through infrastructure projects, territorial plans materialise in ways that can serve the interests of global capitalism rather than the marginalised communities promised modernity and prosperity (Enns & Bersaglio, 2020). How blockchain relates to territorialised visions and future plans reflects the mechanisms and logics of geopolitical power.

Ethnographic approaches examine everyday representations, instruments and orderings of time, as well as social and phenomenological experiences of it (Kirtsoglou & Simpson, 2020).

Anticipatory state security infrastructures, for example, illustrate that time can be seen as a technique of governance (Amoore, 2013; Bear, 2016). This is well known in refugee and migration studies, which recognise orchestrations of time-in-space (e.g. detention, impermanence, waiting) as instrumental in regimes of racialised oppression and mobility control

(Buxton, 2020; Gatter, 2018, 2019). Infrastructures precondition how people experience the structure and passage of time in situ and therefore everyday social life. For example, trains connected communities to a schedule tied to space, telegraphs gave a sense of simultaneity, electricity allowed for labour at night (Edwards, 2004, p. 195). In aid, data technologies construct refugees as ‘categories in digital place’, shaping people’s trajectories of movement and access to resources (Witteborn, 2021). There can be profound tensions between dominant logics (abstract, capitalist, neoliberal time, used to measure value) and lived experiences of time in particular places (Bear, 2016). As Bear puts it, critical social science must ‘explicitly engage with the material timescapes of inequality in which ethics, knowledges and techniques of capitalist time interact.’ (Bear, 2017, p. 1). Borrowing from Bear, I look at the multiple timescapes implicated in the use and management of blockchain. Some suggest blockchain is a deterritorialised, borderless infrastructure which flattens socio-economic relations and institutes real-time, immutable systems of exchange. In practice, we need to examine the labours and struggles, the conflicts, hierarchies, and hegemonies, not just *in* but *of* time and space, as mediated through (blockchain) infrastructure.

### **iii. Materialities**

If we see infrastructure as instituting temporal-spatial logics and regimes, these are always material. In a special issue establishing the field of Digital Migration Studies, Souad Osseiran, Marie Gillespie and I (2018) demonstrated the value of an infrastructural approach to understanding the ‘digital passage to Europe’ taken by Syrian refugees. Alongside others (Latonero & Kift, 2018; Leurs & Smets, 2018), we oriented focus towards the materiality of infrastructures of survival, movement, and care. This socio-technical infrastructure incorporates

information and communication platforms, unstable Wi-Fi connections, and plastic bags to keep mobile devices dry. Socio-technical infrastructure is as critical to mobility as roads or railways but entails acute material challenges and risks such as electricity cuts, data surveillance and policing by hostile states and their bordering apparatuses. Our work rechannelled discussions of digitally mediated migration away from singular devices and affordances towards the infrastructural vulnerabilities and violence faced by refugees.

The materiality lens draws on STS approaches to the agency of humans *and* non-humans in shaping social outcomes. The material form of humanitarian technologies and devices reveal particular logics and effects (Scott-Smith, 2018). In the governance of migrants, asylum seekers and refugees, material devices—from e-border gates, iris scan cameras and facial recognition software to humanitarian debit cards—are instrumental in the enactment of control over their legal status, mobility, and access to resources but it is also through material practices that people resist control and exert autonomy. The materiality of blockchain infrastructure is understudied. In a recent collection of papers on ‘data matters’, I extended my contribution to research on data and data infrastructures as material artifacts in border and migration management with a study of blockchain governance proposals (Cheesman, 2020; Leese, Noori, & Scheel, 2021). This thesis builds on that work by generating new knowledge about the material structures instituted with a novel decentralised socio-technical system, and how people manage, maintain, and negotiate them. I have suggested that infrastructures are maintained by affective, imaginative and discursive work; it is also important to examine the material labours of their maintenance (Ramakrishnan et al., 2020; Ribes, Jackson, Geiger, Burton, & Finholt, 2013).

In my case study, blockchain is a payment infrastructure. I bridge previously unconnected work on the materiality of migration management infrastructure with social studies of finance, which confirm the utility of the socio-technical infrastructure approach in studying payment systems. The infrastructure analytic helps us theorise the co-evolving relations between imaginaries about money (and therefore society), monetary forms and pragmatics, data and devices (Caliskan, 2020; Rella, 2020). Financial anthropologists and media theorists have begun to make a strong link between novel digital payment infrastructures (like Bitcoin or sharing economy platforms) and questions of material inequality and exclusion (Maurer, Nelms, & Swartz, 2013; Nelms, Maurer, Swartz, & Mainwaring, 2018; Swartz, 2020). Just as a new highway that does not cater to public buses will exclude a subset of citizens who cannot afford to drive, a payment platform requiring high tolls, digital literacy and bureaucratic requirements will force out those for whom that is unaffordable. As Maurer puts it, payment is the ‘public infrastructure’ of value transfer with great public interest; the material process of getting paid can be a life or death issue (Maurer, 2012, p. 26; Swartz, 2020).

Because they are collectively held, infrastructures demand scrutiny in relation to issues of inequality and the public good (J. Ferguson, 2012; Ustek-Spilda, Ferrari, Cole, Reneses, & Graham, 2021). It is therefore surprising that perspectives and insights from infrastructure studies have not been applied more often on research in humanitarianism, a field uniquely attuned to the connections between material resources and ethics, fairness, power structures, and wellbeing. Leurs (2020) notes the potential for deeper conceptual work on socio-technical infrastructures to understand (i) how they project and are projected with assumptions, agendas, and aspirations about managing migration; (ii) how they call upon a range of brokers such as

NGO workers, activists, government agents, and technicians; (iii) how they comprise not just abstract data but tangible ‘stuff you can kick’. Leurs develops ‘migration infrastructure’ as an analytical lens through which to understand the material architectures of migration and border management, which did not pop into existence with the recent rise of big data but rather have long bureaucratic histories (Leurs, 2020). This thesis helps to build out the socio-technical infrastructure approach in humanitarian aid and migration studies. My conceptualisation of socio-technical infrastructure extends the analysis beyond imaginaries, intermediaries, and materialities. In summary, I focus on three interconnected elements:

- (i) Subjectivities: The affects, imaginaries, and rationalities established, suppressed, or maintained with infrastructures (here blockchain).
- (ii) Timescapes: The temporal and spatial logics, routines, and regimes implicated in the design, use and management of infrastructure.
- (iii) Materialities: The materiality of infrastructural processes, practices, and architectures.

With this I aim to contribute a precise theoretical lens, capable of capturing the rationales and agendas flowing through digitalisation projects in a way that does not downplay the affective, embodied dimensions and mundane, messy material cultures and rhythms of their everyday use and maintenance in time and space. Crucially, this offers a way into questions of justice arising from the uneven benefits which (datafied payment) infrastructures like blockchain instantiate.

### 3.2. Towards *Infrastructure Justice*

Through the three-pronged conceptualisation of infrastructure outlined above, I connect blockchain to critical data studies research on digital humanitarianism and issues of justice. Although data gathering and fundraising have been core components of humanitarian work since the 1860s, digital technologies like SMS, cargo drones, cloud software, GIS mapping, and social media have become prolific in humanitarian action and generate unprecedented amounts of data (Read et al 2016:1317; Sandvik et al 2017). In refugee contexts, data collection, sharing and analysis supports the political recognition and protection of persecuted identities, resource allocation, family reunification efforts, conflict mapping, and other essential functions of the international aid system. However, the same data systems are used by states, companies, aid and border agencies—usually without adequate security safeguards or consent—to surveil, police and deport people and extract value from personal data (Dencik & Metcalfe, 2019; Scheel, 2019; Scheel, Ruppert, & Ustek-Spilda, 2019; Taylor & Meissner, 2020; Weitzberg, Cheesman, Martin, & Schoemaker, 2021). Information apparatuses used to know and manage non-Europeans, which have been deployed in asylum contexts since early empires (e.g., through state censuses, maps, statistics), enact and enable carceral, punitive, violent measures taken against racialised populations characterised as surplus, inconvenient and undesirable (Axster et al., 2021; Isin & Ruppert, 2019; Mahmoudi, 2019). This research is motivated by a critical understanding of the historically continuous, interlinked processes of colonialism and racial capitalism that shape migration management and humanitarian aid (Pallister-Wilkins, 2021; Walia, 2017, 2021). As a socio-technical infrastructure for managing data about refugees, blockchain is implicated in pressing questions—old and new—about fairness and rights, visibility, racism, and representation in public-private knowledge regimes. Humanitarian blockchains may appear to

challenge political orders of centralised surveillance, but they do not stand apart from the international border system in which people's mobilities and socio-economic rights are restricted.

With the concept of *infrastructure justice*, I connect this study of blockchain infrastructure with research on 'global data justice', a term that has become fundamental to researchers evaluating the institutional and corporate processes of mass data harvesting, and its effects on marginalised populations (Heeks & Renken, 2016; Leurs & Shepherd, 2016; Masiero & Bailur, 2021; Taylor, 2017; Taylor, Sharma, Martin, & Jameson, 2020). In these literatures, justice refers to the distribution of resources and privileges in society, and the commitment that 'everyone has the right to be treated fairly by public (and private) authorities of all kinds' (Taylor, 2017, p. 3). Justice gives a crucial, historically grounded optic on the ethics, fairness, and equity of societal issues. At the same time, concepts of justice need evolving in the era of big data. Data justice frameworks have examined digital rights and freedoms such as representation and access. They have also illuminated the disproportionate discrimination against and value extraction from disadvantaged groups and encroachment on their autonomy and livelihood opportunities. While the justice approach has teeth—it can be connected with legal and policy frameworks—understandings of justice vary across global contexts and communities (Taylor et al., 2020, p. 12). Justice-oriented research appreciates epistemic and ontological diversity: how injustices are experienced and perceived in divergent ways (Kathiravelu, 2021). Data justice frameworks are drawn up from lived experiences of data-generating technologies in international settings and closely attend to people's core rights and needs. At the same time, justice research has related

subjective needs to the analysis of logics, models, and practices of decision-making and governance in the digital age.

Connecting with this important conceptual work, I deem the infrastructural analytic a helpful and complementary way of capturing the diversity of affects and rationales, material structures and administrative techniques involved in humanitarian data practices, and in constructions and negotiations of them in space and time. For example, popular critical accounts of injustice assume that datafication strategies are bringing about the de-materialisation and de-humanisation of humanitarian aid (Devidal, 2021). By contrast, my anthropological approach to *infrastructure justice* aims to surface the new and ongoing webs of material relations that come with digital payment systems, which mediate and (re)configure the work of humanitarian organisations and the socio-economic lives of refugees. This theoretical approach also helps capture the *structure* of data: distributions and movements of information and material resources in space and time. I extend data justice research on emic approaches to digital rights and needs by bringing attention to divergent subjectivities. This illuminates the imaginary and affective dimensions of socio-technical change and resistance, as felt, understood, and experienced from different subject positions, according to differential relations (of gender or coloniality, for example). I attend to the timescapes orchestrated through infrastructure as a core dynamic of refugee governance. This captures infrastructure's trajectories and territories, the regimes of precarity and carcerality affecting refugees, and how they are maintained or contested through the everyday socio-technical work of aid workers. Indeed, data justice researchers highlight that socio-economic rights—including workers' practices and conditions—are understudied in favour of other human rights such as privacy and non-discrimination (Niklas & Dencik, 2021). In combination, the three

components of *infrastructure justice* (subjectivities, timescapes, and materialities) provide a way of tackling tangible, situated issues of fairness, rights and accountabilities in socio-economic context.

Blockchain is intervening in the data practices underpinning humanitarian economies. As well as affording a nuanced perspective on humanitarian data politics, a key contribution of my theoretical approach is that it aims to capture financial aspects of justice. Money and payment technologies are a crucial means of distribution and redistribution, shaping people's capacity to live well. They are called upon in debates about public utilities, societal stratification and inclusion, about violent, racialised global relations of financialisation, capitalism and debt, and therefore they are implicated in crucial justice concerns (Donovan, 2021; Kish & Leroy, 2015; Rea & Nelms, 2017). How blockchain is used by and affecting refugees as a payment infrastructure is yet to be critically examined. My work responds to calls from intersectional feminist researchers studying financial technologies in international development to investigate 'whether and how the sphere of finance can be repoliticised as a site of struggle for social justice' (Gabor & Brooks, 2017; Natile, 2020, p. 5).

### 3.3. Theoretical background

Connecting with the *infrastructure justice* framework, this section discusses several key theoretical tenets:

- Payment infrastructures are inextricable from socio-technical systems of identification and migration management. These socio-technical systems condition refugees' trajectories of movement in space and time, and their access to resources. Experimental infrastructure projects must be linked with critiques of paternalism, coloniality, surveillance, racial capitalism, and marketisation in the aid industry.
- Intersectional feminist theories of labour complement both the analysis of the material brokering and maintenance of infrastructure by local aid workers, and of the socio-economic priorities and practices of refugee women in the context of wider 'social reproduction'—the maintenance of socio-economic relations through under-recognised forms of work (Cook, 2020; Rai, Hoskyns, & Thomas, 2014).
- By examining the imaginary, affective dynamics of infrastructure according to different subjectivities, we can take up the important task of foregrounding emic and non-western approaches to socio-technical systems—which may not fit into the discourse of empowerment, for example. This helps us follow how logics and aspirations materialise in support of some priorities at the expense of others.

### 3.3.1. Humanitarian governance

#### *UN governance and trust after blockchain*

The Links project is an experiment in infrastructure change. BASS seeks to transform humanitarian governance with a shared blockchain. Specifically, by using blockchain to enhance (a) the coordination of aid agencies and in so doing (b) the management of aid beneficiaries. The term governance refers to various ‘institutionalised, regularised, systematised, embedded’ mechanisms of controlling and shaping people, action, places, and things deployed by a landscape of actors, not necessarily government or formal law (Johns, 2021, p. 54). Governance involves power—the ability to manage and influence—which can involve top-down authority or more diffuse and productive (rather than repressive) forms of control through self-government (as per Foucault’s concept of biopower) (Scott-Smith, 2015). As with tech platforms such as Airbnb or eBay, blockchain promises to mediate the social trust involved in governance, and therefore to mediate cooperation and economic exchange. Indeed, trust in and the trustworthiness of digital infrastructure is now a major theme in current policy debates about the governance of human societies with augmenting reliance on automation and algorithmic decision-making (Brandusescu, Van Geuns, & Mozilla Insights, 2020; Micheli, Ponti, Craglia, & Suman, 2020). Critical research has examined how algorithmic decisions mediate contemporary social life and raise fundamental problems for the trustworthiness, transparency, accountability, and fairness of welfare systems, urban administration, labour conditions, journalism, democracy, and more (Eubanks, 2017; Graham, Kitchin, Mattern, & Shaw, 2019; Pasquale, 2015; Woodcock &

Graham, 2019). Through the theoretical frame of *infrastructure justice*, this study of blockchain contributes to the latest debates about governance and trust in the digital age.

The infrastructure analytic helps examine the politics of blockchain networks: how important decisions are made with, by and about them and how they (re)configure power relations. Most research on this subject has taken place in social studies of the governance of notable cryptocurrencies like Bitcoin and Ethereum. Crucially, this work distinguishes between blockchain imaginaries—how the infrastructures underpinning cryptocurrencies are believed to function by proponents—and how they work in practice (DuPont, 2018; Lehdonvirta, 2016; Sclavounis, 2017; Vidan & Lehdonvirta, 2019). Scholars stress the material practices, settings, political conflicts, and adaptations that blockchain governance involves, counter to the powerful myths of neutral automation surrounding it. DuPont’s 2018 ethnography of Bitcoin elucidates the culture of blockchain governance and maintenance: it requires a community of users, gatekeepers and decision-makers operating with hierarchies and shared socio-economic customs, norms, expertise, and beliefs.

Studying how UN organisations design and use blockchain means ‘studying up’—i.e., examining apparently ‘global’ or ‘universal’ institutions, values and development goals—which has been an important move in making anthropology less about othering and exoticising local, ‘traditional cultures’ (Nader, 1972; Rabinow, 1986, p. 241). Post-colonial work has refused the assumption that technology design is culture-free in the West but culture-laden elsewhere (Philip, Irani, & Dourish, 2012). Humanitarian practices, policies and technologies are bound up in the socio-political and cultural conditions of their time (Scott-Smith, 2020). In my previous work I have

begun to examine the governance frameworks and political and corporate agendas behind blockchain-based digital identity projects for refugees (Cheesman, 2020; Cheesman & Slavin, 2021). This thesis goes further, contributing to these studies with new knowledge about the inner workings, political conflicts and material practices involved in imagining, making, and governing a decentralised, putatively trustless socio-technical infrastructure for aid. Examining blockchain governance as managed and realised by BASS opens up the research agenda to important terrain—the socio-technical operations of major traditional global governance institutions.

Previous ethnographic research on the governance of UN organisations has emphasised the diversity in their cultures, processes, and mandates (Allen & Hoda, 2020). Humanitarian aid involves a complex, varied, and contested set of projects (Mosse, 2011). The UN is not a stable, singular entity but rather a notoriously competitive, fragmented system of organisations (Galtung, 1993). For example, UN agencies have their own proprietary IT systems; despite the unified set of UN founding principles such as multilateralism—equal voice to all member states on issues like Internet governance—research demonstrates power disparities, non-participatory and corporate-empowering models of authority (Hauben, 2021). Critical research de-stresses the notion of coherent global power and instead looks at the situated practices, logics, values, and ideologies through which aid organisations operate, in conjunction with host and donor states and other partners in particular political climates (Krause, 2009). I study aid organisations and the implications of their infrastructure projects through the lens of their specific cultures of bureaucracy, collaboration, and expertise, in the Middle East and in international settings (Mitchell, 2002, 2004).

The implications of using blockchain in the governance of international organisations has received scant attention in academic research. However, several studies from different fields examine the effects of decentralised infrastructures on institutional practices of coordination and collaboration. Through examinations of decentralised digital infrastructures in biomedical research (Bot, Wilbanks, & Mangravite, 2019), the music industry (Baym et al., 2019), and global finance and law (Bernards & Campbell-Verduyn, 2019; Walch, 2017a), this body of literature shows that blockchain does not straightforwardly bring stakeholders into strong and transparent collaborative relationships, flatten power dynamics, or resolve the problems arising from traditional centralised data ecosystems. Decentralisation has unintended consequences, it maintains and recreates patterns of authority, and the social and institutional practices, imaginaries, and effects it comes with need to be unpicked.

How infrastructure intervenes in relations of authority and trust in aid is a pressing question of social justice. In the reported crisis of trust between and among stakeholders (donors, aid agencies, affected populations, local communities and governments), recent breakdowns in accountability, political frictions, and major data security breaches seriously undermine the ethics and effectiveness of humanitarian work on systemic and operational levels (Aly, 2019; Parker, 2020). The United Nations is associated with significant ruptures in trust as major humanitarian agencies have mismanaged sensitive data systems and seriously compromised data subjects' safety, for example, by leaking and sharing information or data modelling contracts with hostile political actors and nefarious intelligence actors like the government of Myanmar,

the Taliban, and the surveillance company Palantir (Fournier-Tombs, 2021; Privacy International, 2019; Rahman, 2021).

In the contemporary moment, institutions are staking claims as trustworthy guardians of digital data (Woodall & Ringel, 2020). The subjective, spatial-temporal, and material arrangements of trust require unpicking in relation to blockchain if we are to understand its implications for a fair and just future of the governance of (displaced) societies. Rather than buying into blockchain proponents' ideas of trust (or rather, trust-less-ness), or adopting an overly economic-rationalist definition (Hardin, 2006), I take the concept of trust ethnographically. Like Bodó, I seek to examine how trust, coordination, and governance are imagined, produced, (re)configured, and *mediated through* socio-technical infrastructure—here, blockchain in contexts of humanitarian governance by UN agencies, principally BASS (Bodó, 2020). This follows cultural studies approaches that see trust as a complex, multi-scalar phenomenon operating on personal and collective levels, and produced by people and institutions through collective knowledge and norms (ibid). I explore debates about trust and digital infrastructure as they play out in the sensitive geopolitical contexts of humanitarian governance and data management. This is especially pressing since humanitarian contexts have become a dominant global reference point for experimental technology testing and development.

### *Infrastructure experiments in aid*

The Links pilot is not a radically new format of socio-technical change, but rather part of the wider phenomenon of experimental infrastructure projects in aid. Across the public and private

sectors, the pilot project has become the paradigmatic way of testing, proving, and developing new ideas (Given, 2008). From academic studies to clinical trials, pilots are usually real-world experiments conducted on a small scale. Governance institutions like United Nations agencies use pilot projects to test concepts in particular contexts. New technology pilots serve an important institutional function in drumming up investment and trust from the international community (Krause, 2014). The blockchain pilot I study contributes to the Jordanian aid apparatus' political performance. Pilots are not merely temporary or inconsequential. They tinker with lives and relationships, constitute what technologies end up doing, how and for whom, and so are important terrain for engaged research and critique (Grommé, 2015).

As socio-economically isolated, controlled spaces where subjects have limited rights, refugee camps make for convenient technological test sites (Robson, 2020).<sup>7</sup> Innovative, experimental refugee camp pilots generate profit and create markets. Aid agencies are increasingly expected to innovate as part of their performance of care and credibility to international donors (Sandvik, 2016; Sandvik et al., 2017). The underpinning assumption of innovation is that private sector

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<sup>7</sup> Since the inter-war period, camps have been used to selectively exclude and detain communities—foreigners and minorities—from accessing the standard rights, freedoms and civil liberties associated with citizenship (Kauth & King, 2020). They are not a radically new approach to the marginalisation, criminalisation and experimental management of populations considered surplus or undesirable. Axster et al (2021) show that 'Mass incarceration, police brutality, and border controls are part and parcel of the everyday experiences of marginalized and racialized communities across the world.' This carceral politics has historical genealogies and has intensified in neoliberal times as part of the long-term 'organised abandonment', surveillance of and violence against marginalised populations (Brankamp, 2021; Gilmore, 2020). The organised abandonment of and violence against refugees and asylum seekers has been most studied in relation to South-North migration, for example, the border spectacles of Fortress Europe (Maggs, 2019). But South-South migration politics, as is the focus of this research, is gaining more attention. Critiques of racial capitalism and colonial domination remain relevant here (Fiddian-Qasmiyeh & Daley, 2019). For example, humanitarian labour and funding are chiefly distributed among historically marginalised, dispossessed countries in the Global South—in the case of the Syrian crisis, among Turkey, Lebanon, and Jordan. Governments and UN agencies in the 'Global North' or 'West' promote this South-South 'burden-sharing' as it supports their financial interests and hostile asylum policies (ibid). In immigration diplomacy, refugees have become 'bargaining chips' as rich metropolises seek to outsource the responsibilities of refugee protection and care to low-income countries (Walia, 2021, p. 4).

logics of entrepreneurialism will inject new ideas into tired, clunky humanitarian bureaucracies (Scott-Smith, 2016, 2020). Such neoliberal approaches legitimise ‘quasi-religious belief in the “hidden hand”, and the self-propelling virtues of “the market”.’ (Hall, Massey, & Rustin, 2015, p. 12). However, humanitarian organisations are also prone to innovating for innovation’s sake. Anthropologists of technology have long examined the specific motivations behind innovation, noting that the myth ‘necessity is the mother of invention’ does not always hold (Pfaffenberger, 1992). Neophilia pervades the aid sector, i.e., a proclivity for flashy new technical quick fixes (such as PeePoo Bags, LifeStraws and PlumpyNut pouches) rather than more substantive and time-consuming improvements to people’s lives (Scott-Smith, 2016, 2020).

The problematic justice implications of experimental approaches to socio-technical infrastructure and policy in aid contexts have been well noted (Molnar, 2020). Studies show that the primary method of exporting and imposing ‘travelling models’ designed in the Global North to low-income countries often means ignoring local priorities and preferences (Olivier de Sardan, Diarra, & Moha, 2017). Taylor and Richter trace how ‘smart’ big data approaches to water distribution in Bangalore are not locally generated and suited to communities’ needs, but rather are designed to extend the agenda of multinational companies like IBM, who ‘use one utility sector as a practice ground for developing systems that can then be replicated and scaled for other utilities and other cities.’ (Taylor & Richter, 2017, p. 731). Private companies benefit substantially from aid sector technology pilots. They provide the chance to develop new markets, trial new products and develop patents—in conditions of limited accountability, critics suggest, since data protection standards tend to be minimal and humanitarian partners have legal immunities (Duffield, 2013; Jacobsen, 2017).

The Links project tests blockchain infrastructure (along with biometric iris scanning) for humanitarian coordination and cash assistance at a large scale: 106,000 refugees in Jordan's camps. Of such pilots, Madianou (2019) asks: why are they not being tested on smaller samples and 'less sensitive populations', for example, European citizens 'who are normally not in fear of persecution if their data are leaked' and who have data protection regulations such as the EU's General Data Protection Regulation (GDPR) to support them? This opens up important questions about how the aid industry apparatus maintains a differential set of values and standards for refugee populations as opposed to, for example, white 'expats' or domestic citizens (Benton, 2016; Fassin, 2007). Migration management infrastructures produce hierarchical evaluations of human life, sorting who can move, when, where, and under which conditions. The international border system, which shapes the conditions of movement in the world, follows colonial, racist lines: forced migration, dispossession, poverty and conflict are shaped by imperial, racial histories and structures of global capitalism (Achieme, 2019; Mahmoudi, 2020; Mayblin & Turner, 2021; Walia, 2021). As Walia has it, 'Classifications such as "migrant" or "refugee" don't represent unified social groups so much as they symbolize state-regulated relations of governance and difference.' (Walia, 2021). Racism and coloniality have always shaped technology testing. Indeed, colonies were the original laboratories for imperial governance strategies, especially population management techniques used to manage poor, indentured, and enslaved people like biometric fingerprinting or panoptic prisons (Axster et al., 2021, p. 7; Barder, 2015).

The historical testing of governance models and techniques on non-Western populations demonstrates how the risks of new technologies are disproportionately carried by marginalised groups and people of colour. Sandvik, Jacobsen, and others highlight the significant risks involved in trying out unproven data technologies on persecuted or vulnerable groups such as refugees. For example, they unfavourably compare western public health frameworks to the inadequate regulatory approaches taken by aid agencies, arguing that technological experiments conflict with the core principle of humanitarianism: Do No Harm (Jacobsen & Fast, 2019; S. McDonald, Sandvik, & Jacobsen, 2017). Key problems here include the lack of adequate safeguarding, regulation, or informed consent, postcolonial power relations, and technology failure compromising access to vital resources. The risks involved in testing novel data technologies on refugees do not just stem from privacy breaches and the exposure of persecuted groups' personal information. The discriminatory dimensions of digital harms must be understood as an insidious and structural part of datafication (Browne, 2015; Noble & Tynes, 2016; Sim & Cheesman, 2020). A starting point of the *infrastructure justice* approach is we need to understand how the experimental refugee population becomes part of the infrastructure that is required for the data economy to function. While humanitarian beneficiaries such as refugees sometimes benefit from innovation pilots, we must understand how they become part of a product being sold (Krause, 2014).

*Humanitarian payments: paternalism and marketisation*

The pilot project I study uses blockchain as a platform for recording and facilitating financial transactions in refugee camps. Theorising blockchain as socio-technical infrastructure helps us understand how it is not simply part of an assemblage of data technologies used by the aid industry apparatus to identify, track, and control refugees (Madianou 2019), but is a payments infrastructure implicated in everyday socio-economic life and questions of poverty, inequality, and financial justice.

In accordance with the sector-wide Grand Bargain (IASC, 2016), humanitarian agencies are increasingly expected to offer people *cash assistance* rather than food, goods, vouchers or coupons. The turn towards cash is linked with the recent commitment to the ‘localisation’ of humanitarian aid. Cash transfers encourage aid agencies to (i) inject value into local economies rather than flood them with goods, which discourages production, and (ii) allow the beneficiaries of aid to make their own purchasing decisions (ODI, 2015). Cash transfers involve regular payments to humanitarian beneficiaries. They are understood as an ‘economic multiplier’, a significant step in reducing the historic dominance and paternalism of aid organisations, and they are also cheaper for organisations to deliver than most other items or services (ibid). These arguments were partly elaborated by Amartya Sen in the 1980s, who won the Nobel Prize in Economic Sciences for his contributions to welfare economics, but cash transfers as an approach to humanitarian relief can be traced as far back as the work of the Red Cross’ work during the 1870–71 Franco-Prussian War; they were also used, for example, in response to famine in 19th century India and in development work in 1980s Botswana, but they gained mainstream

popularity in Latin America in the 1990s (Millán, Barham, Macours, Maluccio, & Stampini, 2019; ODI, 2015, p. 15). The use of cash transfers in humanitarian aid has accelerated in the last decade, and in the last two years its use has doubled (CaLP, 2020b).

The forms and functions of goods provided to communities by humanitarian and development organisations, but also by welfare states and government anti-poverty programmes, has been a central concern in academic research on global inequalities in general (what do poor people need?), and the ethics and politics of aid in particular ((how) should the aid industry give it to them?) (Scott-Smith, 2020). In ‘Give A Man A Fish’, Ferguson situates the cash transfer revolution as part of longstanding debates about the power relations between the Global South and the Global North, along with issues of colonialism, dependency, and the international distribution of resources in global capitalism (J. Ferguson, 2015). Cash transfers are implicated in a politics of conditionality in aid. *Unconditional* cash transfers are money given to people regardless of criteria such as occupation, age, gender, or any requirement for action (like finding employment or engaging in ‘productive’ activities). Ferguson shows that unconditional schemes are widely associated with prejudices and assumptions—that directly giving people money makes them lazy and unproductive, for example—which do not hold in practice. He famously argues that unconditional cash transfers hold the potential to play an important part in global wealth redistribution through basic income provision by states, which should no longer be conditional upon the neoliberal paradigm of productivity and labour market integration.

Ferguson’s vision would be a radical break from the status quo. *Conditional* cash transfers have long been the norm. Direct payments have been used to shape poor people’s consumption

practices and encourage them to perform ideals of good citizenship since the 19th century (Roy, 2010). Conditional cash programmes now tend to be underpinned by experimental concepts and approaches borrowed from behavioural economics and motivational psychology. They incentivise people to engage in behaviours that build ‘human-capital’ such as preventative healthcare and good school attendance (Peck & Theodore, 2015, p. 104). The idea that people should have to ascribe to economically rational behaviours in order to access basic rights has been widely critiqued as paternalistic control (Ladhani & Sitter, 2020, p. 31). It has also become clear that conditional cash transfer schemes offer a new profitable frontier of market creation, especially for institutions like the World Bank which are funded by high-income countries on the basis of ‘social targeting actively linked to human-capital investment’ (Elyachar, 2012; Peck & Theodore, 2015, p. 104). The financialisation of human life through the creation of new markets is a racialised process: in how subjects are constructed as good investments (financially and morally), there are continuities between humanitarianism, colonialism and slavery (Kish & Leroy, 2015).

The *infrastructure justice* approach flows from this theoretical background of paternalistic conditionality, behavioural ‘development’, and market-making. GEN’s cash-for-work scheme, which the blockchain pilot intervenes in, must be seen in this context. To access cash, refugee women must fulfil labour requirements. Lenner and Turner and others argue that through policies such as the Jordan Compact, which established refugee cash-for-work opportunities in 2016, Jordan has become ‘a laboratory and a showcase for a new global blueprint for economic development in refugee hosting states, thereby attempting to marshal the unused “human capital” of refugees.’ (Gordon, 2021; Lenner & Turner, 2018, 2019, p. 12). Refugees in Zaatari and

Azraq camps, pushed to the deserts of Jordan, are expected to fall into the Jordanian state's economic and migration management strategies, which are intent on shaping Syrian refugee populations as a labour force. These practices sit in the wider global context of 'escalating anti-immigrant xenophobia, fearmongering about racial demographic change, and panics about job losses due to austerity,' in which migrant workers are marginalised and produced as a 'pool of cheapened and disposable labour without disturbing the racial social order.' (Walia, 2021, p. 8).

### *The datafication and coordination of humanitarian payments*

In the aid industry, the use of data-generating technologies such as cards, mobile money platforms, and biometric payment authentication, are a relatively new development (Bailey & Harvey, 2015). Compared with the history of Euro-American finance, where the datafication of money began with the development of payment cards in the late 19<sup>th</sup> century (Lauer, 2020), humanitarian economies still mainly function through in-kind goods distributions, vouchers and coupons. The recent move to digitalise cash schemes is considered one of the most significant contemporary developments in humanitarian aid (UNOCHA, 2021, p. 219). The Overseas Development Institute (2015) argues: 'Using digital payments makes disbursing and receiving transfers cheaper, improves their transparency and traceability, increases security for recipients and can give people an entry point into other formal financial systems'. Digital payments promise to support the financial inclusion of poor, 'unbanked' people by helping them build a credit profile via payment data (Donovan, 2018).

Links responds to a new sector-wide conundrum: the increasing digitalisation of cash transfers has not been accompanied by adequate efforts to coordinate either the delivery of the cash or the vast amount of data the transfers and transactions generate (CaLP, 2020a, p. 6). International organisations and policy commitments have been set up to address this problem, which reportedly causes significant operational issues at all levels (ibid). Research has suggested that unreliable and siloed information management structures within and between agencies play a significant role in limiting the effectiveness of humanitarian operations (Altay & Labonte, 2014; Dubey et al., 2019). By reorganising digital data with blockchain, Links proposes to enhance not only the coordination of cash assistance, but of aid industry activities in general. Documenting and examining how blockchain impacts humanitarian coordination is therefore a way of gaining insight into the material processes and imagined horizons of the governance of UN organisations.

Modern governance systems have long marshalled data infrastructures in their coordination and administration (G. Bowker & Star, 1999a). Optimistic studies of humanitarian governance and coordination suggest that innovation is about ‘adaptation and improvement’ and ‘finding ways to enable people to work together—to better connect staff at headquarters to those in the field, to better connect refugees to international organisations, and to link people with problems to people with potential solutions, cutting across traditional sectoral, geographical and socio-economic boundaries.’ (Betts, 2014). The assumptions here need to be interrogated in practice. More critical studies of innovative approaches to governance stress the slipperiness of coordination. Aid professionals debate and disagree about what partnerships are, and new, imagined, and established informationalised worlds come into competition with one another and persistent, less

or un-informationalised legacy worlds (Jensen & Winthereik, 2013). We need to see coordination as an unstable concept and phenomenon.

Furthermore, we need to ask *what ends* coordination and data sharing initiatives serve. The digitalisation of payments has ushered new private sector technology companies and financial service providers into the humanitarian apparatus, generating an exponential amount of transactional data which the sector struggles to manage safely and responsibly. From the infrastructural perspective, whoever owns the rails of payment is in a position to profit (Maurer, 2015a; Swartz, 2015, 2020). Already, we have seen that data from so-called emerging markets have become a racket for the private companies that harvest and commodify aid subjects' digital footprints (Gabor & Brooks, 2017; Lemberg-Pedersen & Haioty, 2020; Tazzioli, 2019).

Migration management closes off and restricts (black and brown) people, but it opens up to capital (Walia, 2021). We must examine the justice implications of private companies such as technology providers gaining further legitimacy as public actors without public values in humanitarian finance (Taylor, 2021b). There is also a need to investigate the effects of the new visibility of information about the everyday transactions of humanitarian subjects, and how far they may enable practices of surveillance and oppression of already marginalised, criminalised groups. Little is known about how blockchain challenges or connects with these issues. Thus, studying blockchain in aid is a lens into the major transformations happening in the sector and the digital economy more broadly. We need to understand how this decentralised, potentially privacy-enhancing infrastructure, linked to radical peer-to-peer money ecosystems like Bitcoin, intervenes in established trends in the politics of humanitarian payment infrastructure.

### *The identification-payment nexus*

Payment is closely associated with identification and profiling. In most countries, Know Your Customer (KYC) and Anti Money Laundering (AML) regulations require that identity information is collected by financial service providers. In racial capitalism, personal data is used to make moral assessments about individuals' deservingness, for example, in welfare and lending decisions (Axster et al., 2021, p. 15). In aid, allocations of resources are made based on metrics of vulnerability: credit scores, food consumption, bodily abilities, and other classifications. Aid organisations provide people with identification so that they can access social, financial, mobile, and welfare services. The personal data and identity profiles humanitarian organisations collect and build are intended to support fair and targeted payments and empower people with formal recognition and the associated rights (Weitzberg et al., 2021). Of course, these practices are also implicated in justice issues of surveillance, social classification, and discrimination. The ever-expanding collection of data and use of identity checks by aid organisations and governments is widely critiqued and disproportionate and exclusionary (ibid). Indeed, there is a 'recurring tension between, and within, theories of classification and justice' (Martin & Taylor, 2020, p. 3).

The Links project incorporates iris scanning into its socio-technical infrastructure. Biometric identification has been widely adopted by aid organisations, as is the case in Jordan. Biometric techniques include iris scans, DNA profiles, facial recognition software, and fingerprinting tools. They capture biometric data, which is stored as a template and used as the basis of identity verification: someone's claimed identity is authenticated against the template (Martin & Whitley, 2013). In government and technology industry circles, biometrics are widely understood as a

neutral, accurate way of ensuring the veracity of people's identity claims. Biometrics have been proposed to reform corrupt election procedures in Chad (Debos, 2021) and 'deracialise' citizenship administration in Kenya (Weitzberg, 2020). Yet, these studies demonstrate that biometrics are far from neutral and do not resolve but reformulate socio-political problems. The problematics of biometric systems have been extensively explored. Biometric identification connects with a genealogy of techniques in anthropometry, slavery and branding, which Browne terms 'digital epidermalisation'—'the marking of the racial other' (Browne, 2009). With biometrics comes the assumption that bodies are 'stable entities that can reliably give us definitive proof of identity'; Magnet shows that this fosters discrimination as populations are stratified on the basis of biological traits, race, gender, class and other axes (Magnet, 2011, p. 150). In migration management and aid, biometric techniques contribute to 'suspicious infrastructures', technocratic means of dealing with the mistrust of migrant others (Noori, 2021). Biometrics are a primary technique of contemporary securitisation, surveillance, policing, and mobility control (Amoore, 2006; Lyon, 2008). They are disproportionately used on marginalised and migrant populations, and in-depth work in refugee contexts has illuminated significant issues around informed consent, data protection, and security leaks (Kaurin, 2019; Latonero, Hiatt, Napolitano, Clericetti, & Penagos, 2019; Schoemaker, Currión, & Pon, 2018). The practice of tying people's IDs to permanent biological information which then has implications for their mobility and wellbeing has given rise to dangerous systems avoidance in refugee contexts (Rahman, 2018). In a number of data security crises, the mismanagement of biometric identity systems by aid agencies has seriously endangered the safety of persons of concern, rendering them vulnerable to expulsion and persecution (Guo & Noori, 2021; Privacy International, 2019; Rahman, 2021).

The convergence of payment and identification is under-theorised in anthropological terms. Clearly, biometric identification must be understood as a deeply problematic technique refugee governance. A justice-oriented approach helps us interrogate how identification systems mediate people's livelihoods, unveiling the power dynamics and the ambivalences of inclusion and exclusion (Martin & Taylor, 2020). Examining *infrastructure justice* allows us to trace how biometric checks mediate the governance and coordination of humanitarian payments, structured by blockchain. Critical approaches to digital identity in humanitarianism have not yet reckoned with the frontier between blockchain, a potentially surveillance-resistant system, and biometrics, a renowned and widely denounced family of privacy-invasive technologies. At this frontier, the politics of paternalism and conditionality, targeting and profiling, fairness and discrimination are potentially made anew, with significant implications for socio-economic justice. **Do blockchain implementations and discourses transform humanitarian governance? (RQ1).**

### 3.3.2. Local aid work

#### *The colonialities of infrastructure development*

The infrastructural development of this international blockchain platform by GEN and their partners in Jordan must be examined through a postcolonial lens. Postcolonialism as a theoretical perspective invites us to critique the asymmetrical relations that persist between formerly colonised and colonising societies; it engages with the enduring struggles to decolonising thinking, subjectivity, knowledge, practices, and socio-economic power (Mayblin & Turner, 2021, p. 17). The United Nations is generally conceived as ‘a guardian of international peace and security, as a promoter of human rights, as a protector of international law, and as an engineer of socioeconomic advancement.’ (Hanhimäki, 2015, p. 1). The United Nations—and the host of organisations, secretariats, programmes, institutes, agencies, commissions, divisions, and departments it comprises—carries the ambitious remit of ‘representing the interests of the entire world’, and UN membership has been viewed as an important mark of international recognition for decolonised countries (ibid, p. 21). Major humanitarian agencies of the ‘UN family’ have received Nobel Peace prizes. At the same time, UN organisations emerged from colonialism. For example, the UN refugee protection agency was invented by colonial powers to protect European refugees (not people of colour) after World War II, and the migration agency was founded to settle Europeans in Africa (Mayblin & Turner, 2021, p. 11).

British colonisers in Jordan shaped and constituted the nation’s borders and the very state of Transjordan for their own foreign policy interests (Alon, 2007). By the late 1920s, British

officials and ‘a largely imported administrative class’ controlled the Jordanian government (Robins, 2019). While Jordan gained independence from British rule formally in the 1950s, the United States soon became its next ‘great protector’ (Yom, 2021).<sup>8</sup> Jordan can still be characterised as a resource-poor ‘banana monarchy’ economically dependent on foreign connections (Barakat & Leber, 2015; Yom, 2021). Imperial and colonial legacies shape how postcolonial states such as Jordan manage migration. For example, how postcolonial states ‘reproduce colonial-era tropes via the surveillance and control of segmented migration streams that redistribute labour for the global economy.’ (Sadiq & Tsourapas, 2021). Colonialities continue as Western professionals have been dispatched to the Middle East and North Africa for decades to work on foreign policy, international development, or education (ibid). In this thesis, I use the term *coloniality* which refers to ‘long-standing patterns of power that emerged as a result of colonialism, but that define culture, labor, intersubjective relations, and knowledge production well beyond the strict limits of colonial administrations.’ (Maldonado-Torres, 2007, p. 243). As Casilli puts it, ‘coloniality does not operate as an abstract metaphor but as a feature of both Western and non-Western subjectivities.’ (Casilli, 2017, p. 3947). Rather than conflating any kind of global power relations with dynamics of colonialism or neo-colonialism (which are too often characterised as unidirectional domination), coloniality emphasises asymmetrical and contested relations of knowledge, voice, and power (Casilli, 2017, p. 3946).

The colonialities of infrastructure are material and epistemic, affecting international knowledge flows, not just resources and data—for example, through racialised divisions of labour and the connectedness of whiteness and engineering knowledge (A. Davies, 2021). The pilot project I

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<sup>8</sup> This served US political interests: ‘so long as Jordan endured, it could be a geopolitical firebreak insulating Israel and the oil-rich Arabian Peninsula from the radical forces of communism and Arab nationalism.’ (Yom, 2021).

study was originally conceived and driven by UN agencies headquartered in the US and Europe. At a hackathon in the US office of GEN, 7 technology developers vied to become vendors by pitching their proposals for the pilot and none were actors local to Jordan. The blockchain system was then developed by an Eastern European company. The pilot's initial development and funding were generated by Scandinavian government donors. GEN's operations in Jordan were overseen by western partners (staff from BASS's EU-based Accelerator). GEN Jordan is largely composed of Jordanian women staff, but more senior roles generally go to ex-pats. As I discuss in more detail in the empirical chapters, colonialities of power and expertise structure humanitarian work, including the socio-technical making and management of blockchain.

However, the domination of western donor states and western-based (here, United Nations) experts should not be over emphasised. Hanafi suggests that postcolonial scholarship on the Middle East over asserts the role of imperialism in the region and generates an 'oppositional binaries' with the West (Hanafi, 2019, 2020). For example, he argues that the powerful role of new empires (not just the US, Britain, and France) in the management of the Syrian crisis—Saudi Arabia, Russia, Turkey, and Iran—is regularly overlooked, as are local and internal power dynamics and crises. Hanafi's work urges anti-imperialist scholars to recognise the significant role neoliberal authoritarianism and 'crony capitalism' has played in Arab countries for over half a century. Here, Arab states, in conjunction with international actors, deploy coercive power to extend the interests of commercial and political elites (Hanafi, 2020, p. 9). Humanitarianism in the Middle East involves not just Northern actors capturing the South or Southern qualities as its 'special place', as per Said's *Orientalism*; it involves Northern *and Southern* actors reasserting, solidifying and legitimising the South as a space for appropriate intervention and capital (Carpi,

2019). Local and regional actors are complicit in colonialities of power and knowledge in the Arab world.

While capturing important dynamics of experimental innovation in the Global South, theories of the aid industry's 'blockchain imperialism' (Jutel 2020), 'data colonialism' (Couldry & Mejias, 2018), and 'technocolonialism' (Madianou 2019) have so far neglected these nuances of coloniality in situ. Justice-oriented approaches to technological experimentation and datafication are capable of attending to issues of international geopolitics and coloniality alongside market co-optation and exploitation (Taylor et al., 2020). With an eye on *infrastructure justice*, we can follow the distribution of material resources, authority, and profit in a way that accounts for Southern subjectivities, interests, and practices. Through the component of timescapes, I examine how the 'coloniality of infrastructure' (A. Davies, 2021) operates in specific historical contexts and across particular temporal and spatial trajectories.

### *The labours of infrastructure maintenance*

Anti-colonial work can illuminate and analyse the forms of hidden or invisibilised labour that comes with digitalisation (Casilli, 2017, p. 3947). Critical studies of the aid industry have noted that the rationalities, practices, expertise and challenges of local aid workers are often neglected in accounts of humanitarian and development projects (Fechter & Hindman, 2011; Musmar, 2017; Olivius, 2014, 2016). Attention is most often on the construction of top-down, 'global ideas' and how they are experienced by beneficiary communities. However, it is necessary to examine not just the making of universal goals by UN agencies in their international civilising

projects, but also how they interface with and are transformed by national and regional cultures in practice (Brumann and Bendix 2018). Local aid workers play the primary role in designing and co-constituting outcomes. The most inconsequential-seeming administration tasks can involve the arbitration of rights and entitlements, and therefore logics about ‘how one should live and who should decide’ (Mosse, 2005, p. 12). Aid work is affective: professionals do not implement neutral logistical missions but rather are human beings completing projects with their own politics and prejudices, plans and assumptions (L. H. Malkki, 1996, 2015). Technology pilots are no different. This work advances studies of digital humanitarianism, coloniality, and justice by closely attending to the role of aid workers and other local and regional actors (not just hegemonic western actors) in imagining, maintaining, selling, and being sold in technological experiments.

Everyday humanitarian work has always been socio-technical. It depends on and is maintained by data systems; statistics, lists, and quantified needs assessments have always been part of professional practice of aid workers (Macias, 2020, p. 336). STS literatures emphasise how it is important to look at the humdrum work of material maintenance, which is the often invisible or invisibilised labour that keeps a socio-technical system ticking. Prominent examples include the underpaid and under-recognised ‘ghost work’ of online content classification and moderation that props up Silicon Valley platforms and AI (S. T. Roberts, 2019; Suri & Gray, 2019). STS approaches to maintenance are compatible with feminist theories about the labour of upkeep, which is unevenly distributed along intersectional (gender, race, class, caste) lines, and does not simply disappear (as it is often assumed to) with the advent of new technology (Cowan, 1984; Mulvin, 2021). Information infrastructures are always maintained through the graft of a

constellation of human and non-human brokers, fixers, and mediators (Ribes et al., 2013). The infrastructure analytic helps us trace the socio-material practices and effects of ‘brokering’ work involving aid sector professionals, technicians, and enumerators in the field (Donovan, 2015; Leurs, 2020; Mosse & Lewis, 2006). This is particularly important with blockchains because they involve real-time records-making, and therefore continuous maintenance. For example, ‘Without a community of computers running the protocol and engaging in transaction verification, the [blockchain] system stops working.’ (Dupont & Maurer, 2015). The theoretical lens of *infrastructure justice* highlights the rhythms and distributions of labour and material upkeep in the socio-technical operation of blockchains by humanitarian staff, and the subjective experiences of blockchain’s maintainers.

#### *Automation and streamlining after blockchain*

Because digital ‘infrastructuring’ involves ‘delegation to technology’ (Ribes et al., 2013), it incorporates specific imaginaries and practices of automation and algorithmic decision-making. Across different fields, blockchain is strongly associated with imaginaries about smoothing out social and institutional relations. This is because of the foreseen potential of disintermediated, decentralised, peer-to-peer exchange and self-executing ‘smart contracts’ (Lubin, Anderson, & Thomason, 2018; Rella, 2020). GEN’s Links pilot in the refugee camp women’s centres aims to streamline everyday humanitarian work. The ideal of technologically enabled streamlining is not unique to blockchain or indeed this UN pilot project. It can be connected with a genealogy of imaginaries about labour-saving technological change in general (Mulvin, 2021), and the seamless automation, decision-making, and accountability goals of humanitarian and migration

management organisations in particular (Amoore & Raley, 2017; S. McDonald et al., 2017; Willitts-King, Bryant, & Holloway, 2019). Critical studies of digitally mediated migration management examine the politics underpinning these imaginaries. For example, by critically evaluating the idea that ‘irregular’ or ‘undesirable’ populations can be managed perfectly with automated data systems—which those populations struggle to contest themselves. That communities are dreaming about pure, direct, unmediated information and communication systems is not new. In wider studies of media and finance, social theorists observe a suspicion of mediation (Swartz, 2020). For example, fiat money has been viewed as dirty, corruptible, and expensive since long before cryptocurrency advocates came onto the scene (ibid). In the early stages of mass consumer culture, the intervention of computerised methods of authorising and transferring funds were designed to streamline clearing and settlement processes (Lauer, 2020). As with humanitarian streamlining ideals, financial dreams of seamless accounting can be tied up with political and corporate agendas: data-processing techniques were established to develop a coherent financial and customer identity for the purposes of targeted advertising and credit services (ibid).

We need to critically examine the socio-economic justice implications of blockchain as socio-technical infrastructure in aid, and this must be investigated from perspective of humanitarian workers, not just policymakers and refugees. How are dreams and ideologies of automation made, who do they benefit, and how they are translated into and maintained by the everyday labours of aid workers in Zaatari and Azraq? We need a record of the labour history as this decentralised infrastructure meets humanitarian action: **Does blockchain streamline the aid work of UN Gender (GEN) in Jordan? (RQ2).**

### 3.3.3. Refugee women's empowerment

#### *Representations of victimhood and vulnerability*

This research requires tackling the diverse implications of conducting research with war and disaster-affected Muslim women in circumstances of restricted rights, low income, and pervasive debt. At the Wahat, the refugee camp women's centres where this field research was based, women workers are recruited based on skill level but also household vulnerability. Indeed, the cash-for-work scheme is hybrid, providing not just work (at only 1-2 Jordanian Dinars per hour, roughly equivalent to £1-2) but also charity and advocacy. Through the Wahat, refugee women workers can access social protection, legal support, and counselling, for example in handling divorce procedures or gender-based violence. GEN recognise these as significant issues in Zaatari and Azraq. Most of the refugee women workers who participated in this research were well acquainted with serious hardship. The majority of Zaatari residents and many of the participants in this research came from the Dera'a province of South-West Syria (UNHCR, 2019a). Dera'a was the site of a major siege by Assad's army on civilians and Arab Spring protesters. Many of Dera'a's refugees have experienced acute trauma; in the military crackdown, anyone could be shot upon walking outside (Shadid, 2011). Some have also experienced extended protraction: Dera'a previously hosted people who had fled the drought in Northern areas of Syria (Gunning, 2011). As for Azraq, residents were more likely to have fled major cities such as Aleppo and Homs. These were also settings of conflict, destruction, sieges, and starvation.

At the same time, the pilot project I study centres on the concept of refugee women's empowerment, but this is a concept up for critique. In their efforts to mobilise empathy, investment, and action, humanitarian organisations' representations of so-called beneficiaries narrate hierarchical assessments of human life (Benton, 2016; Fassin, 2007; L. Turner, 2019). Here, the aid industry's gendered, classed, and racialised politics of representation has historically emphasised the vulnerabilities of refugees and maintained tropes of passivity, white saviourism, and reliance on humanitarian largesse. In Arab countries like Jordan these representations connect with historical modes of Orientalist othering (Burney, 2012).

*Intersectional feminist perspectives on oppression, 'empowerment', and labour*

In response, critical, anti-colonial feminist scholars have avoided taking categorisations of specific groups' victimhood as given. Instead, they engage with those groups to understand their experiences of displacement, gender-based violence, and humanitarian action from the ground up (Fiddian-Qasmiyeh, 2014, 2016; Fiddian-Qasmiyeh & Fiori, 2020). Feminist anthropologists have shown that ethnographic work can help to adequately render the complexity of women's lives in the Global South instead of feeding into assumptions and spectacles around their suffering, oppression, and lack of agency (Abu-Lughod, 2013; Backe, 2017; Mahmood, 2005b). The narratives of gendered aid projects must be evaluated by comparison (and usually contrast) with the values, priorities and responses of women themselves (Elyachar, 2010; Kabeer, 2012; Natile, 2020). Alongside feminist, anti-colonial scholars, my work re-centres southern subjectivities and responses to displacement and humanitarian aid.

It is important to note that women's empowerment narratives can often foreclose wider intersectional issues around gender. Intersectional feminism understands gender dynamics as affected by social structures such as class, race, sexuality, and disability. However, humanitarian agencies tend to equate gender issues with women's issues and neglect LGBTQ lives and experiences of displacement and asylum-seeking, which can involve serious forms of discrimination, violence, and marginalisation (Mole, 2020; Nasser-Eddin & Abu-Assab, 2020; Raboin, 2020). GEN also takes this narrow lens. Their approach to cash transfer programmes is, like most gendered cash projects, maternalist, in that they target mothers as the most reliable recipients of money because they are seen as self-sacrificing care-givers (De Sardan & Piccoli, 2018, p. 12). My discussion of gender in the thesis is limited to the issues of 'bodies gendered-as-female' (Berry, Argüelles, Cordis, Ihmoud, & Estrada, 2017), which is product of the organisation's heteronormative approach to the Wahat.

My work draws on intersectional feminist perspectives on labour. I see inequality as rooted in unfair economic and political relations based on patriarchal and racialised capitalist structures (Bhattacharya, 2017; Gilmore, 2021). 'Social reproduction theory' is a widely accepted approach which goes beyond the lens of capital, markets and the Global Economy to recognise everyday roles such as childcare, domestic work, communicative and emotional work, and biological reproduction as significant forms of labour propping up socio-economic life (Cook, 2020; Rai et al., 2014). This labour is disproportionately carried out by women and is overwhelmingly unpaid and undervalued. It is therefore important to locate gendered aid projects, particularly cash-for-work schemes, in this context of the existing labour pressures women face, and also the wider goals they may have for themselves other than profit or empowerment (Natile, 2020). It is not a

given that cash transfers empower women, nor is it self-evident what empowerment is in the first place (Ladhani & Sitter, 2020, p. 32).

An important starting point in recognising social reproduction in this thesis is to refer to the users of the blockchain pilot as ‘refugee women workers’.<sup>9</sup> This allows me to resist blanketly referring to them as refugees, which would foreclose important subjectivities—the label is too often used and fetishised as though it reflects a generalisable type of person rather than a political status (Crawley & Skleparis, 2018; Leurs & Smets, 2018, p. 10; L. Malkki, 1995)—but also to emphasise the centrality of their labour, their rights and their struggles in their households and communities *and* as employees in the Wahat. As I show in Chapter 7, this is what their own perspectives highlight.

### *Intersectional feminism, digital media, and money*

I see these perspectives on gender, labour, and humanitarianism as compatible with anti-colonial and intersectional feminist research on digital media. Intersectional feminist studies have revealed differentials, discriminations and inequities when different communities (women, people of colour) engage with digital platforms, data, and technologies (Ford & Wajcman, 2017; Klein & D’Ignazio, 2019; Noble, 2018; Noble & Tynes, 2016). As Leurs puts it, this work has granted ‘ethical reflection on how digital mediation impacts upon responsibility, intersectional power relations, human subjectivity and the autonomy of research participants over their own data.’ (Leurs, 2017, p. 130). Recent anti-colonial work highlights how technology research and

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<sup>9</sup> For clarity: if I am referring to aid workers, I describe them as such.

design is most often oriented towards western concerns, settings, behaviours and frameworks (surveillance, data protection and privacy, automation) rather than those of marginalised groups (Arora, 2019a, 2019b; Milan & Treré, 2019). Simplistic assumptions about refugees' dependence on aid, their economic isolation, technological ineptitude, or homogeneous practices pervade humanitarian action, policy debates, and research. I contribute to critical work that interrogates assumptions, fully recognises, and deepens knowledge about marginalised perspectives on digitally mediated economies (Burrell, 2016; Graham, 2019). With the *infrastructure justice* frame, I build on theories of diverse and non-Western approaches to datafication, empowerment, rights, and justice which address the 'cognitive injustice that fails to recognize non-mainstream ways of knowing the world through data.' (Milan & Treré, 2019, p. 319; Taylor et al., 2020).

Attending to the emic in this way—how refugee women workers use and experience a new blockchain payment system—involves analysing the processes and material practices by which technologies become ritualised within social life. Anthropological studies have unpicked payment politics and the intervention of novel technologies and 'money stuff' in everyday life (Maurer, Musaraj, & Small, 2018; Maurer & Swartz, 2017). Money technologies must be seen as bound up in specific places and spaces, temporalities, kinship and family networks, intersectional relations, and religious practices (Rea & Nelms, 2017). However, the materiality of humanitarian giving requires deeper research (Redfield, 2012; Scott-Smith, 2015). My infrastructure analytic emphasises the materiality of datafied socio-technical systems, and the struggles around material resources in space and time from the perspective of refugee women workers. In analysing how a blockchain-based infrastructure is negotiated and used by refugee women in the context of their wider socio-economic lives, my work contributes to ethnographic studies of refugees' digital

media practices and priorities in the Middle East and elsewhere. These studies have examined how refugees' socio-technical tactics, imaginaries and discourses intersect with their worldviews and concerns (Gillespie, Osseiran, & Cheesman, 2018; Twigt, 2018; Witteborn, 2018). I extend this work by looking at interlocking issues of gender, labour, and socio-economic justice: **How does the blockchain pilot advance or hinder the needs, priorities, and concerns of refugees?**

**(RQ3)**

### 3.3. Research questions

#### 3.3.1. Overarching research question

*What promises are made with blockchain, and are they met in practice?*

I draw on multiple, ethnographic-centred methods to address the knowledge gap around what blockchain can do for international aid and inequality. Links is an experimental infrastructure project affecting the lives and work of multiple stakeholders, chiefly UN organisations (BASS and GEN) and refugees. Multiple, competing imaginaries and priorities characterise the design, use and negotiation of this socio-technical system, including projections of the ideal governance of global populations through automated digital infrastructure, but also the ideals and ideologies of refugees and local aid workers. Infrastructure's promises and practices alike take up material forms in time and space. The thesis presents close-up work with the key stakeholder communities connected to the unprecedented use of this novel and putatively transformative digital infrastructure. I investigate whether and how the Links GEN-BASS pilot fulfils its promises of (1) co-ordinating the governance of humanitarian organisations, (2) streamlining everyday humanitarian action, and (3) socio-economically empowering refugee women workers.

#### 3.3.2. Sub research questions

Each research question focuses on the practices and outcomes of imagining and using blockchain for each key stakeholder community. The questions are dealt with in turn in each chapter, but

they are interrelated: these communities are co-constitutive in practice as they interact with, comment, and cast light on one another.

**RQ1 (Chapter 5):** *Do blockchain implementations and discourses transform humanitarian governance?*

**RQ2 (Chapter 6):** *Does blockchain streamline the aid work of UN Gender (GEN) in Jordan?*

**RQ3 (Chapter 7):** *How does the blockchain pilot advance or hinder the needs, priorities, and concerns of refugees?*

As I have demonstrated in this chapter, concepts of empowerment, streamlining, and coordination should not be seen as taken-for-granted starting points. Rather, this research examines how goals are made, what they reveal, and what and who they (de)prioritise. I respond to the research questions through the theoretical framework of *infrastructure justice*. This framework provides the conceptual tools to understand the implications of blockchain in a way that illuminates issues of justice in depth and from a range of competing perspectives. Bridging literatures from infrastructure studies (anthropology and STS), critical data studies, and aid and migration studies, this thesis argues that injustices are extended, contested, and experienced through three categories of infrastructure: subjectivities, timescapes, and materialities.



## Chapter 4: Methodology

Academic studies of humanitarian blockchains have raised pertinent questions about technosolutionism, power, profit, and surveillance (Madianou, 2019b; Manski & Bauwens, 2020; Rugeviciute & Mehrpouya, 2019; Zwitter & Boisse-Despiaux, 2018). However, these studies have not involved extended work with communities using and shaping the technology—in particular, humanitarian subjects, aid workers, and decision-makers. This thesis presents the first close-up ethnographic examination of the emergent field of humanitarian blockchains, based on participatory fieldwork and long-term engagement with the United Nations project, Links. As I have outlined, Links is developing new modes of transferring financial aid in Jordan’s refugee camps. This involves a collaboration between GEN and the UN Basic Assistance (BASS) (BASS) which has provided refugee women with digital wallets and connected the two agencies around a shared blockchain. My research examines the imaginaries, uses and effects of this humanitarian blockchain project from the perspective of aid organisations and practitioners and, crucially, refugees. These are the primary stakeholders, i.e., communities with a legitimate interest in the project’s outcomes (Eversole, 2018). As such, my research design follows a multi-stakeholder approach. I combine primary fieldwork in Zataari and Azraq camps, Jordan, and digitally mediated ethnographic work with aid industry actors based in Jordan and in international settings.

This chapter firstly provides a concise summary of the overall research design. This outlines the specific methods I used to address each research question, which each relates to a different stakeholder community. The rest of the chapter then discusses the methodological approaches

adopted in the research. I examine (1) the general inter-stakeholder issues involved in undertaking ethnographic work across multiple communities, and then (2) the specific intra-stakeholder concerns associated with specific communities and methods.

(1) I begin by explaining how this thesis draws on ethnographic approaches to the digital as well as digital approaches to the ethnographic. I use a combination of complementary methods to address each research question and so construct particular forms of ethnographic knowledge with every chapter. Threading through these chapters is an infrastructural analytic. I study blockchain as a *socio-technical infrastructure* which structures and facilitates a set of technologies, interfaces, ideas, people, organisations, practices, and things. What blockchain is and means depends on who you are. Adopting this analytic means drawing together a *networked field*, which I show is characterised by inequality and disconnection as much as coherence. Then I outline key challenges and strengths in doing engaged anthropology and using multi-stakeholder research to make a meaningful contribution to the different communities involved.

(2) Among the intra-stakeholder concerns, I firstly discuss my work with refugee women workers, which involved participant observation and focus groups in the Wahat women's centres within the securitised Zaatari and Azraq camps. I discuss language learning, positionality and power, the politics of participation and of 'giving voice' to marginalised groups. I stress the neglected importance of language workers—here, Arabic-fluent research assistants—as interlocuters and collaborators, and their bearings on the positionality of the researcher in different humanitarian settings. Secondly, I discuss the

research with GEN Jordan, which involved participant observation and multi-stakeholder workshops. I evaluate these methods and examine issues of language, power, and participation, as well as struggles around presenting critical findings to organisations. Thirdly, I discuss the research with BASS on blockchain governance, where such struggles crystallised in negotiations around a legally binding research agreement. I examine digitally mediated approaches as resourceful ways of participating in organisational practices, but also tracing opaque social relations and scavenging material.

#### 4.1. Research ethics

This ethnographic research required adjustment to the moral worlds and expectations of multiple communities. Working with refugees and humanitarian organisations is sensitive and demands continuous reflection, adaption, and sensitivity. Refugees have restricted rights and precarious livelihoods, and their concerns were central in my research activities. Ethics is an ongoing negotiation and a relational matter, not resolvable by a set of standardised consent forms. Accordingly, my discussion of ethics is woven throughout this chapter and the thesis as a whole as I address critical questions about power, positionality, duties of care, privacy, and consent. However, as outlined in my approved ethics committee (CUREC) application, this research followed established measures, training, and guidelines, for example, from the University of Oxford's Refugee Studies Centre and the Bodleian Library in relation to anonymising participants (including UN agencies, as I discuss at the end of this chapter) and handling sensitive data with care. I have followed the requirements I negotiated with the aid organisations. This involved agreement on ethical pragmatics, for example, that I would not

record any refugee participants in Zaatari and Azraq camps. This research draws on my previous experience working with refugees as well as aid organisations in a research capacity in a number of other projects such as Mapping Refugee Media Journeys (Gillespie et al., 2016).

## 4.2. Research design summary

### **RQ1 [Chapter 4]: Do blockchain implementations and discourses transform humanitarian governance?**

With the BASS Links project team and connected actors (including their UN partners, private sector vendors, consultants, and other aid industry experts) I conducted participant observation through regular and continuous meetings and interviews, mainly via video calls, emails, and messages since Summer 2017. This involved engaging in key debates about the Links governance framework and international ‘scale up’, sharing and discussing knowledge resources (articles, documents, reports, slides) provided by BASS, me, and networked actors. The ethnographic work in Jordan complemented this. I engaged in BASS meetings with GEN and in informal meetups and post-fieldwork de-briefs with the regional and international BASS staff managing the overarching vision of Links. This was supplemented with systematic research of the materials produced by and about Links in articles, press-releases, videos, and webinars, and over 30 elite interviews with aid industry experts involved in or commenting on the humanitarian adoption of blockchain.

## **RQ2 [Chapter 5]: Does blockchain streamline the aid work of GEN in Jordan?**

GEN aid practitioners in Jordan shape, use and manage the blockchain system, and are also intended beneficiaries of the pilot. I conducted participant observation with the aid workers in the field, IT and data management staff, the monitoring and evaluation team, and other staff engaged in implementing the blockchain pilot. During the Wahat fieldwork, I spent considerable time with GEN aid workers on the 2-hour journeys to and from the camps each day, within the Wahat, and in walkalongs to the supermarkets. With the GEN Jordan staff from other teams, we held meetings and jointly organised 5 multi-stakeholder workshops which included partner agencies and companies involved with implementing the pilot. I also conducted digitally mediated ethnographic work using video calls, messenger, and email. Between trips to Jordan (I made 4 overall and spent 5 months in total there), we discussed updates on the pilot and related affairs, feedback on their monitoring and evaluation strategy, and planned the research visits and materials. I also produced 3 field reports for GEN/BASS Links outlining the main dynamics affecting the pilot and workers' experiences with it over time, which involved rounds of discussion and feedback.

**RQ3 [Chapter 6]: How does the blockchain pilot advance or hinder the needs, priorities, and concerns of refugee women workers?**

At the core of this thesis is the grounded research I conducted with refugee women workers in Zaatari and Azraq camps, the end users of the GEN-BASS blockchain pilot. This was completed over three 2-week camp fieldwork periods between May 2018 and December 2019, before and after the pilot was launched, when I would spend every workday from 9-3pm based at the GEN Wahat. Research findings are drawn from (a) a total of 40 in-depth focus groups discussions in which roughly 300 workers participated, (b) an initial baseline survey with 113 workers, and (b) participant observation. The latter involved spending the day with women workers: eating meals, playing with children in the day-care centre, teaching English and learning Arabic, joining in computer skills sessions, Eid and *dabke* parties, and other events arranged by GEN staff. I also accompanied workers to the supermarkets, where we walked through the biometric iris scan process at checkouts and talked to other shoppers, BASS aid workers, and supermarket cashiers and managers. The research with refugee workers was conducted collaboratively with a native Arabic-speaking research assistant—Dr. Deena Dajani or Dina Batshon—throughout.

## 4.3. Inter-stakeholder dynamics: ethnography across communities

### 4.3.1. Ethnographic approaches to the digital, and vice versa

This thesis is a stakeholder ethnography: it is based on close engagement, continuous learning and collaboration with (not just about) multiple, connected communities (Pink, Postill, Leder Mackley, & Astari, 2017). Ethnography is a craft in which the researcher is both the instrument of data collection and analysis. Malinowski's 'full blooded descriptions' have long been the ethnographic paradigm. This involves using participant observation to understand and record lived experience in detail. Close engagement with communities allows the researcher to develop trust, rapport, and comfortable interactions with people. This is a valuable position from which to generate ground-up rather than imposed categories of analysis, ask meaningful questions, and inspect the taken-for-granted. Ethnographic work can render the strange familiar and the familiar strange, at the dynamic intersection between small places and large issues (Hylland-Eriksen, 2001).

Ethnographers' immersive, long-term engagements no longer necessarily involve continuous habitation with communities for over a year or more (Bernard, 2006, p. 261). Understanding the interplay between what people say and what they do requires methods that harness the strengths of digitally mediated ethnography as an important mode of 'being there'. This thesis draws on ethnographic approaches to the digital but also digital approaches to the ethnographic (Boellstorff, 2012; Hine, 2015; Pink et al., 2015). These reject real-versus-virtual, online-versus-offline dichotomies and take seriously how organisations' digital artefacts and practices—from hyperlinking to Wikipedia editing—are a key part of cultural action (Beaulieu, 2005; Geiger,

2016). For example, alongside participant observation office meetings with GEN or BASS in Jordan, I consider interactions in video calls and traces in the comments sections of web articles or the track changes of Microsoft Word documents important parts of organisational research.

What constitutes ethnographic participant observation is both widely contested and idealised. Seaver (2017) demonstrates the efficacy of plural methods and a focus on context appropriateness in digital-social research. He shows that thick data can be gleaned from interviews, which in some organisational settings are not simply artificial scenarios created by the researcher, but ‘part of the world in which research subjects live and make meaning.’ (Seaver, 2017, p. 8). In this multi-stakeholder research, I incorporate workshops, interviews and focus groups into the overarching ethnographic approach. I show that these are not alien forms to participants but rather are in keeping with local modes of dialogue and discussion.

Ethnographies of digital media have rooted knowledge in everyday practices. They have destabilised exaggerated, epochal or universalist accounts of sociocultural change through digitalisation by examining cultures of technology use, adaptation, and circumvention close-up (Coleman 2010). While ethnography may claim culture from technological determinism, it is also important not to see technology as merely a substrate (Knox and Walford 2016). Digital infrastructures have material features, affordances and logics that actively construct social and organisational life (Ribes et al., 2013). The way their ‘code/spaces’ are configured creates avenues for power and profit, not simply neutral connection (Zook & Graham, 2018). It is therefore necessary to look at the contexts and cultures of technology design and decision-making as well as use: technologies are not just *in* culture, they *are* culture (Pfaffenberger, 1992;

Seaver, 2018). Accordingly, this thesis does not examine the Links blockchain as though it were a non-social variable. Instead, it follows the project through diverse spheres of interface design and algorithmic governance, and its everyday use as a socio-technical infrastructure.

#### 4.3.2. Approaching blockchain as socio-technical infrastructure

As I have shown, blockchain is best conceptualised as a socio-technical infrastructure. Like other infrastructures, blockchain is difficult to research because it is ambiguous. It is both big and small, spanning time and space but embedded in routine daily practice (G. Bowker, Baker, Millerand, & Ribes, 2010, p. 113). As both product and process, it has invisible qualities and seems to ‘sink into the background’, yet it is also transparent to use, i.e. supporting the circulation of people, objects, and information without needing to be re-assembled (Star & Ruhleder, 1996, p. 111). Infrastructures are hard to pin down because they are relational more than they are a thing (Star, 1999, p. 377). They call on an array of actors (in the case of Links, designers, developers, engineers, administrators, users, policymakers and so on) and bring together a range of material forms (the functioning of the Links blockchain relies on biometric interfaces, Excel spreadsheets, computers, and paper documentation such as receipts and workers’ timesheets). Ethnographers must also reckon with the imaginative, affective dimensions, partial knowledges and contestations that comprise everyday infrastructural work. Especially significant in the case of blockchains are the promises and enchantments of infrastructure, which are different between and within different stakeholder communities (Anand et al., 2018; Harvey & Knox, 2012; Hetherington, 2016; Larkin, 2013).

The Links blockchain is particularly difficult to pin down. It could be considered a ‘sticky’ technology, somewhere in between the fluid (GEN’s pilot is based on adaptable open source code) and the fixed (as with all blockchains, the data are immutable) (Scott-Smith, 2018). It incorporates a combination of technologies, ideas, people, organisations, practices, and access points. For example, refugees are not informed that the blockchain exists. They directly make new data points by completing biometric transactions, but the ledger is not made visible to them—the only transaction record they access is in the paper receipts provided by supermarket cashiers. Understanding how blockchain affects refugee workers involves taking a wide and long-term lens on the socio-economic dimensions of infrastructure. Accordingly, I follow workers’ financial management and analogue record-keeping practices, their attitudes to biometrics and their concepts of digital banking.

Likewise, understanding how blockchain is used by and affecting UN agencies means examining a range of material practices, people, logics, norms, and forms of expertise. The same infrastructure will be constructed, negotiated and interpreted differently in different contexts (Geiger, 2017, p. 10). For GEN aid workers working in Zaatari and Azraq, the Links blockchain is also intangible, except when they upload Excel spreadsheets with workers’ hours and salary information to the user-friendly interface. With the BASS visionaries planning Links’ future, the imaginary horizons of an aid industry-wide blockchain trumped discussions of its current materiality. Only in the GEN office in Amman was it possible for me to see the actual ledger, what it did, how it was structured, what it connected to, or who sees what. But to the few GEN staff with access to the ledger, it was not clear why an anthropologist wanted to look at an ultimately mundane list of data and the administrative practices around it. Threading through

different communities' engagements with infrastructure, I focused on tracing how what a blockchain is emerges with people in practice, and how what it means and looks like depends on who you are. Following Star (1999), I looked for moments of breakdown, seeking to examine the system during productive moments of visibility and contestation, when the background comes into the foreground. For example, when the pilot had launched, refugee workers were reporting that the salary delivery was delayed. This was an opportune moment to sit with a GEN aid worker in Zaatari at her laptop as she tried to resolve the problem. During episodes of disruption such as this, I was able to probe in detail how exactly the shared ledger was supposed to function and where the frictions and challenges in the distributed socio-technical infrastructure lay.

#### 4.3.3. Constructing a networked field

Studying complex, interconnected communities and networks comes with significant methodological and conceptual challenges, especially with an unwieldy collaboration project like Links. BASS and GEN participants are internationally distributed, based in not only Amman, but also Norway, the US, Egypt, Italy, and Germany. So too are the connected actors involved with Links: technology developers, supermarket companies, consultants, NGO, and civil society experts were in various Scandinavian and Middle Eastern countries, the UK, the US and elsewhere. While refugees are subject to strict mobility control and so Zaatari and Azraq camps present an apparently well-bounded field site, a complex array of global connections and digitally mediated communications were involved in imagining, producing, and maintaining the blockchain pilot.

Ethnographers must go through processes of selection and choice to reduce the indeterminacy of field experience into a meaningful account (Candea, 2007). The ethnographic field cannot simply exist ‘awaiting discovery’ but must always be laboriously constructed (Amit, 2000). Multi-sited approaches have destabilised the notion of the complete, bounded field site (Marcus, 1995). However, these methodologies often make presumptions about a world system and macro contexts such as modernisation or globalisation (Tsing, 2000). I approach the ethnographic field as a network. This allows for engagement with a plurality of digitally mediated, physical-virtual-imagined spaces (Burrell, 2009). Networked ethnography enables the researcher to compare the narratives and practices of different communities connected to a particular industry (Neff, 2012). While engagement with one community or type of community would have provided great empirical depth and richness in this research, doing networked ethnography helped me to understand the interrelationships between actors and the structural factors affecting them (Neff, 2012). A networked approach is methodologically ‘equal to the ambitions of its phenomenon’, here the multi-stakeholder humanitarian blockchain (G. Bowker et al., 2010, p. 113). In particular, networked approaches attend to the ‘constellations of power relations and institutional entanglements, mediated through technologies’ (Levy, 2015). Knowledge is always situated, contingent and partial, and the strength of ethnography lies in reflexively drawing together threads into ‘plausible coherence’ (Knox & Nafus, 2019). This research brings together ethnographic work with specific communities connected to the same project by cutting through variegated sites and perspectives. This was a productive means of understanding the competing logics and tensions in how Links was being imagined, made, and experienced.

Following other networked anthropological studies, I aim to ‘localize the macro, extend the micro, and capture the relations between [...]’ (Dow-Schüll, 2012; Ho, 2012, p. 31).

Ethnography is not just a mode of end-user research, but a way of looking closely at how people and institutions make everyday plans and strategic decisions about technology which have significant effects on populations (Seaver, 2014). In this vein, I examine how an internationally distributed set of actors—the BASS project team alongside their partners—set the overarching agenda for Links and negotiate debates about the future of humanitarian governance and coordination (RQ1). I build into the picture my ethnographic work with the aid workers using and managing the Links pilot (RQ2). I use ethnographic approaches to demonstrate the relevance of heterogeneous end-user experiences with technology, here Syria’s refugees<sup>10</sup> living with blockchain (RQ3).

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<sup>10</sup> Both Zaatari and Azraq camps were set up to provide refuge specifically to people from Syria. However, in this thesis I refer to camp residents and research participants as Syria’s—rather than Syrian—refugees. This is a way of avoiding ‘methodological essentialism’, which would posit them as part of a unitary or fixed social group (Yuval-Davis, 2006). *Syria’s refugees* signifies not just Syrian citizens, but also refugees from Palestine, stateless Kurdish people from Syria, as well as other ethnic minority groups (Chatty, 2017, p. 38), which is relevant in this thesis. This term also recognises the various and contested nature of cultural, regional, religious, and ethnic identities and protracted migrations. Syrian national identity is not singular. As Khaddour (2014) highlights, it could comprise ‘an Islamic identity drawing on the Sunni history of places like Aleppo; a cosmopolitan cultural identity coming from artistic production in Damascus; a tribal Arab identity based on the Bedouin history of the northeast; a “cradle of civilizations” identity drawing on the country’s Christian heritage; a secular identity championed by the country’s minorities.’ (Khaddour, 2014). Equally, I approach Syria’s refugee women working in the Wahat as representing a range of subject positions and life experiences. For example, in chapter 7, when drawing attention to the significance refugee women workers gave to the Islamic concept *barakeh* in their evaluations of the pilot, I do not also make assumptions or generalisations about how this linked with their religious identities as a group.

#### 4.3.4. Disconnection and inequality in the networked field

Emphasis on how connections are constructed neglects the significance of hiddenness, disconnection and what gets cut out in any networked ethnography (De Seta, 2020). As Jensen points out, knowledge asymmetries of ‘limited presence, partial information and uncertain connections’ are characteristic of ethnography and the humanitarian field alike—nobody knows everything (Jensen, 2010). In response to the perennial issues of disconnection, Seaver suggests that ‘scavenging’ is a key tactic in research on complex and distributed socio-technical systems (Seaver, 2017). Likewise, the field of this research can be defined by its very fractures, inconsistencies, opacities, and gaps—why else would the idea of an all-co-ordinating blockchain come about? Relevant actors and activities were always going on elsewhere. For example, I missed out on important action at the agencies’ internal meetings, myriad aid industry conferences and closed events, and beyond the Wahat and supermarkets within Zaatari and Azraq. As I later discuss, the securitisation of research in refugee camps meant my access was limited to specific locations and time periods. As well as my access to the camps, UN gatekeepers managed and limited my engagements with people from companies and other organisations involved in the pilot, for example but curating who could and could not attend the participatory workshops we held at the GEN office in Amman. Accessing, tracing, and explaining how different nodes in the network related to each other involved challenging scavengery.

Spatial and geographical assumptions shape the terms of debate and the politics of research, and studies of networks need to engage with their ‘power geometries’—the ways in which those

networks are uneven (Graham, 2013, 2015; Massey, 2005). The networked field I have constructed is not flat. Each community has different amounts of resources, decision power, authority, and influence. Each has divergent agendas and intersectional dynamics. Aid organisations operate with hierarchies, and refugees have limited opportunities, political rights, and labour representation. I construct a webbed account of a blockchain's social life that, in the vein of feminist techno-science, weaves together 'an earth-wide network of connections, including the ability partially to translate knowledges among very different and power differentiated communities.' (Haraway 1991:580).

#### 4.3.5. Engaged anthropology in aid: collaboration and its challenges

Scholars are not the primary originators of methods: expert approaches to data and technology are all around us (Knox & Nafus, 2019; Neff & Nafus, 2017; Savage & Burrows, 2007). Critical debates about who wins and who loses from digitally mediated economies should engage different kinds of expert perspectives beyond academia (Graham, 2019; Taylor et al., 2020). The paradigm of the lone connoisseur ethnographer is hubristic and no longer viable or appropriate. In stakeholder ethnography, research is not just about but with participants (Pink et al., 2017). Doing this project involved continuous learning and the collaborative co-constitution of knowledge.

Supportive and collaborative relationships helped me draw together a multi-stakeholder network and bridge different communities. Connections, gatekeepers, and key informants in academia and the aid industry supported and advocated for my entry into the different spheres of Links.

During my master's research, I co-organised and co-led a workshop and an industry report about blockchain with a London-based aid organisation and alongside senior academics Professor Marie Gillespie (researching the digital inclusion and civic engagement of refugees) and Professor Jamie Cross (working on humanitarian goods and peer-to-peer infrastructures) in 2017. This was where I first developed the collaboration with the Links project manager, Alex, who was a participant. Working alongside experts at this workshop event played a significant role in helping me gain legitimacy. I was not coming in 'cold' as a junior researcher but as part of a respected network of humanitarians and engaged scholars. With support from this well-connected network and by keeping in touch with the Links project manager (plus affiliation with Oxford helped), we developed a relationship of reciprocal knowledge sharing, which meant that he helped set up my relationship with GEN Jordan. Without his backing, I would not have come through the tense negotiations of my research agreement with BASS lawyers. Allies among the GEN aid workers supported and facilitated the Wahat research throughout and made sure I always got through camp security checks. Connecting well with the GEN monitoring and evaluation staff was also important: by producing and discussing the three field reports, I was able to complement their work and establish a role the organisation found useful. At the Wahat, refugee administrators helped plan and organise the focus groups, ensuring we had the right facilities and that the groups were comfortable. Several refugee women workers helped me forge important interpersonal links by introducing me to friends and colleagues. Crucially, as I discuss in more detail below, I worked with two different Arabic-fluent research assistants in the camps, Dina Batshon and Dr. Deena Dajani, who played an invaluable role in the fieldwork in Zaatari and Azraq.

This research contributes to the fields of public anthropology and social science, which treat ethnographic methods as crucial tools for participatory action and critique in aid and other settings (Fassin, 2017; Gardner & Lewis, 2015). Through fieldwork presence and empirical inquiry, ethnography helps us draw out ground-up insights which can be used to contest received wisdoms and reframe public debates (Borofsky & De Lauri, 2020, p. 6). Academic work on digital data and technology can be meaningfully connected with international rights policies and social justice agendas (Dencik, Hintz, & Cable, 2016; Martin & Taylor, 2020; Taylor, 2017). Socio-technical research provides new evidence that can be put into action (Cugniere, Wright, & Milner-Gulland, 2019), and this is especially in the case of workers' rights (Katta, Howson, & Graham, 2020; Shaw & Graham, 2017). Ethnographic knowledge can and should be used to address issues of inequality and marginalisation.

I used the cross-pollinating findings generated in my stakeholder ethnography to engage multiple actors. For example, I closely examined the ideals, values, assumptions, and underlying interests of decision-makers, but also worked with them to suggest meaningful alternatives. GEN considered the reports, workshops, and active contributions to their monitoring and evaluation work valuable and requested my consultation on a range of matters. A strong example of this is the first field report I produced which, despite UN participants' idealised discussions about a digital economy, highlighted the importance of physical cash to refugee women workers in Azraq and Zaatari. This evidence influenced GEN's decision to provide cashback at supermarkets through the pilot instead of digitalising the salary delivery completely (as in BASS's initial Links initiative in 2017). Conducting digitally mediated participant observation with BASS on the governance framework of Links brought the opportunity of sharing and

debating issues that had arisen in the Jordan fieldwork. I learned much from working, discussing, and collaborating with experts in GEN and BASS. With both agencies there was ‘good-natured sparring’ (Maurer, Nelms, & Rea, 2013) as I debated what empowerment or dignity really meant with GEN aid workers or what democratic, responsible and sustainable blockchain governance should look like with the BASS Links team.

However, this level of engagement with me and the findings I was producing was far from constant and unwavering. I found that maintaining a research partnership with one UN agency was very challenging, let alone two. For humanitarian organisations, their reputation is paramount. Following recent public scandals around data leaks, privacy violations and sexual abuse, they can be extremely hesitant to invite or engage with external scrutiny. They are cautious and risk-averse, tasked with protecting vulnerable subjects but also guarding their politically neutral reputations, public funding sources, and sensitive commercial information (Lewis et al 2019; Van der Haar et al 2013). The next section focuses on the significant difficulties I encountered in sustaining access and relationships with the organisations and making a positive difference whilst occupying a critical, independent position. These challenges involved UN agencies attempting to control my research outputs and extended contestation with BASS lawyers about my academic freedom.

A key challenge in practicing public anthropology is maintaining critical distance whilst playing a practical, advisory role. While researchers such as anthropologists have long been allies of subaltern groups, advocating for new thinking and cultural sensitivity in aid, they have also been complicit in colonial relations, in notable cases providing development projects with certificates

of social acceptability (Gardner & Lewis, 2015, p. 63). There are forceful critiques of the aid industry and the loss of objectivity that comes with engaged research (Escobar, 1995; J. Ferguson, 1990). A central concern is that working with powerful organisations ultimately waters down researchers' ability to privilege marginalised perspectives. Advocating for the serious concerns of refugee workers about humanitarian operations in meetings and reports whilst maintaining comfortable relationships and access with organisations was one of the biggest challenges of this research. I was simultaneously concerned about losing the fragile and highly sought-after access to the organisations if I appeared hyper critical of their activities and being complicit in or legitimising Links and the pilot project. There were huge trade-offs. My reports and advice were used as a tick-box exercise by UN agencies to demonstrate social accountability. Quotations from my field reports were selectively used in promotional materials—at one point, without my knowledge or permission in GEN's celebratory and inaccurate 2021 report highlighting only the positive impacts of the pilot. I co-organised and often held the pen in the workshops where UN staff designed and defined the objectives of the pilot. As much as I was a critical figure, participating in this work meant I was enabling and constructing the experimental technology project rather than dismantling it or the asymmetrical power relationships it comprised. As much as I was making tangible critical interventions and producing knowledge with and for marginalised groups (refugees but also aid workers at the frontlines of the pilot), I was profiting from the research process. These ethical tensions are emotionally taxing. My research is anti-colonial, but it was not capable of decolonising aid. However, ultimately, I see aid as involving a complicated, heterogenous, and contested set of projects (Mosse, 2011) which I was tasked with diplomatically and tactfully negotiating in order to record history and make the best possible difference. While my work draws on Ferguson and

Escobar's important studies of aid as a powerful and depoliticising discourse and practice, I do not assume it is an all-powerful force or 'evil twin' of anthropology (J. Ferguson, 2002).

Humanitarian organisations and staff are multi-faceted. Humanitarians co-constitute the knowledge produced in research projects, and working closely with them structures the research design, questions, and sense-making (Van der Haar, Heijmans, & Hilhorst, 2013). GEN aid workers brokered my access, transport, security, and logistics to and within the refugee camps, providing a network of connections and a wealth of contextual knowledge. I was not only studying the logics and practices of GEN humanitarians—they were co-constituting my study of the refugee women workers and their partner agency in the pilot, BASS. Working within and between (multi-faceted, competitive) aid organisations and with critical aid industry commentators presented challenges in impression management. Working with refugees formed my impressions of aid organisations and vice versa, as well as their impressions of me. In the next section, I discuss the methods and methodological issues pertaining to each research question in turn in more analytical depth. I go into more detail about the co-constitutions of knowledge, positionality considerations and other key concerns with each chapter, starting with my fieldwork with refugee women workers in Jordan's camps. However, as this section has highlighted, these concerns can be cross-cutting and interrelated in practice.

## 4.4. Intra-stakeholder dynamics: community-specific concerns

### 4.4.1. Research with refugee women workers

#### *Access and securitisation in humanitarian research contexts*

The securitisation of research in refugee contexts tends to remove the researcher from local populations where possible and place them in a ‘safety bubble’ (Peter & Strazzari, 2017, p. 1546). In Zaatari and Azraq refugee camps, the Jordanian authorities’ security restrictions limited the window of time I could spend there, and meant I had to always stay in the Wahat. Visits to the supermarkets had to be arranged in advance and were usually accompanied by UN staff. It is argued that these kinds of restrictions represent colonial dynamics which prioritise keeping westerners safe and associate proximity to whiteness with diplomatic privileges (Benton, 2016, p. 196; Lewis et al., 2019, p. 208; Peter & Strazzari, 2017). However, some restrictions are also justifiable in that researchers and others should not presume to enter any domain of camp residents’ lives. Researchers do not operate in a vacuum but alongside multiple other forms of data collection by humanitarian and state actors. For example, in Zaatari, regular needs assessments already burden refugees in their homes (Macias, 2020, p. 341). The Syrian refugee research industry whereby academics extract data to analyse and capitalise on in their careers in the Global North (Sukarieh & Tannock, 2019) is prolific in Jordan’s camps. A drawback of this work is that it does not go beyond the women-only spaces of the Wahat and so, for example, gender dynamics cannot be understood in relational terms. To gather wider perspectives on life in Zaatari and Azraq, I sometimes jumped at the chance of a new connection by knocking on the supermarket manager’s office door or chatting to other shoppers at the supermarket checkouts. However, overall, I was conscious about minimising my inevitable contribution to the extractive,

invasive, and surveillant practices already taking place in the camps and spent most of my time at the Wahat.



Figures 6, 7, and 8: Setting the scene: the women's cash-for-work centres (the Wahat) in Zaatari and Azraq. Figures show the two caravans where workers do embroidery and tailoring in Azraq and the pet kitten of one of the Zaatari Wahat, perched on a pram by the well.

### *Participant observation at the Marakat al Wahat*

The *Marakat al Wahat* (sanctuary centres) are the main sites of my research in the camps. They are the workplaces of the refugee women enrolled as end-users of the blockchain pilot. As with other community centres such as schools in Zaatari and Azraq, the Wahat comprise a cordoned-off collection of caravans with a guarded entrance. In every Wahat, caravans designated for each type of job collect around an outside seating area and playground for the workers' children. There are also communal spaces designated for prayer and childcare, and the goods workers have produced (jewellery, rugs, embroidery, mosaics) are on display. Alongside their work at the Wahat, women share breakfast and lunch, celebrate birthdays and religious festivals like Eid and events organised by GEN such as visits from donors and diplomats and International Women's

Day. As well as being workplaces, these centres are valued, intimate social spaces. In my field research it came through how many women enjoyed going to the Wahat: the job brought new income, friendships and support and a sense of everyday purpose and hope to people in protracted circumstances.

Syria's refugees have fled war and persecution, contexts without freedom of speech where they could be killed for dissent or criticism. The surveillance regime in Jordan is renowned (Jordan Open Source Association & Privacy International, 2018). Within Azraq camp, there is the heavily securitized zone, District 5, where people are sent to be vetted. Residents of both Azraq and Zaatari have been sent to District 5 or involuntary repatriation (referred to by the refugee women workers as *qazzeff*—'catapulting') to fear. This affects the dynamics of research and the ethics and possibilities of participation. Spending time with workers was the essential means of generating trust and rapport with them and understanding on an ongoing basis how to methodologically respond to their needs and risks. Participant observation is the foundation of this research, and my immersion in the Wahat was the basis upon which I could use other methods (the focus groups and survey, which I discuss below) appropriately.

The populations of both camps are generally Muslim and religious practices are a significant element of everyday life. In Zaatari there are 120 mosques (Ababsa, 2018) and most women workers usually had wrist watches or alarms on their phone which called them to prayer several times a day. While the Wahat are designed as women-only safe spaces, respecting ritual such as prayer times and especially gender norms were important. This involved wearing modest clothing (covering at least the neck, wrists, ankles) and behaving sensitively. I learned how to be

sensitive to cultural and gender norms through experience—and making faux pas in a few personal discussions. However, most of the time, personal discussions were the basis on which I connected with women. At the Wahat, I built friendships with mothers by playing with their children alongside them and with the computing and English teachers when helping with their lessons. I got to know some families, their backgrounds, and priorities particularly well because selected workers had longer contracts,<sup>11</sup> so I spent time with them over every fieldwork period. Women workers often asked me intimate questions, especially about marriage and children, out of interest but also because (as some even said in the focus groups) it affected how far I was able to relate to their everyday lives and considerations. As a white foreigner from the UK with various privileges and without the demands of a husband and children (and forced displacement, precarity, rations, mobility control, restricted rights...), there was a limit to my understanding of most women workers' experiences.

Yet, I could not have undertaken participant observation at the Wahat (and even at GEN) if I were not a woman. Not only because men are not allowed to enter the Wahat, but also because this was gendered work. For example, in December 2018, my immersion involved considerable time with four women of about my age who were training at the beauty salon in Azraq. The basis of our trusted relationship was that I had let them pluck my eyebrow hairs and try out

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<sup>11</sup> GEN give longer job contracts to women classified as vulnerable (such as survivors of gender-based violence and widows) and those who are considered highly skilled such as language and computing teachers and administrative workers. Refugee women workers can also apply to have their contracts extended, for example if they are in pressing financial need or other extenuating circumstances. The fairness of GEN's decisions about contract lengths was always hotly debated, especially because most women workers had short contracts of 3 or 6 months. Some agreed with GEN that the opportunity to earn at the Wahat should be rotated so that many women in the camps could benefit from it. Others saw long contracts as a sign of unfair privilege and connections (*wasta*) and thought the contract extension decision-making process was opaque. The regular rotation of jobs makes it difficult for GEN to adequately monitor and evaluate their programs and the outcomes over time, including the blockchain pilot. This also affected my research, and it was difficult forging relationships with workers and their children and then not being able to see many of them on the next trip.

experimental makeup. Grooming went along with gossip as an important mechanism of social bonding (Dunbar, 2004), and this (unprofessional) behaviour and extended time ‘hanging out’ also differentiated me from the GEN aid workers.



Figure 9: Tapestry by Wahat workers in Zaatari depicting two women heating up flatbreads. Lunch times involved gatherings like this as women workers would make picnics with warm bread, hummus, labneh, maktous and other foods.

‘Wearing humanitarian clothes’ is an unavoidable positionality problem in research with refugees (Lewis et al., 2019). The positionality of researchers in humanitarian contexts is affected by varying levels of interaction and independence in research partnerships with aid organisations. I did not literally wear humanitarian clothes—the khaki vest with an

organisation's logo—and I reiterated my independence from GEN throughout, especially in the focus groups. But while the qualitative nature of the time I was spending with the women workers distinguished me from the GEN aid workers in the camps, by arriving and leaving in the jeep emblazoned with GEN's logo, talking amicably in English with the staff, and asking refugee women about their concerns, it was difficult to avoid wearing humanitarian clothes metaphorically. On several occasions during my first trip to the different Wahat in May 2018, it was clear that my presence was initially associated with diplomatic and other formal visits because workers lined up to greet me one at a time in quite a formal manner. I resembled the white demographic of donors and diplomats. Overall, the association with UN institutions waxed and waned in different circumstances; it simultaneously helped build trust with workers and undermined it. The GEN field staff brokered relationships by introducing me warmly to them. But negotiating cross-cutting relationships and sustaining my distance from the blockchain pilot and powerful institutions was challenging. Especially when there was conflict between GEN staff and refugee workers about the problems the pilot was bringing about. In the ambiguous role researchers can occupy in this kind of work, it is also not unusual to experience feelings of guilt for 'profiting without providing'—benefiting from the research data collected and the authority humanitarian partners lend in the field, without doing concrete, direct humanitarian work to address people's problems (Lewis et al., 2019).

### *Learning Arabic*

Language learning does not flatten out the persistent power dynamics in research in humanitarian contexts or provide an authentic research experience (Brankamp, 2018). But having a grip on the local language helps researchers avoid contributing to the Anglophone tendencies and silencing effects of humanitarian discourses, allowing us to understand in greater depth refugee

participants' stories and desired modes of expression (ibid). Participating in and observing everyday life in the Wahat and among aid workers in Jordan necessarily involves familiarity with Arabic. Arabic presents intrinsic difficulties to native English speakers as a Semitic language with distinct sound and root patterns and a non-Roman alphabetic script. A variety of dialects are spoken between and within communities; Syrian Arabic is different to Jordanian, which is different to Modern Standard, the written variety. I needed to be comfortable with each. Over the last three years I have undergone continuous language training, sponsored by the UK's Economic and Social Research Council (ESRC). This has involved multiple courses with teachers in Oxford, discussion practice with my Syrian conversation partner Tarek through the platform Natakallam, and a summer immersion course based at the Sijal Institute for Arabic Language and Culture in Amman. Basing myself at the Sijal Institute for several months as a research fellow, I was also able to learn from local scholars, share work and become conversant with their research interests. This opportunity to engage in Arab scholarship was an important step in rejecting 'methodological projection', which frames data from global margins with theories and concepts from the metropole (Connell, 2007) instead of supporting epistemic diversity and de-canonising the anglo-centric, westernised hosting of ideas (Fiddian-Qasmiyeh, 2020b; Todd, 2018; Vanyoro, 2019).

Immersion is fundamental to learning dialects and cementing knowledge of a new language: some even argue that language learning is ethnography in the first place (Cohen, 2011; C. Roberts et al., 2001). Workers in the Wahat and GEN staff generally supported and encouraged my Arabic speaking, which at the start was very limited. I found this painful and frustrating. The discomfort of non-fluency does not go away. But a partial understanding of Arabic helped with

establishing relationships with participants and as time went on my conversation improved. It helped to be strategic about learning vocabularies relevant to the research at hand: family, work, shopping, finances, aid, and such. I also built on learning the common idioms and expressions first, for example with Muslim greetings like *yatiik alafiyeh* (a way of expressing respect or thanks when you see people working). Crucially, my research in Zaatari and Azraq involved essential teamwork with two different local research assistants. Language learning and support with the research assistants helped me learn in-situ as I could practice phrases and ask them questions.

*Language workers: collaboration, care, and positionality*

In forced migration research, there has been a particular lack of recognition to the collaborative role of non-academic experts and para-ethnographers in fieldwork (Sukarieh & Tannock, 2019). As de Seta puts it, ‘Digital ethnographers are often closer to practical brokers, curious newcomers relying on the knowledgeability and interpretive guidance of what Holmes and Marcus (2008) call ‘para-ethnographers’ [...]’ (De Seta, 2020, p. 92). The two different research assistants I collaborated with over the course of this work were more than research assistants. They were interlocutors who not only supported me in gaining sociolinguistic skills and confidence, but also led, transcribed, and translated the focus group discussions with workers and were involved in many of my engagements with GEN field staff who came with us to the Wahat. The RA and I were seen as a team, which meant my positionality was not mine, but relational. I worked with Dina Batshon and Dr. Deena Dajani at different times. They both provided new insights and expert opinions and reflected with me on events and ideas. I searched for and selected them on the basis that they were experienced women researchers in refugee contexts, sensitive to the dynamics of the Wahat—Dina in child education and development and Deena in

displacement and hosting. They were both in their late 20s and both from Jordan with specific knowledge about the political economy of forced migration.

Recent accounts problematise the treatment of local research assistants and pervasive lack of respect for translation work in the research and aid industries, where it is sometimes the case that ‘if you’ve done a good job, it’s as if you’ve never existed’ (Heywood & Harding, 2020).

Sukarieh and Tannock highlight the unfair working conditions imposed on subcontracted research assistants in refugee studies and their under-recognised but ever-expanding responsibilities in the research process (Sukarieh & Tannock, 2019). Leurs highlights the need for an intersectional feminist ethics of care in refugee research to reckon with dynamics of marginalisation (Leurs, 2017). These analytical perspectives should be extended to language workers and other research assistants. Planning the Wahat research involved consideration of the ethics and sensitivities for refugee participants, but also Dina and Deena.

For example, I needed to set a viable focus group schedule that accounted for breaks and time to process emotions: Links engages people who have experienced war and gender-based violence, with sets of fears, pressures, and hardships. Burnout, compassion fatigue and vicarious trauma are challenges stemming from cumulative engagement with difficult stories and people under distress (Barrington & Shakespeare-Finch, 2013; Guskovict & Potocky, 2018). Several times, individuals came to us with a problem that was troubling them and asked for help. For example, one middle-aged loom worker told Dina and I in December 2019 that she was in despair having heard her son had gone missing in Syria. There was not much we could do except find out which services were available to help her find him. We both found this instance of ‘profiting without

providing' very difficult, but language workers taking on facilitation roles can experience these research challenges most directly and acutely.

While I was financially independent from GEN, I negotiated for them to cover the research assistant's pay in each fieldwork period. GEN was able to offer more than my ESRC budget, and I was still able to design the terms of reference and ensure clear roles and instructions were established. This included the focus group facilitation guides, which I drafted before each trip and then adapted based on inputs from GEN and the research assistants. This guide outlined the discussion topics and some key tenets for facilitation: mainly and actively listening; upholding a supportive, non-judgemental atmosphere; explaining the purposes of the discussion; highlighting the confidentiality and anonymity assurances, participants' right to opt out and decide what gets written down and how; asking for illustrative examples.

Studies neglect how the role of language workers affects research in practice (Gibb & Iglesias, 2017). In the focus groups and in spending time at the Wahat, the different research assistants had distinct effects on the research dynamics. On the first trip in May 2018 and for part of the fieldwork in December 2018, I worked with Deena. She maintained a warm but neutral and formal demeanour throughout, which meshed well with GEN staff. Her quiet compassion was evident, and some of the most emotional discussions and troubling, personal stories ensued from her expert facilitation. Deena was committed to participatory, refugee-led research (she had worked with refugees in a range of global contexts) and described her motivations for the research as about recording history. Both Dina and Deena had Palestinian connections which animated their solidarity for communities affected by conflict and forced displacement. Dina was

more of an overt political activist in Jordan—she had extensive experience working in Zaatari. I worked with Dina for most of the field research and together we experienced the aftermath of the pilot’s launch in December 2019. Dina was always open about her stance—which was highly critical of paternalistic power dynamics in the Jordanian aid industry—and would sometimes directly ask GEN staff difficult questions. For example, some Wahat workers are employed to embroider tote bags and weave baskets made from recycled plastic, and on one occasion Dina asked a GEN aid worker ‘Why do the refugees have to make products they would never actually use or buy? You never see any of the women carrying these kinds of bags and that plastic is old.’ Rather than negatively affecting the research relationship, Dina prompted occasional frictions which were fruitful because they probed UN staff to explain and justify their practices. Dina’s matter-of-fact manner spurred lively focus group discussions and brought out the assertiveness and confidence in participants.

#### *Voice and participation in research with refugees*

There are no legal instruments obliging states or international agencies, at international or regional levels, to consult with and listen to refugees when designing programmes and policies that concern them (Harley & Hobbs, 2020, p. 27). Advocating for the valuing of voice is intrinsic in this participatory research, as aid routinely positions ‘poor populations as listeners rather than people whom they should be listening to’ (Tacchi 2012:233). However, listening does not simply fall into place and the problems associated with white western anthropologists ‘giving voice’ to subaltern groups have been well noted—in particular, the power imbalance involved in speaking for, about, and above (Simpson, 2007; Todd, 2018). Participatory methods are regarded as the crucial alternative to extractive and dominant relations between researcher and researched.

Innovative methodological approaches position refugees as creative co-designers and co-producers involved in making visual story boards, arts-based and public research outputs (Neill, 2019; Talhouk et al., 2019). However, participatory methods can still impose one-sided approaches upon refugees and disguise inherent power imbalances (Cooke & Kothari, 2001; Ozkul, 2020). As Ozkul suggests, the important issue to emphasise is not which novel or creative methods to use, but how exactly those methods accord with and extend refugee participants' needs and interests, and how they ultimately help fulfil the objective of understanding and destabilising inequalities.

#### *Focus groups at the Wahat*

In my research with refugee women workers, we held focus groups as a way of engaging participants in a dialogue which they could steer towards their priorities and be recognised as opinionated actors. This was a strategic way of fostering discussion with workers within a limited time window as each research period involved 2-weeks research in the camps, as prescribed by the Jordanian authorities and GEN. The focus groups resulted in 40 transcripts, each 5 A4 pages or more of rich discussion when typed-up. The format was appropriate in the context of the Wahat: workers already spend most of their time in groups of 7–15 in a particular caravan, completing their work and socialising with colleagues. Group discussion was less pressured than, for example, one-on-one interviews, and the most inclusive approach—literacy is not a given and so using written materials can alienate some participants (as we determined with the survey). We co-ordinated with the refugee administrators of each women's centre to ensure workers participated in groupings they were comfortable. The facilitation guide I produced for the RAs ensured key topics relating to the Links pilot were covered: it outlined open-ended

questions about money management, spending, bartering, and saving practices, attitudes to technology, attitudes to relevant institutions, concepts of aid, development, and gender (see Appendix II for example guide from December 2019). While focus groups are somewhat defined by their implementers, in the aid industry they have been shown to produce fruitful communicative contexts where participants give the discussions their shape and substance (Kratz, 2010). Within the overarching facilitation plan, every group discussion covered a many themes, stories, and unexpected twists.

As part of the ethnographer's toolkit, focus groups are particularly useful as a way of generating reflection and debate (Bernard, 2006). Some groups took the lead more than others, but in general and as planned, participants did nearly all the talking. In some groups there was a tendency towards normative perspectives and agreement around shared understandings rather than contestation, so the RA's role was vital in eliciting varied perspectives and evaluations. After each (roughly) 1-hour session, Dina and I spent at least half an hour filling out the notes, writing down further comments, and reflecting on the discussion. On my side, this was based on behavioural observations and a partial understanding of the flow of Arabic conversation, which grew from an uncomfortably limited one over the course of the field work. We would think about what the main points of debate and disagreement were, but also where there was silence. The famous Arabic saying goes *al sukut al amat al rhidda*, silence is a sign of agreement, but this cannot be taken for granted in research. For example, certain individuals were particularly dominant, and it was difficult for the research assistant to manage the balance between allowing those with a sense of urgency to make their points while setting up the space for everyone to share their perspective. We observed on a couple of occasions that some people were less likely

to disagree with dominant voices in the group discussions but would take a different position in the survey. For example, in December 2018, more workers reported they did not feel safe in the supermarket in the survey than in the focus groups. However, all in all, the discussions we recorded were marked by diverse voices. Pages and pages of transcription notes each time demonstrated the keen engagement. Fatima, a teacher in Azraq, shared her poetry in two different sessions. Every single discussion involved storytelling and laughter, some with more bawdy jokes than others, punctuated by several unforgettable moments of collective tears.



Figures 10 and 11 show two different caravans we used for focus groups in December 2019. On the left is in Azraq and on the right Zaatari. The facilities in the Zaatari Wahat were in general more dilapidated. For example, Azraq caravans have new furniture and installed heating and air conditioning machines. In Zaatari, when in winter the rooms were very cold and tended to have little natural light, this affected the mood and energy of the group discussions and demanded more upbeat moderation.

At the start of each focus group, the RA mentioned the previous research visits, what they were about, and shared high-level findings. This was an important way of feeding back, discussing the ongoing research with participants, and demonstrating the care taken to share their perspectives accurately and responsibly with the UN institutions. We ensured everyone was fully conscious that their participation, while completely anonymous, would be collated, analysed, and shared with GEN and BASS to inform their programming. However, we made sure not to promise, given our independence from the UN, that our endeavours would lead to desired change. Indeed, when we returned to the Wahat after the Links pilot had been launched, some participants were aware that our work had had limited effect. For example, those who spoke against the idea of collecting their cash salary in the busy supermarket were now having to do so. Nevertheless, the opportunity to debate and discuss the status quo was always taken up: *inshallah*, it was often said, we could make some difference. In this, the RA's notebook was an important participatory device. Deena observed that it was symbolic of our mediation between the refugee workers and the UN practitioners. Workers would point to it and say 'Write it down like this:...' or 'Actually, scratch that out'. Though workers were not all able to read or write up the discussion themselves, allowing for a conscious discussion of what was being recorded and how was an important part of active listening, transparency, and understanding how participants privileged different concerns.

Claims to ethnographic authority can reproduce patterns of dominance as researchers neglect informed consent and also replicate aid industry narratives like the trope of tragic, decontextualized refugee voices (Cabot, 2016; Rozakou, 2017). We did not assume that everyone wanted to participate in the focus groups. They took up time away from workday

commitments and could be emotionally draining. We took careful measures to establish prior and continuous informed consent in the Wahat. Given mixed literacy levels, this was delivered orally, first by GEN staff who informed workers about the research in advance of each fieldwork period, and then by me and the research assistant when we were setting up the focus groups, to ensure workers could opt out. Some workers also chose to attend only parts of the discussions, for example, so they could resume childcare responsibilities. However, as Ozkul (2020:233) points out, informed consent is compromised if you are already in someone's home or workplace (as I was continuously) and inviting people to participate, though freely, still positions the researcher hierarchically. I learned about the importance of recognising how consent is always mediated; for example, I could not easily control how GEN staff presented the research or the impression of me the RA, and how that related to refugee women workers' sense of agency in participating.

### *Supermarket walk-alongs*

By contrast, despite the issues I outline above, participant observation avoids assuming an elevated role in people's lives. My fledgling Arabic was best suited to conversation with individuals or small groups: this involved more personalised engagements. Rather than interrupting an overall group flow, I could put together sentences and ask questions, we could use photos and look up translations using our mobile phones to exchange in meaning-making. As part of the participant observation approach, I used walk-along methods with individuals and small groups. This involved (with permission and usually accompaniment from GEN staff) me and the research assistant going to and from the supermarket with refugee women workers as they walked to the supermarkets, queued up and used the new biometric salary collection and digital wallet system. In-between, in-transit moments are where much human sense-making and

stock-taking plays out, and walk-along methods reveal how people and technologies connect or tune-in along the way (Ingold & Vergunst, 2008). This mobile method was a crucial way of understanding the impact of the pilot via the tactile, embodied, phenomenological experiences of the workers.

Going to the supermarket with a small retinue of outsiders (me, the research assistant, often GEN and sometimes BASS aid workers were present) no doubt transformed workers' usual experience there. But the walk-alongs taught me about the workers' everyday practices, rhythms, routes, mobilities and interactions with cashiers, shoppers, and aid workers outside of the Wahat, which I was not privy to otherwise. I learned more about their patterns of money management, their practices of contesting, concealing, reconnoitring, checking, and how these were embedded in time and space, entangled with routes of age, gender, disability, experience, and status.



Figure 12: My eye displayed on the cashier's screen at the supermarket in Zaatari, December 2018. During a walk-along with a small group of three refugee women workers and Dina the research assistant, I got to try out the iris scanner myself. Even though I obviously wasn't registered on the system (the machine had no photograph of my iris to match the scan with), I still experienced the cajoling involved in getting humans and machines to interact successfully (Donovan, 2015, p. 25) as the cashier instructed me to widen my eyes, adjust my position and so on, and what that was like within the supermarket setting.

### *The baseline survey*

Surveys help with scoping out intersectional dynamics and understanding how much different sociological factors count. For this reason, they are a good entry point into communities (Bernard, 2006). I designed a 4-page baseline survey for the first research trip (see Appendix I for Arabic and English translations of the May 2018 survey). The head of GEN Jordan was not initially convinced that an outsider should come and inspect Wahat activities and take up workers' time with a survey. In our first in-person meeting in May 2018, she vetted all the questions I planned to ask in the survey questionnaire, with understandable concern for the women refugee workers' rights to privacy. Among the sensitive data management procedures undertaken here, the questionnaires were designed to be anonymous and minimise the potential for information to be personally identifiable, but the vetting was helpful in ensuring the questions were relevant, used appropriate language and were as sensitive as possible. By the next trip, I had begun to develop trusting relationships with GEN staff and Wahat workers, helped set up a stakeholder workshop and produced a useful report, and GEN did not intervene in the Wahat research materials again, except when I asked aid workers for advice about accessibility, e.g., the language used in the questions.

We conducted this survey in every focus group and at each Wahat, with 113 workers overall. This gave us the opportunity to quantify variables to map the overarching contexts and households in the camp of which the women respondents were part, and to compare these contexts in the two camps. Surveys are particularly useful in establishing a systematic frame of understanding and basic attitudes towards phenomena (Fink 2006). In this case, I was able to scope refugee women workers' experiences with cash shortfalls, their attitudes to the supermarkets, banking, or to biometrics and how they related to demographic categories like age and household size. However, surveys use closed questions which impose categories upon their respondents and limit variation and nuance in responses. The best designed survey may still not be understood and answered by all participants in the same way. I encountered significant issues with implementing the survey and ultimately decided it was not only of limited use. It did not present insights that surprising, or which could not be reached through the other methods, and it was an insensitive method. The literacy and numeracy levels in the Wahat were very mixed. We designed the questions so they followed a simple, clear format and wording, but a great number of the women could not complete the survey without the support from the research assistant (one-on-one or by going through the questions in small groups). This was a lot of work for Deena and Dina respectively to manage. It undermined the benefit of surveys as being a private way of answering sensitive questions (e.g., about gender relations and personal finances) and was time-consuming and pressurising for the women workers. There were lots of non-responses in the results. GEN (and BASS, who were invested in the success of the blockchain pilot) were most enthusiastic about me using survey methods as this is the main approach that they (and most aid agencies) deploy in monitoring and evaluation exercises—they allow for apparently neat quantification and illustrative graphs. However, I saw this baseline survey as a skeleton, or

the archaeological remnants of one, to be fleshed out with ethnographic explanation and accounts of social meaning (Gillespie, 1995, p. 52).



Figure 13: Two discussion groups completing the baseline survey in the largest women's centre in Zaatari, May 2018. The women workers are helping each other fill out the questionnaire, surrounded by textiles, mosaics, tote bags, and other creative items they have produced in the UN GEN cash-for-work scheme.

#### 4.4.2. Research with GEN Jordan

##### *Participant observation in the camps, on the road, and in the office*

My ethnographic research with GEN was multifaceted as I tried to stay attune to the heterogeneous roles and experiences of different staff within the organisation who were involved with the pilot. Through conducting the research with refugee women workers, I fostered the strongest ties with the humanitarian aid workers who run the programs in the Wahat and are the main intended beneficiaries of the blockchain implementation. During the long journeys driving to and from the camps, I spent considerable time with the small group of five GEN aid workers. We would listen to the radio, share snacks, and reflect on everyday happenings. These were some of the most important windows into the routine operations, challenges, objectives, and experiences of aid workers around the implementation of blockchain. Ethnography is already ‘in movement’ as participant observation involves shared activities and action (driving, walking, eating, imagining) (Pink, 2008). As with the supermarket walk-alongs with refugee women workers, the drive-alongs with GEN illuminated how people described and understood their comings, goings and trajectories, how they wanted paths (theirs and others) to play out (Ingold & Vergunst, 2008).



Figure 14: Base camp for humanitarian organisations in Zaatari, December 2019

Ethnography helps us uncover the specific techniques and cultures of practice involved in digitalisation projects. Beyond opening up the ‘black box’ of algorithmic systems, it is important to understand how newcomers become socialised into the administrative workflows underpinning their everyday functioning and maintenance (Geiger, 2017). I wanted to know how GEN aid workers tackled the new automated infrastructure. Even though the blockchain removed their role in handing out cash, the aid workers were still responsible for collating and checking the workers’ timesheets (which were the basis on which funds could be released) and submitting them to the blockchain platform’s interface. They still were responsible for communicating with workers and resolving issues with the salaries. One GEN aid worker, Aisha, became my key informant on the daily journeys to the camps. In December 2019, Aisha was burned out, looking for a new job, and particularly critical of some of GEN’s activities. She was open with me about her impressions of the blockchain pilot and how it had affected her everyday

role, about hierarchies and tensions within the organisation, and about difficulties and concerns in her work with refugee women. In the Wahat but mainly on the journeys, she would also show me what she was working on her laptop, for example, demonstrating how the timesheets and other databases were structured and maintained, what information they comprised, how they were uploaded onto the blockchain platform, how she understood the system to work in comparison with the previous one. In this sense, my ethnographic work with GEN aid workers involved digitally mediated research—ways of sharing, engaging and commuting with participants in tandem with technologies and techniques (Pink, 2016).

With staff from other roles within GEN, digitally mediated work was crucial in allowing me to keep abreast of the developments with the blockchain pilot while I was not physically in Jordan. In-between planned research trips, it was sometimes difficult to stay in-the-loop as the senior staff at GEN Jordan resisted regular communication: they were extremely busy, reluctant to share details about UN operations, and understood my role as firmly in in-situ impact research (conducting fieldwork with refugees) and knowledge management (organising workshops and producing reports). With the monitoring and evaluation team I carved out a useful complementary role, so I worked mostly with them. For example, we used video calls and email to plan and coordinate each research visit, held debrief meetings where they gave feedback on each of the field reports I shared, and I gave advice on the research materials they prepared such as the survey questionnaire for an internal assessment of the impact of the pilot in late 2019. This team were knowledgeable about the context and sensitivities of the Wahat and took some responsibility in helping me set up the fieldwork, but also in how I interpreted the findings. I was interested in how they anticipated and responded to issues with the blockchain pilot, defined and

measured its success, as well as how they tackled the new audit and reporting opportunities the datafication brought about.

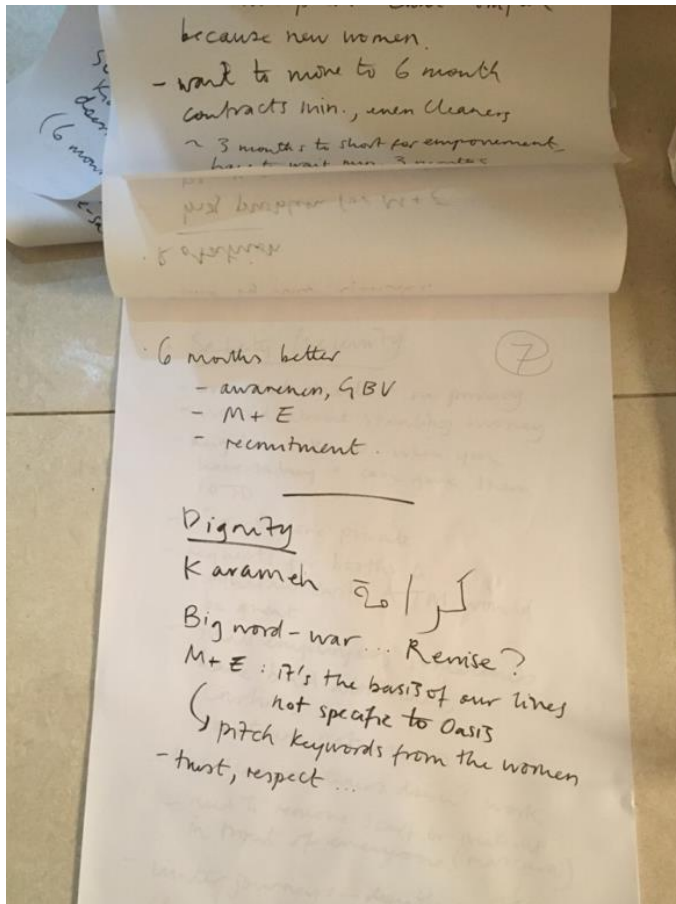


Figure 15: Example notes from group brainstorm with GEN aid workers and the monitoring and evaluation team in December 2019, where we used flipcharts to discuss how to understand the impact of the blockchain pilot.

Due to UN security protocols, I needed a pass to enter the GEN office in Amman. This pass could only be obtained if I had a designated purpose for being at the office. My research interests in blockchain were not just about evaluating the efficiency gains and coordination issues; the pilot was a window into the structure and culture of UN agencies undergoing digitalisation. I wanted to understand how institutional choices were made and negotiated by other (not camp-

based) GEN staff designing and managing the socio-technical infrastructure in Jordan, and how they worked with local and internationally distributed BASS staff and companies. I had several opportunities to arrange meetings with GEN data management and IT staff, the gatekeepers of the blockchain who authorised data flows. This allowed me to spend time with the ledger and the handful of people involved in managing it from their perspective of the interface and level of access. I also arranged several meetings with both the aid workers and monitoring and evaluation team together to plan research and discuss findings. However, the most useful method for ascertaining a picture of the different expertise, roles, and responsibilities in GEN, and how GEN was making and managing the blockchain pilot in collaboration with BASS and private partners, was the multi-stakeholder workshops.

#### *Multi-stakeholder workshops at GEN Jordan*

The social, organisational and institutional expectations for data and technology are most contested at the boundaries between stakeholder groups (Fiore-Silfvast & Neff, 2013).

Interactive workshops showcase the tensions but also affinities between stakeholders in what they want and expect from collaboration projects, here the blockchain pilot. Workshops are also a convention in aid organisations and so were a comfortable social form for participants. I drew on my experience conducting multi-stakeholder workshops in cultural value analysis projects (Gillespie, Wilding, Bell, & Cheesman, 2015) by leading five half-day workshops at GEN's office in Amman. These were spread across the four periods I was in Jordan, both before and after the launch of the pilot.

GEN Jordan collaborated in the design of these multi-stakeholder workshops and the senior staff curated the attendance. In this kind of work, the nature and extent of participation is largely down to the organisation's commitment and perceptions of risk, as well as bureaucracy and regulation (Gardner & Lewis, 2015, p. 142). I suggested that refugee workers should have the option to be represented in the workshops, but according to GEN it was not possible (or too burdensome security and bureaucracy-wise) to bring community leaders from the Wahat outside the camps, or even to gather the other stakeholders at the camp instead of the GEN office. As Gardner and Lewis suggest, major aid industry bureaucracies tend to be top-down and systemically non-participatory: the planning and administration they comprise rarely factor in alternative modes of understanding and organising activities (ibid).

How GEN shaped the attendance of the multi-stakeholder workshops revealed much about the dynamics of the blockchain pilot and humanitarian co-operation at large. From the outset I asked that we have as many participants as possible from each of the stakeholder groups involved in the pilot—this would have included staff from within GEN Jordan, BASS (the Jordan-based cash assistance team, the BASS Disrupt Programme, the BASS Links project team), UNHCR Jordan, the biometric technology vendors, the blockchain vendors, and the supermarket companies. However, the first multi-stakeholder workshop in May 2018 involved just 4 senior participants from GEN Jordan and the 3 Links team members from BASS. GEN had invited wider BASS Jordan staff—not just from Links—and the controversy around why they weren't there was illuminating of the inter-agency collaboration and the silos and tensions within BASS. Over time, the workshops gained traction (as a viable and useful thing to do from GEN's perspective, and the stakeholders were working more closely together as the pilot was beginning to take

shape) and GEN invited more participants from a greater variety of stakeholder groups. Subsequent workshops always involved GEN staff from the different teams, who became more involved in planning the pilot's vision and implementation. The biometric technology vendors attended nearly all the sessions, and this brought dialogue around questions of privacy, profit, and risk. By the final workshop in December 2019 there were 20 participants to represent nearly all stakeholder groups. This included three representatives from UNHCR Jordan, who sparked new tensions around issues of refugee protection.

Disappointingly, the blockchain vendors never attended the workshops. This was partly because they were based in eastern Europe and partly because GEN stressed that they had a merely back-end role and would not contribute much to the discussion. Again, the politics of participation was revealing of logics and assumptions around the pilot. To address gaps in my engagement with important actors connected to the pilot (the blockchain vendors but also Jordanian banks and government authorities), I tried to come up with questions that only absent stakeholders could address and asked to be connected with them via email; I left blanks and questions in the field reports for GEN that I hoped relevant actors would fill in. These strategies did not always work out—certain topics (especially state authority and surveillance) were off limits and had to be excavated through a combination of desk research and interviews with wider aid industry contacts in Jordan and internationally.

In each workshop, I took a participatory ‘actionable ethnography’ approach, using ethnographic material for co-analysis and activities to generate shared understandings among stakeholders (Jaffari, Boer, & Buur, 2011). I delivered findings from the research with refugee women workers as a way of representing their interests, alongside the Wahat aid workers who shared this role. It was vital that the workshop came after the field research so that I could share pressing, current findings. However, the final multi-stakeholder workshop came before my post-pilot fieldwork in the Wahat. This was due to the scheduling challenges involved in bringing together a large group. It meant that the workshop was useful in terms of examining how stakeholders were working together, framing, and legitimising the pilot. However, I did not have a chance to present in person (only through a subsequent report) the critical findings from the final field research period about refugee women’s experiences of delays and precarity which the pilot induced (see Chapter 7). This was regrettable: while field reports provide organisations with a useful and detailed evidence base, I found that discussing findings in-situ at workshops was a more direct and engaged-with way of sharing the research.

I worked with participants to produce brainstorming about the objectives and challenges of the pilot, inspired by Gillespie’s participatory methods (Gillespie et al., 2015). These brainstorming were exploratory, collaborative, and multi-perspective as participants mapped out the key stakeholders and their aims and risks over time (at present, for the launch, in the long term). In larger workshops, we divided into sub-groups, used flip charts, and then delivered the results to everyone at the end. Flip charts and visuals catalyse debate in group discussions, enhance recall and creative thinking (Kratz, 2010, p. 815) and they were also vital records of the proceedings. In June 2019, close to the pilot’s launch, participants each made a diagram depicting what its

success would look like, which was a particularly provocative exercise in revealing competing perspectives on the same project. Overall, the workshops were a great way of opening channels of communication, generating critical debate and revealing how GEN tackled divergent agendas and priorities between different groups.



Figure 16: Representatives from different stakeholder groups presenting visual depictions of what a successful blockchain pilot would look like, June 2019.

Anthropological methods are rooted in European colonial administration (Asad, 1973). Jordan only gained independence from Britain in 1946. The continuation of western dominance and white saviourism in Arabic-speaking countries is still widely apparent, but especially in humanitarian and development aid (Nasser-Eddin & Abu-Assab, 2020). Unequal privileges, authority and conditions of mobility follow racial lines as aid organisations differentiate between local or national and expatriate staff (Redfield, 2012). Several key contacts from BASS and UNHCR were white English-speaking men who tended to dominate group discussions. GEN

staff were generally Jordanian women, not technology experts, some of whom were not fully comfortable speaking their second or third language, English, in this kind of busy professional setting. As in the Wahat, I followed the intersectional ethics of care approach in addressing dynamics of marginalisation in the workshops, primarily by trying to moderate the discussions carefully, making space for women to speak, and trying out exercises that could appeal to everyone (Berry et al., 2017; Leurs, 2017; Raghuram, 2019).

*Field reports: collaboration and control*

An important component of establishing an impactful and reciprocal research collaboration with GEN was writing and sharing reports with them. I wrote up summaries of the workshops as well as extended field reports with executive summaries and recommendations. A key challenge was that many of the issues I raised on behalf of refugee workers were considered beyond the scope of Links and indeed of both GEN and BASS's activities. For example, in Azraq the complete lack of transport infrastructure was often brought up as a fundamental concern to all residents of the camp, affecting everyday life in many ways but also access to the supermarket and the pilot (as we shall see). In the first field report I wrote up for the UN agencies, they asked me to remove several points, including this and refugee women workers' issues with biometrics, because they were 'outside the mandate'. GEN did not hesitate to censor parts of my reports by removing or adjusting sentences in track changes. Even though the reports were not public, they were shared internally. Including critical comments about issues pertaining to other organisations' mandates (or anything about the Jordanian state authorities) meant 'stepping on toes' or jeopardising the reputation of the pilot. Independent researchers ultimately must negotiate the pressures, requirements, and priorities of organisations and political context. I found that it was important not to assume that GEN did not have a good understanding of the

issues refugee women workers face, even if they were not appearing to respond to them. Rather, this revealed the sensitive politics of humanitarian mandates, accountability and agencies' performances of neutrality, impartiality, independence, and success. However, it was extremely disheartening that important parts of the knowledge produced in the Wahat research were disregarded as irrelevant or not actionable. Confrontation with evidence is not enough to effect change (Onuoha, 2020). UN organisations are extremely reluctant to admit fault or failure (Boon, 2016). It was—is—difficult to ascertain how far, once shared, key findings were discussed, taken seriously, and acted upon.

#### 4.4.3. Research with BASS Links project

##### *Multi-stakeholder workshops*

In investigating the implications of blockchain on humanitarian governance and coordination (RQ1), multi-stakeholder workshops were instrumental. BASS is an expansive family of organisations. BASS organisations involved in Links chiefly included: (i) three full-time Links Project employees, (ii) collaborators from the Europe-based BASS Disrupt Programme, (iii) BASS Jordan country office staff. Even GEN staff expressed uncertainty about the different BASS teams and their roles in the pilot collaboration. The workshops gave the chance to understand how the expansion of the Links project was being managed and negotiated by BASS staff (mainly the Links and Disrupt Programme teams, as opposed to local and regional BASS staff) on a strategic level through relationships with the other nodes of the network, including the other UN agencies, technology vendors, and blockchain consultants. The workshops revealed what setting up a shared ledger, a decentralised system putatively owned and controlled by no single entity, really involved in practice.

The ‘messy talk’ before, after, or in-between planned agenda items at the workshops was particularly illuminating as participants gave more details, feedback or reflection (Dossick & Neff, 2011). In one instance, John, a BASS staff member from the Disrupt Programme halted the flow of discussion in a workshop. John occupied the title ‘New Venture Project Manager’ and was responsible for the branding and strategic partnerships of Links. He asked that I and everyone else stop referring to the pilot project as the ‘Links pilot’. He said it would be better if, in the rest of the workshop and any research materials I produced, everyone could just refer to it as simply ‘the pilot’ or ‘the blockchain pilot’. When I asked why, he took out a piece of paper and drew one box on top of another box. One he labelled ‘technology’ and the other ‘service delivery’. John explained his position: ‘We know the underlying technology works, it’s the service delivery that could cause problems. GEN’s roll out in the camps should not be equated with the name of Links.’ He made it clear that BASS did not want to tarnish the name of Links or indeed blockchain if the pilot goes wrong. In another 1-1 chat at lunchtime, he also brazenly suggested that it would be better if I stuck to doing anthropology about the ‘service delivery’ with refugees and left the technical element alone. When I broached this subject again to the group of GEN staff, the terminology battle was far from innocuous. GEN staff were confused and offended about John alienating them from the Links project. This patronising episode revealed a lot about the inter-agency sensitivities and power dynamics, John’s anxiety around the project’s branding and fear of criticism and failure, his outdated interpretation of my expertise as a social scientist and collaborative researcher, and most of all his avowedly simplified model for understanding the interplay between technology and society, which for a blockchain evangelist didn’t really add up.



Figure 17: Model depicting early construction work and food delivery in Zaatari camp, BASS Jordan office

### *Digitally mediated methods: the governance framework*

Alongside the workshops and other formal and informal meetings in Amman with BASS staff, I engaged with discussions about the vision for the humanitarian blockchain platform using digitally mediated methods. Through video calls, emails, messages, and written documents, I worked with the Links team and their partners (chiefly ConsenSys, the blockchain company)<sup>12</sup> on the blockchain governance framework. The framework was both an evolving conversation

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<sup>12</sup> ConsenSys is one of the largest specialist blockchain software companies. It was founded in 2014, is headquartered in New York, and in 2018 the company employed over 1000 people but following restructuring now employs around 500 people (Wilson, 2020). Led by Joseph Lubin, a founder of Ethereum (the second most popular blockchain after the Bitcoin blockchain), the company builds Ethereum-related infrastructure and products, invests in start-ups, and offers blockchain educational services and expertise. ConsenSys is involved with at least a dozen projects in the humanitarian, NGO, and social impact space (ConsenSys, 2021).

and an in-progress document setting out the objectives, rules, ethics, incentives, power structures, procedures, guidelines for a humanitarian blockchain platform. I participated in meetings and email exchanges about topics such as: the requirements for becoming a member of the Links network; the structure and types of membership; decision-making power, voting and rights; how to establish consensus and resolve conflict; who audits the auditors; data protection and privacy; legal considerations. In particular, examining the governance of distributed socio-technical infrastructures involves looking at how humans and non-human relations are configured to collaborate (Ribes et al., 2013). For example, I investigated how the BASS team planned for algorithmic decision-making to come about, when, and how they delegated authority to protocols.

The lexicon of blockchain technology is notoriously difficult (Walch, 2017b). Acronyms and initialisms are prolific in the aid industry. Language was core to cultural competence in organisational research, not just the camp-based research in Arabic. Working with blockchain experts helped me keep abreast of the technical terminologies, concepts, and novel developments. However, I was also expected to be one of the experts myself. Especially by the Links project manager, Alex, who had invited me to participate. While some of his colleagues (like John) assumed ‘anthropologist’ meant expert in traditional cultures, he responded encouragingly to my interest in the politics of setting up this humanitarian blockchain network and sought to strengthen the document with academic scholarship. To contribute a critical perspective on the governance framework, I had to learn a lot about distributed ledger technology and political science on the go.

There was an especially challenging instance in 2019 at the early stages of the governance framework's development when the Links team had prepared a set of questions to discuss with external experts and posed them to me on a video call. Some of the questions were provocative and open, generating debate about democracy, trust, and ethics, but others came with the expectation of a straightforward 'right answer', which I was not prepared to give. For example, the team asked me how many of the network's members should constitute a quorum, how they should weight votes made by members about the network, how many computer nodes need to reach consensus for a block to be valid, which types of decisions should be categorised and audited as 'on-chain' (executed algorithmically) and which should be 'off-chain' (executed outside of the blockchain). I responded to these questions by trying to understand and break down what was at stake with each, particularly from the vantage point of how decisions about the network affected concrete humanitarian operations, and I gave a sceptical appraisal of the on-chain vs off-chain dichotomy. Responses like these opened even more big and complicated questions and seemed to grate against the Links team's analytical frames and expectations for straightforward, actionable answers. Maintaining access and achieving meaningful impact with policy-oriented audiences involves maintaining one's relevance and persuasiveness (Cunha, 2017), however, I think catalysing critical debate and slow thinking is an important part of public social science.

My interactions with the BASS Links team often seemed heavily curated and restricted. For example, a limited number of staff joined the first few multi-stakeholder workshops, I was put in blind copy in emails which made it difficult trace who else was connected to the blockchain pilot and governance framework, and there were extended periods of disconnection and non-response

to my communications, especially in-between and after my fieldwork visits to Jordan. I connected with Alex in regular 1-1 calls at the start of the research, which gave me unique insight into the strategy driving the wider international project of Links. The calls tended towards a positive, visionary perspective: they gave me a detailed understanding of the ongoing and long-term vision for blockchain in humanitarianism more than the warts and all challenges and concerns. By the final year, these calls were few and far between, and email replies required multiple follow-up messages. There could be multiple explanations for the waning connection. Perhaps I had not met the expectations for continued contact—my contributions did not offer quick, direct consultancy but were critical, anthropological, slow, and questioned the ethos and makeup of the project. Indeed, the more data and experiences I had gathered in Jordan, the more critical I was of Links. However, if ethnography is about ‘being there’ long enough to get a sense of typicality and norms, the internet helps strengthen learning and connection (Miller, 2020). Digitally mediated approaches present ethnographers with new opportunities to follow behaviours, analyse discourses, and compare the said with the unsaid. I tracked and analysed digital materials about the Links project, including their web page (all historical versions are available on the Wayback Machine ([webarchive.org](http://webarchive.org))), public articles, press releases, YouTube videos, webinar presentations, old Meetup.com pages. This was a resourceful way of studying social relations at a distance, and it involved not just passively lurking, but actively tracing interactions and connections (Geiger, 2016).

My analyses in Chapter 4 are also informed by research with a constellation of experts connected to the field of humanitarian governance and blockchains. During the research, I conducted interviews with over 30 professionals from wider aid industry and civil society organisations

using or commenting on this topic. As Howard points out, knowing who to talk to is not obvious when organisations operate with complex, de-territorialised and disparate international multimedia connections (Howard, 2002). Beginning with established relationships within the Links team and by using relevant conferences, webinars, reports and mailing lists as a way of following discourses and identifying informants, I gathered a snowball of connections which informed my analysis of the implications of blockchain and Links on humanitarian governance and coordination. Reliability was a challenge with the elite interviews. There were few aid industry experts who also had blockchain-specific expertise, let alone access to a detailed understanding of the makeup of Links. Some aid industry professionals' critiques of Links included conjecture and bias, especially experts working within competing organisation who demonstrated suspicion of BASS and its political-economic power in the sector. The elite interviews were mainly useful in illuminating industry dynamics and agendas rather than detailed appraisals of blockchain in aid.

#### *The research agreement*

GEN is a small, under-resourced and relatively new humanitarian agency (launched in the early 2010s), less inclined to pursue extended legal debates and research agreements. The blockchain pilot was also GEN Jordan's first foray into a potentially contentious new technology project. The informal nature of my research with them—providing reports and expert workshops in exchange for access and logistics—afforded more possibilities for engagement. By contrast, BASS is the largest aid organisation in the world, operational since the early 1960s, both extremely well-resourced and risk averse. Reputational damage was a major consideration for BASS in collaborating with an independent researcher. The manager of Links encouraged our research collaboration and open dialogue yet demonstrated great caution around criticism at the

same time. He suggested that BASS needed to ‘protect the roots’ (reputation) of the project to let it grow and flourish as a case study. While the collaboration began informally, once I made my first trip to Jordan and produced the initial field report with critical findings, for example, about the quality of food provision in the camps, lengthy research agreement negotiations with BASS began.

The BASS legal department drafted a ‘memorandum of understanding’ to formalise the research collaboration with me and the University of Oxford. This set out legally binding expectations and responsibilities for publishing research findings, intellectual property ownership, and the rights and obligations of the collaborators. While this research agreement was set up to avoid potential conflict, it created it. BASS lawyers were committed to ensuring the agency had ultimate control over my research findings, outputs, and intellectual property rights. This included the ability to rule out any publications outside of the doctoral thesis, approve all content, and hinder or prevent the submission of my thesis. The drafting process was revealing empirical material. In the document and the (over a year-long) negotiations, BASS lawyers promoted a particular view of knowledge as something potentially pernicious that should be a private service rather than a public good. The research agreement debates with BASS introduced tensions in the research collaboration and made me consider the benefits of alternative possible arrangements which I could pursue in future (how to avoid agreements and legal disputes with suspicious and powerful organisations? Would working as a paid consultant provide stronger forms of access and trust?).

The final memorandum of understanding which we signed with the help of Professor Gina Neff and the Oxford research contracts team better protects my academic freedom. It no longer includes a clause giving Oxford unlimited liability, which the University could not accept as a charitable institution. However, while it does not require permission from BASS to write about my research, the memorandum does require that I ascertain approval from BASS to use its name, or the name of Links. It includes the condition that I share drafts of the thesis and related publications (I am permitted three) for comment by the Links project manager, who will have the opportunity to liaise with me about how BASS and Links are presented and identify ‘unpublishable information’ (defined as information that is confidential). Ultimately, the finalised memorandum far from solves the intimidating challenges of accessing, engaging closely with, and writing about organisations. This is ongoing.

Directly using aid agencies’ names in critical research about them can be an effective way of examining their specific characteristics and holding them to account (Sandvik & Jacobsen, 2016). However, using the organisations’ names may not add to the quality or relevance of the research presented in this thesis. It can be construed as ad hominem attack and can make it difficult to conduct subsequent research in the sector. It would also introduce inevitable frictions with BASS, who would need to review all the writing about them, and I may be obliged to re-write or remove parts they could argue were confidential (the definition of ‘unpublishable information’ is not well detailed the memorandum, so it is difficult to anticipate what kind of content BASS could identify as such). Therefore, I have concealed the identities of the specific organisations and used pseudonyms for BASS, GEN, and the Links project. However, I still describe them as United Nations agencies. This retains a crucial sense of the context,

particularity, and significance of these actors in the global governance and humanitarian apparatus. Even though there are currently at least 16 UN agency blockchain projects, perfect anonymisation is not possible in the case of Links. The project is well known, having received widespread attention from journalists, academics, and other critical commentators. Therefore, I have still liaised with the Links project manager—as well as a key contact in GEN Jordan—on how the pseudonym organisations are represented in the thesis to demonstrate a good-willed effort to address their reputational concerns and the spirit of the memorandum.

## 4.5. Conclusion

This chapter has presented the work I have undertaken in this networked, stakeholder ethnography, and the thinking, decision-making and challenges around it. I have outlined my approach to participant observation, which involves physical-digital spaces and incorporates plural, context-appropriate methods such as focus groups and multi-stakeholder workshops. I have discussed core issues in research ethics, gender and care, positionality, and participation, and how they connect across but also differ between the stakeholder communities. I have sought to highlight the importance of learning and collaboration in the practice of ethnography. Doing engaged research means becoming familiar with new scripts, whether Arabic, blockchains, aid industry acronyms, legalese, or codes of behaviour. It involves collaborative work, reciprocal giving, confrontation and action with different sorts of para-ethnographers, experts, gatekeepers, and guides. Ethnographic work collaboratively shapes humanitarian discourse and practice. Research methods co-constitute the feedback loop between international aid organisations and their so-called beneficiaries, grounded research with whom allows us to investigate what policy makers and technologists can learn from refugees. In keeping with much anthropological work, I

draw on immersive, human-centred research as a means of developing situated explanations of power and inequality and questioning taken-for-granted and hegemonic understandings of social phenomena. Now, I turn to the first empirical chapter: a study of the design and management of the Links project by BASS, and its intervention on issues of coordination and trust in global governance institutions.

## Chapter 5: Trust, power, and privacy: Humanitarian governance after blockchain

This chapter examines the transformations that discourses and implementations of blockchain helps to shape. I investigate how three central blockchain tropes play out in the design and expansion of the Links project. BASS promote blockchain as a means of transforming both the coordination of aid agencies and the governance of aid beneficiaries through the claim that it delivers: **(i) trustless trust, (ii) decentralisation, and (iii) transparent privacy**. Firstly, I demonstrate that Links follows a logic of technocratic consensus which neglects the complex, social nature of trust and the established data and decision-making processes within the United Nations system. Secondly, I show that the political meaning of decentralisation is ambivalent. The Links platform potentially establishes a commons for humanitarian actors which circumvents extractive financial intermediaries. BASS staff are not simply ideologues of neoliberalism: they advocate Links as a collaborative, neutral, decentralised commons for payment facilitation and information. However, in practice and despite this intentionality, Links serves neoliberal ends: the project dismantles humanitarian-led systems and the platform's material infrastructure provides a steady foothold for profit-driven companies in aid. Thirdly, I argue that Links follows a colonialist timescape: it is driven by the rationale of providing an authoritative, interoperable platform that makes aid activities transparent across territories in the Global South. The notion of a singular, authoritative digital identity for each beneficiary—which can be used to control their access to resources—comes into tension with promotions of blockchain's cryptographic privacy. The project struggles to scale up because of strongly cultural

and affective aspects of governance, cooperation, and social trust. Nevertheless, Links proposes to extend dynamics of infrastructure injustice in aid through its neoliberal, surveillant management of material resources and colonialist timescape.

## 5.1. Trustless Trust

### 5.1.1. Trust as blockchain

The overarching aim of Links is to facilitate collaboration and coordination among humanitarian agencies. In my first ever interview with the project manager, Alex, on a video call in 2017, he stressed: ‘The key point in doing all this in the long term is to get a harmonised stream of big data and AI. The unique potential of blockchain is to harmonise aid to an unprecedented degree.’ Blockchain was not just the infrastructure to coordinate cash assistance, but any humanitarian activities (‘from supply chain to medical aid to identification’). It was to unify the aid sector by bringing the messy deluge of information—and therefore action—into coherence. This vision rested on the premise that aid organisations, particularly UN agencies, were malcoordinated and uncooperative:<sup>13</sup> ‘Blockchain gives us the trust so we can make competitors into partners, we can focus on collaborating around resources rather than bickering in our corners. Links is all about forging alliances.’ Here, the UN system—with siloed, proprietary socio-technical infrastructures—fits the description of a Hobbesian world of vying, mutually untrusting, self-interested entities. With a shared blockchain platform, ‘a neutral space, 100 per cent co-owned and co-operated by its members’, competitive UN agencies could be brought into meaningful and equitable exchange relationships. In this way, the Links project was seeking to address a

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<sup>13</sup> This perspective is in keeping with the wider ‘UN cooperation’ agenda, exemplified by the UN Secretary General’s [High Level Panel on Digital Cooperation](#).

concrete issue: that the coordination of information and resources has been a major challenge within and between aid organisations since long before digitalisation, but this challenge has been amplified with the complexity, scale, and risks of data ecosystems (S. McDonald, 2016, p. 18). Rather than resolving the competitive structures of the UN system through institutional reform, they could be remade through the power of blockchain.

Employed by BASS headquarters, Alex leads the small project team of two full-time Links employees: a business development manager and a corporate administration manager. Alongside other partners (including GEN and technology vendors and consultants), BASS staff from other departments also contribute to the project, especially the Disrupt Programme (and ‘new ventures’ business managers based in Europe such as John) and the Jordan country office (the local cash assistance team). In 2018 when I first met Nadine, another Links team member whose background was in finance, she described Alex as a ‘visionary’. As we walked from a meeting to the lunch cabin at BASS’s Jordan country office, I had asked Nadine what drew her to the project, and she suggested she was most inspired by the long-term transformation Alex was pushing for in bringing cooperation—and blockchain—to the sector. The vision of an expansive network of humanitarian agencies co-ordinating their work around a shared data platform was ambitious. Nadine suggested there was a lot of work to do to bring about this vision, but it was bold, pioneering, and worthwhile.

Although designed and driven by BASS, staff reiterated that the Links infrastructure was a commons resource for aid organisations. For Alex, the key idea was that ‘blockchain allows us to have a shared overview of aid which no single agency owns.’ In a journalistic article promoting

the project, a BASS spokesperson suggested, 'Blockchain takes the ego out of the conversation about whose system is being used. It's not about whether it's BASS's system, the government's system, or someone else's. It's just a blockchain.' BASS representatives of the Links project all espoused the idea that, compared with existing data systems in aid, blockchain was a politically neutral trust-generating machine. Conviction in the neutrality of the infrastructure was rooted in blockchain's technical features. Unlike other algorithmic governance systems which can foster concentrations of power, staff suggested decentralised blockchain architectures meant that no single party could have exclusive control of the system. Members of the network would write their own self-enforcing smart contracts and deploy consensus algorithms instead of (un)trustworthy people, institutions and intermediaries making decisions. At various points, interlocutors from BASS described trust as 'built' or 'baked' into the Links network. Trust was redefined as engineering itself rather than as an experiential social outcome of engineering. Transactions and exchanges could be automatically verified, seamless and direct, and social trust was unnecessary. Blockchain *was* trust.

By April 2019, the main project activities in Jordan had launched. The Links team were due to commission the blockchain consultancy company ConsenSys to produce a governance framework for the project. With the caveat that they were not governance experts, Alex and Nadine began researching what this should include and asked me for preliminary feedback on their notes. The approach they had taken was surprisingly abstract and philosophical, and avowedly technocratic. They sketched out space to acknowledge different possible political paradigms ('meta governance') and 'legal and community aspects', but the most developed section was on 'technological governance'. This section included the explanation,

The primary form of rationality is engineering. Other logics and languages are translated and even subordinated to it. [...] Code is law: it limits and guides social behaviour, makes possible or impossible certain trends of individual and collective action and, in this way, structures social relations.

It was not obvious from the notes what a governance framework was supposed to do. By governance, did they mean a code of conduct for members of Links (which now only included BASS and GEN), a governing body or disputes committee, an outline of protocols and processes, or just some general considerations for how the system should be designed? It was unclear where and how the complexity of existing authority and cooperation in the UN system was being mapped out, how the coordination of aid workers' actual activities on the ground fitted into the framework, or whether the individual and collective experiences, perspectives, and rights of refugees would be factored in. I responded to the notes with some critical research-based provocations: that while code does structure social relations to a degree, this is not deterministic; that seeing code and law as being in a mutually adaptive relationship might be more helpful than the code-defeats-law myth, especially if law is to adapt to fit technological change, and if blockchain is to comply with regulations around e.g., data protection and the human right to be forgotten (Finck, 2017); that blockchain governance is not a merely technical matter but a fundamentally social process which needs to be fair, robust and predictable (Sclavounis, 2017).

As the governance framework took shape, my interventions remained at odds with the technocratic approach to trust and cooperation. Examining how ConsenSys led the development of the framework and what logics and evidence the consultants drew on was revealing. The framework was based on 'the best practices of private sector blockchain consortiums, adapted to

the humanitarian data ecosystem'. Unsurprisingly—ConsenSys is a for-profit venture of Joseph Lubin, one of the founders of the Ethereum blockchain—the consultants' presentations and reports connected with promotions of 'decentralised autonomous organisations' and Ethereum as the 'world computer' (Abra, 2020). Here, organisations are posited as sets of decisions that can largely be automated through smart contracts and algorithmic protocols. Forging the framework centred around scoping out relevant decisions and sorting them into the categories of 'on-chain' (decisions executed algorithmically) or 'off-chain' (decisions executed 'outside of the blockchain'). These categories appeared to replicate the dichotomies of social-vs-technical, human-vs-machine or real-vs-virtual. On a call where Alex and three ConsenSys consultants presented the first draft of the framework, one consultant defined on-chain decisions:

This is the completely neutral stuff of technical governance. Like, if there is a new version of Parity Ethereum client<sup>14</sup> released, how do the nodes [BASS and GEN] reach consensus with how to update at the same time? Or how is proof-of-authority [the consensus algorithm]<sup>15</sup> achieved—that's obviously a 2/3 majority—, or how do we go about updating new software? All this is pretty standard. Consensus algorithm, nodes, members, network maintenance, security and risk management, technical standards—we can get all these elements on chain. We don't want to recreate the clunky models of the UN that have been time-consuming. This needs to be agile as possible.

In this case, the question of where you draw the line between apparently neutral and political decisions was framed as self-evident. Some decisions still required social and democratic processes and debates, but this was to be minimised in favour of delegation to algorithms. A core

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<sup>14</sup> Parity are the blockchain company that provided the core decentralised infrastructure for Links. An Ethereum client refers to an application (here, provided by Parity) that allows you to run an Ethereum node. This node is part of a synchronised blockchain network where transactions are made and managed.

<sup>15</sup> Blocks of data and transactions must be validated; consensus algorithms—computer protocols—prevent malicious entities from commandeering the validation. Different consensus algorithms (e.g., proof-of-authority, -work, or -stake) achieve this in different ways.

aspect of automating decisions was synchronisation. Indeed, the consultants suggested ‘Data is definitive because it’s validated by the distributed network, and it’s tamper proof once it’s on there. Everyone has a record at the same time. If someone needs to verify information, they can check when exactly the data was validated.’ Transactions would be completed and records would be synchronised automatically, giving a ‘single version of the truth which all parties share and coordinate around’. Blockchain was a way of standardising time and, in so doing, making veracious, verifiable records. Blockchain delivered trust in the data flowing through it. This resonates with the ‘epistemic determinism’ of wider datafied aid projects in which ‘certain sources of information (including the quantified, large-scale and digitally generated) become considered more reliable, accurate, and truthful than others’ (Cherlet, 2014; Taylor & Richter, 2017, p. 722). Just as Bitcoin developers make appeals to technical expertise to maintain the appearance of the blockchain system’s ‘trustlessness’ and promote ‘trust in code’ (Vidan & Lehdonvirta, 2019), BASS staff’s approach to governance, in collaboration with ConsenSys, centred on the technical strengths of blockchain as a neutral, automated system providing ‘trustless’ trust. Here, trust is not found in the experience of infrastructure, trust is *inherent in* blockchain infrastructure. In other words, the idea was not just ‘governance by data’, the use of data to exert control over people, places, and things (Johns, 2021), but governance *as* data infrastructure—control by blockchain.

### 5.1.2. Neglected issues of social trust and cooperation

The project team’s commitment to a future technocracy neglected the complex, socio-political nature of trust relations, cooperation practices, and decision-making processes UN agencies were

already doing in Links and in general. As I was channelled into discussions about blockchain-based rulemaking, the wider picture of existing UN organisational structures, proprietary databases, and data sharing rules and protocols was missing or downplayed. So too were the intermediate steps of transition to a shared decentralised platform. The governance framework was largely speculative; it did not address the current particulars such as who currently validated data on the network, who had access rights (including technology partners such as biometrics and blockchain companies), how monitoring and evaluation currently worked, or who oversaw the response to a data conflict, against which database. In BASS and ConsenSys' governance research, capturing and sorting important decisions was a seemingly exponential task that involved reimagining humanitarian organisations as collections of contracts, agreements, permissions, and votes. Deciding which components of this should go 'on chain' was not as straightforward as some Links advocates made out. For example, while it is normal that large institutions delegate decisions about technical changes such as software upgrades, a member of the Disrupt Programme agreed that some decisions were ambiguous, not just 'on-chain': 'The consensus algorithm is a totally technical part, but if we upgrade or change it, the relevant contacts in member agencies will need to understand why, and what the implications are, so they can trust the system.'

Debates around the consensus algorithm crystallised the socio-political nature of blockchain governance. Links is a private, permissioned network: only authorised nodes can read and write and validate transactions. The Links consensus algorithm is proof-of-authority. This means that blocks of data are validated based on the reputation of nodes' identities. Nodes (members of the network like GEN) with the power to be 'data validators' must have approved accounts. The

choice of this authority-based approach instead of the alternatives (which involve extreme energy usage or cryptocurrency holdings)<sup>16</sup> brought up tensions around what coordination was or should be: who exactly should have the authority to validate information on this collaborative platform? What would happen if authorities were saying different things about the same data subject? Who else would BASS and GEN collaborate with, in the future, how, and to what ends? Fundamental questions arose around what kinds of actors and content could run across the Links network. In the governance framework, ConsenSys outlined the principles of Links, which included the tenets of ‘fair, inclusive governance’ and ‘members are free’. This chimed with wider discussions I had with Alex in early 2019:

In so far as other organisations or entities join, they host their node on their own cloud servers, and they can write and deploy their own smart contracts. Everything is independent. I don't want any governance over that—that's why Links is neutral. Their smart contracts could be irrelevant—well, I don't want to say irrelevant because we don't want them to slow down the network. They couldn't do crypto trading, for example. But in theory they could do whatever they wanted apart from that. It's like we are establishing the Internet. If someone wants to make Google or Amazon on our network, they can. As long as the organisation doesn't have malicious intent and is broadly assisting people in their lives then they should be able to do that.

In these early discussions in 2018, before the GEN pilot had launched, membership criteria—and what constituted a malicious actor—were ill-defined. The question of whether this was a humanitarian network or a generic utility was indeterminate. Alex was echoing the ideals of Ethereum and Bitcoin proponents of non-hierarchical networks in which every member of a large-scale distributed network is equal, and Internet network neutrality proponents in the sense

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<sup>16</sup> Alternative algorithms include proof-of-stake (mechanisms that select validators based on their holdings of the relevant cryptocurrency) and proof-of-work (computational power is required to verify transactions. Computers compete, incentivising extreme energy usage).

of ‘the principle that Internet service providers should not favour or block certain content, users, or websites’ (Swartz 2018:11). In the call, I raised the concern that non-humanitarian members with ulterior agendas (commercial or government) would compromise humanitarian principles of ‘do no harm’, and suggested BASS justify the inclusion of each member rather than their exclusion. Over time, Links became focused on convening ‘independent, reputable humanitarian actors who are also implementing their work through the blockchain network’ with the aim of ‘collectively as a sector enhancing coordination, transparency and security by validating each other’s transactions.’ The ideal of trustless trust in a Hobbesian environment conflicted with the realities of designating membership criteria. ‘Real’ social trust and reputation was vital. The proof-of-authority nodes had to fulfil certain requirements of reputability, of technical and organisational capacity, and with clear reason for accessing and participating in Links. New members could only be ‘onboarded’ if they passed a vote in a ‘multi-signatory process’ involving existing members. This process situated power and trust in BASS and ConsenSys as the rule-makers, and current members (BASS and GEN) as rule enforcers.

In determining these governance rules, US-based ConsenSys staff deliberated over fundamental characteristics of democracy. Derek, whose background was in decentralised finance and ‘emerging markets’, was leading the ‘voting structure design’. In a group call in August 2018 when I was invited to give advice on the emerging governance plans, Derek elaborated on his task:

I think there are some decisions that should be weighted by some sort of measurement of engagement. That could be a combination of the volume the participant is putting through the network or the value of that volume, or the number of beneficiaries receiving aid from them, or some combination of

measurable things. And then there are also decisions where every participant should have an equal role regardless of the weight you might assign them: one node one vote. It's like constitutional vs legislative governance. Like how lots of parliamentary structures are designed: voting on law is one man one vote; voting on the structures for creating laws is done in a weighted fashion with different levels of participation from different actors. We are thinking we should follow this route with Links, but that's just a hypothesis. What do you think?

Different types of decisions required different levels of authority. I struggled to decipher what constitutional or legislative governance models would look in the context of UN organisations, and perhaps they did too. The approach neglected the culture of voting that would be necessary. How would Links members be equipped to make *good* decisions? Would there be channels in place for information sharing and deliberation? There was no sign that authority would be distributed to local and regional organisations and least of all to beneficiaries, facilitating continuous deliberation about and recourse to governance decisions that were meaningful to them. The team asked me to recommend relevant standards bodies and regulations like ITU and the Cash Learning Partnership; there were myriad standards and rules that applied to contracts (inter agency or external), transactions, agreements, and relationships. Elena, a tech expert at a humanitarian research institute, had inside experience on the project. She argued that the complexity of UN governance was not being accounted for. For Links to succeed, 'the UN would need to go through such a massive internal overhaul.' This was because:

This blockchain project overthrows standard operating procedures in how agencies do funding and coordination. If BASS headquarters are ok with that, then they need approval from the UN in New York, the Security Council, and the UN assembly. The Links team might be biting off more than they can chew.

### 5.1.3. Faith in blockchain

In theory, Links would make for a novel, unprecedented arrangement and legal framework in which aid organisations share an infrastructure that is itself a kind of trustless regulator. In an interview about their advisory role on the governance framework, an aid industry critic suggested that: ‘This kind of approach to data governance is like setting up a political party while reinventing the wheel of politics—they want everyone to join them but they’re telling us they can redefine what a constitution is, what a voting system is, what sovereign legitimacy is. How is this not a waste of resources?’ The staff developing the governance framework were embroiled in deep, abstract debates about political models and novel socio-technical institutional arrangements. At the same time, they considered the critiques of technocracy I and others made to be an unhelpful counter approach. This resonates with the paradoxes surrounding blockchain-based cryptocurrencies: ‘The same people for whom Bitcoin is the most objective currency [...] worked on and talked about almost nothing else but how the currency existed by being worked on and talked about’ (Maurer & Swartz, 2017, p. 254).

Trustless, technocratic cooperation among UN agencies was not a current reality but a promise. During my fieldwork, GEN and BASS were focused on getting the new pilot project off the ground in Zaatari and Azraq camps. As I will discuss in the next chapter, the main component of collaboration of the pilot was the practical matter of getting GEN’s node up and running on the Links network; there was no evidence of advanced multi-agency data analyses harmonising concrete operations and resources thanks to blockchain. In joining Links, GEN put faith in BASS and their unproven project. Links members resolved code updates, maintenance issues, and other

technical concerns by traditional channels of communication and analogue trust and consensus rather than automation. In 2020, Alex told me, ‘Now we have GEN on the chain it’s relatively easy discussing the important decisions and updates with them on the phone. The governance will be properly formalised when we expand into a bigger multi-agency platform.’ The obvious paradox was that Links was currently sustained by a great deal of ‘off-chain’, interpersonal and institutional trust, coordination, and consensus-making. The Links project was as discursive as it was technological: the vision of a neutral, trustless humanitarian blockchain had to be created, adapted, and sold to potential members, and maintained over time. Indeed, ‘trust-worthy code lives on not as an extant technology, but as a commitment’ (Vidan & Lehdonvirta, 2019). Links echoes other notable blockchain projects like Bitcoin where major conflicts between promise and practice are seen ‘temporary bugs’ which will be resolved at some indeterminate point in the future (ibid).

Links is a pioneering initiative. There was no template for a UN blockchain. There were no antecedent projects to follow for blockchain-based trustless coordination among aid agencies. There was no evidence that private sector inspired governance models worked for aid organisations. With the overarching goal of scaling up the network, it was crucial that Alex and his team proselytised the vision of a neutral Links technocracy. Conviction in the vision of trustless trust itself required trust. Indeed, not just trust, but faith: the team had conviction rather than concrete evidence; their beliefs were strong and resistant to challenge, and they instilled blockchain with a kind of sacrosanct purity. This connects with the wider evangelical conviction proponents have in blockchain: Joseph Lubin (ConsenSys CEO) framed Ethereum as a revelatory object, like a ‘tablet brought down the mountain’ which apostles bicker over the

interpretation of (Tett, 2021), while Tyler Winklevoss (famous in Silicon Valley for his involvement in cryptocurrency and in debates about who first imagined Facebook) suggested that ‘We have elected to put our money and faith in a mathematical framework that is free of politics and human error’ (Strydom, 2013).

As BASS and ConsenSys staff set about planning the governance framework in 2019, the great irony was that they were *already* doing governance. As the coordination of humanitarian actors was being reimagined through the technocratic lens of trustless trust, it also became evident whose trust was being prioritised. Refugees have no formal political representation, in Jordan’s camps or anywhere. GEN was already running a node, but they were not participating at all in framework development with ConsenSys. The perspectives of local GEN staff implementing and maintaining the new blockchain system did not feature in the document. What if, instead, all the efforts BASS put in to deliberating about code—in particular, the on/off chain decisions, the consensus protocol, and the voting structures—, and into performatively proclaiming the neutrality and veracity of the blockchain data infrastructure had gone into deliberation with refugee communities and on-the-ground aid workers about contextual issues, collective needs, and priority actions?

## 5.2. Decentralisation

The political imaginary of Links as a commons resource for aid organisations related to blockchain's putative qualities of not only trustless-trust, but also decentralisation. Decentralised innovation is touted as a progressive solution to the ills of centralised technology platforms and data management. For example, decentralised identity systems being developed by democracies and coalitions of the Global North (e.g. in the UK, the Netherlands, and the EU) are now contrasted favourably with the infamous centralised identity systems of the Global South (e.g. India and Kenya) which have involved government data misuse, overreach, and surveillance (Martin, Schoemaker, Weitzberg, & Cheesman, 2021). In general terms, decentralisation de-emphasises concentrations of power in favour of distributed networks of authority. Decentralised projects have emerged in close connection with blockchain. While it is clear that 'the construction of blockchain as a solution rests on decentralisation not only to contest the control of gatekeepers over information but also to enact a social vision' (Woodall & Ringel, 2020, p. 2203), there has been limited work unpicking the political logics behind decentralised social visions. Links is a decentralised socio-technical system, shared by major global gatekeepers of authority and information (United Nations agencies), and used in everyday humanitarian action. What this entails or will become is not obvious or inevitable.

In the long term, Links proposes to obviate centralised authority over beneficiary data in the humanitarian sector. Blockchain decentralises the transfer of information and value as multiple, geographically distributed actors use it to authorise and record their transactions. In Jordan, the Links website tells us, a core advantage of blockchain is that: 'Blockchain is a decentralised technology that eliminates the need for trusted third parties – including governments, banks, and

financial services.’ BASS and GEN currently use blockchain to ‘reduce dependencies on third party intermediaries for distributions.’ This circumvents fee extractions by financial service providers, ‘keeps audit in-house’, and follows a commonist, open-source philosophy: to prospective members, Links promotions suggested, ‘instead of paying start-ups, let’s work together.’ Driven by ideals of collaboration, community, and collective accountability mechanisms, blockchain appears to challenge the dominance of libertarian, individualist Californian ideology in digital humanitarianism (Scott-Smith, 2016).

However, should we see the relegation of traditional institutions through Links as a political manoeuvre to de-privilege legitimate authority and deprive it of its substance? Does Links represent a conscious withdrawal from both markets and the state, and established ways of structuring humanitarian operations and life in refugee camps? Does Links reject neoliberal, private, individualised approaches to aid? The communitarian rhetoric of decentralisation is central to BASS staff’s dreams and designs for blockchain in aid. But it is also an important part of Links’s political performance. As we will see, it strengthens buy-in and trust from donors and collaborators. In practice, the project’s activities in Jordan do not emulate the anarchist politics which is implicit in this rhetoric.

In a field report I shared with BASS in 2018 based on my work in the camps, the introduction paraphrased the project team’s evolving aims for Links and included the line ‘remove financial intermediaries in aid delivery’. Addressing Alex, Nadine commented on track changes, ‘Do we want to state this as an objective knowing it is not achievable at scale?’ Alex asked that I reframe the project as about ‘reducing reliance’ on intermediaries. While I was in Jordan in the summer

of 2019, at a meeting at GEN's office, John told me he was soon going to a hotel in the Dead Sea for a FinTech conference involving local start-ups and banks. When I asked how this fitted in with the politics around blockchain—the idea of undercutting traditional banking—he laughed: 'To be honest, I'm not sure, haha! It's a diplomacy exercise more than anything. Anyway, we're not interested in putting banks out of work.' Links was not about introducing cryptocurrency to refugee camps or eroding the deposit base of the established financial system. John did not frame big banks as adversaries but rather focused on the rather mundane but convincing business case: the efficiency and control BASS gleaned through reducing the number of transactions going through the Jordanian bank and internalising accounting information. He explained:

After blockchain, the beneficiary makes a transaction, blockchain authenticates it, and BASS doesn't need to communicate with the banks or send them an advance. What takes days with the banks takes seconds with blockchain. BASS has full control to increase or decrease amounts, reconciliation between the amount donated and amount spent is automatic, more transparent, and secure. Anomalies are automatically detected. The whole process is significantly simplified and effort and staffing and costs are hugely reduced.

At the same time as Links staff maintained a diplomatic relationship with the local banking sector, outlining the shortcomings of banks was a key part of the decentralisation rhetoric used to promote the project. Banks were also framed as rent seeking and potentially unreliable intermediaries in politically and economically unstable countries. As Nadine put it in a 2019 aid industry conference talk (in which banks were not present): 'We normally pay \$70m in fees to financial services, and we have to advance funds for an entire month, but this is risky in places where banks are not well regulated, and institutions are on shaky ground.' In this narrative, circumventing or undercutting banks was crucial in the aim of rapid, safe, and low-cost response to humanitarian crisis. But overall, the relationship with established financial actors was

ambivalent: how BASS staff presented the politics of financial disintermediation (undercutting vs reducing reliance) depended on their audience.

Another subject of ambivalence was the position of aid beneficiaries in the Links vision of decentralisation. Imaginaries of decentralisation often invoke ideals of individual and collective autonomy for technology users (Cheesman, 2020). Alex regularly stressed the importance of refugees gaining more control in their experience of humanitarian assistance. In our first ever video call in May 2017, he made the bold assertion that,

Personally, I don't care if the UN ceases to exist. What I do care about is distributing aid more effectively. Ultimately this is about moving towards autonomy for the beneficiary. Blockchain will help us put the beneficiary at the centre of his or her destiny and money.

This was a radical vision of cyberlibertarian anarchism in which blockchain made aid so decentralised and direct that it could even annihilate aid agencies. In later conversations, Alex explored other radical ideas, including a potential project called 'trust lines' where entrepreneurial individuals would create a new, grassroots 'internet of value' by creating digital tokens that represented particular units of value. 'You could say, I'm Margie and I have 2 units of childcare work to give away. Alex has the equivalent value in cleaning tokens. We know and trust each other in the community, let's exchange them. This can be done without intermediaries.' Through Ethereum, anything could become quantified as an asset (though who would decide and regulate the comparative worth of assets was a question left unanswered). Extrapolating from this possibility, Alex envisioned the tokenisation of anything by refugees, who were seen as individuals focused on the rational pursuit of individual interests and

exchange. Ethereum presents the apotheosis of the global market ideology which classifies every human behaviour as either production, consumption, or exchange (Graeber, 2011). So, Links beckoned in the dissolution of hierarchy and bureaucratic aid administration—but at the same time, Alex and team also positioned refugees as incapable of financial autonomy. On a call discussing fieldwork findings in 2019, Nadine suggested: ‘The tech is there. Google is working on cheap satellite infrastructure all over the world, smartphone adoption is only growing. But beneficiaries still have high innumeracy levels, and they may not manage their money in the right way’. As with other libertarian technology projects, the innovators ultimately decided that refugees currently lacked the skills to revolutionise the paternalistic status quo of humanitarianism (Cheesman, 2020).

How BASS positioned itself in this decentralised aid project was ambivalent too. Links staff continued to promote the vision of a commons platform. It was to be the politically neutral, ubiquitous undergirding of humanitarian action. BASS promised that, while it was a permissioned network now, the long-term plan was to shift to a public, permissionless blockchain, which they reported had greater technological guarantees in terms of ‘cryptability, immutability, and the assurance that no single actor will control or tamper with the network’. Alex fought off criticism that the network was not ‘truly decentralised’ in a February 2018 ‘Tech and Global Development’ mailing list debate: ‘Conceptually we favour a public chain as it is self-sustaining and does not require backing from BASS or any other particular entity to function and hence is better suited for long term resilience.’ These assertions did not take away from the fact that Links was, in fact, a ‘consortium’ blockchain. This was reportedly because consortiums were ‘more governable’ and allowed members to modify smart contracts as projects progressed (which otherwise might be fixed). As we saw with the choice of the Proof of Authority

consensus protocol, the BASS project team both determined the membership criteria and authorised new members joining the network. BASS was the convening actor and prevailing decision-maker. BASS was currently the lead actor in the Links governing body, responsible for making decisions over the whole spectrum of programmatic activities and were promising to extend this across new geographical contexts. As we will see in the next sections, other aid agencies were suspicious of the project team's motives in convening the blockchain platform. Critical commentators located Links in a series of 'power moves' by BASS to monopolise payment and identification infrastructures in aid and promote their brand and influence. At the same time, Links was a small project team and Alex and colleagues struggled to win legitimacy even within BASS.

Less ambivalent was the Links project's position on decentralisation in relation to the authority of governments and corporations. While notable blockchain projects promote anarchist and anti-state ideals and resist big tech, BASS did not design and promote Links as an infrastructure to circumvent the authority of nation states *nor* technology companies. Predictably, as a kind of global government which oversees international peace and security, and with diplomacy as its main remit, the UN is ill suited to radical decentralised politics. Indeed, an official UN report on technology governance published in 2021 states that blockchain's 'original concept was born with the clear underlying intention of circumventing central control. Such an approach is not likely to be cognizant of the values of the United Nations and its vocation to deliver public goods'. UN agencies operate at the behest of host states. Despite humanitarian neutrality claims, one critical ex-aid worker told me, 'UN agencies might lobby in the background against the actions of governments they operate under the permission of, against state surveillance for

example, but they will never openly challenge state power'. The Jordanian government is authoritarian and renowned for its advanced technological national security and surveillance apparatus (Access Now, 2021b). BASS and GEN staff in Jordan removed mention of the government from my field reports. The role and oversight of the Jordanian government in humanitarian data governance was notably absent from Links materials and discussions.

Likewise, the circumvention of corporate intermediaries in aid delivery was not part of the Links decentralised political imaginary. At an informal meeting in downtown Amman in August 2019, the Links team were excited about the news that Facebook (now Meta)'s blockchain-based payment platform Libra (now Diem) had been announced. Alex said: 'Libra is good news for blockchain adoption. Maybe everyone will get on that in due course, it's the kind of initiative we can connect with as a way for beneficiaries to redeem cash.' Here, parallel blockchain initiatives like Libra proposed to not only bolster the reputation and relevance of Links, but also provide material infrastructure supporting the global expansion of blockchain-based payments. Rather than articulating suspicion of Big Tech, these BASS innovators saw their work as connected with it. Indeed, Links must be situated within the wider project of Ethereum and the billion-dollar company driving Ethereum-based blockchain innovation, ConsenSys (Kruppa, 2021). Links team members presented the project regularly at decentralised finance conventions, where other initiatives were showcased, largely outside of the aid sector. BASS contracted ConsenSys, which was new to aid, even though several critics I spoke to noted their unproven capacity to deliver in humanitarian work. Collaborating with BASS on Links connected with ConsenSys' expanding global mission of financial inclusion via Ethereum.

Building and maintaining nodes on a blockchain platform required each UN agency to contract other new private sector providers, in addition to ConsenSys. BASS worked with several other small blockchain companies on the smart contracts on Ethereum, the back and front end, and the desktop applications for Links. The blockchain pilots in Zaatari and Azraq increased the number of companies involved in the material processes of delivering everyday aid. For example, GEN's salaries in the Wahat cash-for-work scheme were previously delivered cash-in-hand. To facilitate digital payments, the pilot introduced two Saudi Arabian and Jordanian supermarket companies and the Jordanian-British biometrics company IrisGuard as new primary stakeholders.

IrisGuard's iris scanning machines mediated and authorised refugees' access to funds; the supermarkets were put in charge of providing physical cash and maintaining liquidity.

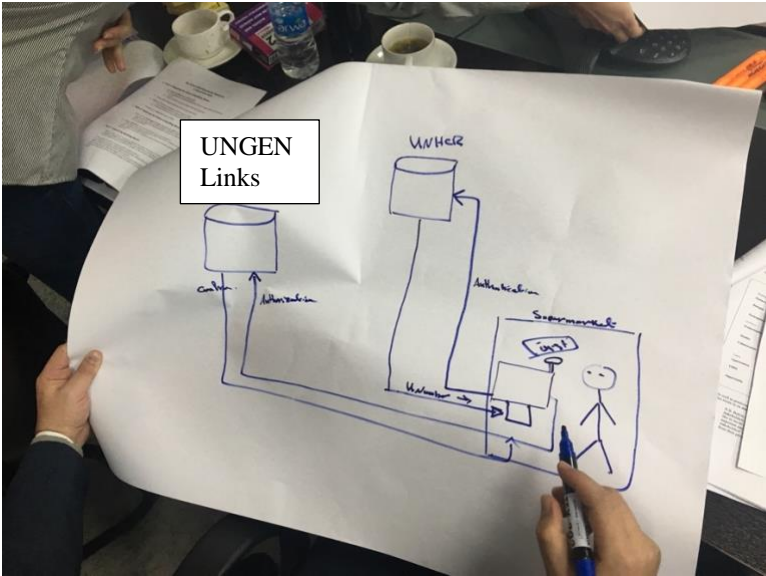


Figure 18: Visualisation of ‘what success looks like’ for GEN’s blockchain pilot project, produced by Ahmed from IrisGuard on 2<sup>nd</sup> December 2018. The visualisation shows a refugee figure within a camp supermarket, standing in front of an IrisGuard machine. The arrows demonstrate the flows of data (biometric and financial). The blocks represent UNHCR, which provides the ‘Authentication’ of the refugee’s biometric identity information, and GEN, which then provides ‘Authorisation’ of the refugee’s transaction, based on account information (sufficient funds). Notably, Ahmed does not include BASS as a relevant block in his diagram.

A business representative from IrisGuard, Ahmed, participated in a multi-stakeholder workshop I co-organised with GEN in 2018. When I asked about the company’s motivations for being involved in Links, as well as corporate social responsibility motives, Ahmed suggested: ‘Well, we have enabled the blockchain concept. We have contributed technical work to allow identity authentication to happen using blockchain technology. Now, it's difficult to use the Links platform without IrisGuard. GEN have joined the network, and from our perspective it's good business.’ While BASS staff advocated a blockchain commons that seemed to challenge neoliberal norms in humanitarian technology projects, the very development of Links code was interlinked with IrisGuard’s authentication methods; the company had a logistical foothold in the material infrastructure. In the next section on the privacy issues surrounding Links, I critically examine the intervention of this company, whose technology proliferates across Jordan, and its major connection with national security interests.<sup>17</sup> Overall, Links did not distribute authority away from the private sector. On the contrary, this mode of decentralisation embedded new non-humanitarian players into the essential material infrastructure of humanitarian payments. It

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<sup>17</sup> IrisGuard is headquartered in the UK and Jordan. The company ‘was co-founded by Imad Malhas who used the iris-scan technology “EyeHood” in 2001 for the first time in the United Arab Emirates to identify illegal immigrants so they could be deported, and by Karim Kawar, one of Jordan’s wealthy businessmen and former ambassador to the US and Mexico. IrisGuard’s advisory board used to include two former foreign intelligence officials: Frances Townsend, a US National Security advisor to former US President George W. Bush during the invasion of Iraq, and Richard Dearlove, who was the head of UK spy agency MI6.’ (Access Now, 2021b, p. 12).

beckoned technology companies into the fields of imaginative work, design, and decision-making about the socio-technical governance of refugees, and afforded those companies access to refugees' financial and biometric data.

Decentralisation is not a straightforward or singular technical concept or political project. It is not a binary feature of blockchain systems but a continuous variable, used as an elastic term and associated with a variety of techno-political rationales (Cheesman & Slavin, 2021; Rauchs et al., 2018; Schneider, 2019). This research demonstrates some ambivalent logics and relationships between traditional intermediaries, institutions, and companies in aid. The Links team's long-term communitarian aspirations for the governance of information and resources by UN agencies must be appreciated. BASS staff implemented open-source software approaches in Links's governance and design; the network was mutually owned by member agencies, and the payment rails circumvented the tollgates of extractive financial intermediaries. Ideals of decentralised inter-agency collaboration and collective accountability drove the project to some degree, as did imaginaries about radical autonomy for aid beneficiaries.

However, Links demonstrates that decentralised computation does not necessarily equate with decentralised political-economic power, or the circumvention of capitalist and state authority. Blockchain does not subvert but shifts and even multiplies sites of centralised control (Campbell-Verduyn & Hütten, 2021). As Zook notes in relation to Bitcoin, 'the goal of decentralization cannot not simply be limited to removing intermediaries but instead is deeply intertwined with a political project focused on reducing state regulation in the favor of markets.' (Zook, 2019, p. 13). While revealing points of ambivalence, this case study ultimately contributes to evidence of

the neoliberalisation of aid whereby technology projects erode the independence of humanitarianism in favour of markets. Neoliberal approaches dismantle humanitarian-led solutions and redistribute the responsibility to manage, repair and recover from disaster to private providers and beneficiaries themselves, who are expected to be (or eventually become) self-reliant and adaptive (Duffield, 2016; Scott-Smith, 2016). Aid agencies function as data brokers, accelerating corporate access to ‘the profitable new risk frontier of the world’s displaced populations’ (Lemberg-Pedersen & Haioty, 2020, p. 621)—albeit cryptographic data.

Links was presented as stripping out actors that are not just unnecessary but points of systemic risk and distrust. However, blockchain innovation invites a specific retinue of new actors into aid: cyberlibertarian blockchain experts. Links could currently be characterised as an oligarchic initiative in which BASS and ConsenSys are the major unelected authority figures. Our accounts of socio-technical governance must also account for the political authority of southern actors which aid organisations have no power to undermine—such as the authoritarian government of Jordan. In many Arab countries, forces of ‘neoliberal authoritarianism’ depoliticise decision-making ‘either through unelected bureaucrats or alliance with entrepreneurship networks’ (Hanafi, 2020, p. 9). In the Jordan pilot projects, the socio-technical infrastructure of Links opens humanitarian payment rails up to IrisGuard and supermarket companies, which have established national security and business interests in Jordan. The IrisGuard connection demonstrates that the horizon of trustless decentralisation BASS promotes does not preclude current dynamics of ‘crony capitalism’—here, the domination of infrastructure by commercial-political elites (ibid). Refugees do not feature in the governance framework as actors capable of contributing to voting and decision-making. Far from a socialist-anarchist utopia, the Links infrastructure provides a

steady material and imaginative foothold for profit-driven companies in humanitarianism. The justice implications of this unfold in the next chapters.

### 5.3. Transparent privacy

The question of what kind of data digital transactions generate,<sup>18</sup> who can access it, and to what ends has become a major concern in critical research (O’Dwyer, 2019a; Tazzioli, 2019). As I have already outlined (Chapter 3 Section 3.3.1.), at the payment-identification nexus, identifying transactors is a core component of aid agencies’ targeting of assistance as well as institutional regulations and risk management strategies. Yet international aid and refugee management are also rife with dangerous data leaks, errors, and conflicts, and illegal and/or unethical tactics of tracking, surveillance, and control. According to many proponents, blockchain promises to facilitate identification in a way that mitigates transactional surveillance. As we have seen with the uptake of cryptocurrencies, blockchain can help curate digital identities not recognised by the state and other institutions, but which correspond instead with a decentralised, pseudonymous digital network. On the one hand, blockchain is strongly connected with anonymous cybercrime and crypto-anarchist politics. On the other, advancements in cryptography propose to enhance the security and privacy of mainstream socio-technical systems in everyday economic life. For example, novel cryptographic techniques and concepts such as zero knowledge proofs, verifiable credentials, public-private key cryptography, and self-sovereign identity offer apparently secure

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<sup>18</sup> The UN agencies hold personal information about refugees (their name, ID number, date of birth, gender, family details, disability status) as well as financial and/or work information (about the entitlements or salary they receive). See the next chapter for a visualisation of the datasets used in GEN’s blockchain pilot. This information is the basis on which aid payments (the correct amounts, corresponding with the correct people) are authorised and recorded on the blockchain, even though the personal and financial information itself is not recorded on the blockchain. The Links blockchain is a shared record of refugees’ transactions. The transaction information is pseudonymous. However, it details the amount withdrawn and from which vendor and location.

ways of doing identity checks that minimise the disclosure of personal data and position the user in greater control of information about them (Cheesman, 2020; W3C, 2019).

Links connects with these developments at the cutting edge of work on digital identity. Privacy and security were an important part of the Links sales pitch to potential members. At a multi-stakeholder workshop when discussing the ongoing work in Zaatari and Azraq camps, BASS staff outlined privacy as part of the ‘problem statement’ blockchain was addressing: ‘Before we introduced blockchain in Jordan, we had to share information about each beneficiary with the local bank. Now, we have reduced reliance on the bank and internalised our accounting information, ensuring greater privacy for Syrian refugees.’ Part of the argument for blockchain was that ‘it means that the usual excuses made about non-delivery, privacy, or transparency cannot be made. You can have a clear line of sight over who [which agency] is assisting who [which beneficiary] in a non-personally-identifiable manner.’ Blockchain seemed to provide the best of both worlds. It gave an automatic, transparent, immutable audit trail, which enhanced accountability and reduced the cost of auditing and regulatory compliance. At the same time, this audit trail was encrypted and safe for refugees—and apparently challenged the power of third parties (here, banks, but implicitly also states) in accessing refugees’ data.

In a one-on-one discussion with Alex in May 2020, he told me about his vision for how UN agencies could build on this work:

If agencies join, Links offers a unified way of approaching sensitive data and the humanitarian privacy problem. For example, to assist people with most services, we don't actually need all the information we keep, like their names, date of birth, or whatever, do we? UNHCR won't give us age or gender information anyway. In some cases, that can be limiting: what if you need to identify an infant and her

lactating mother? We could start using identifiers on the blockchain network. This would mean UNHCR could put an attestation onto the system saying, ‘this is a lactating mother between the age of 30-35’. That's not giving her name or specific age, but it's enough information for us to do our job getting her what she needs. We don't need to know anything more. If other agencies want to come and assist that person with their resources, this is the kind of info they need. Down the line, if and when beneficiaries have smartphones, then we can get into more advanced stuff like zero knowledge proofs where the data can sit with beneficiary. We [UN agencies] wouldn't have a copy of the data, beneficiaries would authorise any use of it via yes/no questions. For example, “would you like to prove to UNHCR you are a lactating mother”, “yes”. That's it. No other PII [personally identifying information].

The emphasis was on humanitarian agencies coordinating their data and therefore their operations better through advanced privacy-protecting technological means. Despite this, Alex's approach faced regular criticism around the untested privacy and security outcomes of using blockchain in refugee camps. In online forums and public presentations, the Links team countered concerns with the argument that Links was safe because no PII such as names, dates of birth or biometrics were recorded directly on the system. Outside of the blockchain network, they argued, only the refugee protection agency UNHCR registered refugees' identities and kept the record of PII. On the blockchain, beneficiaries' digital identifiers were anonymised and ‘hashed’—i.e., they appeared simply as a sequence of numbers. They also reminded critics that, for now, transactions were only visible to a private and permissioned network of members rather than publicly available. Overall, BASS staff discursively connected Links with principles of data minimisation and privacy.

In theory, the project followed developments in cryptography and preserved the safety of refugees' data by disintermediating third parties. In practice, it was jarring to read about and discuss these claims with BASS. However, in practice, it was evident since the inception of the

project that Links was more about augmenting the availability of useful information and targeting aid than it was about data minimisation and privacy. The driving logics behind this deployment of blockchain were (i) **Tracking:** the imaginary of a single, unified ‘authoritative view’ of beneficiaries and (ii) **Scaling:** an expansionist, colonialist timescape which would bring more data about diverse global populations into the purview of Links members.

### 5.3.1. Tracking: the ‘authoritative view’

In a video call in early April 2018, Alex told me:

Beneficiary lists are constantly duplicated. Databases are all fragmented and riddled with errors. Blockchain can clean all this up and get us [aid agencies] on the same page. We want there to be one identity for beneficiaries receiving different entitlements from a range of organisations. Beyond camp settings we really don’t know what this will involve. In local communities, people are undocumented and in complete darkness. But ultimately, we want a unified, authoritative view of humanitarian beneficiaries. So far we’ve been tracking value, but the aim is to start tracking information as a step towards digital ID.

This quote exemplifies the vocabulary of visibility and order that characterises the prevailing imaginaries of blockchain in aid. Refugees that were not tracked on a database system, especially across borders, such as people returning to Syria, were in a ‘black hole’. Links was about eradicating mess and uncertainty. These ambitions represented an affective kind of ‘archive fever’ (Jacques Derrida, 1995), an additive compulsion to assemble and organise information. The Links platform was promising to be a one-stop shop humanitarian Domesday Book. The project aimed to ensure refugees and their transactional information (e.g., data about the aid they were receiving, when, where, and how much) were not just visible to BASS, but to a distributed network of organisations. Beyond tracking transactions, Alex aimed to track other kinds of

information, such as vaccination records ('There might be 40 clinics in one camp. We could consolidate all that info'). Using blockchain 'to coordinate the determination and delivery of assistance under common identifiers' meant working towards a horizon where each aid beneficiary was fixed to a unitary digital identity—albeit 'hashed'. Suggestions of the tamper-proof, immutable quality of blockchain data, which was validated by the distributed network, indicated that this unitary identity would be considered definitive and unquestionably trustworthy.

More than achieving privacy, Links staff stressed that using blockchain meant 'reaching the right people', consolidating resources, and 'looking at transactions to understand what people need and how to optimise our services accordingly'. The motives of transparency and targeting are twinned with aid donors' objectives of eliminating fraud and the misallocation of resources. In my wider aid industry interviews, several critical commentators referred to the issue along the lines of 'donors want accountability and therefore they want better identity verification' and suggested this was tied to a tightening of budgets and politics of securitisation and suspicion against refugees. For critical commentators in the sector, the most controversial part of the Links project was its connection with iris scanning and the biometric technology provider, IrisGuard. A primary concern (ironically, for a decentralisation project) was that data generated through biometric scans would be held by this third-party company, shared with security agencies in Jordan and elsewhere, and used to deny refugees access to movement and resources.

Contracted consistently by the government, IrisGuard technologies proliferate across Jordan; they are used to authenticate the identities of citizens at borders as well as customers at ATMs (Access Now, 2021b; Holloway, Masri, & Yahia, 2021, p. 17). Biometric iris scanning was first introduced in Zaatari and Azraq camps by UNHCR in 2013 as the means of registering people as refugees, i.e., providing them with a functional form of identification which gives them the rights and protections associated with refugee status. Beyond refugee registration, biometric iris scans are now used a means of verifying people's identities before delivering them services. The use of biometrics in both Jordanian camps has proliferated. The same biometric identification system, managed by UNHCR, has since been incorporated into BASS's provision of food at camp supermarkets (since 2016) and bread at bread distribution centres (since 2019). Launched in 2019, GEN's blockchain pilot at women's centres also uses the UNHCR-based biometric verification to deliver salaries. At one of the multi-stakeholder workshops when GEN's blockchain pilot was being designed, we were discussing the challenges of working with private sector actors like IrisGuard. An enthusiastic Links team member anticipated criticism: 'Some people are wary of IrisGuard because of their connections to national intelligence and in general because of the moral panic about biometrics. But I like working with them, they are efficient and good. They have worked closely with us in Jordan to enable the blockchain concept.' Another BASS staff member suggested, 'The iris machines were installed before blockchain came into the picture anyway, it's not like we are introducing biometrics to refugees with Links, but IrisGuard provided them for free and for now they are only charging 1% per transaction.' For the Links team, IrisGuard were a natural partner; they were already embedded in the camp environments and provided an effective, charitable service.

For other participants in the multi-stakeholder workshops, including myself, the subject of data sharing with commercial vendors and governments was discussed as a concerning and opaque aspect of Links. In December 2019, I co-convened a workshop with the UN agency members of the project at the GEN Jordan office, and GEN also invited representatives from some other NGOs and IrisGuard. In a mind-mapping exercise, we discussed the risks and challenges of the GEN blockchain pilot, which had been in place for several months, while the wider BASS project involving IrisGuard had been operating in Jordan for several years. John from the Disrupt Programme asked an IrisGuard representative, Ahmad, what seemed like a fundamental question: ‘IrisGuard have a database called EyeCloud with the refugees’ information. Does the Jordanian government have power over it? Is EyeCloud managed by UNHCR or IrisGuard?’ Ahmad replied ambiguously, ‘We are allowed certain levels of access. Just enough for the authentication of ID for transactions.’ Lina, the Head of Programmes from GEN, muttered with a frown, ‘That might be something we should look into...’. The longstanding data sharing agreements with corporate third parties were still not evident or understood among the key people doing and making Links. In the same session, an aid worker from another NGO asked, ‘Is UNHCR a single point of failure here? They presumably have access to the original EyeCloud database of refugees’ iris information. They know what the hash token is. So, if UNHCR were to join the blockchain, they would have this ultimate and scary power to connect all the dots?’ The BASS staff present did not know if this was correct. There was also no definitive answer to the question of whether the ‘authoritative view of beneficiaries’—the shared knowledge of what various programmes refugees were enrolled in, what resources they were accessing and how—had currently achieved in terms of GEN and BASS’s programmes in Zaatari and Azraq, nor whether or how that knowledge could be used for or against refugees. For example, could this

overview lead other aid agency members to cut off certain sources of support, or could it be used by security authorities to surveill people and target them for deportations? Details about data flows and how they were being operationalised were not transparent and accessible to the staff making and maintaining Links.

### 5.3.2. Scaling: the colonialist timescape

Narrativising the temporal momentum and spatial scope of the Links project—its timescape—was an important part of making the platform and building the network of participants. The scalability of the network was one of the most discussed governance topics. BASS staff consistently demonstrated expansionist logics. BASS’s new ventures, business, and project managers working on Links maintained a feverish focus on speed and scale. Nearly every call I had with Alex cited transaction figures, how much value the system had handled in US dollars, and how many beneficiaries it was reaching, and would reach in the next financial calendar. He and John continuously emphasised the concept of achieving ‘economies of scale’, the idea that bringing together more members and integrating more beneficiaries on the network would bring business advantages. In an interview with Lisa, who was an independent consultant working on the monitoring and evaluation of BASS’s programmes, she suggested, ‘This project is all about solution ownership. Links originated with BASS and the pilot gives them validation. Every time another agency uses it, their brand goes out with it.’ Some other critics I interviewed considered Links a dead-end project. In 2019 it still only had two UN agency nodes (GEN and BASS), and a blockchain vendor I interviewed suggested, ‘For the project to be useful, multiple un-trusting parties needed to join the chain and verify their own records. Otherwise, it’s not in the spirit of

blockchain, you might as well use any database.’ Scaling up was a major existential anxiety for the project team. BASS needed to make sure the ‘infrastructural burden’ of maintaining the network was shared to prove that Links was a truly decentralised multi-party system. When GEN joined the network in 2018, this was a major feat. GEN’s pilot would, for BASS, build trust and investment in their product, proving that this blockchain worked as a shared, decentralised infrastructure, with multiple UN agencies running nodes. As one of the Arabic research assistants I worked with, Deena, put it, ‘if the pilot doesn’t work, the blockchain sales pitch will fail’.

In 2018, Jordan’s ‘Blockchain Taskforce’ was set up by BASS’s Disrupt Programme to bring together representatives from regional UN agencies. The choice of the term ‘taskforce’—militaristic language denoting an armed force organised for a special operation—signified the existential importance of the mission. They hosted multiple meetings and workshops exploring potential collaborations and projects. For example, one ‘human centred design’ workshop involved 15 participants—mostly Jordanian—from GEN, BASS, UNHCR, UNDP and other agencies mapping out problems faced by aid workers and beneficiaries in Jordan, and how blockchain could help address them. Potential use cases were imagined in personalised healthcare, child protection, home economics, work, and emergency response. Most of these imaginary projects had nothing to do with decentralisation or privacy; they were pie-in-the-sky ideas about creating ‘unified databases’. For example, creating a centralised planning database ‘to give programme teams a simplified list of refugees, their locations and instant visibility of their financial context’, or for documenting all international cases of child labour. Even though social issues were examined, experimenting with blockchain was the end goal. The report based

on this workshop concluded, ‘The general experience and capacity of the blockchain taskforce could be further developed to enable more experimentation.’

BASS Disrupt Programme staff had a demonstrably experimental mindset. The premise of the organisation is to bring private sector ideas and models of disruptive technology change into aid industry contexts. Europe-based staff fly out to pilot projects offering mentoring, guidance, and funding support. In a coffee break, I spoke with John as he reflected on what he had learned from being involved with the GEN pilot: ‘Other country offices joining Links need to realise they have to be open and adapt to a new way of doing things, and they may not necessarily have the capacity.’ John stressed his educational role in attempting—and struggling—to equip local staff with the knowledge and means to use blockchain. When I asked him about which country offices, he thought *did* have the capacity, he told me that an important part of working on Links was identifying the contextual factors in which a new node would thrive. Institutional and technical arrangements made a big difference (the financial climate, state of the banking sector, infrastructural readiness). But, according to him, a key challenge was the potential inadequacy of aid workers’ knowledge and technical and administrative capacities. This deficit model of understanding local aid organisations in the Global South amounted to an attitude of paternalistic coloniality, part of a pattern in the discourses around Links.

In 2020, the opportunity to expand the project to Bangladesh arose. On a call with Alex, he told me why this was significant:

Our work in Jordan had potential. We were going to build out to the communities [local areas in Jordan outside the refugee camps] and other things. But to be honest we had one BASS country director when we started scaling up, then a new country director came in. They are very risk averse, and they want everything localised, so international staff are leaving. The whole environment and the mood changed. Talking with contacts in Bangladesh, they are extremely open-minded and pro-innovation. The country director is super supportive, and we have essentially a carte blanche to do anything we want here. We have to get in quick before everything changes. In Bangladesh we plan to reach 900,000 beneficiaries whereas in Jordan it's only been 300,000.

The experimental appetite of Links was seen as urgent and global. This narration of the changing dynamics in Jordan positioned the project as international, in opposition to local and regional actors. Nadine suggested that ‘In places like Jordan and Pakistan the identity problem is being solved. In others like Afghanistan and the Central African Republic and Colombia it's not. It's an extremely political and painful conversation so far but Links could play a really important role in this—this is where the floodgates could open.’ The prioritisation of the Links network's expansion and scalability was not a neutral effort to save humanitarian organisations time and resources. Echoing the discourse of the tech elite, Links promoted a colonial language of the ‘landgrab’—the capture of territories, populations, labour, and resources (Coudry & Mejias, 2021, p. 3; Crawford, 2021). In aid and migration management, the colonial connections are concrete. From paper-based technologies (lists, permits, certificates) to big data and AI, socio-technical infrastructures have constituted fantasies and practices of ‘efficient ordering, administrating and limiting of refugee bodies in space and time’ (Seuferling & Leurs, 2021). The project team's rhetoric had neo-colonial overtones: this was a project proposing to ‘leverage and

reinforce asymmetrical relations between advanced capitalist economies and postcolonial states’ (Alami, 2018). Coloniality is an appropriate term here because it captures the hubristic big data rhetoric that ‘only through the maximal collection and concentration of data can the world be developed, understood, governed, and saved.’ (Couldry & Mejias, 2021, p. 11). Links can be situated alongside a host of aid initiatives about making refugees visible and therefore governable (Martin & Taylor, 2020; Taylor & Broeders, 2015)—here, governable not just *with* but *by* blockchain.

Links is presented by BASS as a privacy-enhancing infrastructure. However, to suggest they are more secure than traditional registries is misleading (Narayanan & Clark, 2017). My research accords with observations that data protection and privacy in blockchain projects is narrowly defined as ‘no PII on chain’ (Coppi and Fast 2019:19). The information may not be PII, but if you have data stored on the blockchain that connects a unique identifier to a set of characteristics, this can still be privacy violating. The lack of PII does not mean that sensitive information about individuals cannot be inferred. What is considered non-sensitive information in one context (e.g., about women’s lactation) may be sensitive in another. Furthermore, as I discuss in Chapter 7, the narrow approach to privacy disregards the situated, contextual privacy considerations faced by refugees. Links potentially creates new problems for digital rights and data protection in environments without strong safeguards and institutional standards. Although decentralised architectures enhance privacy in the sense that they can encrypt content, ‘they cannot protect themselves against third parties’ analysis of metadata, which is openly disclosed to every node connected to the network’ (Filippi, 2014). Additional efforts are required to protect metadata, otherwise ‘highly decentralized infrastructures, designed to promote privacy and

autonomy, end up being more vulnerable to governmental or corporate scrutiny than their centralized counterparts.’ (ibid). Experts argue that encryption is insufficient; organisations need to start minimising data collection in the first place (Hersey, 2021b). While Links seeks to consolidate and harmonise the data generated in humanitarian action, the project far from reduces data collection. GEN’s pilot, for example, replaces an analogue cash delivery system with a digital arrangement that tracks all transactions refugee women make.

Links is not the first time humanitarian actors have sought to develop a single, authoritative source of information about beneficiaries in the attempt to rationalise resource allocation. For example, McDonald notes examples such as the Liberian government’s failed ‘command and control’ approach during an epidemic (S. McDonald, 2016, p. 15). Ultimately, the Links platform proposes to ensure that nobody receives more entitlements than necessary, which means it is implicated in the politics of conditionality and deservingness in aid distribution. Quantified systems measure people’s needs based on various classifications, standards, and supposedly impartial techniques, aiming to make (incommensurable) human suffering universally commensurable (Glasman, 2020). Research shows this ‘infrastructure of commensurability’ is consistently minimalist: it sets a low bar for needs and satisfaction (ibid). Evidence also suggests that ‘big ID’ projects are not necessary in establishing the uniqueness of individuals in order to deliver the right resources, and they undermine people’s right to anonymity (Access Now, 2021a). As Mikel put it in December 2019, ‘How many people are flying from Ethiopia to Mogadishu to get extra food rations? You have a node in Bangladesh, woopdidoo, but is there a practical need for that node to talk to the node in Jordan?’.

Promoted as an authoritative source of information, blockchain brings the moralistic promises of truth and trust. Links project managers' emphasis on blockchain data as neutral foreclosed recognition of assumptions and harms built into the code of the system, a subject that requires deeper research. Code embeds disparities and discriminations (Benjamin, 2019). When a smart contract is deployed, for example, it may not be bug-free, fair, or just. The default logic that the machine is always right that comes with digitalisation strategies, especially biometrics, 'risks turning the intended aim of privacy protection into a problem, namely denying assistance' (Jacobsen & Steinacker, 2021). Perfect accounting systems enhance organisations' capabilities in including beneficiaries, making them and their needs visible—but they are also used to classify people, shape and manage their behaviour, and exclude them. In addition to resource allocation, Links could be used for more hostile purposes in migration management. Dreams of optimising aid with digital infrastructure tend to be inextricable from the politics of suspicion and migration control (Noori, 2021). There is not sufficient indication that Links won't ultimately support the longstanding classification, control and marginalisation of racialised bodies considered risky or undesirable in humanitarianism and beyond (Axster et al., 2021; Pallister-Wilkins, 2021).

BASS's defence and incorporation of biometrics into the blockchain pilot projects in Jordan—even though biometrics are not a platform requirement for authentication—undermines their claims to promote the privacy of refugees' data. Unlike paper-based identification, biometric data cannot be erased; it is considered a 'special category of particularly sensitive data whether it is stored anonymously or not'—indeed, data can be de-anonymised (Jacobsen & Steinacker, 2021). Indelible biometric techniques connect people to their previous identities, traces and behaviours; they are used by authorities to ascertain 'identity dominance' over populations—

particularly those considered national security threats such as refugees (Privacy International, 2021; Woodward, 2006). The proliferating use of biometrics in Jordan aligns with wider trends towards the function creep of identification systems across international settings (Martin & Taylor, 2020). Martin and Taylor's work demonstrates that biometric function creep can be theorised as the extension of biopolitical control. This refers to the cumulative transformation of human bodies into visible and governable subjects in an array of social domains. In the case of refugees, this is the management of non-citizens through the orchestration of their access to resources (ibid). In the Links project, BASS and GEN trust a company to mediate aid payments that has registered 5.5 million irises, facilitated various strategies of national security and deportation, and that has multi-billion dollar developments in 'financial inclusion' across 5 countries (Hersey, 2021a). Civil society activists contest the opacity around 'if and how they [companies like IrisGuard] obtain consent from refugees, if they share these data with third parties or local government agencies, how the data are stored, and what technical and legal safeguards are in place to protect this massive amount of sensitive data' (Access Now, 2021b, p. 14).<sup>19</sup> The investigative journalist Yasmin Fanselow examined undisclosed data sharing agreements with IrisGuard—whether they have source code or access to data—and a UNHCR representative in Jordan commented, 'You have to trust who's selling you the system that it has high military grade encryption.' For Fanselow, 'basically IrisGuard are the only ones who know how it works and we just have to take their word for it' (Fanselow, 2018). The way in which Links consolidates IrisGuard's position as a core part of the aid infrastructure is an example of corporate 'sphere transgressions' in socio-technical governance (Global Data Justice, 2021).

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<sup>19</sup> According to Access Now's report, the Jordanian government requests user data from ride sharing apps, and personal data is exploited through Internet service providers and telecommunications companies, sometimes to influence political behaviour (ibid, p.11).

## 5.4. Faith and infrastructure

What Links is proposing isn't a one-off set up. It's a whole new model for humanitarian governance. You know the Italian expression *discutere sul sesso degli angeli*? They are talking about the sex of the angels. What would the UN look like if it were not the UN? Well, it is the UN. And it won't change tomorrow.

Elena, a technology specialist at an aid sector research institute, believed Links' long-term proposal was lofty and futile. For her and other critics, the vision did not fit reality: 'We are thousands of years away from all this. Local organisations still use Excel and take 7-8 years just to change their HR platform using a private vendor off the shelf. In Jordan, the decentralised data and cash coordination might work, but in South Sudan we still get cash to people by sending a guy with a case of money on a plane.' Little was known about the implications of a blockchain technocracy for UN organisations, let alone beneficiaries. The staging of Links suggested the impossibilities of certain digitally mediated ways of relating, trusting, and cooperating. In fact, despite the ambitious, neo-colonial timescape of the project, BASS faced significant challenges scaling up to enrol other organisations. By the end of my fieldwork, having followed the project for four years, it was still only a network of two members. Rather than joining Links, several other aid organisations and charities set up similar projects. Even within BASS, another team developed 'Blockchain Chamber', which—like Links—was both an inter-agency blockchain platform and a community providing learning resources, collaboration opportunities, and guidance. The Links team criticised these parallel efforts as duplicative and undermining of their efforts. The development of rival blockchain projects indicated that issues of humanitarian governance, coordination, and trust, strongly influenced by structural and cultural dynamics, had

been underestimated by the Links team when they focused on evangelising trust in their code and the concept of trustless cooperation.

#### 5.4.1. Economic incentives and strategic advantages

Elena was optimistic about the idea of a ‘single platform for assistance’, in theory: ‘It would solve a lot of problems and stop us all wasting resources, especially for cash. You could streamline negotiations with financial service providers to speed up the process of securing banking services, and get good deals, like on the transfer of value, and you could share market functioning information.’ However, she asked, ‘do aid agencies actually *need and want* that coordination?’ Elena had been doing consultancy work with UN agencies on cash assistance. She told me, ‘It feels like I’m a marriage counsellor. Agencies are in a battle to “own” cash. Several players have sophisticated beneficiary databases, and they want to use them to take charge of cash in the sector.’ Elena suggested that, because many aid organisations were beginning to deliver cash instead of traditional services or goods, they were ‘fighting it out’ to remain relevant: ‘Whoever dominates payments, wins.’ Many of the critics I interviewed echoed the line of thinking that ‘aid organisations are data companies now’ and that ‘cooperation means giving up power’. Paul, a UNHCR representative in one of the workshops in Jordan in Summer 2020, suggested that ‘No UN agency has the appetite to share data. For the same reason that Facebook doesn’t share data with Google.’ As McDonald also points out, (2016, p. 14):

Inter-organizational data sharing is rarely a contractual requirement for response organizations, and therefore not measured—meaning that it not only causes operational drag, and it actively erodes competitive advantage. It is practically easier and financially beneficial for humanitarian organizations to develop their

own information systems, instead of focusing on building functional communication sharing.

There were strong financial and practical incentives and structures hampering coordination, especially involving how aid donors delineated budgets. For example, a 2021 UN blockchain report stated: ‘Member States do not promote interagency cooperation enough in practical terms and continue to fund individual projects in individual organizations with similar objectives.’ Critics have observed that the dominant business logic in aid is competitive subcontracting: ‘Much like Amazon won’t unionize, national NGOs can too easily be pitted against each other.’ (Boateng & Meier, 2021). Beyond technology projects, the real cooperation problem in the refugee governance regime is structural and longstanding: conflicting interests and corporate survival trump collective action (Betts & Collier, 2017, p. 56).

Numerous interviewees suggested that even if aid organisations were to coordinate more, they did not necessarily need or want blockchain to do that. Existing efforts to build cooperation around digital data and cash assistance did not require the use of a distributed ledger, they used more basic technology and developed consortiums and agreements.<sup>20</sup> Andrea Matwyshyn, a law professor at Penn State, suggested in a November 2021 Twitter debate about blockchain that ‘When I run into blockchain enthusiasts I ask, "what does the blockchain get you that end to end encryption does not?" Real answer someone gave me: "VC funding"’. In other words, other technical solutions could be used for the same ends—but branding an initiative with the

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<sup>20</sup> See for example the Humanitarian Data Exchange (HDX) platform or the Common Cash Facility in Jordan.

blockchain label served strategic functions (Matwyshyn, 2021). Indeed, a 2021 UN agency blockchain report reminded its readers ‘Blockchain is not an end in itself.’<sup>21</sup>

#### 5.4.2. The culture of cooperation: affects of suspicion, confusion, and faith

The critics I spoke to considered how aid agencies measure and address vulnerabilities differently, how they record and use information differently, and how they needed more than blockchain to collaborate: not only economic incentives and regulatory standards, but also shared motivations, categories, languages, and customs. Mikel had worked for UN agencies for several decades. In an interview in December 2018, he said: ‘Blockchain can’t do the trick if there is no existing culture of coordination or consensus. Every agency has its own mandate—water and food to families, health, education of children, or support to individual women. Their work is different, so are their values, categories, and methods. Coordination is extremely difficult.’ Likewise, Paul, emphasised that coordination depended on a host of contextual rules and norms, not just technicalities: ‘There is too much emphasis on proof of concept. Yes, interoperability can be baked into blockchain, but collaboration is also about the cultures of organisations, and their behaviours and rules.’ Elena suggested, ‘Seriously, will three nodes on a private blockchain suddenly improve the relationships agencies need to hone for years with huge diplomacy efforts and confidentiality agreements and so on? If you look at it that way, blockchain is much more hassle than using a nice database hosted in Geneva and then thinking about cooperation on a more social level.’

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<sup>21</sup> In the next chapter, I examine in more detail how the term blockchain is used to promote humanitarian pilots as products to a marketplace of donors.

Alex was frustrated by how agencies were ‘knocking heads on digital identity now everyone’s moving to cash.’ He described the field of rival blockchain innovations and digital identity initiatives as an ‘ugly battle of politics and egos.’ But he was not as cynical as other aid industry experts, and still saw blockchain as a force for long term harmonisation. In 2019, the team were making some new connections with potential member agencies in Bangladesh. Yet, over lunch, Alex told me,

People are still worried about joining Links because it carries the legacy of other BASS projects. BASS have tried to bring everyone to use a system before with the Radius database system. Radius expected other agencies to funnel their data to us while charging them for stuff. People don’t understand how blockchain works, that this is different. We just want to share our resources and build a neutral, collaborative network.

Indeed, in several interviews, humanitarian staff from other UN organisations and NGOs relayed these concerns. Elena said, ‘It sounds like a conspiracy theory, but I have a bad feeling about Links. BASS have a bad rep for trying to dominate. They said “you can use Radius for free” to implementing partners, but they make revenue from the data and analytics anyway. They could add on costs down the line.’ Likewise, Mikel told me in our interview in 2019 that ‘BASS have excluded us [other NGOs] from their data, even when we use their system. I’m suspicious. They want the one ring to rule them all.’ Others articulated a ‘knee-jerk’ mistrust of the BASS brand, which they would need to trust as the convenor of the network.

Affective dynamics of suspicion, ignorance, and uncertainty surrounded not only BASS, but also blockchain. In a 2019 multi-stakeholder workshop I co-organised, we were discussing the divergent understandings of blockchain within UN agencies. Max from the BASS Jordan cash

team admitted there was mistrust: ‘It took Alex over a year to convince GEN to join. John was brought here [to Jordan] to generate interest. But there is still a lot of caution and scepticism about blockchain. We know blockchain alone won’t “solve” coordination, but it should help if we start to let it’. At a big blockchain industry conference called Horizons of Trust, a BASS representative told the audience, ‘Building trust in blockchain as reliable is the big hurdle. Our UN 36 member states on the executive board, they would freak out if we said we wanted blockchain to underpin our operations. Blockchain and its implications are just not understood. That’s why we need your help.’ He acknowledged the indeterminacy around what decentralisation would mean for institutions, the associations with risky cryptocurrency schemes, and the lack of understanding around regulation.

Aid industry tech experts I interviewed were particularly suspicious of blockchain. For Mikel, blockchain and biometrics were ‘the horsemen of the apocalypse’, the apotheosis of tech experimentation and surveillance. Elena was concerned about how a global Links infrastructure would be continuously maintained by aid organisations if they lacked adequate resources and experts: ‘Agencies won’t be constant enough to keep nodes working all the time. What if someone gets fired or quits, or someone goes on holiday? People won’t know what to do. Unless agencies start employing coders, no organisation has enough blockchain expertise. Who are these people going to be that manage blockchain committees but also understand how decisions have bearings in the field?!’ Elena’s concerns about the ignorance around blockchain (how and when to use it) were shared by GEN staff (see Chapter 6). Hannah was a humanitarian tech expert who had written blogs and reports about blockchain, but in our interview in March 2021 she told me:

For a while blockchain was everywhere but I thought, do I have to understand this? Then I realised it was coming for me. I started going to events and there would be presentations, usually by white guys, about how women coffee growers in Uganda can be empowered by blockchain. But they could never explain how. They would say “because blockchain is decentralised”, and I’m like, “I KNOW that, but connect it for me!” Or they’d say “data responsibility is irrelevant with blockchain”—what?! Only a handful of people in my network understand blockchain and its implications. I only get like 50% of what they’re saying.

Hannah had been involved in creating a joke ‘decision tree’ where every question led to the answer ‘no, you probably don’t need a blockchain’. For many critics, the mystification of blockchain by tech vendors was enough to find it repellent. Some interviewees were repelled by blockchain even though they could not pinpoint exactly why. Several people mentioned they were simply ‘sick of hearing’ about it. In general, the aid industry commentators I interviewed expressed strong feelings of confusion, caution, and revulsion around blockchain.

Links was about making a movement for blockchain at the UN. This was a cultural struggle to align new norms and frames of understanding. As Kelty showed in relation to major Free Open-Source Software projects (Kelty, 2008, p. 114), making a movement involves allegiances and agnosticisms, debate and storytelling, evangelising and proselytising. Building new norms and conventions presumes the possibility of *affecting* more and more participants (Rutherford, 2016, p. 291); transforming humanitarian coordination would have to take place on affective and cultural, not just technical grounds. The subjective, affective dimensions of infrastructure reveal the political contestations and labours involved in producing and maintaining it (Ramakrishnan et al., 2020, p. 2). Critics have observed that blockchain adoption ‘by non-technical advocates is faith-based, with vendors’ and consultants’ claims being taken at face value’ (Orlowski, 2018). The Links team put great faith in their project and worked to garner faith in it from others. Faith

is not necessarily without logic; blockchain advocates believe in computer code. Links is not dissimilar from other cyber-libertarian belief systems and their faith that people, collectives, and organisations can be reduced to computation in the promotion of efficiency (Golumbia, 2009). However, as Bodó puts it, ‘The problem with building confidence in the technical aspects of system competence is the instability of the technology and the fragmentation of contexts and experiences. We can only judge the trustworthiness of technology based on our own past experience, or based on others’ experiences.’ (Bodó, 2020, p. 14). Joining Links involves a leap of faith in BASS and blockchain. But other agencies in the UN system did not offer a stable community with shared objectives, and Links did not fully appreciate the complexity of the existing competitive and cooperative structures of UN governance. Ironically, UN agencies did not trust each other enough in the first place to use a supposedly trustless technology.

## 5.5. Conclusion

Links makes an infrastructural proposition: to provide the channels along which organisations and authorities share and handle data about beneficiary populations. Links aims to change how aid organisations coordinate themselves, distribute money, resources, and authority, and manage refugees via data. For BASS, these transformations depended on securing the shared adoption of blockchain from a wide network of aid organisations. During my research, the project only gained one other member, GEN. Links did not challenge or reconstruct the techno-political apparatus of governance already in place within the UN system. However, the effects of blockchain implementations and discourses in aid are not fixed or inevitable. Studying data systems and technologies as finished commodities forecloses what can be learned from understanding them as materially and conceptually emergent (Lanzeni & Pink, 2021).

This chapter has shown that blockchain is still in emergence. Suspicion and uncertainty pervade the debates. Links has been critiqued as ‘not true blockchain’ and ‘BINO’ (blockchain in name only) due to its currently limited degree of decentralisation and private-permissioned rather than radically public makeup. This controversy reflects the diverse ideologies and projects that have come to be labelled blockchain. Alex admitted that the current projects using the blockchain platform in Jordan could have been achieved with a normal shared database. It seemed that blockchain could be almost anything; a range of properties are adopted or discarded without common thread. The Links team reiterated throughout the research that the long-term implications of blockchain were unique: trustless trust, decentralisation, and privacy. These concepts were often invoked by BASS staff and their partners as if they were black-or-white terms. Yet, this chapter has shown that the same people also considered blockchain in its various shades of grey. The three key features of blockchain and the rationales they came with were slippery and indeterminate in practice. Blockchain had concerning privacy implications, and despite the team’s convictions, at other points they recognised that trustless trust was not a watertight concept and decentralisation was on a sliding scale. Despite the contestation, unsettled ideologies, and the nascence of Links and other blockchain projects in humanitarianism—and based on close examination of the design, imaginaries, governance, and current formulation—, we can still see that blockchain is thoroughly implicated in infrastructure injustices along the lines of neoliberal capitalism, coloniality, and surveillance.

Like other identification systems, Links sits at the nexus of classification, representation, and justice (Martin & Taylor, 2020). The project continues to put the pipelines in place to coordinate

and manage networks of computers across global geographies. This is a way of rendering populations more visible and controllable by aid organisations and the governments they collaborate with. Links presents a means of identifying people, authorising their access to services, permanently recording information about those exchanges, and sharing it with a global network. The difference with blockchain is that it appears to resolve justice issues of visibility and data protection by using cryptographic techniques to secure personal information. However, using decentralised, cryptographic technologies can still extend the infrastructural power of influential actors. In the same way, ‘Using privacy technologies such as “federated” or “edge” computing, Apple and Google can understand and intervene in the world, while truthfully saying they never saw anybody’s personal data’ (Veale, 2020). Popular moves to position cryptography as the panacea to privacy issues can distract from the historically racialised, classed, colonial aspects of surveillance projects (Gürses, Kundnani, & Van Hoboken, 2016), which blockchains will likely extend rather than address or dismantle. Companies will continue to capitalise on transaction commissions and the adoption of their decentralised financial services; surveillance practices by authoritarian states are not ruled out, as we have seen with the El Salvador government’s oversight of public blockchains, for example (Cheesman & Slavin, 2021; Cuéllar, 2021). Unrealistic promises made for data infrastructure as a solution to deep rooted societal problems such as surveillance capitalism are part of the theatre of global governance which diverts attention from meaningful strategies and authority to companies (Milan, Veale, Taylor, & Gürses, 2021).

If we evaluate BASS's Links as a vision and an instantiation, we can see how the project extends dynamics of infrastructure injustice:

- Firstly, I explicated the range of subjectivities, affects, and rationales driving and contesting Links. The project team maintained a quasi-religious commitment to trust-in-code and an unproven future of decentralised cooperation in aid. These beliefs were premised on the idea of blockchain as an objective, omniscient authority and regulator of information and value exchange in refugee contexts. This idea is sinister and in tension with the status quo of humanitarian governance because it relegates the existing, necessary social infrastructure of UN cooperation and authority. Aid industry tech experts contested blockchain proponents' commitments on affective grounds of suspicion and uncertainty.
- Secondly, I examined the temporal momentum and spatial scope of Links. The timescape was ambitious and vast. The project can be situated in a trajectory of population management and commodification strategies that follow 'epistemologies of conquest' (Axster et al., 2021, p. 6). Here, the experimental refugee population is enrolled as part of the infrastructure required for the humanitarian data economy to function. Links was to enable an indisputable authoritative view of international beneficiaries, and the cybernetic control of their access to resources. Blockchain promised to be the great, autonomous synchroniser of information for this mission. Moves to optimise logistics are part of a wider imperialistic race—the 'infrastructure scramble'—in which governments, companies, and other actors vie to fund and control the circulation of data and capital in the Global South (Alami, 2021).
- Thirdly, I exposed the material arrangements instantiated by UN agencies' shift to blockchain infrastructure. Links provides the conditions for archiving vast quantities of

transaction and biometric data and the railroads for circulating that data among a distributed network of parties. The project represents the neoliberal encroachment and entrenchment of private expertise and interests in the everyday material and imaginary infrastructure of humanitarianism. In the next chapter, I examine the concerning socio-economic justice implications of this from the vantage point of GEN, and their everyday material practices implementing Links to deliver aid.

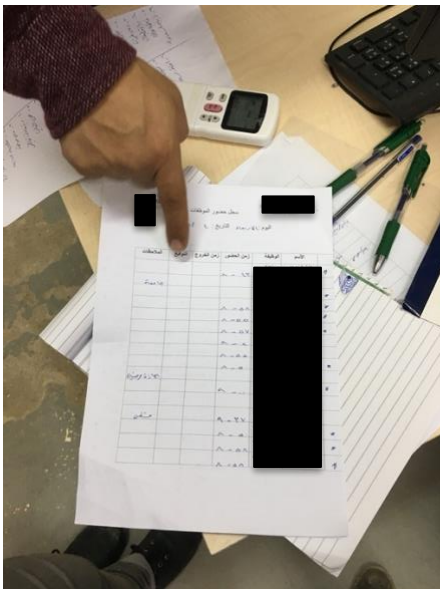


Figure 19: UN GEN workers' paper timesheets, December 2019. Time in attendance (*zaman al-hadwr*) and time out (*zama al-khuruuj*, e.g., medical appointment), each in Arabic numerals, signature of worker (*al-tawqie*), notes (*al-mulahazaat*), next to name, occupation (*al-wathiyfeh*) completed by hand each working day. Refugee administrator monitors the list to ensure information is correct.

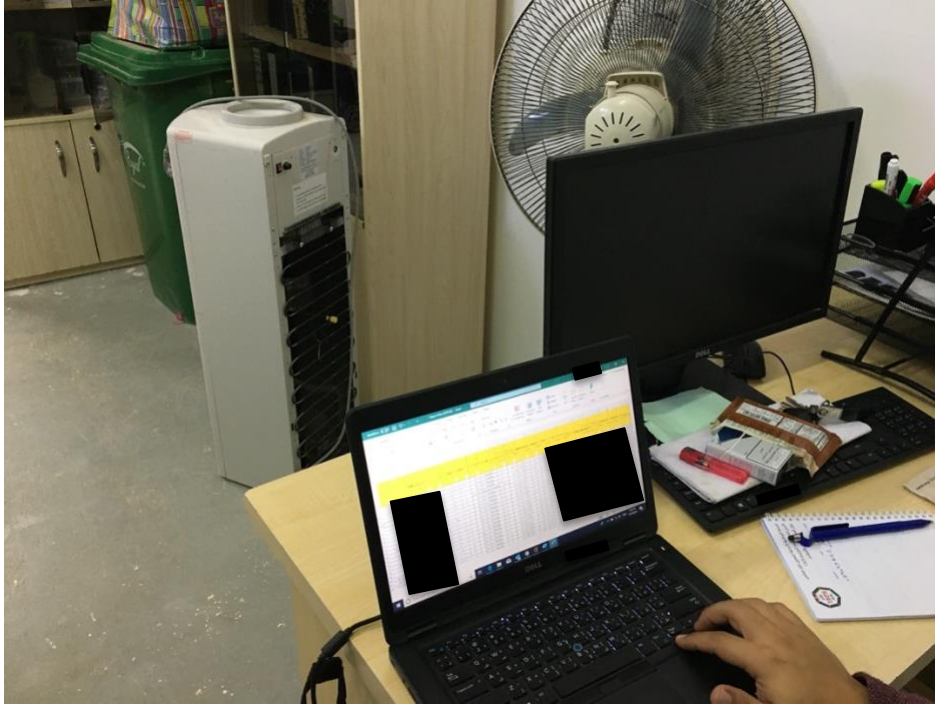


Figure 20: Laptop screen shows TIME dataset, i.e., the Excel sheets GEN camp staff enter the beneficiary labour data into, in Arabic and English. The picture was taken during the first week of December 2019, when I was in the wahat office with Aysha looking at a bug in this sheet from November 2019, which had still not been uploaded to BB.

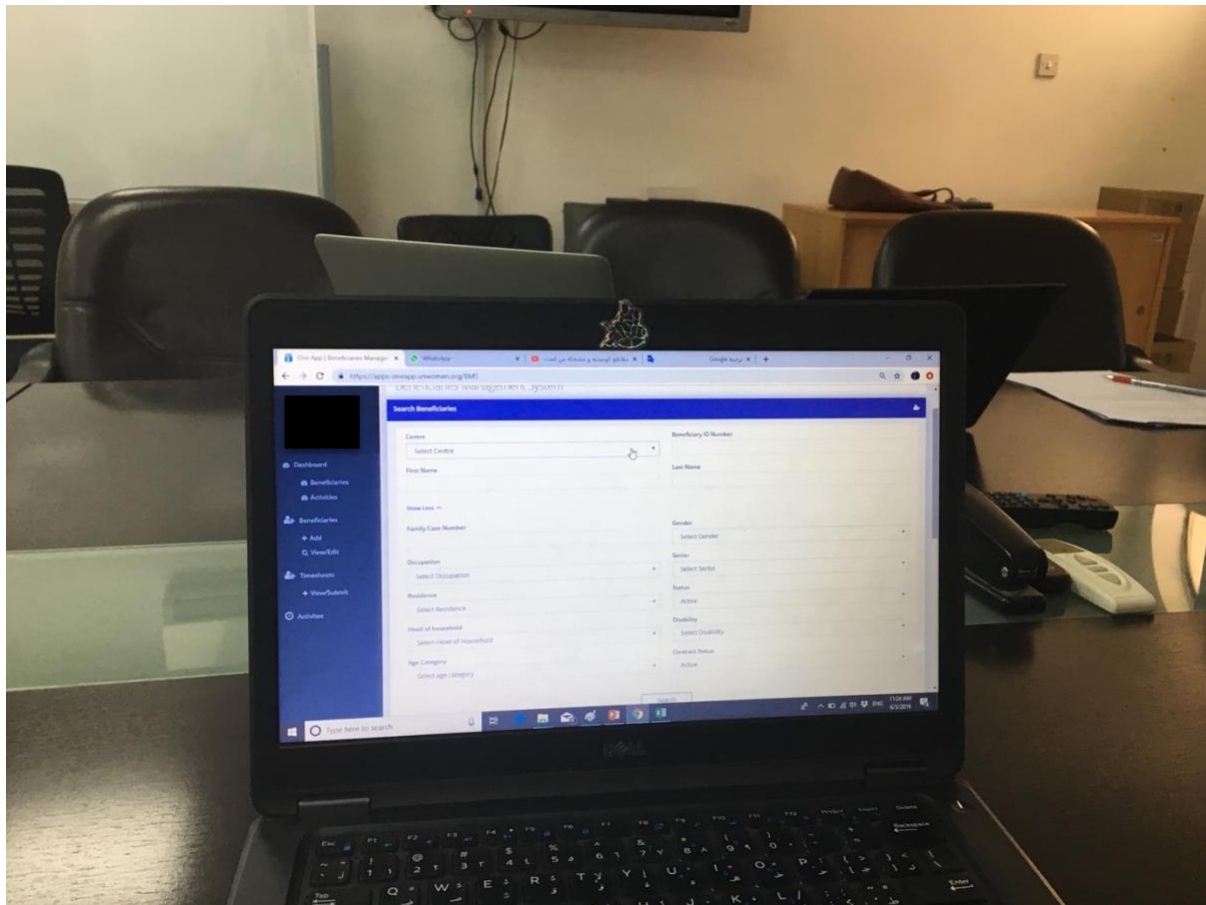


Figure 21: Laptop displaying GEN's Links interface for camp staff. In the GEN office in Amman, December 2019, Aysha was showing me how she and her colleagues uploaded the datasets. On the left, the dashboard shows the portals for uploading the two datasets, BEN, and TIME. The figure displays the 'Search' page for viewing data about a particular beneficiary.

## Chapter 6: Aid work, blockchain, and labour

On the morning of the multi-stakeholder workshop on 2<sup>nd</sup> December 2019, GEN's blockchain pilot had been in operation for nearly 6 months. 20 participants from GEN, BASS, UNHCR, IrisGuard and the supermarket companies sat around a large conference table at the GEN Jordan office with their teas and coffees. After the usual introductions, GEN staff and I had planned to begin with a structured discussion from different perspectives about the benefits and challenges of implementing the pilot so far. I opened that discussion by asking if anyone would introduce how the blockchain pilot worked. There were a few moments of silence as everyone's eyes darted around the room. Then, Ahmed from the biometrics company IrisGuard volunteered an explanation:

So, we all know GEN's beneficiaries used to get cash-in-hand from the GEN staff at the Wahat [women's centres]. What has changed with the pilot is the beneficiary now comes to the supermarket and uses our [IrisGuard] technology to get cash. All she has to do is tell the cashier she is working for GEN. Then the cashier knows to select the GEN wallet. He opens the camera using the touchscreen to capture her iris in one click. The photo of the iris is then automatically searched against the UNHCR database using EyeCloud, the network connection we [IrisGuard] have built with UNHCR for refugees all over Jordan, which is secure and encrypted. If there's a match, the beneficiary's unique case number pops up on the cashier's screen, along with her account balance. The beneficiary then asks to withdraw whatever amount. The cashier enters that amount, and the transaction gets logged on GEN's database. Then the web server will push the beneficiary's individual number to the Links network to process the transaction financially, to debit the amount from the beneficiary's account. All the transactions are verified and recorded by the nodes in the Links network. The cash debit is then confirmed on the cashier's screen, and he delivers the money.

Ahmed gave a thorough, procedural explanation of how refugees' salary payments were authenticated and authorised in situ at camp supermarkets. He put himself forward as the best

person to explain the pilot because he had in-depth technical knowledge about IrisGuard's biometric technology, the identity numbers, the web server, and the blockchain network. His explanation was structured from the perspective of beneficiaries and supermarket cashiers, but mainly it emphasised the back-end process, and the efficiencies of the system ('all she has to do', 'automatically', 'in one click'). This was not the first or last time vendors led the explanation of the socio-technical infrastructure at GEN workshops. Increasingly, technology companies—like IrisGuard and blockchain developers—take up entrenched positions that shape lives and institutions, as well as what is known and not known about data systems and the business interests behind them (Whittaker, 2021, p. 52). This chapter examines the shifting patterns of authority and expertise instantiated by the blockchain pilot. I show that GEN's infrastructure change represents not just the delegation of humanitarian payments to digital technologies, but also the delegation of authority and expertise to private companies. As Ahmed's account illustrates, GEN relied on the social and material infrastructure provided by IrisGuard, the supermarket companies and their cashiers.

*Streamlining: saving money, time, and labour*

Like Ahmed, GEN representatives emphasised efficiency gains when they promoted the blockchain pilot. In this December workshop discussion and beyond it, the concept of 'streamlining' encapsulated how GEN staff described the aims and benefits of using blockchain. Streamlining referred to the idea that blockchain smooths over the salary distribution to refugees by saving the organisation time, money, and labour. Following Ahmed's introduction at the workshop on 2<sup>nd</sup> December, GEN's Head of Programmes, Lina, suggested a major advantage of

the pilot was that ‘We have hugely reduced our staff time in the cash dispersal process. With blockchain, we can channel aid to beneficiaries directly in a fraction of the time.’ Lina’s account conjured an imaginary that often comes with automation in general and blockchain in particular: direct, immediate, seamless financial transfers. Lina was the most senior member of staff at GEN. She played a central role in overseeing the Links collaboration with BASS and other partners and directing GEN staff and objectives. Lina was keen to stress that the pilot was not just aiming to empower refugee women, but also some of the staff in her organisation. GEN was a small organisation of about 40 staff members.<sup>22</sup> Blockchain changed the work of office administrators and IT mgers, Lina suggested, but most importantly, it automated and simplified the work of humanitarian aid workers—the camp staff.

There were 5 main members of the camp staff, all young (under 35) and lively Arab women. Their contracts were temporary, and their aid work was challenging, involving long journeys to Zaatari and Azraq each day to engage with refugee women workers and manage everyday operations in the Wahat women’s centres. The camp staffs’ perspectives on automation were mixed. In the multi-stakeholder workshops I organised with GEN, some of the camp staff celebrated the blockchain pilot. Imane, a Jordanian woman in her 30s who worked mainly with refugee women workers in Zaatari, was the most engaged with the blockchain pilot discussions from the beginning. During the December workshop, she followed on from Lina’s comments:

With blockchain I don’t have to make the envelopes with the cash and go through the lists and documents and check off one beneficiary by one. *Sanjad* [seriously]...this saves me so much time. We are treating beneficiaries now like

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<sup>22</sup> Roles at GEN Jordan include the policy officers who do advocacy and campaigning work around gender equality in Jordan and the Middle East, the trauma and gender-based violence specialists who give refugees training sessions in women’s rights and protection, and the communications team who promote projects such as the blockchain pilot.

normal workers, they have their accounts, and the supermarkets deal with it. They collect their money with more dignity, and it's empowering staff like me by making our work less effort and less time consuming.

For Imane, the efficient system of biometric cash withdrawals at the supermarkets trumped the onerous manual labour of delivering cash envelopes at the Wahat. Imane asserted that doling out small amounts of cash to women by hand was not only an outdated but demeaning method. Automating the payment system accorded with her moral frame and modernisation perspective on aid.

In effect, the blockchain pilot disintermediated humanitarian aid workers from the payment process. The benefits of disintermediation were a central theme in the workshop. Lina followed on from Imane's point by highlighting the main strategic advantage of the pilot from her perspective:

But the biggest benefit of using blockchain is cost effectiveness. There have been a few overheads setting up our node, but the overheads from working with UNOPS were so large that using Links will be a huge cost saving. We're coming in and riding on the back of all the investment BASS has put in.

Lina argued that blockchain allowed GEN to cut out significant financial intermediary and logistics fees. This echoed official GEN press releases for the project suggesting the decentralised infrastructure allowed GEN to: 'directly transfer digital assets without the need for intermediaries and associated costs [...] create and store verifiable digital identity for refugees as well as enable trackable and inexpensive cash transfers.' By piggy backing on the work and investment BASS had already put into designing and coordinating the Links project, GEN could consolidate the cost savings that blockchain already enabled. Overall, GEN staff's contributions

to the multi-stakeholder workshop in December 2019 crystallised the ethos of the pilot: to streamline bulky bureaucracy into a disintermediated, effective, machinic payment system.

## 6.1. The politics of liquidity

Fieldwork in Zaatari and Azraq revealed the new material relations, contingencies, and political frictions involved in maintaining the putatively streamlined payment system. Streamlining was achieved by GEN's delegation of key humanitarian roles and responsibilities to private companies and technologies. In December 2018, before the pilot's launch, I spoke to Fouad at the Amman office about the institutional arrangements GEN were making for the pilot. Fouad was a Senior Programmes Manager, which meant that among other projects, he oversaw the salary distributions at the Wahat.

We have to go through the supermarkets. We can't launch the pilot in any other location. They are the only place we can achieve the liquidity and security for the cash provision. And they have stable Internet. It's just not possible to do that at the Wahat, it would defeat the point of the whole blockchain pilot to hire security and bring cash into the workplace once a month like how we normally do. There would be no change. We aren't permitted to have ATMs at the Wahat either. The supermarkets have the ID validation in place already, which solves the issue of giving cash to the right women. They just have to start delivering physical cash for us, which they haven't previously done.

Instead of camp staff, IrisGuard's biometric authentication system verified refugees' identities and supermarket cashiers doled out their salaries. For Fouad, delivering the salary through IrisGuard and the supermarkets sufficiently achieved innovation, transformation, and novelty. But more than that, Fouad's narrative suggested these vendors were fitting in the context of

restricted security, regulatory and infrastructural conditions—not because of innovation or blockchain, but because of the costs and risks of maintaining cash and credit operations. After the pilot’s launch, in the December 2019 multi-stakeholder workshop, Fouad celebrated how GEN had overcome major contingencies involved in privatising aspects of humanitarian operations:

For a small pilot involving only a few hundred beneficiaries we have 6 stakeholders directly involved. The number of stakeholders in our projects is normally limited to 2 or 3. So, this pilot has not just required UN based cooperation, but also cooperation on the ground with private providers from the region. It’s hard to ensure objectives are met. It’s all new for everyone, but somehow, it’s running. We should be proud of that.

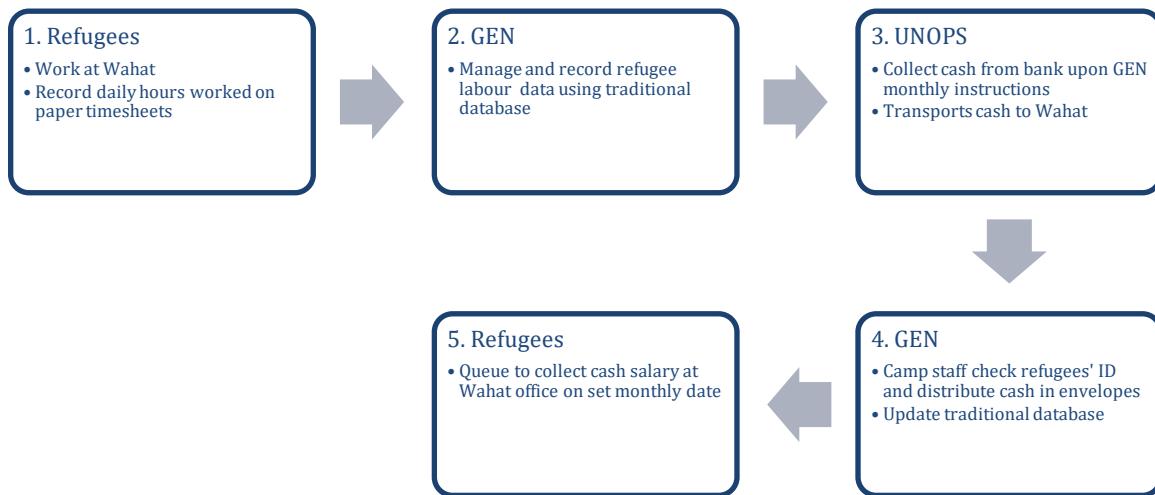


Figure 22: Flow chart: monthly salary distribution pre-blockchain pilot

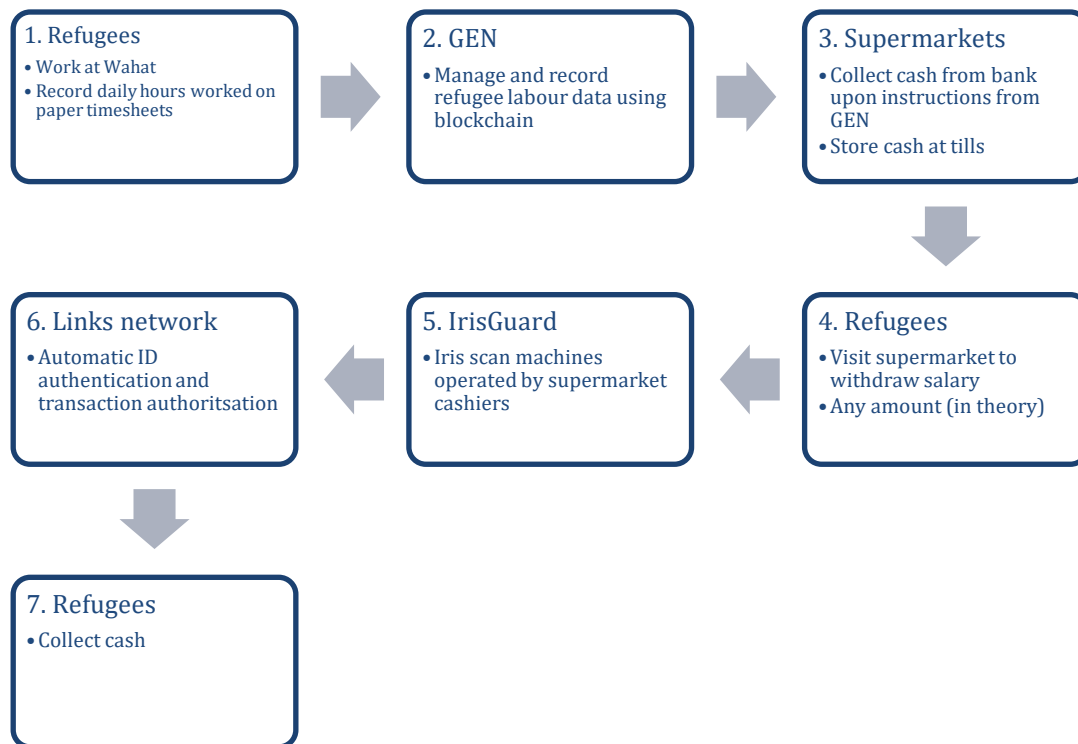


Figure 23: Flow chart: the salary distribution process in GEN's blockchain pilot. Supermarket companies and IrisGuard replace the UN agency UNOPS

Like Imane, Fouad tended to put a positive spin on the blockchain pilot as streamlining and labour saving. He and other GEN staff framed the pilot as 'enhancing the localisation of aid' by partnering with companies based in the Middle East region. However, after the workshop, in more in-depth chats we had in the Amman office in between my work in the camps, Fouad was more critical about the delegation of humanitarian responsibilities to the supermarkets. It had involved new bureaucratic tasks and conflicts:

The supermarkets have previously only distributed goods, not cash. When we contracted them they had no cash flow. To meet our brief, supermarket managers had to start getting approvals to withdraw cash and bring it to the camp. They needed their own permissions from the camp authorities, their own logistics and security to bring cash in. The supermarkets didn't want to get cash unless we

[GEN] transferred them in advance.<sup>23</sup> Even though that wasn't in our contract with them, for a while they were pressurising us about securing the advance. We kept having meetings with different bodies within the company to explain how it should work. They didn't get it. We had to ask BASS to intervene and help us put pressure on the supermarkets to provide the cash.

Throughout my fieldwork in December 2019 (as we will see further in the next chapter, based on refugee women workers' perspectives), the cashiers were not consistently providing cash—usually because there was no cash at the shop. Some of the problems around this became clear when I visited the supermarket with Aysha, who was one of the camp staff members present at the workshop discussion. She didn't speak up at the time, but a few days after the workshop when we were driving to Zaatari, she suggested that delegating important logistics tasks from UNOPS to supermarket companies led to unpredictable outcomes: 'From their perspective, they are not a charity, why should they provide regular cash to refugees?' According to Aysha, the companies did not have the humanitarian SOPs [standard operating procedures] or the mandate of humanitarian care, so it was not surprising they were not reliably fulfilling the humanitarian role.

That day, I walked with Aysha and a small group of refugee women workers in their lunch break to the nearest supermarket. Once we got to the tills, we observed as women workers withdrew cash and asked the cashier questions, for example about their balance, about issues with the amount, or about when the next payment from GEN would come through. Rolling her eyes, Aysha leaned over and said in my ear, 'Look, now the women ask their questions to the cashiers, but they're just cashiers, they don't know anything more about the salaries.' Sarcastically, she

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<sup>23</sup> The supermarkets each submitted a weekly invoice to GEN Jordan. GEN paid the supermarkets the total amount of cash they gave beneficiaries that week in dinars [the Jordanian currency, JOD], plus a small percentage (roughly 1%) of that total amount. IrisGuard also took a small percentage out of transactions and GEN paid them according to a monthly invoice.

added, ‘Though they [the cashiers] obviously still give the women an answer. They won’t say they don’t know.’ The supermarkets were usually hectic, and the cashiers inundated. The cashiers had receiving training about how to deliver the GEN salaries. But it transpired that sometimes they would give misleading information. Some refugees also reported to me that cashiers had told them they must withdraw their entire salary all at once, rather than any amount. Aysha said the supermarket cashiers were ‘not like UNOPS, they just don’t stick to what we need them to do with the pilot’. She suggested the biometric verification and transaction data were treated by cashiers as self-evident; refugees had little opportunity to contest or inquire. The cashiers had the flexible and powerful material authority to withhold or extend refugee women workers’ access to money. Sometimes they had no cash in their till, or just a small amount, and would tell women to come back another time. For Aysha and for refugee women workers, the supermarket companies were not reliable in the most crucial material responsibilities: maintaining liquidity, delivering salaries, and providing salary-related information.

Within Zaatari and Azraq, humanitarian organisations deliver their respective mandates (childcare, healthcare, food, shelter, education, for example) within their own territories (caravans or centres). The supermarkets were the domain of BASS, not GEN camp staff. The pilot involved the spatial untethering of camp staff from humanitarian action: the setting of salary payments shifted from the Wahat to the supermarket. This detached aid workers from the in-situ practices of humanitarian care. When there were issues with the salaries (which in December 2019, was often), camp staff had to undertake additional labour of calling up the supermarkets or physically going there to inquire about and resolve the issue. As Nour—a gender-based violence specialist and camp staff member—told me in December 2019 as she put

down the phone with the Azraq supermarket manager, ‘Sometimes there is confusion because the supermarket tells the beneficiaries we will handle a salary issue, but we tell them the supermarket needs to handle it. I have to address it with them [supermarket managers] on the phone. Often I’m busy so I send refugee administrators to find out what’s going on.’ About the problem Nour was dealing with, her colleague Meriem suggested when we got back to the office, ‘Well, it’s not our problem anymore. Everything’s been arranged from our side. It’s not our money to deliver, it’s theirs [the supermarkets]. If it got trapped on the way, it’s not our problem.’ Meriem had no qualms with GEN abandoning the work and care of salary delivery. Nour and other camp staff did not agree with this sentiment.

Contrary to the blockchain rhetoric of streamlining and smoothness, the delegation of humanitarian responsibilities to non-humanitarians introduced frictions and indeterminacy when refugees sought recourse and accountability. In practice, the pilot could only be maintained by the additional labours of checking, asking, and holding supermarkets to account. This communication work fell upon not only camp staff in their calls and negotiations with the supermarkets, but also refugee women workers themselves—the refugee administrators sent by aid workers inquire about the salaries at the supermarkets. These kind of essential communication roles, all not coincidentally undertaken by women in the Links pilot project, constitute social reproduction in that they (attempt to) support the smooth running of socio-economic relations (Elyachar, 2010; Lai, 2021). From a social reproduction angle, the blockchain pilot gave rise to injustice in that it required reliance on women’s mitigation strategies and so fostered the depletion of their overall resources (social, relational, emotional, not just financial)

(Rai et al., 2014). Social and communicative work remain an important lens into labour and inequality in blockchain-mediated economies.

GEN's blockchain payment system represents the neoliberal privatisation of material roles, resources, and responsibilities in aid. These findings contrast with GEN and the Links project's claims about blockchain eliminating bureaucracy and reliance on third parties. The rhetoric of streamlining promoted by some GEN representatives in workshops and press releases was undercut by the experiences of camp staff in practice. The socio-technical system introduced new material contingencies and depended on IrisGuard and the supermarket companies to function. Blockchain did not bring about the obviation of centralised control, but the delegation of humanitarian authority to new, profit-motivated actors who did not share the humanitarian ethic. The issues recorded in this research could be ironed out—for example, if the supermarkets standardised their processes for managing the burden of liquidity and their channels for communication and issue resolution with GEN and refugee women. But the long-term issue is the integrity of humanitarianism. In digitalisation projects, aid organisations—unique in their diplomatic immunities, ethical and political principles and emergency mandates—are losing control of their operational footprint and independence (Global Data Justice, 2021; S. McDonald, 2021; Scott-Smith, 2016). However, aid workers' perspectives such as Aysha's show that the neoliberal delegation to companies does not go un-contested by humanitarians in the field.

## 6.2. The rhythms of data work

The core challenges of the pilot were not just material issues stemming from the delegation of tasks such as liquidity maintenance to the supermarkets. The pilot also introduced frictions in the data processing work of camp staffs. These frictions undermined GEN's projections of blockchain as a labour-saving technology. The previous cash-in-hand system had involved aid workers like Imane, Nour, and Aysha collating, typing up, checking, and updating datasets about beneficiaries, their contracts, and their hours worked (see Figure 24). This data work was the linchpin of the payment system, the basis on which money was allocated to refugee women workers. Previously, it was performed monthly, in advance of the salary payments on the 26<sup>th</sup> of each month. By contrast, the blockchain pilot aimed to provide refugees more regular and flexible access to cash, mimicking a bank account. The camp staff now needed to perform their data work on a weekly rather than monthly basis.

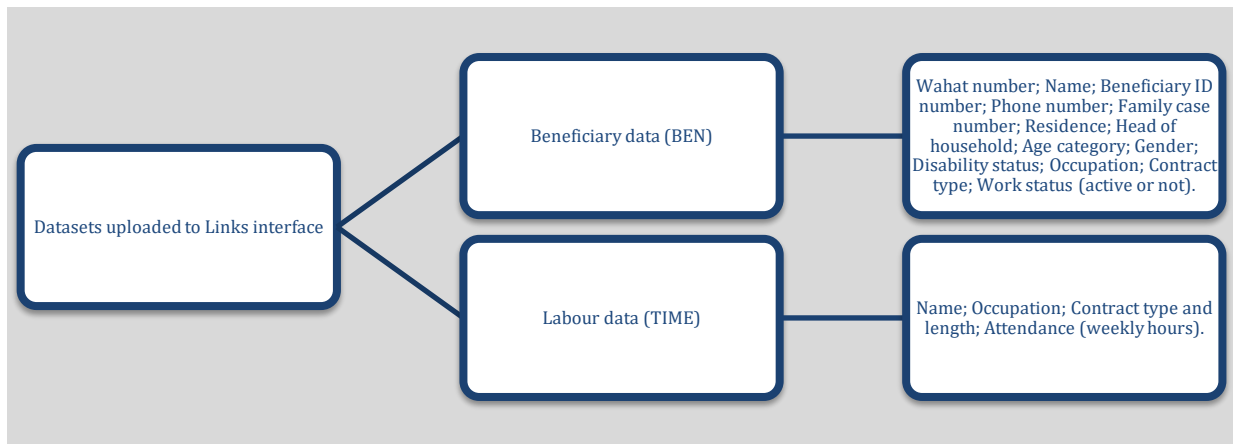


Figure 24: Diagram of how camp staff trigger the financial transfers. Camp staff upload datasets to GEN's blockchain interface on a (supposedly) weekly basis. The staff use a different Excel sheet for each of the 4 Wahat centres. Beneficiary data rarely changed, so GEN only edited it if need be. By contrast, beneficiary labour data must be uploaded regularly: it is variable as refugee women workers' take time off for sick days, appointments, lateness, transportation issues, and other reasons.

I sat with Aysha and Nour in GEN's Administration office in Azraq. It was the second week of December 2019, and the batch of salaries that were due in the last week of November had still not been delivered. Aysha was helping Nour resolve a bug in one of the November TIME datasets (containing labour data, i.e., refugees' hours worked) so the payments could finally be processed. Nour was saying, 'I am a bit behind with this one because we've had donor visits and other demands and it's the end of the financial year.' Aysha replied, 'I know. I was up until midnight dealing with spreadsheets. My days are so busy I have to fit it in somewhere. This pilot costs me a lot more time.' When Nour left, Aysha told me she was frustrated with her colleague:

What would take me 2 minutes in Excel would take Nour 2 days?! She drags her feet over a tiny issue. This slows the entire salary distribution down. We have too much flexibility and distance from the process now. We are supposed to upload the sheets weekly, but nothing happens when we don't. Meriem is another example, she went on holiday and didn't do her admin. When she came back, she phoned me on my day off because she needed help with three names on the BEN

list, it turned out she had copied and pasted them wrong. *Ianni* [like]... it's down to our personal commitment to do it on time and our skills and ability to keep on top of the data management.

Ironically, Aysha suggested the crucial gap in expertise affecting the maintenance of the cutting-edge infrastructure was not with blockchain but with data management software that has been pervasive in humanitarian work (and in this specific job at GEN) for decades: Excel. She connected her moral principles with the temporality of the data work. Upholding efficiency and a sense of urgency about processing the data over time was a principle other camp staff were compromising—whether out of variable levels of competence or diligence. Within the Links interface, I found that there were no warnings or red flags raised to more senior staff if dataset uploads were delayed. The weekly temporal order was based on loose agreement among GEN colleagues rather than a requirement built into the system.

The camp staff did not decide on the temporality change, but it was their work that was most affected by it. Aysha, Nour, and Mo (another member of the camp team) all complained that the weekly timeline was not realistic, and it needed to be extended. When they brought this up in an internal workshop with other GEN staff in late December 2019, Meriem, the Programme Associate who validated data based at the Amman office contested the complaint: 'How is it more work for you? It's easy. You do the same tasks as you did before. It's the same amount of data overall, just spread out across the month.' There were occasional tensions between office-based staff and those who worked in the camps. Afterwards, Mo and Aysha told me they felt Meriem did not understand their everyday demands because 'She has never been to the camps', and that she and other colleagues were prioritising the whole idea of the digital wallets and continuous cash over understanding what a manageable schedule of work looked like in the

camps. Even though the aid workers had the same amount of data to get through, doing the work four times per month rather than in one go felt more onerous and was more difficult to schedule. Time and timing in workplaces is not just a technical problem, but an ethical and affective one (Bear, 2014). Unsustainable working conditions disproportionately affect people doing contingent work that isn't quite automatable, but is seen as eventually replaceable (Suri & Gray, 2019). The imposition of temporal boundaries on aid workers represents an important operation of power by the more senior GEN staff designing that aspect of the pilot. Most of the camp staff felt frustrated and overburdened because of the accelerated timeline. However, the agency of workers is not stripped away with digital infrastructures (Ferrari & Graham, 2021). Seeing infrastructure and infrastructural relations as collective and generative rather than scripted reveals important contingencies (Gabrys, 2016). There was room for manoeuvre as the camp staff also manipulated and delayed the timelines of their work to make it manageable.

### 6.3. Blockchain hierarchy: the delegation of authority

Hierarchy and status were a strong theme in the camps. The job contracts of the camp staff were usually renewed on a rolling basis but nevertheless temporary and precarious, and they were in one of the lowest pay brackets. Their routines were unstable, involving hours of travelling and patchy network connections each day. The camp staff were a motivated group, each pursuing independent studies and keen to build their careers. Yet, Aysha in the Azraq admin office told me she was frustrated that the pilot didn't bring her any technical skills development: 'We are just working with Excel, same as always. We have nothing to do with blockchain.' Aysha's

perspective contrasted with the empowerment narrative put forward by Lina and Imane in the workshops. Imane was also an aid worker, but she was named the ‘blockchain focal point’ and had a strong sense of ownership over the pilot. She represented it in public events, journalistic articles, and on diplomatic and donor visits to the camps. Participating in Links was rewarding and gave her status:

My husband’s family want me to keep a lower profile, but I want to be in press releases promoting the pilot. I am passionate about blockchain, but the mentality especially in South Jordan is still that people don’t believe women can do great things. My work with the blockchain in the camps proves them wrong.

Imane articulated her role in the pilot as part of her own personal dignity and empowerment as a Muslim woman. The technical aspect of working with blockchain and any issues she experienced in managing the data work and the relationships with supermarkets were less important than championing innovation and feminism.

Imane’s perspective was not shared by her colleagues. For Aysha, the blockchain pilot reinscribed the hierarchical politics of the GEN Jordan office. The proclaimed affordances of blockchain—real-time data and transparency—were not extended to aid workers. They could upload datasets to the GEN Links interface, but they did not have any further access to data or authority to amend data in the system:

If I could access the blockchain and get information about beneficiaries’ wallets and the status of their payments, I could answer their questions when they come to me at the Wahat. The women are often asking me what their balance is and I can’t answer them. I can only upload data. I can’t even edit the information I’ve uploaded once I’ve sent it. If a beneficiary tells me there is a mistake with her salary, I must go through Meriem or Khalida. If something goes wrong, we [camp

staff] have very little power in the organisation. We don't have the visibility at head office. I'm not even meant to speak to the Director, I would have to go through Fouad. GEN is a huge hierarchy.

What the blockchain was or looked like depended on who you were in the organisation. GEN's blockchain node was designed around a sequence of ranked, prescriptive data validation roles for selected GEN staff (see Figure 25 below). BASS Jordan and GEN Jordan each created a different Links interface according to the segregation of duties and authority within their own organisation. There were nine 'users' of GEN Links. Each individual user had a different level of access to data and authority in the system. This corresponded with the existing hierarchy of roles at GEN. Once the camp staff uploaded datasets to the GEN blockchain interface, the Programme Associate, Meriem, verified the data. She worked with camp staff to resolve any glitches or incorrect data, which were flagged automatically as 'warnings', and were usually caused by typos in the contract information (e.g., rate or length). When Meriem submitted the data, Khalida, the Finance Associate, received an automated email saying, 'Dataset is parked, please review and post'. Khalida would go to the Links interface and sign off on ('validate') the information. Fouad, the next level of authority up (a 'Signatory'), would then also validate the information. Finally, the Head of Programmes had the authority ('Signatory Level 2') to release the total amount and therefore trigger the transfer of financial value to beneficiaries' digital wallets.

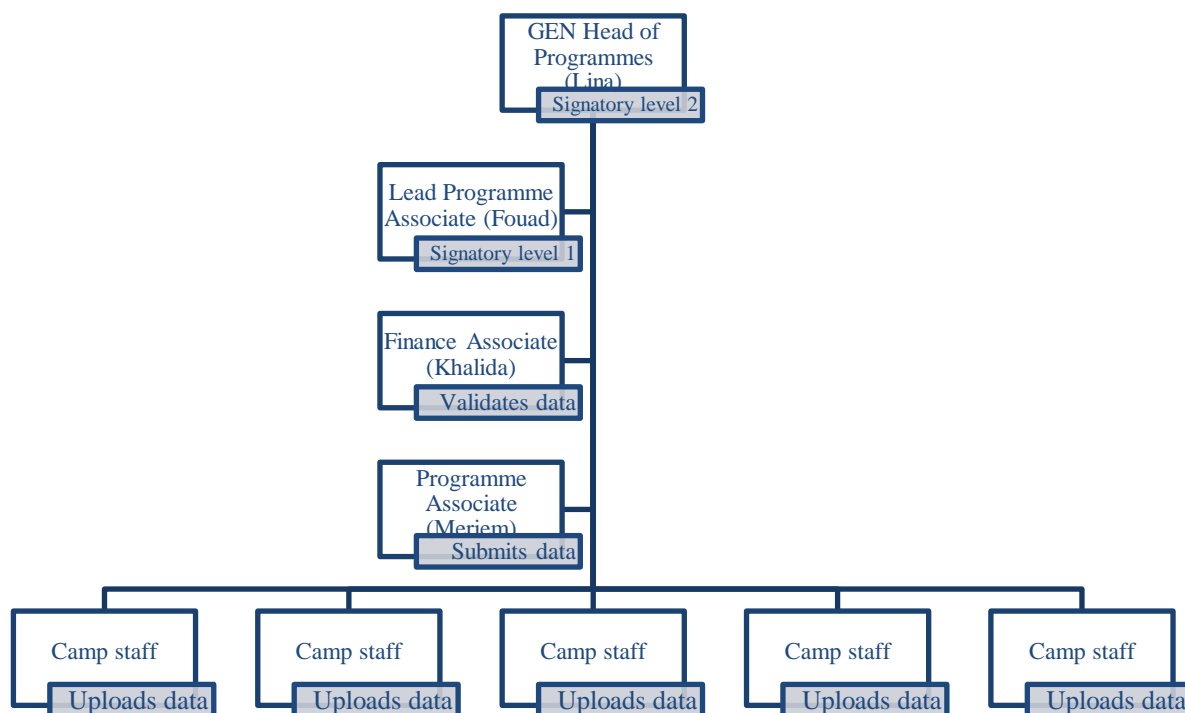


Figure 25: Hierarchy diagram of data processing by users of the GEN blockchain platform

In a 1-1 chat, Fouad explained the logics behind this design: ‘The idea with blockchain is we distribute authority. No single user can do everything. If you want to change something in the data, like correct the amount of salary a beneficiary should receive, you have to go through the checks and approvals.’ Fouad had the second highest level of authority in the system and unlike camp staff had access to information about beneficiaries’ transactions and GEN’s payments to retailers. From his perspective, ‘It seems like many steps but it’s just one click, once a week. I like the blockchain because now we have full control and oversight over the transactions.’ Likewise, Meriem told me ‘I love the blockchain. We have an accessible interface so the blockchain is not as difficult to use as you would think, and I can see all the data there so resolving issues is so much easier.’ The same system that aid workers saw as hierarchical and exclusionary, more senior administrative staff saw as distributing power and enhancing security,

oversight, and the quality of data. Even though the validation could be executed ‘in one click’, Mo and Aysha also suggested it was not just aid workers delaying the data processing: there were multiple occasions when they were waiting over a week for more senior staff to validate data so payments could be processed. On one occasion in early December, the office had been waiting on Fouad for several extra days to sign off on a block of data, but he had been away from his desk, ironically occupied delivering cash salaries to local communities in urban areas of Jordan.

These findings confirm that decentralised data systems do not flatten out hierarchical structures; they can amplify concentrations of authority. The goal of streamlining aid work with blockchain involved GEN attempting to speed up the circulation of data. The circulation of data comprises material labour, and data’s movement does not follow a smooth flow but is a turbulent or ‘crooked’ process in which different temporalities and paces are patched together (G. Bowker & Star, 1999b; Pollozek, 2020). GEN camp staff upheld—and held up—the infrastructure maintenance with their mundane data processing work in Excel. While a key tenet of neoliberalism is its opposition to bureaucracy (‘the paper burden, the cost burden, inefficiency, inertia, etc.’), bureaucratisation is a consistent feature of neoliberal finance projects (Amicelle, 2011, p. 172). This blockchain pilot was no different. It did not simply automate the salary distribution process but introduced new administrative burdens and frictions. Apart from Imane, who felt empowered by her involvement in the pilot, the camp staff articulated a sense of alienation: they had delegated important responsibilities to the supermarkets, and in their data processing were ‘asked to work along a strict standardized pipeline, at a fast pace, without acquiring substantive skills or having a meaningful involvement in their work.’ (Plantin, 2021). Not least, they had lost the ability to know important information, relegating them to the same

state of ignorance as the beneficiaries where their credit was concerned. In humanitarianism, there is already systematic differentiation by race, gender, class, status, authority, responsibility, pay, esteem, and proximity to suffering and danger (Benton, 2016; Fassin, 2007). The blockchain pilot imposed an unmanageable timeline on aid workers—the most junior, precariously employed, local, women staff—and so exacerbated rather than flattened asymmetries within the organisation. Contestations around labour, authority, and hierarchy were fought out on the grounds of timing and temporality. The socio-technical system was not impervious to GEN staff’s adaptations and delays.

#### 6.4. The politics of ignorance and coloniality

Chatting with aid workers on one of my first journeys to Zaatari in May 2018, Imane confidently told me she was ‘into blockchain’. When I asked her what she was into about blockchain, she said, ‘Blockchain is going to be the future, so we are getting there first. Blockchain means we are trying new things to improve our organisation.’ For her, blockchain was synonymous with innovation. Sitting beside her in the van was Nour, who I asked the same question: ‘Your knowledge, my knowledge (*3alimy 3alimak*). I’m not the right person to ask. I don’t know blockchain.’ Lina, another aid worker in the van exclaimed, ‘Don’t ask me about blockchain either!’ To complete their everyday work, not all GEN staff needed to understand how blockchain operated. Indeed, the camp staff did not feel obliged to know the inner workings and structures of other payment systems GEN used like prepaid cards or cash-in-hand. This knowledge was not necessary for their work and educating themselves would come at a high

cost. Ignorance in this sense—the delegation of knowing or acts of knowing elsewhere (to proxies such as other objects or beings, experts, or institutions)—is a commonplace part of mediation (Mulvin, 2021; Žižek, 2006). Like the other digital infrastructures that mediate payment such as VISA or SWIFT, the Links blockchain largely operated in the background, with its technical protocols beyond common knowledge.

While some GEN staff like Nour and Lina never expected to know about blockchain in depth, most expressed anxiety and defensiveness about not-(yet)-knowing. Indeed, across the small organisation, despite staff's levels of engagement with the socio-technical infrastructure and its design, the blockchain-related technicalities of the pilot were treated as an intimidating subject. GEN staff consistently asserted their non-knowledge. They used caveats, deflections, and deferred to colleagues. 'I'm only here to learn, I don't know anything about blockchain', said Saif, an IT Manager in a GEN workshop, a few weeks before the pilot's launch in the summer of 2019. Like Saif, Fouad was a self-described 'technical person'. Other GEN staff considered him the main blockchain expert within the organisation and called on him when they had a question. Yet in a 1-1 meeting he told me, 'Blockchain is very complicated. I don't understand all the details. There is more I need to learn. *Lakin* [but] now we have developed the easy user interfaces for staff we don't have to worry as much about how it works.' It was unclear how much one needed to understand. There was a strong affective sense of anxiety around blockchain and its conceptual inaccessibility.

These affects were shared by staff from across the stakeholder groups. One supermarket manager I interviewed in 2018 said, 'I don't know anything about the blockchain yet, you need to ask

someone else’, even though he had been involved in the pilot negotiations. Likewise, when I met BASS camp staff who worked with the supermarkets and supermarket-goers to regulate the shop environment and pricings, they told me ‘We don’t know about GEN or the blockchain, we haven’t understood what it’s all about!’ Across over 30 elite interviews with aid industry experts, anxiety, unease, ignorance, and confusion were consistent affects. Several interviewees asked me to explain blockchain to them. In March 2021, Eliza, a consultant on cash coordination and tech who had written blogs and reports about blockchain, suggested, ‘I still don’t know what the f\*\*\* blockchain is, where it is or what it looks like. How do you make one? How do you put something on it? The aha moment I’ve had recently is, oh, maybe I don’t have to understand it, maybe it will just be a user-friendly interface?’

Literatures on infrastructure stress their background-ness and invisibility; how socio-technical systems only become a subject of attention and debate in moments of breakdown. Blockchain, however, was often discursively in the foreground even before it had a chance to break down or not. Even though aid professionals regularly asserted their ignorance, this did not stop them connecting blockchain with promises and ambitions. For example, in December 2018 I was doing a mind map activity with the GEN staff about objectives for the pilot. Nina, the GEN Monitoring and Evaluation Lead, suggested: ‘As well as giving beneficiaries more dignity, blockchain gives us more accuracy and oversight with who we are delivering the salaries to and makes the system more efficient than when we distributed bags of cash.’ GEN staff regularly conflated blockchain with features and properties of other, connected components of the pilot’s socio-technical infrastructure—and even just generic digitalisation. In Nina’s comment, blockchain simultaneously stood in for the digital wallet concept (the idea of a savings account, which is the main element GEN staff framed as more dignified for refugee workers than cash in

hand), for biometric identity verification (the accuracy technique of the system), and for any kind of automation (which could be capable of making the cash handouts more efficient than a paper-based system). *None of these features demanded or required a blockchain.* A 2020 post-COVID press release about the pilot reported that ‘GEN’s innovative blockchain cash-disbursement system has proven to be a reliable and resilient system, because it can be managed remotely’. This feature also does not require a blockchain. Purported benefits such as efficiency or the reliability and resilience stemming from the shift to remote management (which became a priority in the COVID-19 pandemic context) are driven by automation in general—not necessarily blockchain. The specific link with distributed ledgers was never spelled out, nevertheless GEN staff normalised ambitious leaps of faith about what the technology was capable of. The enchantment with blockchain was inextricably tied to ignorance.

It is important to see aid industry actors’ performances of ignorance as not merely a vacuum, in binary opposition with knowledge. Ignorance has its own substance, is produced by specific practices, and has effects that are ‘distinct from the effects of the lack of knowledge to which the ignorance in question corresponds.’ (High, Kelly, & Mair, 2012, p. 3). Blockchain is widely treated as a conceptually elusive, magic technological object that can without clear explanation provide an extensive range of desirable effects (Jeffries, 2018). GEN and other aid professionals’ non-knowledge is not unique or surprising, given the general mystification around blockchain. Nor is it unusual that aid agencies and partners gloss over what a technology does and how it works and ascribe it with magical powers (Scott-Smith, 2013). This helps to promote and sell the technology as an irreplaceable component of aid (ibid). Indeed, assigning magic agency to technologies or technological teleologies turns them into things that want, do, or transform, and

this obscures the specific processes, agendas, and unequal power geometries at play (Graham et al., 2015). The ignorance around blockchain served strategic aid industry interests.

#### 6.4.1. The pilot as product

Blockchain was parcelled up as part of the pilot model of humanitarian innovation experiments.

According to Lina, GEN Head of Programmes, in the December 2018 workshop,

Donors like to hear we are using blockchain because they like innovation, especially if it is about efficiency and tracking where their money is going. And as we all know, donors are really the be all and end all. It's kind of bad that we've received so much attention and investment with this pilot even before we've done anything. Don't hate the players hate the game, I guess.

Before it achieved anything, blockchain boosted reputational advantages. As Krause puts it, humanitarian agencies 'sell projects in a quasi-market, in which donors are consumers.' (Krause, 2009, p. 9). The pilot was enrolled as part of the humanitarian performance of worthiness to the international audience and their promise to maintain refugee populations well in Jordan if compensated (Gatter, 2021; Tsourapas, 2019). Scandinavian donors were they key supporters of the pilot. For them, innovation was an end in itself. About its launch, a Danish minister commented: 'GEN's pioneering involvement in this new territory can act as an important stamp of legitimacy enabling investment in blockchain solutions designed to help women in emergencies.' Testing blockchain in humanitarian contexts legitimated its use elsewhere.

Aysha was cynical about the claims some of her colleagues were promoting. At different points in my fieldwork, she pointed to a farcical kind of wilful ignorance. For example, about the idea that blockchain was enhancing UN collaboration: 'We already collaborated with UNOPS on the salaries, that's the UN too! Why does working with BASS count, but UNOPS doesn't?' She was also cynical about blockchain empowering refugees:

The blockchain might be good for the UN but *wallah* [really] it's not for the women. The UN is a stage, and everyone is acting. The women can only use this technology during the time they are working with us. For most of them, that's three or six months, then [because of Jordanian policy in the camps] they will not be allowed to work again for a long time. They won't use the technology. We know this really. It's just not going to help them in their lives. Using something like a digital wallet... *ianni* [like]...it's a lifestyle...the contracts are not long enough to change people's lifestyle. We know the women won't like getting the salaries in the supermarkets too. This is for the UN, not for them.

Aysha suggested the benefits of the pilot were always going to be asymmetric; in the next chapter, we will see how her expectations were confirmed. She argued that the pilot was more about cutting costs and gaining reputational advantages for the organisation, and that some of the promises made for blockchain were a convenient delusion. Some aid industry experts I interviewed echoed these sentiments. In January 2021, a digitalisation critic told me, 'I don't think it's helpful to think "aid organisations good, companies bad". In my experience, NGOs care as much if not more about the bottom line as the private sector does. It's naïve to think it's all about the beneficiary. It's all about shining a turd to keep the donor happy and keep bringing the money in.'

Lina, the Head of Programmes, was frank about unknowns (the future results of the pilot), which was not the same as not-knowing. In the December 2018 multi-stakeholder workshop, she said candidly, 'Blockchain's value proposition for beneficiaries may not match up in comparison to the cost savings, so we need to see if that weighs up once the pilot launches.' She referred to my field report findings, for example, about how refugee women reported the supermarket was not a comfortable setting compared with the Wahat. John from BASS's Disrupt Programme responded, 'But we all know that innovation goes through sprints and iterations, you just have to keep assessing the whole range of costs and benefits and adapting on that basis.' Lina and her

team agreed. They suggested resistance to change and ‘teething problems’ were a natural and inevitable part of innovation that would affect beneficiaries and GEN staff and that ‘packaging the pilot as innovation helps with the risk of failure.’ Lina and her team were wary of the pilot’s questionable impact on refugees, but willing to innovate and see how refugees’ responses balanced against GEN’s KPIs (key performance indicators) and bottom line.

GEN and BASS shared a deficit model of refugees’ understanding and their responses to the pilot. Nina, the Monitoring and Evaluation Lead, suggested ‘Women will have a phase of confusion, but going forward, they will be more knowledgeable, aware and accepting of the process.’ Later on, alongside Meriem and Imane in a post-launch workshop, she suggested issues with the pilot were arising from some refugees ‘not understanding the concept of weekly’ rather than monthly salaries. Lina asked that I not conduct research in the Wahat centres until three months after the pilot had been in place: ‘We know already beneficiaries aren’t keen on the pilot simply because it will bring change. They need some time to get used to it, then let’s gather feedback.’ When I was writing up my field report in early 2020 based on my research after the pilot had launched, Alex from BASS asked me to ‘measure what’s normal resistance to change, and what are genuine problems arising from blockchain’. He wanted me to ‘isolate the technical achievement from the implementation [...] It’s good to get the women’s impressions but then there are also hard metrics. Like, the transaction processing times and how they are vastly reduced. That’s captured with the blockchain. Again, I think it will be important to convert perception to reality.’ Alex was asking me to detach the name of blockchain and Links from any issues arising from the pilot in Jordan. The UN agencies were prepared for rupture and contestation from refugee women workers when they implemented blockchain as a

‘streamlining’ tool. They framed refugees within the longstanding colonial, orientalist trope of backwardness and resistance to change (Sukarieh, 2015, p. 393). The strategic fostering of ‘blinkers’ and the marginalisation of particular actors and knowledge forms as less reliable are key institutional tactics of domination (Gross & McGoey, 2015).

#### 6.4.2. Coloniality and paternalism

BASS designed Links as a ‘customisable’ digital infrastructure. However, the costs of entry, necessary resources, and expertise involved in designing, building, and running a node on the network were very high. No GEN staff in Jordan had experience in cryptography, smart contracts, and distributed ledger design. Lina pointed out, ‘We are only a small organisation and not super strong with data management’. In an expert interview with an aid industry consultant, Jennifer, she suggested GEN were following a risky and expensive ‘out with the old, in with the new’ strategy:

Tech solutions might shine gold, but they can also be unsustainable because nobody can manage them without long-term outside expertise, which is not affordable. Blockchain projects will look at infrastructure readiness and tech. But they’re unlikely to look at policy issues, vendor issues, user readiness, or monitoring and evaluation. Then they’re surprised when they end up with supplier lock-in solutions!

I have already examined UN agencies’ delegations of material roles, responsibilities, and authority to companies like IrisGuard, the supermarkets, and ConsenSys through Links. Crucial in implementing Links was GEN’s collaboration with BASS. My fieldwork revealed the grey area between collaboration and paternalism, consensus, and control. The politics of ignorance at

GEN connected with the BASS Links' domination over decision-making and network management. As discussed in the previous chapter, the BASS team designed the blockchain governance framework, delineating what goes 'on or off chain', how technical issues should be resolved, consensus algorithms chosen, and more. At the start of the pilot, BASS's paternalistic authority was encoded in a very concrete, material way: BASS Jordan 'hosted' GEN's node.

Fouad told me in July 2019:

We had an issue starting to use our node. It was to do with the identification aspect, we have different types of ID numbers to BASS because we serve individuals and they serve households,<sup>24</sup> and somehow it wasn't working, and the issue started to affect the BASS node. So, for now we are just using BASS's node and testing different scenarios until we launch our own.

Beyond this initial proprietorial makeup of the blockchain network, BASS also shaped GEN's contracts with vendors. Blockchain induces disintermediation, which requires new kinds of unfamiliar contracts. Rather than the usual arrangement with UNOPS (the logistics agency), GEN had to develop contracts with new technicalities—for example, data agreements with IrisGuard and the blockchain developers. GEN worked with all the same companies as BASS had in their original Links experiment. Over coffee in Amman in December 2018, John from the Disrupt Programme told me he had been trying to get GEN to finalise their procurement since May:

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<sup>24</sup> The agencies' different beneficiary types brought major technical challenges relating to private key management. The agencies are custodians of beneficiaries' private keys, and they cannot share the keys with each other for privacy reasons and so that one agency cannot spend another's money. Much technical development was required to allow GEN and BASS's digital identities for group and individual beneficiaries to correspond with one another in a secure way. In future iterations of the project, BASS planned to collaborate with aid organisations that also delivered to individuals for ease of design.

Within the UN system there are massive reservations about sharing contracts because of the potential shared liability. But GEN needed our help, so I managed to get the right document to share with them. I don't know why their team didn't take the initiative to get it, it only took me asking 2 questions to 2 people and I got it. The problems with getting the pilot off the ground are a combination of slow bureaucratic processes, a lot of GEN people are like "if the book says this thing, then we will go by that", but also a lack of real technical skill and understanding to get it done. Basically, nobody here knows what they're doing. I mean... setting out the TOR [terms of reference] was appalling at best.

Mirroring UN agencies' deficit approach to refugees, John type-cast GEN staff—nearly all Arab women—with the temporal orientalist trope of retardation, slowness, backwardness (Sukarieh, 2015, p. 393). Some aid workers complained about John's tendency for condescension, which was not representative of all BASS staff but was significant because he was the main person employed to work with on the pilot. After the December 2018 multi-stakeholder workshop, I had a de-brief chat with the camp staff and Imane suggested 'The BASS brand is like Nike—just do it. They want to control everything.' At the workshop, John had contested GEN staff's—and my—use of the term 'Links'. He interrupted me to suggest,

You may call this Links but that's not what I mean by Links. The technology is separate from the service delivery. The blockchain is ready to go, humans are the problem. We don't want to be responsible for any issues that arise with GEN's service delivery.

John positioned blockchain as separate from social complexity. He was alarmingly upfront about preserving the reputation of Links and securing its infallibility—just like Alex when he asked me to separate my analysis of the technology from its implementation. Failure would be down to GEN's work, not the blockchain per se. This partly contradicted the UN agencies' promotions of blockchain as the basis for social change—only, it ensured that if change failed to take place, or not as hoped, then blockchain could not be blamed. Conveniently, blockchain could be both the

reason for refugee empowerment and humanitarian streamlining and coordination (when convenient for reputational advantage) *and* it had nothing to do with it (when it came to managing liability and reputational risks). Links was openly available for expert adaptation *and* its only partner, GEN, was ill equipped to adapt it.

Following John's intervention, GEN and I agreed to refer to 'the pilot' rather than 'the Links pilot' for the rest of the workshop. John also asked us to remove 'Links' from the research materials and not to take the field reports I had printed off out of the meeting room. But GEN staff did not passively accept this domineering approach. The camp staff were particularly critical. In a de-brief discussion after the workshop, Imane asked: 'Why is BASS controlling this so much, we have been under the Links label the whole time. This is the Links project?!' She and her colleagues expressed offence and dejection. Staff were wary of the dynamics of subordination to BASS, which were ironic given GEN was a women's organisation, and they pushed against them.<sup>25</sup> In a subsequent workshop, participants were discussing how Links was about 'access to information' and UN agencies' ability to target aid. Lina probed, 'But that's a risk for GEN, being leveraged by BASS for our data.' To John's retort ('I would hope not, it should be quid pro quo. You are using us for data too'), Lina replied, 'Well, mainly we are using you for the free tech.'

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<sup>25</sup> Camp staff discussed BASS's paternalism within a broader context of racism and colonialities of knowledge and expertise in Jordan's aid sector. In a conversation with Dina and Imane in June 2019 on the road back from Zaatari, for example, Dina suggested, 'Foreigners think they know better when they come to Jordan. And they are treated that way by senior staff in the agencies because they have perfect English.' Imane added, 'If you don't have a Jordanian passport, it's a fast stream to recognition in NGOs, it's white saviourism. We Jordanians assume foreigners will be better, more professional and knowledgeable. It will be less effort and resources training them.' As an Oxford-based, white English speaker coming in as an external 'expert researcher', I fed into to these dynamics of white Anglophone supremacy.

Colonialities in power, knowledge and being survive colonialism; coloniality is not just about the material domination of populations based on racialised hierarchies, it also plays out on an epistemic level, involving the dismissal and subjugation of stories and knowledge systems as communities are constructed as intellectually inferior by others (Maldonado-Torres, 2007; Said, 1994). Digitalisation projects are continuous with colonialism when they follow consistent patterns of domination over voice, knowledge, and power (Casilli, 2017; Couldry & Mejias, 2021, p. 4). The superiority-deficiency binary surfaced in the implementation of GEN's blockchain pilot on multiple levels as non-knowledge was claimed, accessed, and deployed to different ends. Despite BASS's promotion of Links as a customisable, open source blockchain in which all members were equal, GEN did not have an equitable role in Links. Staff felt routinely diminished as BASS exercised gendered paternalism over the development of the pilot. Here, as Aradau puts it, 'The power of ignorance is entwined with the production of credible and incredible knowers, as well as with the reproduction of relations of (epistemic) domination' (Aradau, 2017, p. 330). The BASS team positioned themselves alongside technology vendors as the core experts. They managed the terms 'Links' and 'blockchain', and what was associated with them. The labours of camp staff propped up the socio-technical system, but their struggles and subjectivities were invalidated by colleagues and invisibilised in GEN's promotions of the blockchain pilot as streamlining humanitarian action.

However, patterns of coloniality are not binaristic (North vs South) and they do not create crude victims. Local and regional actors legitimise the so-called Arab world as a space for intervention and capital (Carpi, 2019; Hanafi, 2019). Launching the blockchain pilot was strategically advantageous for GEN, its reputation and its bottom line. The dynamics of ignorance around

blockchain—mystification and leaps of faith about its capabilities and strategic blinkers about its effects—supported its implementation despite risks and unknowns for aid workers and refugees. GEN staff sometimes challenged the paternalism of BASS. They also fed into the complex colonial present of aid projects in Jordan, where the epistemic violence and arrogance of aid industry actors positions beneficiaries (Muslim, Arab people, here, Syrian refugees) as an obstacle to linear progress or evolution—which is to be resolved through capitalist integration and entrepreneurial achievement (here, financial inclusion and empowerment) (Sukarieh, 2015). The blockchain pilot contributed to epistemic injustices in humanitarianism by which the discourses and perspectives of not only aid workers but also refugees were neglected and discredited (Fricker, 2007; Kathiravelu, 2021, p. 5).

## 6.5. Conclusion

This chapter examined whether the blockchain pilot streamlined the local aid work of GEN in Jordan. In doing so, I evaluated the objective of streamlining and its social costs for the aid organisation and its staff. Blockchain fostered disintermediation. GEN's use of blockchain helped them cut out intermediary fees in delivering cash assistance. GEN also reduced the tasks of aid workers by delegating humanitarian responsibilities (authenticating and authorising aid payments) to private companies and technology. These transformations met GEN's objective of streamlining aid: they reduced costs, labour, and time for GEN and its staff, in general and in total. However, examining these transformations through the framework of *infrastructure justice*—materialities, timescapes, and affects—reveals important labour inequalities, struggles, and contestations that GEN's rhetoric of streamlining glossed over. In the chapter, I analysed (i) liquidity politics: how the *material* re-distribution of humanitarian resources, responsibility, and

care to non-humanitarian actors eroded the reliability of aid infrastructure; (ii) data work: how aid workers' administrative rhythms (were) challenged (by) the *timeline* the blockchain pilot imposed; (iii) authority delegation: how the structure of GEN's blockchain node amplified existing organisational hierarchies; and (iv) the politics of ignorance and paternalism: how *affects* of confusion and mystification around blockchain and the blockchain pilot were accessed and deployed to extend the epistemic hegemonies and strategic interests of aid institutions.

Through the *infrastructure justice* lens, I showed that injustices instantiated by the blockchain pilot followed the lines of neoliberalism, coloniality, and intersectionality, at the same time resisting binaristic judgements of North vs South or private vs public. In other words, GEN's infrastructure prioritised market actors and efficiencies at the expense of substantive care for refugees and aid workers. It reinforced asymmetries, especially around gender and race. However, the market actors profiting from and extending their influence via this infrastructure were not simply western but local and regional companies. UN agencies too were strongly motivated by their bottom line. Jordanian aid professionals were both subjected to and participated in the colonialities in power and knowledge. The chapter also examined contestations of hierarchy and paternalism in the blockchain pilot, for example, through aid workers' adaptive strategies involving communicative labour and revisions of administrative timelines. This demonstrated that infrastructure is not fixed, but contingent and continuously remade and maintained.

How this pilot played out for GEN exposes lessons for re-orienting infrastructure projects towards socio-economic justice according to different organisational perspectives. Just

infrastructure would ensure the integrity of aid, as opposed to the reliance on corporate resources, practices, and commitments. It would establish equitable collaborations between differentially resourced partner aid agencies. For aid workers— people whose work is imagined as simply automatable or soon-to-be-automated—justice-oriented infrastructure would value their vital socio-technical and communicative labours and working conditions. For example, through reasonable administrative timelines and inclusiveness regarding access to information, essential skills, and resources. Crucially, justice connects with epistemic recognition, valuing, and prioritising of the subjectivities, perspectives, and expertise of aid workers and refugees— which in hindsight, may have meant the blockchain pilot would not come to fruition in the first place.



# Chapter 7: Faith and failure: Refugees' cultural contestations

In this chapter, I evaluate the outcomes of GEN's blockchain pilot project for refugee women workers. I address the question: **how does the blockchain pilot advance or hinder refugees' needs, priorities, and concerns?** I take the approach of investigating this from refugee women's perspectives. This means examining the very premise of the project: that a type of backend accounting system can be used to empower women, and that empowerment is a valuable concept according to those women themselves.

## 7.1. What is the impact of invisible infrastructure?

In the pilot project, GEN use blockchain as the new infrastructure of refugee women workers' salary delivery. This reconfigures how GEN move money around and therefore how and when workers access their cash salaries. It reformulates the institutional arrangements workers deal with and thus where and who to go to with payment problems. The implementation of blockchain also changes how the aid apparatus knows and provides for workers. It shifts how information about them is managed: names and account details are no longer shared with a bank, for example. The blockchain is a living, real time record of workers' transactions, offering an unprecedented level of visibility over their financial behaviours.

Yet, as far as the refugee workers know, blockchain does not exist. This is the case in the Wahat pilot but also the wider blockchain-enabled food distribution system (which uses Links) in Jordan's camps. The two 'digital wallets'—one for the household food entitlements, one for the Wahat salary—are not forms of mobile money. They do not have any sort of peer-to-peer functionalities that might be expected with a blockchain project. Refugees cannot access or manage their individual or household financial record on their own digital devices. Instead, blockchain is intentionally backgrounded by GEN on a 'need to know basis': because the technical complexity is deemed inappropriate for the end-user context, due to the mixed literacy and numeracy skills and technical capacities of workers. Informed by GEN's 'beneficiary sensitisation' strategy, workers understand their digital wallet (*maHfadda* meaning wallet) as a new kind of bank account which, as with their monthly food wallet, is accessed through a biometric eye scan at the local camp supermarket. Workers cannot add money to the account, only withdraw it. When their eyes are scanned by the supermarket cashier, the biometric check authenticates the transaction by triggering a cryptographic private key—which they do not know they have.

GEN's aims for the pilot are 'exploring how blockchain can empower women affected by humanitarian crisis' and 'using technological innovation to advance women's economic empowerment'. But does blockchain, in the socio-technical instantiation of the pilot, have specific qualities that benefit the women refugees? How can this be when the blockchain is not known or visible to them? Does it matter that refugees are not informed that a new blockchain is at work, let alone how it works? Most infrastructure has invisible qualities (G. Bowker, 1994; Star & Ruhleder, 1996). Abstraction is after all a fundamental feature of computing and money

alike. For example, most people don't know the machinations of the financial infrastructure when they swipe their contactless card in a shop or receive a payslip from their employer. People are much less likely to think about the nature of the value at the source of transactions or how money moves than they are about keeping that money and their source of income (Maurer, 2015b, pp. 40–42). Opacity and obfuscation characterise how money and information are controlled in the digital era (Pasquale, 2015). Indeed, when technology is translated into a new context, designers often consider it successful if it becomes a 'black box'. This means its inner workings are opaque and go unquestioned because operations seem efficient and effective. In other words, the technology is 'made invisible by its own success' (Latour, 1999, p. 304).

In the case of the GEN blockchain pilot, the technology is invisible to the women refugee end-users, but this is not because it is especially successful. Nor do refugees consider the processes of their salary's delivery a matter of taken-for-granted indifference. On the contrary, this chapter reveals how the pilot is a cause for deep contestation. I unpick how the new institutional arrangements induced by GEN's shift to a blockchain system unsettle workers' money management and disrupt their trust in the service provision. The complex outcomes for refugees of the new socio-technical infrastructure cannot be simplified as 'blockchain's social impact'. As my literature review has suggested, despite techno-optimist discourses positing blockchain as a revolutionary agent, it must be understood as a socio-technical infrastructure. It is not possible to separate out 'pure technology' and its effects. I examine not the effects of blockchain per se but the blockchain pilot. Centred around the terms and experiences of the women workers, I investigate the impact of a set of socio-technical practices, spaces, artefacts, and interfaces.

### 7.1.1. Three sites of contestation: space, interface, and accounting

For refugee women workers, the pilot is about going from a monthly envelope of cash provided by GEN at the Wahat workplaces to a system of more regular cash withdrawals at the supermarket, authorised using biometric iris scans. Accordingly, this chapter identifies and examines the three main factors affecting workers' experiences of the pilot: **(1) Space: the spatial relocation of where salaries are delivered; (2) Interface: the use of biometrics in salary delivery; (3) Accounting: the women's money management and accounting practices.** These refer to the primary setting of, access to, and everyday use of the new socio-technical system. Examining these concerns in turn is a lens into the core sites of friction and contestation between the reimagining and reconfiguration of essential financial infrastructure by GEN and refugees' own worldviews, resources, and priorities.

In the first section, I examine refugee women workers' experiences of the spatial relocation of salary delivery from the private Wahat centres to the public camp supermarket environments. I show that cross-cutting issues of mobility, gender, and space lead to new burdens on women, particularly those already more disadvantaged with disability or childcare issues. The pilot obliges all women workers to navigate the uncomfortable public financial visibility of collecting their salaries in the supermarket. The workers' perspectives demonstrate that, despite the projections of GEN and other proponents, money technologies—even high-tech digital wallets, automated biometric payments, and decentralised, cryptographic blockchain infrastructures—are not conduits for seamless, unfettered financial flexibility. They are embedded in specific places, practices, social dynamics, and concerns. The infrastructure arrangements are revealing of the

asymmetric political order: refugee women's situated concerns about the relocation are subordinated by GEN to make the pilot work.

The second section focuses on the technology refugee workers use to access their salary, biometric iris scans. Biometric checks are an integral part of the blockchain pilot's socio-technical infrastructure. Iris scans at the supermarket checkout ensure only the owner of the wallet can access the cash. They are intended by GEN to facilitate greater financial control, security, and independence for individual women workers. Yet, my research counters the assumed value of financial individualism. Women's own perspectives suggest a range of collective, household-centric concerns and priorities, as well as unanticipated grounds for distrusting and contesting iris scanning machines. These grounds for contesting biometric technology go beyond normative western paradigms of individual data rights like privacy and informed consent, revealing embodied anxieties about health and wellbeing—which are delegitimised by aid organisations as unscientific.

The third section then examines how the blockchain pilot is incorporated into the women workers' everyday accounting practices. The blockchain-enabled digital wallet is intended to help with money management, giving women a flexible, alternative, and safe way of saving cash. However, I show how workers evaluate and contest the pilot through the lens of *baraka* (بركة), an Islamic concept meaning (not) blessed or consistent, substantial, and dependable. This concept allows us to unpick how infrastructure change transforms the substance and rhythm of—and workers' faith in—payment.

I show that injustices are wielded through infrastructural shapings of the temporality, materiality, and sociality of payments. Both the physical money and information about the salary were regularly unavailable and workers deemed the digital wallet (and the new corporate actors involved in managing it—the supermarkets) an unreliable system of saving. Workers reverted to analogue money management strategies, such as keeping a record of money earned with paper and pen and storing cash at home.

Overall, this chapter unveils and emphasises workers' priorities and analytical frames. I show how this humanitarian blockchain infrastructure is experienced in practice as a combination of socio-technical things, spaces, relationships, affective engagements, and practices. I provide insight into cultural contestations of infrastructure, tracing how anxiety, distrust and moral concerns are articulated through emic, embodied, and religious frames. Faith—not simply trust—emerges as a significant factor in shaping responses to innovation. The chapter draws on feminist approaches, especially social reproduction theory and critiques of Orientalist Muslim women's empowerment narratives (Abu-Lughod, 2013; Ahmed, 1992; Elyachar, 2010; Rahbari, 2020) to suggest that this implementation of blockchain in Jordan's camps must be located alongside other feminised financial inclusion projects that do not identify or address the most important concerns and root problems in women's lives. Rather, the pilot imposes and relies on new burdens, labours, and responsibilities for women workers, which extend existing conditions of precarity and oppression by the aid apparatus in Jordan. Within this, I highlight the (analogue) technologies, resources and strategies women workers draw upon for socio-economic survival.

## 7.2. Money, gender, and space

‘We’ll be very happy if they bring us donkeys instead.’  
—Eman, a textiles worker based in Azraq

On a grey and drizzly day in December 2018, a group of six women gathered in a Zinco caravan for a focus group discussion about the pilot project which had not yet launched. In Azraq, weeks of rain had left vast pools of murky water to collect around the caravans and along the dirt roads. As our discussion took off, we broached the new concept GEN had developed of collecting salaries in the supermarket. Eman, who is a mother of three in her 30s and, with her colleagues in the group, produces colourful textured rugs each week at the Wahat, gestured towards the window and said frankly, ‘Look, we’ve been asking for transport for so long. See that desert we must walk across? I say we go back to the time of donkeys. We’ll be very happy if they bring us donkeys instead.’ The group burst into chuckles. The others responded with humour; ‘We have lots of cats and dogs, but you can’t use them for transport, can you?’ ‘Not unless it starts snowing in the desert. Then we could use sleds...’. These jokes were poignant. They signified the spatial oppression experienced by residents of Azraq. Mobility in the camps was discussed as a pressing issue, particularly among elderly and disabled women and those with young children. Districts are spread out sparsely and my survey found that the walk from workers’ homes to Azraq’s Sameh supermarket—the only one in the camp—reportedly takes between 20 and 90 minutes. Whereas in the hustle and bustle of Zaatari the supermarkets provide bus services and people can pay for a range of other transport options such as private cars, due to the acute

securitisation in Azraq, the only permitted transport are bicycles and bicycle carts. These are only ridden by men. This not only demonstrates how inequality is intimately linked with mobility, space, and gender norms. Eman's request for donkeys also encapsulates an important dynamic in women workers' experiences of the blockchain pilot: the mismatch between their own priorities and the humanitarian innovation. Women regularly re-routed discussions of the pilot and the digital wallet to longstanding issues such as this which they considered more important.



Figure 26: The bleak view between one district and another in Azraq, December 2018. Without transportation, residents must walk across desolate stretches like this to get to the supermarket or the GEN Wahat.

### 7.2.1. Disruptive innovation: infrastructure reconfiguration for whom?

Deploying blockchain involves *infrastructure reconfiguration*—cutting out intermediaries in an aid delivery system necessarily requires that institutional and material arrangements shift.

Infrastructure change is inherently experimental and disruptive: infrastructural relations are complex and so the effects of reconfiguring them are always emergent and unpredictable in practice (Harvey et al., 2017; Jensen & Morita, 2017). The blockchain pilot in Jordan is an example of disruptive innovation. ‘Disruption’ is a business principle commonly held since the late 90s about ‘the perceived ability of technologies to upend the status quo of power within established industries and social institutions’, usually so that new market entrants can displace established incumbents (Fiore-Gartland & Neff, 2016, p. 101). Here, GEN uses the decentralised infrastructure, blockchain, to (theoretically) cut out bureaucracy and intermediaries. In the blockchain pilot, the bank, the logistics agency UNOPS, and GEN field staff no longer deliver the physical cash to refugees. This is supposed to enhance the efficiency of the process and make cost savings. Disruptive innovation assumes that the power, expertise, and practices of intermediaries can be re-codified or are unnecessary (ibid). But displacing specific actors from a system does not necessarily make them or the need for their role disappear. As I discuss later in the thesis, local banks are also still a constituent part of the pilot (they are still where the cash comes from), and—inevitably and paradoxically—other intermediaries come into the picture. In this case, two refugee camp supermarkets.

Instead of collecting their salaries from the GEN field staff at their Wahat workplace, the pilot means refugee women workers have to collect it from supermarket cashiers. With

cryptocurrencies, which are the most notable example of blockchain-based systems being adopted by everyday end-users, people specifically choose to benefit from disintermediation. For example, people use Bitcoin to make transactions without the involvement, oversight or control of banks, payment processors and governments. By contrast, in the case of this humanitarian pilot project, refugee end-users did not choose the new intermediaries or to circumvent the old ones. While—in theory—delivering salaries through the supermarkets instead of the fixed monthly cash-in-hand system should mean workers have more financial freedom (to decide when and how much salary to receive),<sup>26</sup> as this chapter shows, these freedoms are not realised in practice. It would also be disingenuous to suggest these theoretical freedoms for refugee workers were the main reason GEN decided to deliver the salaries through the supermarkets. The supermarkets are the only possible settings in the camps where GEN could host the digital salary delivery because they have cash liquidity and security capabilities. New infrastructure does not operate from a blank slate; GEN must implement blockchain within the constraints of the Jordanian camp contexts. As in other humanitarian technology projects (Madianou, 2019a; Madianou, Ong, Longboan, & Cornelio, 2016), the disruptive innovation is driven by and serving the priorities of humanitarian organisations—launching the blockchain pilot—more than their subjects. Refugee women workers did not favour the supermarkets as intermediaries and settings for collecting salaries. In fact, the relocation introduced new problems by bringing issues of geography, finance, and gender into entanglement.

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<sup>26</sup> GEN promote the idea that refugee women workers are now (1) unconstrained by limits and can withdraw *any amount of cash* from their digital wallet at the supermarket till, and (2) unconstrained by access, able to withdraw cash *whenever they need*.

### 7.2.2. Navigating the pilot: gender and in-situ financial privacy

In both Zaatari and Azraq, the Wahat are near the supermarkets, approximately a 10-minute walk away. Some saw the benefits of being able to flexibly collect their salaries at the supermarket instead of the Wahat, for example because it is open on weekends. The majority of workers were well accustomed to passing by the supermarkets before or after work as part of their routes and routines, so the relocation was not a source of upheaval. However, a few women said that before the pilot they rarely or never used to make trips to the supermarket. This was because, for example, their husbands managed the shopping (in Azraq, ‘men can carry the bags in a bicycle cart but we don’t do that’), because they are older and frail, or because they struggled with journeying there in the winter when the roads are muddy and prone to flooding. Those who lived far away or faced mobility issues were now obliged to visit the supermarket more. The challenge of getting around the camp was particularly acute in Azraq, but some Zaatari residents with limited means also said they could not afford transportation. The relocation of the salary delivery introduced opportunities for some, but it extended existing challenges for those already disadvantaged in terms of mobility.

Where challenges were extended, gender dynamics were important. The GEN Wahat are women-only spaces. Several men are employed to guard the gates, but they are not permitted to enter, and GEN staff are generally women. Throughout the research it was clear that many workers valued this: the caravans within the Wahat were seen as spaces of women’s friendship, solidarity and often intimacy. For example, spending time in the nursery or the beauty and hairdressing training rooms, women would breastfeed and remove their headscarves, which they

would never do in public. The gender separation was also important for a few women because they reported it was the main reason that they and/or their husbands considered the Wahat job appropriate and agreeable. Most of the women had never been in paid work before, followed conservative Muslim gender codes carefully and would not spend time with male strangers. For many of them, mixed gender environments such as the supermarkets were considerably less comfortable to navigate than the Wahat. Across focus groups, the supermarket salary collection was described as uncomfortable (*mish muriih/mbrtah*) in comparison to the Wahat, and workers regularly used the moral phrase ‘not right’ (*mish sah*). Most groups posed their own alternative suggestions for locations and processes, for example, ‘Other agencies have ATMs even within the supermarket but in a quieter corner. This would be better for us.’ ‘They could have the iris scan if they want, but why not in the Wahat? It’s our workplace, the supermarket is not right.’ While GEN’s previous cash delivery process had its own problems, workers missed the private Wahat setting and the trusted interactions with GEN field staff there—who, as opposed to supermarket cashiers, have the information about different workers’ cases and can directly investigate issues (e.g., if a payment is delayed or does not correspond with the hours worked). It was unclear to workers why GEN would abdicate the responsibility of managing the salary distribution to the supermarket companies.

As the only official shops in Zaatari and Azraq, the supermarkets are busy, bustling environments. When the cashier scans a workers’ eye with the iris scan technology, the identity verification allows the balance in their GEN digital wallet to be made visible on the checkout screen. The balance is also displayed on a second tablet screen and read aloud by the cashier. Therefore, at the checkouts, the socio-material arrangement means that the salary withdrawals

are conspicuous to other shoppers (see Figure 27). These other shoppers cannot withdraw cash themselves: the cash function is unique to this blockchain pilot as only GEN workers are able to access physical money from the supermarket checkout, which otherwise operates in digital-only transactions. Some workers reported receiving unwanted public scrutiny because of this: ‘It’s hard for us women to receive the salary at the supermarket. People get annoyed when we take their place in the queue and they ask us questions about where we work and how much we earn, or why they aren’t receiving the same cash.’ Workers in the most financial need who were visiting the supermarket regularly in relation to the salary reported discomfort around their public financial visibility. This was uncomfortable especially for the women who were concerned about being pressurised to repay debts. Fatima, a teacher in her 40s who had a big family of nine and great repartee joked:

We should call our newborns *Rateb* (*meaning salary but also a boy’s name in Arabic*) just from how much we ask about the salary! Sometimes I go with colleagues twice a day, it gets embarrassing because the staff there have memorised our faces from how much we ask about the salary. But seriously, when you have a big family like me and a lot of expenses, you have a lot of debt. If you go to the supermarket, people see you taking your cash and before you know it your neighbour will demand that you repay them immediately.



Figure 27: A Wahat worker about to have her iris scanned by the cashier, plus a male onlooker prying on the screen.

Tazweed checkout, Zaatari camp, December 2019

Women workers' accounts provide new knowledge about the entanglement of blockchain systems in specific geographies and social relations, despite powerful discourses emphasising notions of technocracy, algorithmic governance, dematerialisation and disembeddedness (Zook & Blankenship, 2018). This blockchain pilot shifted the terrain of salary collection for refugee workers and exemplifies how money's functioning depends on its embeddedness in space and society (Zook, 2019). Money involves sensitive politics of communication, material practices of concealing and revealing, and, as these findings demonstrate, is deeply embroiled in everyday frictions around reputation, inequality, and justice (Nelms & Maurer, 2014). Maurer and Swartz note the vulnerabilities which transacting necessarily entails—for example, in waiting for authorisation, clearance, and settlement when a cashier swipes your bank card (Maurer & Swartz, 2017, p. xxiii). These sensitivities are arguably intensified in humanitarian settings where scarce resources are distributed on the basis of needs, which are measured by aid organisations in opaque, quantified assessments and invite contestation among refugees around fairness. The regular use of the expression 'not right' (*mish sah*) indicates workers' moral issue with the shift in payment intermediary.

Cross cutting issues of mobility, gender and space undermined the potential benefits of relocating salaries to the supermarket. Prompted by the infrastructure reconfiguration via blockchain, the relocation to the supermarkets disrupted public-private norms and, as we will see, refugee workers' very trust in the system. It is twistedly ironic that these everyday dynamics of privacy have not been accounted for in this large-scaled and pioneering implementation of blockchain. This is the technology based on cryptography, the very science of privacy, secrets, and ciphers, which has enabled its users to exchange and transact with unprecedented

confidentiality and anonymity. Promotional materials about the pilot celebrate the privacy and security benefits of using blockchain for refugees in terms of aid organisations' custodianship of personal and transactional information about them ('Refugees don't have to worry about an external bank having their data'). Yet, GEN and BASS neglect the issue of transactional surveillance: cash is anonymous, but the pilot turns Wahat workers' habits of cash withdrawal into data points. These findings suggest that any evaluation of the privacy-enhancing properties of blockchains must consider the broader socio-technical infrastructure in anthropological terms, examining closely the lived experiences, conventions and settings in which people make and manage boundaries of public-private life. Clearly, Simmel's claim that institutional power and social control are negotiated through practices of visibility and disclosure, wielded in the exercise of determining how secrets are kept, who is required to remain visible and who is not (Manderson, Davis, Colwell, & Ahlin, 2015, p. 184; Simmel, 1906), holds in the age of digital humanitarianism and financial inclusion.



Figure 28: Outside Zaatari's Tazweed supermarket. Men and boys park their bikes alongside mural of an eye, the payment method there, December 2018

### 7.3. Do Muslim women really need biometrics?

In her ethnography 'Do Muslim Women Really Need Saving', Lila Abu-Lughod critiques patronising, Orientalist approaches to feminist rights 'under Islam' based on grounded research with women's communities. I reference this title to suggest, based on my findings about women's own priorities, problems, and ideals, that the link between biometrics and visions of their empowerment is problematic. I evaluate the idea espoused by GEN decision-makers that individual workers need biometric checks for their digital salary accounts to ensure financial

security, control, and independence from men. Women workers' embodied experiences of iris scanning and their perspectives on its implications, and on the gender dynamics of money management, provide vital accounts which challenge the very aim of biometrically mediated empowerment.

Since 2013 biometric iris-scanning devices have been used by UNHCR to register camp residents' identities as refugees. Since then, the use of biometric checks has proliferated in both Zaatari and Azraq. Since 2016 they have been used in supermarkets to authorise access to food. In 2019 they were also installed in bread distribution centres. The Wahat salary delivery is the next iteration in this trend. As with the decision to implement the blockchain pilot through the supermarkets, it would be disingenuous to suggest GEN's decision to use biometrics to authorise salary payments was purely (or even *at all*) out of their empowerment goals for refugee women. Since the supermarkets were the only suitable settings to deliver cash (with liquidity and security provisions), and the supermarkets already have biometric iris scanning machines installed at the checkouts as the authorisation mechanism for digital payments, GEN *had to* use biometrics to deliver the blockchain pilot. Again, we can see that infrastructure projects follow the grooves of the context. Despite rhetorical claims asserting their social benefits, decision-making around them in humanitarian settings is dominated by the goals and priorities of powerful institutions. UN organisations use biometrics because they are efficient way of targeting aid and tying people to the data about them, which is used to support population management and mobility control apparatuses—which in Jordan are co-managed with the neoliberal authoritarian government authorities. Critical debates around the use of biometrics in refugee contexts usually focus on the pervasive absence of informed consent, data protection issues, security leaks, surveillance, and

function creep (Kaurin, 2019; Latonero et al., 2019; Schoemaker et al., 2018). These issues hold with the iris scanning machines in Jordan's camps. However, in my research they were not the concerns voiced by refugees themselves.

### 7.3.1. Normativity, choice, and unexpected emic concerns

This high-tech access device but also the top-down decision-making around its implementation had become normalised in the camps. I was surprised that most workers described the iris scan interface at the supermarket as easy and normal (*sahl* and *3ady*). Testament to how, with ritual usage, new technologies become rapidly mundane, most people considered biometric checks a habitual and efficient practice. The issue of data privacy was never raised and has no direct translation in Arabic.<sup>27</sup> A few people brought up the problem that the iris scans were obligatory unless the machine didn't work on your eyes due to cataracts or other ocular complaints. A few workers also expressed preference for other forms of ID: for example, 'They should have just left it on a card like it was before, that was best.' These perspectives signal the importance of choice. In refugee camp contexts where opting out of a technology can mean opting out of eating, informed consent is meaningless (Latonero et al., 2019). Workers were not given the opportunity to weigh up alternative options such as PIN numbers or photo ID cards—which I would argue meaningful informed consent should include. Biometric iris scans are a requirement in Jordan's camps for access to basic services.

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<sup>27</sup> This is not to say that refugees do not care about data privacy. On the contrary, many asylum seekers and refugees evade and resist identification infrastructures. For example, some people undertake grievous forms of systems avoidance involving self-harm to escape biometric data capture (Akbari, 2021). Anecdotally, I have encountered persons who have burned their own fingertips to avoid mobility restrictions associated with biometric governance.

Unexpectedly, the single most common concern with biometrics, which was regularly articulated across focus groups, was its health implications. Women workers expressed a range of fears and perceptions about the bodily effects of regular iris scanning: ‘We will go blind from the amount of eye scans we do.’ ‘It’s all the time for the salary and the food and every time we want to buy bread too. My eyes burn after I scan them, it’s too much.’ ‘I fear for my eyes and my health.’ Some people mentioned worries about the effects of iris scanning machines on pregnant women or the reproductive organs more generally. Health concerns also arise in investigative journalist Yasmin Fanselow’s short [documentary](#), where she interviews supermarket shoppers in Azraq about biometrics and informed consent (Fanselow, 2018). The workers—and I the researcher—raised the concerns to GEN throughout the research but they were not addressed by any outreach efforts. Perceptions of the trustworthiness of digital infrastructure, especially controversial technologies like biometrics, is a key factor in the success of aid projects (Masiero, 2018, p. 8). Medical anthropology shows us that social trust and perceptions of risk matter through and emerge in embodied forms of knowledge (Grimen, 2009). I found it difficult to discuss the health anxieties with GEN, who readily dismissed them, rather than thinking about how the anxieties might have implications for how they are doing consent in their innovation projects. For example, how aid organisations currently focus on consent to data rather than interactions with hardware. Rather than being taken seriously as expressions of embodied discomfort, distrust in and resistance to technological change, these concerns were delegitimised, reifying a divide between traditional/unscientific/indigenous and rational/modern/western thought that has long persisted in the aid industry and beyond (Agrawal, 1995). These health concerns were not necessarily irrational, especially for women with issues such as cataracts and pregnancy. They

were discussed more widely by women workers than any about gaining more financial independence as individuals.

### 7.3.2. Biometrics for women's protection?

A number of groups discussed the 'gendered affordances' of biometric technology promoted by GEN staff (Schwartz & Neff, 2019). In the Wahat, workers were informed that biometric checks are intended to give women more individual control over their salary since nobody else—such as coercive male husbands or relatives—can access it. Some described this as beneficial in theory: 'This protects women who are abused and have no say.' However, very few women participants were comfortable personally reporting that they themselves found it useful in addressing personal circumstances of male control, especially in group settings. On the contrary, several workers expressed sobering scepticism that the biometric checks could ultimately address abusive relationships and coercion: 'They want to protect us from the men who stand at the Wahat gates waiting to collect the salary from their wives, but now the same men can be waiting outside the supermarket.' GEN's programmes prioritise women who have survived or are enduring gender-based violence and oppression. But in the focus groups, participants would stress that this was not a majority issue. One group joked at length about how they in fact controlled their husbands: 'I let him think he makes the decisions, but I'm the one who really manages the money'. The realities of gender relations are mixed, and some suggested that workers should be able to *choose* whether they biometric checks as security protection on their salary were useful to them or not.

Biometrics are a fundamentally individualist technology engineered to ‘fix’ people to identity (Martin & Whitley, 2013). Designed to prevent fraud or manipulation, biometric systems are ‘stiff’ in the way they insert people into pre-defined categories and allocate resources (*and manage mobility*) strictly on that basis (Scott-Smith, 2018, p. 6). Here, they are used to identify the composition of a single person’s iris. However, workers highlighted the importance of the cash salary as a collective resource rather than something they wanted more individual control and security over. One of the questions we asked each time in the focus groups was ‘what does the salary mean to you?’. In response, the most common position was that the earnings were for the household rather than the individual. For example, in December 2018, Eman suggested:

We don’t share things with our husbands because we’re forced to, we’re a family. The salary is not for us. It’s not for extras or luxuries. Working here helps us afford the basics for our children, pay some of our debts and get the essentials we were lacking before, like medicine, mattresses, kitchenware.

Indeed, many groups mentioned that the monthly aid they received was never enough to last their household a whole month. Workers often discussed their strategies for making the food entitlement last, for example by selling supermarket items for cash to buy cheaper vegetables on the informal market,<sup>28</sup> pickling foods and freezing bread.

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<sup>28</sup> Humanitarian goods, including digital cash, materialise particular ethics, logics and sensibilities about aid, but also about market exchange (Cross, 2013). They inscribe market relationships. In both Zaatari and Azraq camps, the food entitlements system is cashless. All residents must interact with iris scans to pay for their main food supply. The introduction of iris scans came after a coupon system, which also limited people in their purchasing ability: they are only redeemable at the supermarket. With biometrics in place, one can only buy the food available there. We can therefore see them as carceral technologies because they peripheralise and restrict refugees into a socio-economic ‘carceral archipelago’ (Axster et al 2021).

Most focus groups revealed negative attitudes towards the supermarkets. In Azraq, they reported that because there is only one supermarket, the lack of competition keeps prices high. Workers suggested the informal street markets were more affordable, with a much greater variety of goods, and better-quality produce, especially vegetables and meat. Everyone used the informal markets in Zaatari, where (unlike Azraq) the security was more flexible, and people brought in goods from outside the camp. These markets were against the rules but tolerated by the authorities. Women workers reported visiting the street markets more often than the supermarket because stall

### 7.3.3. From individual protection to collective need

Workers' collective outlooks on finances accords with other accounts of women's concepts of welfare in circumstances of poverty, for example, the cooperative familialism in rural Indian communities which downplays the importance of individual rights and care needs (Sen, 1987, p. 7), and matri-centric approaches to feminism and livelihoods in migration studies (Erel, 2011; Erel & Reynolds, 2018; O'Reilly, 2019; Rahbari, 2020). Workers had a range of different socio-economic backgrounds, remittance networks, family sizes, but all the focus groups emphasised circumstances of entrenched poverty and debt, and this was especially the case for those with big families and expenses such as healthcare. Workers related the pervasiveness of financial shortfalls to the strict labour restrictions on refugees in Jordan, the scarcity in legal work opportunities with decent pay and long-term contracts, and the significant challenges in accessing formal loans. The 'standard operating procedures' of cash-for-work schemes such as the Wahat require roles to be rotated every 3 or 6 months and pay is limited to between 1 and 2 Jordanian Dinars per hour, roughly equivalent to £1-2 (UNICEF Jordan, 2018). Such schemes are all technically 'incentive-based volunteering' and so straddle charity and underpaid labour

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holders would extend credit: it was possible to take the produce you needed and pay later. Selling goods bought at the supermarket for cash (usually via local traders, often on the street outside the supermarket) was described as commonplace among all camp residents. Many workers told us how this was a necessary way of accessing the informal cash economy. But it often meant losing out by selling what you have for less than its value in the supermarket. These cultures of practice reveal the multiplicity of money. People differentiate between different types of money based on their use and fungibility (Dodd, 2014). Aid is always part of hybrid money ecologies which people continuously remake (Elyachar, 2005). In continuing to provide physical cash in a context of restrictive demonetisation, the GEN blockchain pilot maintains refugee women workers' access to a crucial resource. However, as I suggest in this section, the use of iris scans was restrictive in other ways.

without representation.<sup>29</sup> The only other official work opportunities outside the camps are characterised by poor conditions and pay, limited low-skilled roles, and a bureaucratic maze to require a permit in the first place (Lenner & Turner, 2019). Crucially, strict refugee labour regulations in the camps mean that only one person per household can be in employment at a time. This rendered money management even more of a household matter: the few with an income felt responsible for the collective as the *mwklet nfsha*, the provider or breadwinner.

Workers who had experienced protracted turmoil and instability such as ex-residents of the high security District 5 in Azraq had more acute concerns about the individualised biometric system. Dina and I spoke with Sara in a quiet corner of the Wahat playground in Azraq. Sara had a congenital disease and had also been sent to live with her family in District 5 upon arrival to Jordan, feared the biometric checks might disable her from accessing their salary in extenuating circumstances of policing, mobility control or sickness:

What if I am really sick or have an accident and I can't go to the supermarket because I'm bedridden, how can I get my salary then? What if I am sent back to Syria all of a sudden, or back to District 5? How could someone collect my salary for me? With the earlier system my husband could come to the Wahat with my ID and his ID and our UNHCR registration document and take my salary if I was sick for example.

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<sup>29</sup> How value is extracted from the products of their labour and the chains they are embedded into would be an important topic for further research. Refugees and humanitarian aid workers reflected on the restrictive regulations around the GEN cash-for-work products. They could only include a limited set of items such as tote bags, jewellery, and baby-suits, which some suggested were non-essential, Western-inspired, and not necessarily the kind of goods women would make of their own accord if they had the chance to choose (this might, some suggested, include making headscarves or pickled foods such as *makdous*). The items had to be sold at specific events (often charity markets outside the camps) and to donors and diplomatic visitors. Some refugee women workers critiqued the lack of opportunity to sell (or donate) the goods they made among their own networks.

Others mentioned that they trusted GEN to ensure they received what they were owed in this kind of eventuality. However, for most workers and particularly those with the most concerns about the precarity of their livelihoods, the individualism of the biometric salary checks was seen as potentially restrictive and at odds with collective ways of coping with poverty and precarity.

As Leila Ahmed suggests, in work on Arab women ‘it is often assumed that modernity and “progress” and westernisation are incontestably good and that the values of individualism are always unambiguously beneficial.’ (Ahmed, 1992, p. 248). The biometric checks incorporated in this blockchain pilot project must be situated in a genealogy of ‘moral crusades’ which have assumed Muslim women’s lack of agency and taken up the prerogative to rescue them in a way that only partially understands and represents their problems (Abu-Lughod, 2013, p. 81). The pilot exemplifies contemporary approaches to both gender and digital technology in humanitarianism, which now tend to go beyond the mandate of providing life-saving needs and seek to transform disaster-affected societies construed as underdeveloped (Duffield, 2016, p. 153; Olivius, 2016). The iris-scanning element in particular provides another example of ‘the projects of Muslim women’s rights [which] do not begin to exhaust women’s conceptions of rights or their experiences of trying to assert them.’ (Abu-Lughod, 2013, p. 172). Control of resources (here via biometric checks) does not necessarily bring empowerment in the sense of women having more control over their lives anyway (Bailur, Masiero, & Tacchi, 2018, p. 101). It is ironic that the aid organisation aiming to provide women with more agency and freedom from paternalism introduced biometrics in a top-down, paternalistic, non-consensual way. These findings contribute further evidence that technology studies’ narrow, ethnocentric lens must deprivilege white, middle-class, Euro-American frames to include and take seriously subaltern

priorities and needs (Arora, 2019a, 2019b; Taylor, 2017; Taylor, Floridi, & Van der Sloot, 2017). Beyond individual data rights such as consent or privacy, women workers' concerns about iris scanning represented deep embodied distrust in the new technology. The iris scans also represented an individualistic model of money management that assumed a common context of women's oppression rather than—more accurately—collective need.

#### 7.4. Unsettled matters: money technologies and accounting

This final section examines how the blockchain pilot is both incorporated into and resisted in the women worker's everyday accounting practices. The blockchain-enabled digital wallet is intended to empower women with a new money management tool by giving them a safe way of saving cash. Some workers considered it useful, and others did not: different workers have different means and needs and so it is not surprising that there was variation in their attitudes to and reported uses of the digital wallet system. Some, particularly those financially better-off, said that keeping money in the digital wallet over brief periods was helpful for household budgeting. For example, in one group discussion, workers said:

'It's impossible to have that money at home and not buy the things we need to buy. I like to repay my debts in full and if I have a debt of 100JD, that's 3 weeks work, so I wait to withdraw until that adds up.' 'I spend my salary on my children. They are young and if I want to buy them anything, like pyjamas for example, it is unfair if I don't get it for all of them at the same time, so I wait until I have enough money at the supermarket.' 'Yes, I want to save my salary until the end of the month for a doctor's appointment, and I don't know how much that will cost'.

Some workers mentioned the choice and flexibility that the digital wallet could provide favourably: 'Circumstances are not fixed. I like that this week I can withdraw the salary

whenever I need it, but when I don't need it, I can keep it till the end of the month.' 'I think it's a good initiative, if I need money urgently, now I can just go and withdraw that particular amount if I have it, without having to borrow'. Considering the variation in financial circumstances and money management strategies, an important positive feature of the pilot was that it provided everyone with choice: it facilitated access to physical cash, which is seen as imperative by all, especially the most in-need, but it also gave workers access to a digital wallet, which some viewed as helpful in managing budgets. However, these beneficial feature of using the blockchain-enabled digital wallet for safe budgeting were not experienced as dependable or consistent. Several problems with the salary delivery meant that it was widely described as unreliable and therefore antithetical to a significant Islamic paradigm: *barakeh*.

#### 7.4.1. Re-centring the significance of religion in aid: the concept of *barakeh*

Notions of wellbeing, progress, development and charity are shaped by sociocultural and political forces—including religion and spirituality (Redfield & Bornstein, 2011). Since the sector became professionalised after World War II, aid organisations have tended to frame activities as secular in rejection of the colonial religiosity of humanitarian and development 'missions' in the 19<sup>th</sup> and 20<sup>th</sup> centuries, but also as a way of bolstering their political power and funding streams by strengthening appeals to laical universalism and neutrality (Fiddian-Qasmiyeh, 2020a; Stein, 2012). Faith-based approaches to aid have been understood as undermining of and even antithetical to projects of women's rights, especially in Muslim contexts. Now, the significance of faith in social justice and in responses to displacement is a consistently neglected area of research and prevents dialogue around the needs and values of

refugees, and how they experience humanitarian services (Fiddian-Qasmiyeh et al., 2020; Muhanna-Matar, 2019).

While there is great spiritual diversity among Syria's refugees, '[...] from the moderate Sunni who chooses not to observe the fast to the Ismaili who is an atheist' (Eghdamian 2018), Islamic concepts were a vital part of how participants in Zaatari and Azraq experienced and discussed the blockchain pilot and their wider socio-economic lives. Islam is not an isolated, exceptional theme, but rather a strong contextual factor in the tapestry of people's everyday relations and exchange.<sup>30</sup> Islamic concepts, frames and interests of Muslim women should be understood as shaped by fluid networks of influence rather than essentialised or fetishised through sterile dichotomies of traditional, religious and non-western versus modern, secular and western (Kandiyoti, 2011). Indeed, anthropologies of finance and infrastructure have emphasised how faith, morality, myths, and magical thinking are consistent features of capitalist and industrial societies, from transcendent belief in the market to the divination of digital futures (Appadurai, 2012; J. Bowker, 2005; Dourish & Bell, 2011; Hart, 2012, 2015; Swartz, 2018). The spirit, ethics and cosmological significance of exchange, demonstrated since Mauss' *The Gift* (Mauss, 1954; Weiner, 1992), has been examined in terms of the asymmetrical relations of humanitarian giving and donorship (Bornstein, 2012; Hattori, 2003; Henkel & Role, 2016; Kowalski, 2011; Mawdsley, 2012; Scott-Smith, 2016, p. 2235). However, this can be better understood in terms of refugees' perspectives on and experiences of aid.

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<sup>30</sup> I see religion and religious faith not as an exceptional or abstract category but a deeply embedded contextual factor in people's lives and subjectivities (Rowlands & Ager, 2019). I follow the lived religion approach in religious studies which suggests that it is not just about strict beliefs, deep commitments, deliberate thought and reasoning; religious faith involves moral feelings, material rituals and practices, and tacit dispositions (Boyer, 2001, p. 21; Chidester, 2018).

*Baraka* is a central notion in Islam and is usually translated as ‘blessed’. In this research, this was the most repeated and significant concept across all focus group discussions in relation to women’s livelihoods and the salary delivery. *Baraka* was more relevant to women workers than the idea of empowerment—this does not have a straightforward translation except as the term for ‘self-entrusted’ (*mwaklet nfsa*), which they did not often invoke. The three-letter root of the word (‘ba’ ‘ra’ ‘kaf’) can be traced in well-used Islamic phrases such as *Eid Mubarak* (blessed Eid). The concept is ambivalent and contextual, with a multiplicity of meanings which cannot be simplified, and so is difficult to articulate in English (Denffer, 1976). I found the concept very slippery and could not have reached a nuanced understanding without the help of the research assistants, friends, and interlocutors—a prime example of western researchers’ indebtedness to para-ethnographers. Throughout and since fieldwork many friends have discussed with me what *baraka* means to them. Muslim colleagues Dr Angham Abdullah and Dr Azadeh Akbari expressed to me the intangibility of *baraka*, how difficult it is to explain let alone translate; it is an affective phenomenon, felt more than it is understood. In dialogue with women workers, Dina provided anecdotal examples to help explain its different meanings and significances. For example, how in the holy month of Ramadan (*shahr Mubarak*) the act of giving *baraka* involves a donation of some kind that will be received as a blessing; how objects such as religious amulets can be transferred *baraka* if inscribed with Qur’anic words; but also, how people such as holy figures or those who have performed charity (*zakat*) (even if they are not religious) can be or have *baraka*. The term can signify a blessed quality but also bountiful, abundant quantity in and of things as well as acts. It is associated with miracles like rain in a drought or several small seeds growing into a bountiful crop. It is also associated with the saying *ibtarak al jamal*,

meaning ‘the camel has kneeled’, which refers to a quality of predictability, dependability, or reliability (camels are notoriously stubborn and stay in their place). Equally, the lack or absence of *baraka* has popular associations. For example, my friend Salwa connected it with sins, ‘illnesses of the heart’ like vanity or envy or acts of injustice: she said that ‘*baraka* can be explained away if a person’s life does not particularly manifest the love of God. You often hear the expression “God will not place *baraka* in his fortune/life/children”’. Several interlocuters expressed *baraka* as a kind of ‘Muslim karma’ that defied rational explanation. Allah is the source of *baraka* and so the workings that make something more or less *baraka* is a mystical, mysterious subject (Al-Dirassa, 2019; Denffer, 1976).

The working emic definition I came to through this research was: a person or thing or act has *baraka* when, through god’s blessing, it possesses qualities of goodness, bounty, consistency, and dependability. In my fieldwork, *baraka*, or, as pronounced in Syrian dialect, *barakeh*, was an important ‘religious narrative’: women drew upon the concept as a way of making meaning through the ‘co-participation of transcendent or Sacred Others’ (Ammerman, 2007, p. 216). Here, the meaning-making was about women workers’ sense of their own socio-economic prosperity and wellbeing, and their moral concerns with the socio-technical infrastructure of the blockchain pilot. *Barakeh* was interpreted variously by workers, but the meanings can be distilled into three main themes: the temporality, materiality, and sociality of the salary delivery. The importance of reliable, predictable salary upload timings, material cash availability, and trust in the supermarkets as a dependable kind of banking institution was articulated through the continual mention of the phrase ‘*mish* (not) *barakeh*’.<sup>31</sup>

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<sup>31</sup> Of course, this religious narrative was important, but it was not the *only* way refugee women workers discussed the GEN pilot.

#### 7.4.2. Temporal *barakeh*: broken promises and the salary as inconsistent

Temporality is important in socio-economic relations. In his anthropological examination of the spirit of reciprocity as the defining feature of all exchange, Mauss (1923) showed that appropriate timing was crucial in practices of giving and receiving. For Hart, money is a collective memory bank: it is not just a thing but the age-old process whereby people remember and configure social relations over time (Hart, 2000). In a similar vein, Graeber suggests that debt is the organising principle of human exchange; as an exchange that has not yet been completed, debt and so temporality are central in how humans imagine justice (Graeber, 2011, p. 121). Guyer shows that inequality and marginalisation are not just social and geopolitical problems but temporal: poverty is related to precarity, and enduring it is a matter of sustaining life over time (Guyer, 2014, 2019). In this research, I found that the spirit and temporality of humanitarian aid transfers were significant considerations for refugee women workers. In the case of the blockchain pilot, the timing of the salary uploads was paramount. Delays in the service provision (discussed in the previous chapter, due to socio-technical issues faced by GEN and the supermarkets) meant that workers considered the pilot not *barakeh*: rather than being temporally consistent and dependable, it was unstable and unreliable.

In Zaatari and Azraq, most residents' core income source is the household food entitlements which are uploaded to their BASS digital wallets each month. Accordingly, most people's financial habits are carefully planned and timed in a monthly cycle, as many families' rituals of spending and debt hinge on the monthly re-loading of household food entitlements. Most groups

expressed the sentiment, ‘We don’t care how they give us the salary, as long as we get the full amount by the end of the month’. Planning finances was seen as challenging without dependable upload dates. For example, several workers in both camps said the system had introduced difficulties with committing to and delivering on debt repayments:

‘It was better before, we took the full amount and on time, we didn’t have to keep asking and nagging and following up, and it had more *barakeh*, we would promise to pay back debt and actually do so. Now we are struggling to manage because we can’t keep promises.’ ‘When there is a delay in the salary, we borrow more money from others. If the salary was full of *barakeh* we would be content over time, whatever life brings us.’

In both camps, the pilot began by delivering monthly uploads to workers’ digital wallets. After proving this system worked, GEN then planned to deliver weekly rather than monthly uploads. This change aimed to support workers suffering from cash shortfalls by providing them with a regular supply of money. GEN also wanted to showcase the new possibilities afforded by changing to a decentralised blockchain system in which traditional financial intermediaries no longer ‘add friction’ to their cash delivery process. However, workers reported that the benefit of weekly cash uploads was not being realised because the uploads were delayed and unpredictable. This was the central concern with the pilot across all focus groups. Workers reported that the new system was not providing them with their ‘full salary’ by the end of each month. For example, ‘We received the full September salary on the 15th of October. And we received October by the 4th of November. Now we are waiting for some of November and any of December. There is always a delay of a week or two.’ Workers relied on the refugee administrators at the Wahat to inform them when the salaries had been uploaded. However, these

administrators reported feeling out-of-the-loop. I was told that ‘nobody knows in advance when the next instalment will be available.’

This evidence suggests that novel financial technologies such as blockchain do not necessarily resolve but rather can extend socio-economic problems faced by refugees. For the majority of Wahat workers who are on short term contracts, the blockchain pilot seemed out of their rhythm in the first place: using a savings account especially for their salary might be a more useful strategy if the job wasn’t just for 3 or 6 months. The timing issues here provide further evidence about the frequency of delays from refugees’ perspectives and the unintended consequences of debt accumulation in cash-based aid programs (Sterck, Rodgers, Siu, Stierna, & Betts, 2020). ‘Revisions of time’ can be understood as an aspect of institutions’ power performance (Donovan, 2021; Guyer, 2011, p. 23). As Guyer suggests, ‘the capacity to delay, defer, or otherwise manipulate monetary calendars is immensely powerful’ (Guyer, 2019, p. 88). Definitions and discussions of poverty in the aid industry must give more adequate consideration to the uncertain and precarious temporalities of finance as an issue of injustice.

#### 7.4.3. Material *barakeh*: the salary as not substantial or tangible

An important meaning of *barakeh* is bounty, substance, and growth. The smaller, irregular amounts that women received in their digital wallet felt unsubstantial compared with the prior system: ‘We used to get the full salary in one go and had a good amount of money that we felt had good value. It had *barakeh*.’ Women workers described how the value of the cash doesn’t seem to go as far with the new system. It was exactly the same amount. But it did not *feel* bountiful, it didn’t seem to go as far. Money was generally conceptualised as a tangible physical

asset and, for most workers, ‘receiving my salary’ meant having the cash in their hands rather than the digital value in their GEN wallet. The opposite of *barakeh* is the lack of something; the women also used the concept to articulate how the delays in salary uploads meant the money felt materially intangible. Workers described how this sense of intangibility around the salaries was compounded by the lack of information about them.

From women workers’ perspectives, the ledger of truth in this financial ecosystem was not the blockchain itself but rather an old-fashioned accounting technology: the receipt. Blockchain’s added value is in providing a shared record of real time transactional information, but this was not extended to refugee workers, who were not privy to their own transaction ledger. Women workers did not have a way of accessing their account records or salary information, and so the receipts generated from checking on or withdrawing their salaries at the supermarket were workers’ main way of keeping track of their salaries. Money is always surrounded and supported by documentation technologies, but these are usually neglected: they have mundane, trash status (Nelms, 2017). In this research, systems of receipts, ways of collecting and documenting salary information, were crucial to most workers for mitigating the intangibility and unpredictability described. They were also important props in workers’ inquiries and complaints to GEN about the salary delays. In cultural life, receipts involve practices of ‘ceremonial display and careful preservation’ because they confirm and evidence past transactions as well as a person’s credibility in future transactions (Guyer, 2017, p. 193). Women kept receipts folded up safely in their bras during the workday and would bring them out when discussing or contesting salary issues.

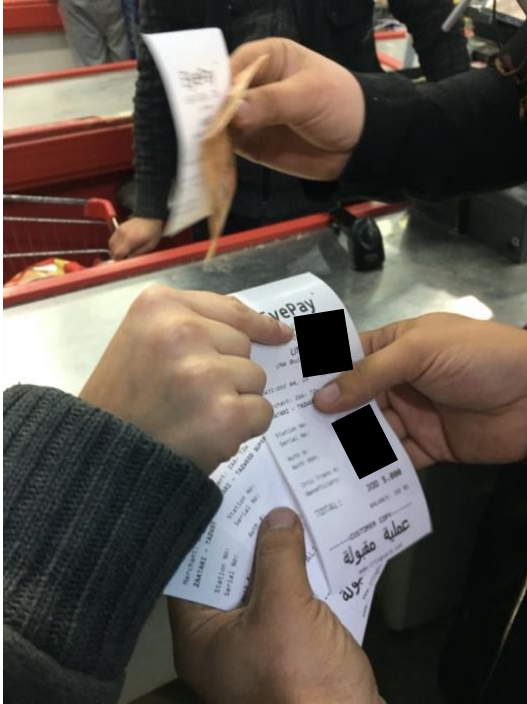


Figure 29: Workers query information on their receipts at the checkout in Tazweed supermarket, Zaatari camp, 6th December 2019

However, while crucial accounting tools for most workers, the receipts were considered exclusionary and useless by others. Almost none of the Wahat workers spoke English, but the information on the receipts was printed in Roman script and English numerals. Accounting practices were usually collective as women relied on those who could best interpret the information—especially workers who were not literate or numerate, which was more common in Zaatari and among older women. Crucially, the receipts lacked important information: they gave the amount withdrawn from the account and the remaining balance but did not outline which hours worked corresponded with which payments from GEN. At the supermarket checkout, a small group of workers told the cashier, who did not have the information to answer their questions: ‘We never know what each payment is for, we might think it’s for this month and it might be for the previous one’ ‘We wish there was clear information somewhere telling us how

much we received based on how many days of work, and when we received it, and how much we withdrew and if there's anything left.' Workers were literally left to their own devices. Often they would supplement the receipts with personal ledgers documenting the hours they had worked. One male guard who worked at the Wahat gates in Azraq called Samir told us that his two wives had a system for keeping track of his salary. With a tongue-in-cheek but frustrated look, he said:

Let me tell you, like the sign-in sheet here at the Wahat I have one at home that logs how many days I have worked. I have 2 signatures checking off the hours every day, and at the end of the month we look at the sheet at home and can calculate the full sum I am owed by GEN. When I collect the salary, I have to bring my wives back the receipt too.

'Little' (light, inexpensive, portable) devices like receipts can be overlooked in aid, but thinking through such things invites nuanced and critical understandings about humanitarian relations (Collier, Cross, Redfield, & Street, 2017). A material culture lens on money reveals how it is always entangled with systems of records and accounts, ways of keeping track of information that allow for its circulation (Maurer & Swartz, 2017; Nelms & Maurer, 2014). Money's pragmatics are inextricable from people's collective systems of faith (or, here, the lack thereof), that the infrastructure will deliver (Swartz, 2018). For the workers of the Wahat, the pilot was considered both temporally and materially *un-barakeh*: it was not dependable or constant, but rather intangible and surrounded by indeterminacy, requiring reliance on ledgers of a non-blockchain kind. Refugee camps such as Jordan's can already be characterised as settings of 'information precarity': they are designed to establish social control in a way that ensures the silencing of refugees, for example, through internet restrictions, surveillance and social media monitoring, and unstable social support (Wall et al., 2017). These findings highlight new and

material dimensions of precarity as instantiated by the blockchain pilot. Crucially, I also evidence the ways in which communities mitigate precarity using socio-technical resources of their own.

#### 7.4.4. Social *barakeh*: the supermarkets as not dependable or trustworthy

Before the pilot was introduced, one group in Azraq compared the idea of the digital wallet favourably to popular analogue ways of storing money away. Fatima, the teacher, told us:

We could keep the money in it and withdraw when we want, like a *hasaleh* (moneybox) or a *matmoora* (a buried treasure), leaving the money there would be safe, it wouldn't increase or decrease, and I am less likely to just spend it straight away.

However, workers suggested that the supermarkets as the new financial institution for their salary delivery were not conveying *barakeh*: the money may not be blessed, safe and bountiful but could disappear or be made inaccessible. Because of the delays and—in addition—cash availability problems, workers reported concerns about the digital account as a safe place to store their money. Most women workers understood the new system as a kind of bank account with the supermarkets as the bank (everyone even referred to the iris scan as 'Al VISA'), and so their faith in the supermarket as a reputable financial custodian was a significant factor shaping their attitudes towards the digital wallet. For example, at the same time as likening the digital wallet to trusted analogue ways of storing money, Fatima also reported:

We don't trust Sameh supermarket because they exploit us by always changing their prices. They sell the same items for a high price at the beginning of the

month and a lower price at the end of the month when we have run out of food. If I could save, I would keep the money with me not at the supermarket.

Tazweed was thought of as a more favourable family business than Sameh. Yet in both camps workers reported that issues with cash availability—in addition to the salary upload delays—were negatively affecting their trust in the supermarket (which they were already dubious about as a corporate rather than humanitarian actor), and therefore the digital wallet as a safe means of storing money.

Workers reported that cash often runs out quickly at the supermarket, in which case they had to make repeated trips: ‘Even if we hear the salaries are ready, we might not get the cash for several days if the supermarket doesn’t have it or runs out. That’s why it’s best to rush there as soon as we hear of a new upload.’ Workers also reported that during the busy time of the food entitlements each month, when everyone in the camp goes to spend the value, their household has just received, it is more difficult to access cash at the supermarket. In Azraq for example, one group reported ‘from the 1<sup>st</sup> to the 10<sup>th</sup> of each month the supermarket is very crowded, and the cashiers don’t agree to open a new till for us and give us the salaries, they don’t even let us do an eye scan check, they say come another day because they can’t stop the regular processing.’ As I will discuss in the next chapter, this was due to an underlying liquidity issue faced by the supermarkets, which were not accustomed to providing the amount of cash necessary for the pilot and had not systematised their processes of collecting it from the local bank.

In combination, refugee women workers expressed the upload delays and cash access issues as contributing to a sense of financial insecurity:

‘The problems with the supermarket made us feel uneasy, otherwise we would have considered keeping our money there. Most of us withdraw cash as soon as it is available.’ ‘If we were to save, we would keep the money with us for fear that there will be issues at the supermarket. What about when we need the money, but they say they have no cash? We can’t go to bed knowing we have money with other people.’ ‘The new system is not *barakeh*. For 3 days now, I am trying to withdraw my 45JD from the supermarket, imagine how it would be if we had left hundreds of Dinars with them.’

There was also a broader affective sense of unease and distrust stemming from unfamiliarity with banking. The majority of workers told us they had never engaged in banking in Syria. In a chat with Sara, she told me: ‘I’ve never been inside a bank in my life and never had a bank account. We didn’t have banks back home, we invested money in land, or gold is best because you can have it with you and it can’t be confiscated.’ Banking can be a touchy subject due to the issue of interest (*riba*) which is forbidden in Islam. People were also afraid of the Syrian government confiscating their assets. 79% of Zaatari residents came from the Dera’a province in South-West Syria (UNHCR, 2019b), which tends to be described as a remote and tribal region, with conservative, agricultural populations (Smulovich, 2014; Sterling, 2012). By contrast, more Azraq residents fled the civil war in urban areas of Syria and were more likely to be familiar with banking practices and institutions. Yet most workers in Azraq also reported using analogue saving practices: ‘If we want to save money, we put it in the mattress or in a money box.’ Pooled funds (*jamiyeh*) were commonly discussed, where a network of neighbours or friends would put money in so that each month one family received a portion. In withdrawing cash immediately and relying on these analogue practices based on relations of trust, workers resisted using this new financial technology. This account therefore highlights the socialities of non-use: people sometimes reject the assumed value and inevitability of technology adoption (Baumer, Burrell, Ames, Brubaker, & Dourish, 2015). In this case, the blockchain pilot prompted an unreliable

institutional arrangement and un-*barakeh* practices, and many people relied on their own community-based strategies of money management. Social justice-oriented approaches to digitalisation are often concerned with how people are represented through data, but it is clear they must also account for the need to opt out (Taylor, 2017, p. 8). So too with the financial inclusion agenda and the widely presumed desirability of becoming ‘bankable’ (Donovan, 2018).

While the significance of social trust and morality has been well recorded in research about money, financial institutions and exchange (N. Ferguson, 2008; Parry & Bloch, 1989), proponents of blockchain consistently argue that it renders those concepts irrelevant (Lemieux, 2019). This end-user research follows a blockchain project in which this is demonstrably not the case. Market-based models are increasingly beckoning in private companies as humanitarian actors (Cross, 2013; Scott-Smith, 2016; Taylor & Broeders, 2015). Beyond humanitarianism, public authorities, standards and protocols of global governance are being displaced by corporate actors, digital infrastructure and big data projects (Harvey et al., 2017; Ruppert, Isin, & Bigo, 2017). In refugee camp settings as GEN delegate humanitarian work to non-humanitarian actors, these findings here shed light on the lived experiences and effects of neoliberal corporate function creep.

### 7.5. Towards *barakeh* aid?

Following the field research, GEN reported they have responded to the findings by systematising the salary delivery in Zaatari and Azraq so that funds are now available at more regular and predictable times. GEN could fix other issues with the system, for example by issuing more informative receipts, giving workers access to their account information via a mobile money connection to the blockchain ledger, or changing the location of the salary delivery to a more

private space. However, it would be misguided to assume that, even with technical and administrative fixes, the use of blockchain could resolve the root problems refugee women workers face such as poverty and gender inequality. Cash-based aid programs provide essential financial support and give people more control over their resources than in-kind aid. But they do not necessarily address the structural factors leading to pervasive indebtedness or support community safety nets and debt management strategies (Sterck et al., 2020). As Natile shows with the example of MPesa, the famous and widely-adopted mobile money service in Kenya, financial technologies can actually create new responsibilities because they promote the notion ‘that poor people can live well on a small and irregular income if they have access to a financial instrument such as M-Pesa to help them manage their money efficiently.’ (Natile, 2020, p. 11).

While the rhetoric of the blockchain pilot encouraged and emphasised autonomy, empowerment, and independence for women, in practice it involved the new and burdensome work of checking, asking, calculating, and waiting. Rather than seamlessly benefitting from the blockchain pilot, the refugee women undertook these extra labours to maintain the payment infrastructure. Rather than solving financial privacy issues, this implementation of cryptographic technology ironically extended them. Instead of fulfilling its potential in supporting women’s financial agency and flexibility, the pilot led to outcomes of material and social precarity and impinged negatively on debt relations. My research therefore contributes new evidence to emergent critiques of digital financial inclusion projects which unintentionally extend gender inequalities (Natile 2020). Such projects disproportionately burden women with new responsibilities (Chant, 2014; Cook, 2020; Elyachar, 2010; Kabeer, 2001, 2015). They rely on women’s practices of solidarity and survival, rather than recognising and supporting women in the labour (paid and unpaid) they already

disproportionately do to sustain life such as childcare and domestic work, and in the longstanding issues they already face. This anthropological work highlights the strategies and resources refugee women workers in Zaatari and Azraq use to mitigate, maintain, and contest the payment infrastructure, including old-fashioned ledger technologies—handwritten tallies and receipts—as accounting devices where blockchain’s reputed benefits as a real-time, transparent shared record are nowhere to be seen.

In combination with the issues around the spatial relocation and biometric checks, the *barakeh* analytic highlights the significance of *faith in infrastructure*—but in a different way to Chapter 5. Workers’ perspectives formulate infrastructure politics as directly implicated in the moral vernaculars of cultural life. Even if the blockchain is invisible and unknown to end-users, they seek—and should be able to have—have faith in the socio-technical apparatus, especially that it (iris scans, the digital wallet, the intermediaries) is safe, secure, and reliable. Workers’ perspectives provide important theoretical lessons. They foreground how socio-economic injustices were realised through the suppression of subjectivities and regulations of the sociality, rhythm, and material substance of the payment infrastructure. Firstly, through the pilot, GEN overlooked the *subjective experiences* of refugee women workers—their priorities, needs, and embodied fears about biometrics—, and their social and emotional resources were depleted through their waiting, queuing, and reliance on community networks. Secondly, the *timescape* of the pilot—the displacement for salary collection from the Wahat, issues of privacy and mobility with the supermarkets, and the unreliable timelines of payments—posed significant conflicts with refugees’ socio-economic schedules and commitments. Thirdly, while operating as background infrastructure in the pilot, the novel use of blockchain invited *material disruption*,

intermediary, and technology change, unclear processes, and serious financial and informational precarity. Based on refugee women workers' perspectives, *infrastructure justice* would involve *barakeh* humanitarianism: service delivery that is (i) consistent and sustainable over time, (ii) materially substantial, and (iii) socially dependable and trustworthy. The different meanings of *barakeh* and how they connect to the socio-technical system provide a new account of the inter-related importance of timing, materiality, and faith in money matters, processes, intermediaries, and institutions.

This chapter has addressed the question: how does the blockchain pilot advance or hinder refugees' needs, priorities, and concerns? I have suggested that the blockchain pilot did not address the most important concerns in the women's lives. Innovation can be experienced as a 'sticking plaster' in the face of structural conditions of poverty and inequality (Taylor, 2018, p. 158). Beckoned in by the infrastructure reconfiguration, this disruptive innovation project extended the socio-economic issues refugee women workers face. Prioritising their concerns would mean centring programs around collective needs and *barakeh* principles rather than digital innovations orchestrated around disingenuous assumptions about their vulnerability and lack of money management skills. Refugees' pressing collective needs include basic rights which asylum seekers and refugees in Jordan—and all over the world—do not have: the right to work, to decent, long-term contracts and reliable pay, the right to permanent sanctuary, and the right to mobility, which would be better addressed with a donkey than a blockchain.



## Chapter 8: Discussion and conclusion

Through the study of the United Nations Links project in Jordan, this thesis has presented the first in-depth ethnography of blockchain in aid. I answered the overarching research question, ‘what promises are made with blockchain, and are they met in practice?’ The promises of Links were: **(1)** to transform humanitarian governance by uniting multiple aid organisations around an authoritative shared data platform, **(2)** to streamline the practices of UN Gender (GEN) in Jordan by decentralising and automating their delivery of financial aid to refugee women, and **(3)** to socio-economically empower refugee women by providing them with digital wallets. Each chapter demonstrated how the meeting of those promises fell short. However, it could be argued that the UN agencies could simply ‘fix’ the Links project by improving on its ability to meet the promises it made.

**(1)** Chapter 5 demonstrated that putatively trustless blockchain was met with suspicion and uncertainty by other aid agencies and that Links did not address the cultures of competition and systemic non-co-ordination in aid. In response, the Links team—charged by UN Basic Assistance (BASS) with managing the project—could direct their efforts towards strengthening not just the technical but the social and institutional structures of collaboration. To develop Links into a privacy-protecting, adaptable, common information resource for aid organisations as promised, BASS could foster a stronger set of technology savvy, self-reliant aid industry collaborators and prioritise surveillance resistance and meaningful local forms of coordination—rather than the paternalistic, colonialist expansion of infrastructure and tracking of aid beneficiaries across the Global South.

(2) The research findings from Chapter 6 suggested that in GEN's Links pilot at women's centres in Jordan's refugee camps, the adoption of blockchain shifted intermediary arrangements and GEN delegated the role of issuing humanitarian payments to non-humanitarian actors. This led to problems around liquidity management and coordination, issues GEN could remedy by establishing due diligence processes, logistical standards, and fixed requirements for private providers.

(3) Following on from Chapter 7, GEN could also give refugee women the adequate information and support around aid payments which they consistently lacked. Over time, refugees might find the digital wallets more beneficial. Indeed, this was a popular position among UN staff participating in the research: that only when refugees gained more technical and financial skills and the infrastructure change became routinised would they find the blockchain pilot empowering. Many of the problems for aid workers and refugees arising from the pilot were put down to generic teething problems and resistance to change.

For Links proponents, fixing the short-term limitations of the blockchain network and GEN's pilot in Jordan would be worthwhile in the long term, especially because Links had proved that it made transaction processing times more efficient and saved organisations money by reducing transaction fees. However, focusing on the fixes outlined above would neglect the problematics of how blockchain promises were manufactured, for whom they were made, and in support of what logics, ideologies, and strategic interests. It would neglect the structural dynamics of

inequality spread unevenly among stakeholder groups, which blockchain does not begin to address: in particular, the diminished socio-economic rights of refugees regarding the right to work, mobility, and political representation.

I have drawn together multiple key perspectives on Links, including not only humanitarian professionals and aid workers in Jordan, but also Syrian refugee women in the camps there. This multi-stakeholder approach has allowed me to identify and evaluate asymmetries between the different communities making, managing, and using the blockchain system. The research shows that Links was driven chiefly by donor agendas of effectiveness, efficiency, and innovation. GEN designed and maintained the Links pilot as a strategic product to market to donors. The experimental approach to infrastructure change entailed socio-economic reconfigurations and ruptures for those working and living in Zaatari and Azraq camps. This case study strongly suggests that infrastructure reconfiguration—using so-called disruptive technologies like blockchain to transform business-as-usual practices—should be de-prioritised by global governance institutions as a matter of urgency. The adoption of blockchain as payment infrastructure neglected the subjectivities and concerns of people and place and as a result was implemented at the expense of the temporal, material, and social rhythms of everyday life and work in the local context. The UN agencies anticipated the ruptures the GEN pilot would generate. However, decision-makers cast refugees as unreliable narrators of socio-technical change, whose perceptions had to be sifted out from the unique technical achievements of blockchain. The UN agencies resisted critique. The promises of decentralisation, privacy, and empowerment masked the Links project's inextricable link with established aid industry

practices of the permanent surveillance of refugees and control of their access to resources and mobility.

The key contribution of this thesis is in illuminating how social and economic injustices operate in the digital age. I advance theoretical work on digitalisation and humanitarianism by putting forward the framework of *infrastructure justice*. This framework contributes to infrastructure studies, aid and migration studies, and global data justice research agendas. I develop theoretical research on blockchain by conceptualising it not as a singular, revolutionary technology, but as socio-technical infrastructure. This focuses attention on its structural role organising the distribution of material resources as well as shaping imaginaries and experiences of socio-technical change in time and space. The main argument of the thesis is that injustices are experienced, extended, and contested through three interlocking dimensions of infrastructure: **subjectivities, timescapes, and materialities**.

## 8.1. Justice in the valuing of subjectivities

The first component of *infrastructure justice* tackles subjectivities: the imaginaries, rationalities, and affects that are established and maintained with socio-technical systems. In other words, the lived experiences and mindsets of stakeholders, especially marginalised groups such as refugees. This accounts for how digitalisation plays out differently from different perspectives and life-worlds. I argue that the valuing of subjectivities is central to justice: justice-oriented infrastructure projects would meaningfully account for and be evaluated based on multiple stakeholder perspectives. What blockchain is, or what any socio-technical system is, emerges

with people in practice. What it means and looks like depends on who you are. Attending to the range of subjective experiences and logics that come with blockchain, and infrastructure change in general, supports a ground-up anthropological approach to justice, rights, and fairness.

In **Chapter 5**, I examined the overarching design and governance of Links. Literatures on blockchain have taken up knee-jerk analytical positions which neglect the techno-political background of blockchain as a force for decentralisation and cryptographic privacy, and how that background surfaces in the subjective positions and imaginaries of aid industry designers. The UN Basic Assistance (BASS) team and their consultancy partners from the blockchain company ConsenSys approached the UN as a system of mutually untrusting, self-interested agencies, and projected ambitious visions of their technocratic coordination via a putatively neutral blockchain. In these visions, agencies would use shared data to optimise the resources refugees receive. Despite the absence of evidence of blockchain as a cooperation tool in aid, the BASS staff put their faith in blockchain's celebrated properties of trustless trust, decentralisation, and the magic of markets. The Links designers and decision-makers emphasised their avowed cyberlibertarian commitment to technocracy and to evangelising the blockchain to other aid agencies. At the same time, they neglected the mundane, existing structures of traditional centralised authority, trust, consensus, and cooperation in aid—which the Jordan pilot, ironically, relied on even as it disrupted prior modes of working and living. Accompanying this faith in a future technocracy were the BASS team's experimental and colonialist rationalities. The ambitious Links rhetoric emphasised the rapid expansion of infrastructure to establish a unified, 'authoritative view' of aid subjects across the Global South. However, BASS's paternalism and evangelism were resisted

by other aid organisations on affective grounds through articulations of suspicion and uncertainty about blockchain, Links, and the actors initiating and involved in it.

**Chapter 6** investigated how UN Gender (GEN) staff in Jordan made and managed a blockchain pilot project in Zaatari and Azraq camps, as part of the Links network. This chapter makes a major contribution by remedying the complete lack of previous research on the subjectivities of aid workers and their perspectives on the design and maintenance of blockchain infrastructure. In the pilot, aid workers were forced to cede important work to private companies, diminishing their ability to support refugee women. Their subjective experiences with socio-technical change involved both jaded disillusionment and feminist pride. The skills and expertise required for GEN to develop a blockchain node and implement smart contracts were challenging. GEN staff both resisted and embraced the paternalism of BASS. While the rhetoric of the pilot emphasised the streamlining of aid delivery through automation and disintermediation, GEN aid workers' responses to infrastructure change involved novel forms of social and emotional labour and stress. Affects of confusion and ignorance around blockchain were pervasive. Ignorance was not merely the absence of knowledge, but a substantive practice involving the mystification of blockchain and the strategic social production of its value. It was only in the context of a politics of ignorance that GEN could maintain unrealistic promises and corporate intervention in the pilot—and neglect root issues causing problems for on-the-ground aid workers and refugees.

**Chapter 7** looked at the perspectives, practices, and priorities of the refugee women who participated in the GEN cash-for-work scheme. I examined how the refugee women workers experienced and contested the new payment system the blockchain pilot established. Through

religious narratives and their use of the Islamic concept *barakeh*, women workers articulated a lack of faith in the socio-technical payment infrastructure and advocated for changes that would support the moral spirit of humanitarian giving. The refugee women workers also contested biometrics (deployed by GEN to authenticate the aid payments) on affective grounds—fears and suspicions about the health effects of iris scanning. These subjectivities revealed the gap between discourses of empowerment and data protection surrounding digital infrastructure in aid and the embodied experiences of refugees.

### *From trust to faith in infrastructure*

Not all subjectivities are equal; some priorities, visions, and convictions win out over others. In the implementation of Links in Jordan, injustices were realised on epistemic grounds. The UN agencies, BASS and GEN, prioritised cyberlibertarian rationalities and neoliberal commitments over the perspectives and concerns of refugees and aid workers. UN agencies favoured corporate tech know-how over existing forms of knowledge on-the-ground. They delegated the capacity of re-imagining and re-designing aid to non-humanitarian private companies. Various colonialities of knowledge structured GEN's management of the pilot along intersectional lines of race and gender as the organisation denied the subjectivities of refugee women. Overall, the UN agencies used blockchain to project visions of more efficient, effective processes, habits, and behaviours in aid. This approach foreclosed how people operate as collectives bound by responsibilities to each other, not individual rational agents following incentives (Taylor, 2020, p. 2).

Proponents of blockchain and cryptocurrency, as well as wider global trends such as the peer-to-peer sharing economy (companies like Uber) see trust in intermediaries as something to disrupt with technology. This only generates new intermediaries and power relations, along with new kinds of risks and disadvantages for those who use and work with the technology (Woodcock & Graham, 2019). Yet the discourses and processes of disruptive innovation—in business, health, aid, and elsewhere—tend to neglect the intermediate steps by which people tackle the consequences of disintermediation, adapt to changes in authority and responsibility, and come to negotiate and trust (or not) new middlemen (Fiore-Gartland & Neff, 2016). The marginalised subjectivities of refugee women and aid workers in Jordan are represented here to counter this oversight.

While trust is the most important and prominent concept in blockchain discourses, my findings suggest that faith is a more pertinent term. Trust has become enrolled in the vocabulary of technocrats, seen through the lens of the rational *homo economicus* as something to be automated and, ultimately, dispensed with. Faith better captures the cultural and subjective; it gets at the unexpected ways in which digital infrastructures interface with humans and their socio-economic practices and principles, sequences and scripts, choices, and cosmologies, which are not necessarily self-interested, ‘rational’ or scientific. This includes the cultish convictions of blockchain proponents in its revolutionary properties and potential, despite the lack of evidence: it has become obvious that blockchain cannot solve institutional trust issues (Lehdonvirta, 2016; Vidan & Lehdonvirta, 2019), so why do so many proponents still fervently believe it can? It may be difficult to distinguish between blockchain believers and those ‘playing the game’ (Swartz, 2021, p. 13). But there is a grey area between true belief (decided conviction, conscious, deep

commitment) and scam (cynical, calculated strategy), in which ignorance, confusion, and mystery flourish. Faith, which involves moral feelings, material rituals and practices, and tacit dispositions, can also be placed in this grey zone between full commitment and interested game-playing.

The three empirical chapters emphasised how promises belong to the same discourse as trust, faith, and belief: they are all about future-making. The findings have highlighted the contingency of socio-technical promises and futures. Where trust, knowledge, truth, and certainty were expected to be found in the rationality of engineering and big data, this research captures the cryptic and cultural aspects of human thought and behaviour, including confusion, concealment, and leaps of faith and ignorance. I have showcased the multiplicity of modes of human belief in different kinds of authority—technological, corporate, religious, not necessarily traditional institutions and experts. In contrast to the business innovation logic now pervasive in aid organisations which posit refugees as self-reliant consumers and humanitarian action as transaction, my findings orientate the discussion about new technology towards the spirit of exchange and the role of *faith in infrastructure*. The emphasis on cultural, subjective aspects elucidates the asymmetrical nature of humanitarian relations.

## 8.2. Justice in the regulation of timescapes

Infrastructure shapes the passage of time and people's access to spaces and resources. The second component of the *infrastructure justice* framework accounts for 'timescapes of inequality' (Bear, 2017, p. 1). By this I mean the spatial scope and momentum and temporal regimes and routines of infrastructure projects. Blockchain has been theorised as part of an

inseparable ‘biometric assemblage’ of data technologies used in the aid industry (Madianou, 2019b, p. 584). However, my infrastructure approach locates blockchain's *structural* role in organising and distributing data and money across a geographic network and within a specific temporal order. This helps to counter the popular narrative of blockchain as a revolutionary, deterritorialised, borderless technology which neutrally enables instantaneous, equitable socio-economic exchange.

I show that the implementation of blockchain is a spatio-temporal project involving the extension of infrastructure and the synchronisation of record-keeping across territories. Necessarily, then, blockchain infrastructure mediates struggles, conflicts, hierarchies, and hegemonies, not just *in* but *of* time and space. The empirical chapters present multiple, contested timescapes, and cast light on how inequalities and injustices are experienced in temporal as well as spatial terms. Overall, the GEN pilot reinforced rather than countered the existing patterns of spatio-temporal oppression in aid: refugees’ isolation from decisions, resources, and their labours of waiting and precarity; the struggles of aid workers to manage pressing demands within limited time frames; colonialities in the orchestration of data infrastructure in the Global South.

**Chapter 5** analyses the colonialities of the BASS team’s strategic approach to launching and expanding the Links project. The project was driven by experimental logics positioning refugee camps as fertile testing sites for new governance models and techniques. The team focused on speed and scale: the rapid expansion of the infrastructure across humanitarian territories. The ultimate objective was to ascertain an authoritative view of international aid subjects via digital data, albeit using cryptography. Information about aid subjects would be immediately shared and

continuously available for all actors on the Links network. Links exemplified a key operation of governance power, the ability to scope and schedule the extraction and maintenance of socio-technical regimes controlling the availability of knowledge and resources.

**Chapter 6** also examined how authority is wielded in the ability to set the rhythm and spatial scope of infrastructure, but on an everyday logistical level from the perspective of the women's organisation, UN GEN. The rhetoric surrounding GEN's Links pilot emphasised the efficiency and instantaneity of record-keeping with blockchain. This eclipsed the actual, situated practices of infrastructure maintenance in Jordan, and the struggles and frictions it involved. The findings demonstrated not only that manipulations of refugees' timelines and movements in space are a key operation of power in humanitarian administration (this is well understood (Buxton, 2020; Gatter, 2018, 2019)), but also that aid workers become part of those timescapes and must manage and negotiate them. Infrastructure logistics shaped aid workers' timelines and mobility too. Like refugees, GEN camp staff had temporal boundaries imposed on them through the pilot; they struggled to accelerate their usual data management work to keep up with the blockchain data validation schedule. Camp staff were also spatially dislocated from the work of delivering aid payments when this humanitarian role was delegated to supermarkets. However, these aid workers contested and mitigated the hegemonic timescapes by deploying delay tactics, which adversely affected refugees.

**Chapter 7** looked at the analytical frames of refugee women in their evaluations of the UN GEN blockchain pilot. Refugee women challenged how the new payment infrastructure displaced them from more private, accessible settings for receiving financial aid, which were more

comfortable from a gender perspective. Their accounts foregrounded how the pilot contributed to the existing structures of spatial injustice in Zaatari and Azraq, where mobility is controlled and restricted, and refugee residents are already shepherded into specific spatial-temporal arrangements by camp authorities in terms of where and when they can access basic resources. Through religious narratives evoking the Islamic concept, *barakeh* (blessed), the women highlighted temporal consistency as essential in the fair and just distribution of aid. This religious analytic points to the importance of sustained, reliable relations over time for people in protracted, precarious refugee contexts. The blockchain pilot exacerbated refugee women's experiences of precarity by introducing delays, and therefore new burdens of waiting and checking.

### 8.3. Justice in the material distribution of resources, labour, and authority

The third component of *infrastructure justice* captures materialities: the material pragmatics, processes, and practices that making and managing infrastructure comprises. Pushing beyond dematerialised understandings of data politics and data justice, the blockchain case study foregrounds the diverse technologies, techniques, and tactics that prop up inequitable socio-technical systems. Blockchain only functioned as a payment infrastructure *in conjunction with* a set of digital and analogue devices—such as paper receipts, workers' time logs, and biometric cameras. In contrast with the technocratic vision of automation espoused by GEN and BASS staff, the everyday operation of these devices depended on the ad hoc socio-technical work of refugees, camp staff, and non-humanitarian intermediaries such as supermarket cashiers. At the

same time, blockchain structured and organised the operation of these devices, and the very distribution of resources, labour, and authority. Deploying blockchain requires infrastructure reconfiguration; disintermediating any payment system necessitates disrupting institutional and material arrangements. Rather than bringing about a politics of redistribution and fairness, the material arrangements benefited private and surveillance interests more than refugees and aid workers.

**Chapter 5** discusses how UN BASS plan and promote the Links project as an open source, neutral commons resource for aid organisations. Other aid actors criticise aspects of the project's current management as proprietary. However, overall, the research demonstrated that BASS designed Links to provide the pipelines for recording vast amounts of transaction and biometric data and circulating that data across a distributed network of actors. I examined the bureaucratic practices of Links's design and strategic implementation by BASS staff, in conjunction with their private partners—blockchain companies like ConsenSys and the biometrics company IrisGuard. At the same time as it proposes to be a neutral, decentralised, commons resource that circumvents extractions of value from aid transactions, the Links project represents the neoliberal intervention of corporate interests in the everyday material infrastructure of humanitarianism. This has concerning socio-economic justice implications for the integrity of humanitarianism when companies become embedded in context long-term and are positioned to profit from data and infrastructure contracts. Through personal and transactional data, refugees become part of the business model of the pilot project product.

**Chapter 6** examines the material struggles that come with the neoliberalisation of aid, but on the everyday level of aid delivery. I demonstrate that, with blockchain, UN GEN re-distributed humanitarian resources, responsibility, and care to non-humanitarian actors. This undermined the reliability of aid infrastructure. The railroads of payment became dominated by companies which lacked humanitarian principles, mandates, and accountability. Local women aid workers were forced to mitigate the unreliability of the infrastructure with new social and communicational burdens. Indeed, infrastructuring is not simply technical, but a collective socio-material process that must be continually worked at. The labours of upkeep are unevenly distributed along intersectional lines of gender, race, class, and so on. Upkeep and maintenance do not vanish in automation projects. The blockchain pilot compromised the sustainability of everyday relations. It relied on aid workers' (and refugees') mitigation practices and depleted their social, emotional, collective resources.

**Chapter 7** looked at the material devices, interfaces, and accounting practices used by refugee women in the blockchain pilot. I show how the pilot also relied on their (analogue) socio-material practices, and how the religious analytic of *barakeh* emphasised—along with the consistency and dependability of aid—the material bounty and substance of aid. This included money but also the information resources that come with it. Most women associated physical cash with greater financial security. The reliability of payment intermediaries—the actors providing physical cash—was considered essential. The material bounty perspective emphasised how the format of payment shaped refugee women's capacity to live well, but also how, ultimately, having a digital wallet to manage money did not solve the problem of abject poverty. Many women simply did not have enough money in the first place.

Refugee women's perspectives must be situated in the broader picture of the material economy of refugee data and migration management in which the classification of information about people (e.g., their transaction habits) shapes their access to basic needs, resources, and mobility. The privacy benefits of blockchain are unproven. Links promises to track data about refugees, and the consequences will be concrete. Refugees in Zaatari and Azraq live with (fear of) deportation, imprisonment, hostile policing, and criminalisation, and with the traumas of civil war and poverty affecting them on an ongoing basis. The very concept of using a digital wallet cannot be unlinked from the material reality of state violence and mobility control, not least when you factor in the potential for policing based on newly available digital data.

#### 8.4. Policy directions

Experiments in digital humanitarianism in contexts where subjects' rights are restricted are 'canaries in the coalmine', at the cutting edge of socio-technical justice issues (Martin & Taylor, 2020, p. 4). Technology tested in seemingly benign (e.g., humanitarian) contexts normalises data accumulation practices, ensures people are captured as data subjects, normalises the socially disruptive effects of data technologies, and is likely to be transferred to wider domains (Isin & Ruppert, 2020, p. xii). The research findings and the generative *infrastructure justice* framework are relevant to policy on blockchain governance and innovation in forced migration contexts, but they also have implications for policy on digital infrastructures, subaltern rights, and institutional change more broadly.

Highlighting the subjective and imaginary dimensions of a blockchain project's design in aid through the *infrastructure justice* lens has revealed how blockchain can be a thinking tool for debating contemporary challenges and alternative socio-technical formations. For example, blockchain precipitated promising discussions about privacy, the trustworthiness of infrastructure, and the (de)centralisation of authority over data. However, caution must be advised around the misleading, slippery terms of those debates and the techno-political agendas they are embroiled in. Blockchain is often used as a rhetorical device to win investment and reputational advantages. Blockchains are not necessarily privacy-protecting or trustworthy, nor do they solve institutional collaboration issues or redistribute authority. Indeed, blockchain bolstered power disparities and injustices. The implementation of a blockchain node by any aid organisation requires a high level of expertise (for example, around cryptographic key management and network governance, to be outsourced to tech companies), resources, and maintenance. The disintermediation of financial intermediaries may save organisations money. But new intermediaries always come in their place, and many of the benefits which blockchains are purported to achieve can be realised by simpler means. For example, more traditional shared databases, end-to-end encryption, compliance with strong data protection regulation and information security standards. The practical applicability of blockchain is questionable.

My research has generated wider policy lessons which become clear when we pay attention to the components of *infrastructure justice* (subjectivities, timescapes, and materialities). The policy lessons relate to aid organisations' management of (1) digital privacy and consent, (2) the socio-economic rights of refugees and aid workers, and (3) the integrity, independence, and accountability of humanitarianism.

**(1) Digital privacy and consent.** Aid organisations cannot possibly obtain meaningful informed consent from refugees (for example, to use biometrics) in situations where the denial of consent means they must forego basic needs or refugee status. This is well known (Jacobsen, 2015), yet aid organisations still emphasise consent as the key ethical requirement in datafication projects. My findings highlighted refugee women’s embodied perspectives on biometrics, indicating that affective expressions of suspicion or discomfort should be understood as forms of resistance to technological change. These responses should not be seen as irrational or anti-modern. Indeed, there is no data protection law in Jordan, and the fear of biometrics is well founded if one does not wish to be under surveillance or bonded to arrangements whereby access to resources is fixed to biometric identity authentication. Rather, expressions of fear can be an indication of preference. Aid agencies should provide alternative options to biometrics such as prepaid cards. If people are to consent to emerging identity and payment technologies, they need to have a choice. Currently, alternative payment options are only provided in exceptional cases, for example when someone cannot use biometric iris scanning due to a medical problem. Aid agencies are beginning to consider the problematics of digital privacy, but the discourse focuses on data protection. The data protection frame tends to be insufficient in capturing issues of exploitation, dignity, and social protection because it is top-down, focused on contractual behaviour, and the standards flow from European regulation (Taylor, 2021a, p. 1907). Attention needs to be paid to the cultural and situational aspects of privacy. Privacy is different according to different people in different contexts. Privacy issues are highly contextual, especially when it comes to

payment infrastructure. For example, the nexus of hardware, cash, space, and religious and gender dynamics can make a public supermarket an uncomfortable setting for getting paid.

**(2) The socio-economic rights of refugees and aid workers.** Beyond human rights such as privacy, aid organisations also need to establish stronger safeguards for socio-economic rights. This should include, for example, the working conditions not only of aid workers, who are burdened with new responsibilities through technology pilots but whose labour is undervalued. Crucially, it should also include the working conditions of refugees who participate in cash-for-work schemes. Officially referred to as ‘incentive-based volunteering’, cash-for-work-schemes straddle charity and underpaid labour, and refugees do not have formal workers’ rights or representation. Aid organisations already advocate for paid volunteering (work) opportunities for refugees in hostile environments, but they need to develop international standards around the *reliability of payments* and push for *longer contracts*. Arguing against the drive towards demonetisation and the use of biometrics and blockchain to fix credit to individual people, this research also provides evidence of the crucial importance of physical cash as a collective (and anonymous) material commons resource. The choice to receive cash rather than digital credit should be considered a socio-economic right and part of the framework of consent to the medium of aid.

The concept of digital wallets as savings and financial inclusion devices is futile in contexts where people live on extremely low incomes, are not permitted to access formal, long-term bank accounts, are subject to severe labour restrictions and have no basic rights

when they do access (always short-term) work opportunities. Digital wallets for refugees and asylum seekers are currently not long-term solutions to poverty and financial precarity. This is not just the case in Jordan and with cutting edge technology, but internationally and with mundane devices such as prepaid cards. For example, in the UK the Home Office issues Aspen cards to asylum seekers, which cannot be used to save money because the value disappears after a certain time frame, and people have no way of checking their balance—plus, the cards allow the government to track asylum seekers' location and spending (Tillyard, 2019). Overall, digital payment projects can distract from the long and sorely needed substantive legal and structural changes to give refugees socio-economic and labour rights and opportunities and a decent income.

**(3) The integrity, independence, and accountability of humanitarianism.** The independent principles, reliability, and integrity of aid are under threat when non-humanitarian companies take on humanitarian roles. There is a lack of transparency and accountability around data-sharing contracts with private companies and scarce safeguards where host countries lack stringent regulation. Aid organisations should deprioritise reliance on flashy technological solutions and the companies and experts that provide and promote them. They should divest from big tech companies and their extractive data processing models. Addressing and re-orientating the logics and motivations of donors is essential. Donors are overwhelmingly receptive to innovation projects, promotions of technologically driven effectiveness, and ill-defined concepts such as empowerment. But any proposed new socio-technical systems should address specific issues beneficiaries face, based on beneficiaries' own perspectives, and explain

how risks to their interests will be mitigated, based on evidence. Building in-house technical expertise would allow agencies to scrutinise the claims of tech vendors and exercise stronger due diligence, ensuring oversight and accountability over the opaque practices of companies—though perhaps at the risk that the tech experts would be evangelisers for new technology.

## 8.5. Reflections on the study

The uptake of the policy suggestions I have outlined will not address how the international migration management and border system controls and discriminates against refugees, asylum seekers, and migrants. The neoliberal moves to delegate humanitarian roles to private companies form part of a wider longer-term project which the aid industry is inseparable from the organised abandonment of these groups (Brankamp, 2021; Duffield, 2013; Gilmore, 2021; Mayblin & Turner, 2021, p. 73; Walia, 2021). This involves immediate violence but also mundane, technocratic, administrative mechanisms. The project of organised abandonment includes deaths at sea and in many countries the growth of seemingly permanent refugee camps (as well as ‘black site’ camps run by lawless militias) (Urbina, 2021). My thesis is enriched by refugee women’s accounts and experiences of infrastructure change in their socio-economic lives. I have amplified the contestations and struggles of marginalised groups—refugees and everyday aid workers. But this ethnography is not just descriptive: I have stressed the structural dynamics and critical implications of blockchain in aid throughout. Strongly grounded in social theory, I have generated an ethnography of humanitarianism that draws not just on approaches in aid and migration studies, but also critical data studies and infrastructure studies. The theoretical innovation of this research is in the non-normative, interpretive concept of justice. Within the

context and structures of migration management, I have examined how power is mediated through infrastructure in ways that affect different communities in different ways. The theoretical framework of *infrastructure justice* has allowed me to juxtapose the perspectives and ideologies of aid agencies and the justifications of decision-makers with alienated groups such as aid workers and refugees, to surface the unintended consequences of innovation.

Constructing a networked ethnography allowed me to undertake this juxtaposition work. However, one of the limitations of the research is that the rich detail and depth of human narratives gained through ethnography with one key community was sacrificed for this wider multi-stakeholder picture. The research ‘followed the thing’ (blockchain) more than it ‘followed the people’. My work in Zaatari and Azraq refugee camps was hampered by security restrictions, and I was a newcomer to Arabic, meaning I could not undertake a lengthy, explorative, and immersive period of participant observation in the same way some anthropologists might aim for. Ideal or future research would involve spending time with refugee women in their wider lives beyond the UN GEN women’s centres, as a way of examining issues such as the embeddedness of gender or financial relations in family life. I worked closely with para-ethnographers in the camps, especially Dina Batshon and Dr Deena Dajani. This enhanced my consideration of ethics of care for colleagues and of decolonial thinking in humanitarian research. These specialist collaborators had deep contextual knowledge, networks, and linguistic expertise, and I could not have conducted the research without them—but they could have conducted the research without me. In future, rather than contributing to the invasive, white western researcher-led Syrian research industry, I hope to arrange future research projects in a way that allows local experts to lead on refugee camp research and publications.

This study has illuminated the difficulties of working with aid organisations and their private and government partners. Maintaining relationships and access at the same time as academic independence is an ongoing challenge—especially as I negotiate sharing and publishing from this thesis. Through the research, I have provided organisations with useful and actionable findings. But much of this followed the format and objectives that the organisations set: I told them what the mistakes were so that they could correct them. My role in the UN Links project involved me challenging the organisations and their decisions, but I was also helping them problem solve, and therefore I contributed to rather than meaningfully protested or dismantled the problematic innovation.

## 8.6. Future research

Spurred by the global pandemic, COVID-19, the Links project has expanded its reach in Jordan as a means for UN GEN to deliver all its cash remotely and with minimal social interaction. A children's organisation is now part of the network. A similar Links pilot is due to be tested in one of the world's largest refugee settlements in South Asia. The consequences of Links's expansion are difficult to anticipate in this new context, but it is likely they will be resonant with those I have traced here. The pandemic has encouraged the digitalisation of basic services across sectors, a world of reliance on algorithms, online payments, tracking and tracing, QR codes, and vaccine passports in which 'there are no real hosts and no real strangers, just identities to be checked: a hostile environment' (W. Davies, 2021). Future research on how digital infrastructures mediate socio-economic life, work, and governance is ever more pressing. Deeper

work is needed on the encoded biases, discriminations, and harms that come with new technology, including blockchain systems and their smart contracts.

The *infrastructure justice* framework provides future research with a critical lens for empirical investigation and theoretical engagement. The framework could be applied to socio-technical humanitarian and development projects beyond blockchain: it gets to the heart of humanitarianism's care-control, protection-securitisation, compassion-repression dialectics. The three components allow us to examine how humanitarian infrastructures (payment but also energy, water, healthcare) provide refugees with the material conditions to sustain life, but simultaneously may be tightly rationed, foreclose important subjectivities in favour of financial and strategic advantages, and foster permanent surveillance and economic and mobility control in space and time.

The framework can tackle wider kinds of infrastructures beyond blockchain, decentralised or otherwise. For example, it could be used to analyse gig economy platforms, digital identity systems, or new payment platforms—which are seeing a rapid growth (cf. Facebook (Meta)'s Diem). *Infrastructure justice* helps researchers get at the cross-cutting ways in which socio-technical systems bring uneven benefits. The framework highlights how infrastructure change shifts the speed, scope, and scale of socio-economic justice issues. It draws attention to (imaginaries of) the material structure and passage of data, and how that accords with the politics of resource distribution. Future pathways of research must attend to the data economy of identification which underpins all digital infrastructure projects. Beyond dematerialised analyses, the *infrastructure justice* approach illuminates the new forms of value digital identities generate

and for whom. Beyond blinkered analyses, the framework encourages the valuing of alienated, oppressed, and neglected subjectivities of infrastructure's stakeholders.

Cutting edge research will forge new ideals, standards, and possibilities for the socio-technical organisation of societies, as tech and international human rights regulation and law tries to catch up. Just as much, it will stress the importance of 'old' values and aspirations such as justice. The objective of justice from marginalised perspectives will be reached on epistemically inclusive and imaginative grounds or not at all. Who knows, some of the promises made for blockchain—for example, surveillance resistance and alternative public infrastructures that foster the redistribution of resources—could somehow be fulfilled, achieving supportive and caring structures for people seeking sanctuary and for all. But that will require more radical social and political change.

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# Appendix I

## May 2018 Survey (English)

Please tick OR write your response in spaces provided

### You and your household

1. What age group do you belong to? (Tick one box)

18-24  25-34  35-44  45-54  55+

2. How many people live in your caravan, apart from yourself? \_\_\_\_

3. Who are they? (e.g., my mother, my brother)

\_\_\_\_\_

4. What is your level of reading and writing? (Tick one box)

Excellent  Ok  Bad  None

5. What is your level of computer skills? (Tick one box)

Excellent  Ok  Bad  None

6. How good are you at managing money? (Tick one box)

Excellent  Ok  Bad  None

7. Where would you like to receive more training? (Tick one or more)

Computer  English

Literacy  Money management  None

Other (please give details) -

\_\_\_\_\_

8. Which of these devices do you own personally? (Tick one or more boxes)

Basic phone  Smartphone  Tablet

None

9. Do you use someone else's device(s)?

Yes  No

**IF YES**, how often do you use them? (*Tick one box*)

Whenever I want  Every day

Weekly  Monthly

10. When you use someone else's device, which device(s) are they? (*Tick one or more boxes*)

Basic phone  Smart phone  Tablet

None

11. Who owns the device(s)? \_\_\_\_\_

**Spending in the supermarkets**

12. How often do you go to the supermarket (on average)? (*Tick one box*)

Monthly  Weekly  Daily  It varies

13. How far is the supermarket from home?

\_\_\_\_\_ minutes

14. Do you shop outside of the camp?

Yes  No

IF YES, where?

\_\_\_\_\_

15. In general, do you feel safe when you go to the supermarket on your own?

Yes  No

16. Would you find it useful to have a female-only queue at the supermarket staffed by female cashier?

Yes  No

17. How would you describe your experiences with the eye scan? (*Tick one box*)

Good  Bad  Mixed  Prefer not to say

**UN GEN Salary**

18. How often would you like to receive your salary? (*Tick one box*)

Monthly  Twice a month  Weekly  Daily   
Small amounts when I need

19. How long does your monthly salary usually last? (*Tick one box*)

One week  10 days  15 days   
20 days  25 days  All month   
Variable

**BASS Entitlements (“VISA”)**

20. How many times would you like to receive your VISA? (*Tick one box*)

Monthly  Twice a month  Weekly  Daily   
Small amounts when I need

21. How do you know when your VISA has been renewed? (*Tick one or more boxes*)

Mobile phone  From other people   
Other (*please give details*) \_\_\_\_\_

22. How do you track your VISA account? (*Tick one or more boxes*)

Paper  My head  Phone   
Tablet

Other (*please give details*) \_\_\_\_\_

**Your money in general**

23. Are you responsible for managing your money?

Yes  No

IF NO, who is? \_\_\_\_\_

24. Are you ever pressured to give your salary to someone else against your will?

Yes  No

IF YES, please describe:

25. Are you ever worried about your own safety when you carry cash?

Yes  No

26. Does your household save some of its income on a regular basis?

Yes  No

If YES, how much on average each month? \_\_\_\_\_ *JD*

27. Do you send remittances?

Yes  No

IF YES, how often do you send them? (*tick one box*)

Weekly  Monthly   
Less often than once a month

28. Does your household experience financial shortfalls?

Yes  No

IF YES, how often? (*Tick one box*)

All the time  More than once a month   
Every month  Less often than once a month

29. Please give us an example of a basic item you are not able to buy regularly

\_\_\_\_\_

30. How much more money per month would your family need to fulfil basic needs?

\_\_\_\_\_ *JD*

31. What one thing would make your life in the camp better as a Wahat worker?

\_\_\_\_\_

**Thank you for your responses.**

## May 2018 Survey (Arabic)<sup>32</sup>

لطفاً قومي بتحديد الإجابة أو قومي بكتابة إجابتك في المكان المحدد لذلك

### أنت وأسرتك

1. كم عمرك؟

55+  45-54  35-44  25-34  18-24

2. كم عدد أفراد الأسرة الذين يعيشون في نفس مكان سكنك باستثناءك أنت؟

.....

3. من هم؟ (مثلاً: زوجي، ٣ أبناء، ٢ بنات)

.....  
.....  
.....  
.....  
.....

4. ما مستواك في القراءة والكتابة؟ (لطفاً قومي بتحديد إجابة واحدة فقط)

ممتاز  جيدة جدا  جيد  لا شيء

5. ما مستواك في استخدام الكمبيوتر؟ (لطفاً قومي بتحديد إجابة واحدة فقط)

ممتاز  جيدة جدا  جيد  لا شيء

6. كيف تقيمي مستواك في إدارة الأموال؟ (لطفاً قومي بتحديد إجابة واحدة فقط)

ممتاز  جيدة جدا  جيد  لا شيء

7. هل تريد أن تحسلي على التدريب في أي من الأمور التالية؟ (حددي كل ما يهملك)

الكمبيوتر  لغة إنجليزية  تعلم القراءة والكتابة  إدارة الأموال  لا شيء

..... شيء اخر (لطفاً اذكرى ما هو

<sup>32</sup> Translated by Amal Jaber in April 2018 (my Arabic teacher in Oxford), and adapted with Deena Batshon, Dr Deena Dajani, and UN Gender aid workers in Jordan, May 2018.

8. هل تمتلكين أي من الأجهزة التالية شخصياً؟

هاتف عادي  هاتف ذكي  تابلت  لا شيء

أ. هل تستخدمين أجهزة أشخاص آخرين؟

نعم  لا

ب. عندما تستخدمين أجهزة غيرك، ما هي الأجهزة التي تستخدمينها؟

هاتف عادي  هاتف ذكي  تابلت  لا شيء

ت. كم مرة تقريباً تقومين باستخدام أجهزة غيرك؟

وَقْتاً أَشَاءَ  كُلَّ يَوْمٍ  مَرَّةً وَاحِدَةً فِي الْأُسْبُوعِ تَقْرِيْبًا  شَهْرِيًّا

من يملك هذه الأجهزة؟.....

### المصروفات في السوبرماركت

9. كم مرة تذهبين إلى المول؟ (لطفاً قومي بتحديد إجابة واحدة فقط)  
شهرياً  أسبوعياً  يومياً  يختلف

10. كم يبعد المول عنك؟

دقيقة/دقائق.....

11. هل تقومين بالتسوق خارج المخيم؟

نعم  لا

إذا كانت الإجابة نعم، أين؟.....

12. بشكل عام، هل تشعرين بالأمان عند ذهابك للمول لوحدهن؟

نعم  لا

13. هل تفضلين أن يكون هناك طابور نسائي فقط في المول / كاشير أنثى؟

نعم  لا

14. كيف تصفين تجربتك مع بصمة العين؟ (لطفأً حددي إجابة واحدة فقط)

جيدة  متوسطة  سيئة  أفضل عدم إعطاء إجابة

### راتب هيئة الأمم المتحدة للمرأة

15. على كم مرة تفضلين الحصول على دفعات راتبك؟ (لطفأً حددي إجابة واحدة فقط)

شهرياً  مرتان في الشهر  أسبوعياً  يومياً   
دفعات عندما أحتاجها

16. كم يدوم راتبك بعد حصولك عليه؟ (لطفأً حددي إجابة واحدة فقط)

أسبوع واحد  10 أيام  15 يوم   
20 يوم  25 يوم  طوال الشهر   
يختلف

### برنامج الغذاء العالمي \ الفيزا

17. على كم مرة ترغبين بالحصول على الفيزا؟ (لطفأً حددي إجابة واحدة فقط)

يوميأً  أسبوعياً  مرتين شهرياً  مرة شهرياً   
دفعات صغيرة عندما أحتاج

18. كيف تعرفين أنه تم تجديد الفيزا الخاصة بك؟ (لطفأً حددي إجابة واحدة أو أكثر)

رسائل نصية  من أشخاص آخرين  وسيلة أخرى (لطفأً حددي).....

19. كيف تقومين بتتبع رصيد الفيزا؟ (لطفأً قومي بتحديد إجابة واحدة أو أكثر)

من خلال الورق  بالاعتماد على الذاكرة  الهاتف  تابلت

وسيلة أخرى (لطفأً حددي).....

## أنت وأموالك

20. هل أنتِ مسؤولة عن إدارة الأموال الخاصة بكِ؟

نعم  لا

إذا كانت الإجابة لا، من المسؤول عن ذلك؟ .....

21. هل سبق وأن فرض عليك إعطاء مرتبك لشخص آخر دون إرادتك/موافقتك؟

نعم  لا

إذا كانت الإجابة نعم لطفاً وضحى .....

22. هل تشعرين بالقلق حول سلامتك وأمنك عندما تقومين بحمل المال الكاش في المخيم؟

نعم  لا

23. هل تقوم أسرتك بتوفير جزء من دخلها بشكل منتظم؟

نعم  لا

إذا كانت الإجابة نعم، كم توفر أسرتك في الشهر تقريباً؟ .....دينار أردني

24. هل تقومين بإرسال حوالات مالية؟

نعم  لا

إذا كانت الإجابة نعم، كم مرة تقومين بإرسال هذه الحوالات؟ (لطفاً قومي بتحديد إجابة واحدة فقط)

أسبوعياً  شهرياً  سنوياً

25. هل تعاني أسرتك من عجز مالي؟

نعم  لا

أ. إذا كانت الإجابة نعم، كم مرة؟ (لطفاً حددي إجابة واحدة فقط)

دائماً (كل شهر)  معظم الأحيان (عند الحاجة الى العلاج أو مناسبات اجتماعية)

نادراً (مرتان في السنة لسبب طارئ)  أبداً

ب. اعطينا مثالا على مادة أساسية لا تستطيعين شراءها بشكل منتظم؟.....

ت. ما هو المبلغ الاضافي الذي تحتاجه أسرتك شهريا للمستلزمات الأساسية؟..... دينار

[26.](#) ما هو الشيء الذي تعتقدن أنه سوف يجعل تجربتك كموظفة داخل المخيم أفضل؟

.....

شكراً جزيلاً لحسن تعاونك!

# Appendix II

## December 2019 focus group facilitation guide (English)

- (1) Introductions to us and the research: *emphasise we do not work for UN Gender but are independent researchers coming to understand and support women worker's perspectives in the Wahat. We want to know your views, priorities, and needs as workers of the Wahat. This group discussion (and surveys) with your perspectives and input will help UN Gender plan the new system for the salary distribution.*
  
- (2) Discussion questions: *We will discuss a range of questions as a group. We would like to understand more about financial issues, safety issues, skills issues. This will take about 40 minutes. We are especially interested in the new salary distribution process: your perceptions of the supermarkets; how you are managing with the digital wallet; the important factors affecting your money management; your access to relevant information about your money and situation.*
  
- (3) Confidentiality and opting out: *If you would like to opt out, please feel free. In the discussion, don't feel you have to answer any questions unless you feel comfortable doing so. I will take my notes in this notebook. Everything you say to us will be totally confidential. Your names will never be mentioned. We hope the information and experiences that you share will help create a better service for you and others. They will be documented in a report which we will share with UN agencies.*
  
- (4) Opening the group discussion: *Please can everyone share something about themselves: what their job is at the Wahat and something about who is in their household. This is to build our relationship as a group and understand important background information—we will keep this anonymous in our records.*
  
- (5) The main discussion questions:

### The new salary distribution process

1. How do you feel about it – positive, wary?
2. Do you feel you have been sufficiently informed about how it will work? And whether you have a choice to participate in the new system or not?
3. How do you feel about going to the supermarket for the redemption instead of getting it in cash at the Wahat?
4. How do you feel about the eye scan replacing cash?

### Shopping at the mall and the local market

1. How often do you go to the mall?
2. Why? Would you prefer to go more/less?
3. How far is your home from the mall?
4. Do you enjoy shopping at the mall, or does it feel more like a chore?

5. Are there any specific issues you face while at the supermarket? Issues that make you feel uncomfortable?
6. Do you go alone, or does someone accompany you?
7. If accompanied, who usually goes with you? Why does someone accompany you?
8. Would you find it useful to have a female-only queue at the supermarket staffed by a female cashier? Why or why not?
9. What about the local market, is your experience shopping there similar to shopping at the mall?
10. Do you enjoy shopping at the local market?
11. What do you buy from the mall and what do you buy from the local market?
12. Is there a difference between produce? Please give examples (goods available/quality/price)
13. Do you shop outside the camp? Where and why?
14. Would you prefer it in your visa entitlements (from UN BASS) were not restricted? For example, if it were cash?

#### Your spending

1. What proportion of your monthly wages do you *usually* spend at the supermarket (above the visa)?
2. What food items do you always buy and where do you buy them from?
3. What non-food items do you always buy and where do you buy them from?
4. What items do you feel you need but do not buy because you cannot afford it?
5. Do you often face cash shortfalls? If so, how do you deal with that?
6. Do you purchase any items on credit from the local shops in the market?
7. How easy is it to get a credit line at the local shops?
8. Do you pay interest on items bought on credit?
9. Do you borrow from each other? Food items or cash?
10. If you borrow cash, who do you borrow it from?
11. Do you pay any interest?
12. What portion of your monthly salaries goes towards paying debts from previous month(s)?
13. How long does it take you to pay off a debt/credit line?
14. Do you send any money to family in Syria? How? How much do you pay in fees?
15. If there was an app on your phone, so like WhatsApp but allows you to send cash instead of texts, would you use it to send money?

#### Your income

1. What are your main personal sources of income?
2. What are your family's main sources of income?
3. How often do you receive your salary? Is that working for you? Would you prefer a different arrangement?
4. What about your salary? Would you prefer a different payment scheme other than monthly?
5. How do you currently know when your visa has been renewed?

6. How do you currently know when your salary is being paid out?
7. Do you feel like you participate in decision making in how your family income is spent?
8. What about your personal income? Do you have decision making power over how to spend your salary, or a part of it?
9. Tell us a bit more about these financial discussions? How do they go?
10. How do you track your visa entitlements?
11. Would you prefer to track your entitlements and spending *on your phone*?
12. What can you think that would really help you manage your money better?

#### Access and use of information and communication sources

1. Do you own a mobile device? Is it your own or a family phone?
2. How many members of your family own their own mobile device?
3. How much does it cost, monthly, to keep your phone topped up and for you to have access to the internet?
4. How do you top up your phones? How about your family members?
5. Do you prefer some networks over others (Orange, Zain, Omniyah)?
6. Can you access the internet at home, or do you need to go somewhere to access it?
7. Do you share the internet connection at home? If so, whose mobile is the one that usually has internet credit to share/tether?
8. Which device(s) do you use mostly to access the internet?
9. Do you have to ask permission to use someone's device? If so, whom?
10. Can you easily charge your phone on a regular basis or is access to power supply a problem?

#### Other

1. Anything else we haven't asked about and you feel is important for us to know?

## December 2019 focus group facilitation guide (Arabic)<sup>33</sup>

### المقدمة

• نحن فريق مستقل، لسنا جزء من فريق الأمم المتحدة وإدارة المخيم. لقد طلب منا عمل بحث مستقل لتقديم نتائج مستقلة حول وجهات نظركم وأولوياتكم واحتياجاتكم واهتماماتكم كجزء من فريق العمل في الواحة.

• سوف نجلس معاً من أجل حوار للاستماع إلى أفكاركم حول بعض القضايا الهامة: منها بعض الأمور المالية، وأمر السلامة، وأمر تتعلق بالمهارات، وسيأخذ ذلك حوالي 40 دقيقة.

• سأقوم بأخذ ملاحظاتي في هذا الدقتر ولكن ستكون الملاحظات مجهولة الهوية وسرية تماماً. يمكننا أن نخبروني في أي وقت بعدم تسجيل ملاحظة ما. لا نشعر أنه علينا الإجابة على أي أسئلة ما لم نشعر بالراحة عند القيام بذلك.

• سيتم توثيق هذا الحوار في تقرير، وسوف نقدمه للأمم المتحدة. سيوفر لهم هذا التقرير معلومات جديدة ونأمل أن يكون ذلك أحد أسباب تحسين برامجهم.

عرف بنفسك واطلب من الجميع التعريف بأنفسهن أيضاً ("الرجاء إخبارنا عم عملك في الواحة وتعريفنا بنفسك /أسرتك").

الهدف من هذا السؤال هو بناء علاقة وجمع بعض المعلومات الديموغرافية القيمة (مجهولة المصدر بالطبع). لا تسجل الأسماء، ولكن يرجى كتابة معلومات حول المجموعة والتي قد تساعد في التحليل على سبيل المثال: الأعمار، أنواع الوظائف في الواحة، وحجم الأسر.

### أسئلة المناقشة

#### سؤال عام حول النظام الجديد

• هل قام أي منكم بتجربة النظام القديم (دفع الراتب بشكل نقدي مباشر في الواحة)؟ إذا كانت الإجابة نعم: كيف يمكن مقارنة النظام القديم بالنظام الجديد (الحصول على الرواتب في المول)؟ سجل أي معلومات عن تجربة أي سيدة سبق وكانت جزء من النظام السابق، سيكون تقييمها للتجربة ذا قيمة كبيرة.

#### استلام الرواتب في المول أو في الواحة

1. ما هو شعورك حيال الموقع الجديد لاستلام الرواتب (المول) – شعور إيجابي، حذر، بين بين؟ لماذا؟ [حيثما أمكن اطلب توضيحات وأمثلة]
2. هل واجهت أي تجارب صعبة أو غير مريحة في ما يخص استلام الرواتب في مول؟
3. كم مرة تذهبن إلى المول بشكل شهري؟
4. هل تحتجن إلى الذهاب إلى المول أكثر مما تريدون بسبب راتب هيئة الأمم المتحدة للمرأة؟

#### الاقتصاد الأوسع

1. ما هي المواد التي لا يمكنك الحصول عليها في المول؟
2. ماذا عن السوق المحلي، ما هي أوجه المقارنة بين تجاربك في التسوق في المول وفي السوق؟
3. هل هناك فروق بين المنتجات؟ يرجى إعطاء أمثلة (مثلاً: الجودة / السعر)
4. هل تتسوقن خارج المخيم؟ أين؟ ما هي المواد التي تشترونها من خارج المخيم؟ لماذا؟

#### المحفظة الرقمية الخاصة بحساب / راتب هيئة الأمم المتحدة للمرأة (وبصمة العين) مقابل النقد

1. هل تستخدمين ميزة سحب الراتب بشكل نقدي؟ إذا كان الأمر كذلك، فلماذا هذا النقدي مفيد لكن – لماذا تحتجنه؟
2. من منكن يستخدم معاً كل من ميزة سحب الراتب بشكل نقدي بالإضافة إلى ميزة شراء الحاجيات من خلال بصمة العين؟ هل من المفيد أن يكون لديكن كلا الخيارين؟
3. بشكل عام، هل تفضلن الدفع من خلال بصمة العين أم سحب الراتب بشكل نقدي وإنفاقه في مكان آخر؟
4. اطلب إجابة من الجميع عبر رفع الأيدي: من تفضل الحصول على الراتب بشكل نقد فقط وتفضل ذلك على المحفظة الرقمية؟ لماذا؟ من تفضل المحفظة الرقمية: لماذا؟

<sup>33</sup> Translated by Dina Batshon and adapted together in Amman in early December 2019.

5. هل واجهت أي منكن أي تحديات أو مشاكل مع المحفظة الرقمية أو بصمة العين؟ ما هي المشاكل؟
6. كيف تشعرن حيال بصمة العين؟ شعور عادي، شعور مختلط، شعور غير مريح؟ (إذا كان ذلك مناسباً اطلب عرض الأيدي). لماذا؟

#### المحفظة الرقمية الخاصة بحساب/ راتب هيئة الأمم المتحدة للمرأة

1. ما مدى سهولة فهم كيفية عمل المحفظة الرقمية الخاصة بالراتب؟
2. كيف تتلائم المحفظة الرقمية مع فيزا العائلة؟
3. كيف يمكنكم تتبع حساباتكن؟ هل تصلكن تحديثات حول الرصيد عن طريق الرسائل النصية؟
4. أين تذهبن إذا كان هناك مشكلة في ما يخص رواتبكن من هيئة الأمم المتحدة للمرأة؟

#### أوقات الإدارة المالية

1. في ما يخص إدارة أموالكن - هل تفضلن استلام الراتب بشكل شهري أم بشكل أسبوعي؟ لماذا؟
2. بشكل متوسط، كم مرة شهرياً تسحبين من رواتبكن؟ هل تسحبينه كاملاً مرة و واحدة، أم عند الحاجة، أم يعتمد ذلك على أمور أخرى؟ لماذا؟
3. هل تواجهن تحديات مالية في ما يخص كون مصاريف المنزل أكثر من الدخل؟ إذا كانت الإجابة نعم: ما هي تقريباً المدة الزمنية بين كل مرة تواجهن فيها هذه التحديات والمرة التي تليها؟ كيف تتعاملن مع ذلك؟
4. هل هناك فرص لتدوين النقود في المخيم؟
5. ما هي أفكاركن حول الأمور التي من شأنها أن تساعدكن أنتن وأسركن على إدارة الأموال بشكل أفضل؟

#### خطة التمكين

1. تأمل هيئة الأمم المتحدة للمرأة أن تمكّن المحفظة الرقمية النساء من توفير راتبهن. هل تعتقدن أن هذه فكرة مفيدة؟
2. من المسؤول عن الشؤون المالية في منازلكن؟
3. هل الدفع بشكل نقدي أو من خلال المحفظة الرقمية أفضل في ما يخص دوركن في إدارة شؤون المنزل المالية؟ لماذا؟
4. هل تستخدمن المحفظة الرقمية الخاصة برواتبكن لتوفير أي من الأموال لأنفسكن بشكل فردي؟ إذا كانت الإجابة نعم: لماذا؟ إذا كانت الإجابة لا: لماذا لا؟
5. ما الذي تريدونه وتتأملونه من تجربة العمل مع هيئة الأمم المتحدة للمرأة؟ ما هو رأيكن الغرض أو الهدف من الواحة والراتب؟

#### العمل

1. هل أنتن راضيات عن عقود العمل الخاصة بكن هنا في الواحة؟ ومع الأدوار والمسؤوليات الخاصة بكن؟
2. ما الذي من شأنه أن يحسن من عملكن؟
3. كيف تودون قضاء وقتكن في الواحة؟
4. ما هي بعض الأمور أو المهارات المعينة التي تودون تعلمها؟
5. هل يتعين عليكن وعلى عائلاتكن القيام بوظائف غير رسمية لتغطية كافة مصاريفكن كعائلة؟ ما هي أنواع العمل الذي يقوم به أفراد عائلاتكن أو تقومون به أنتن؟
6. ما هي المهارات التي تمكنتن من تطويرها أو تعلمها هنا في الواحة؟
7. هل تعتقدن أن هذه المهارات ستكون مفيدة لكن في المستقبل؟ كيف؟
8. هل قام أي منكن بتطوير مهارات/ تعلم المهارات رقمية في الواحة؟ (مثلاً إكسل، ورد، مهارات حاسوب) هل هذه الدورات مفيدة لكن؟ كيف؟

## المهارات الرقمية

1. هيئة الأمم المتحدة للمرأة مهتمة بمساعدتك في إدارة أموالك باستخدام التكنولوجيا (مثلا من خلال أجهزة الكمبيوتر/الحاسوب والهواتف المحمولة). هل تعتقد أن هذا سيكون مفيد لكن؟ لماذا؟ لماذا لا؟
2. هل تملكن أجهزة هواتف محمولة؟ هل الأجهزة خاصة بكن أم هي مشتركة للأسرة؟
3. كم يكلف الهاتف المحمول شهرياً للحفاظ عليه القدرة على استخدامه لإجراء الإتصالات والوصول إلى الإنترنت؟
4. هل تفضلن بعض الشبكات على شبكات أخرى؟
5. ما هي أوضاع الكهرباء؟ وأوضاع الوصول الى شبكة الإنترنت؟ هل يتوفر كل منهم دوماً؟
6. هل يمكنك الوصول إلى شبكة الإنترنت في منازلكن أم تذهبن إلى مكان آخر للوصول الى شبكة الإنترنت؟
7. هل تستخدمن الواتساب؟ لماذا؟
8. ما هي الأمور الأخرى التي تقومون بها باستخدام هواتفكم المحمولة؟

## أسئلة الختام

1. هل يوجد أي شيء آخر لم نسأل عنه وتشعرن أنه من المهم بالنسبة لكن أن نعرفه؟
2. هل يوجد شيء واحد محدد من شأنه تحسين حياتكن في [الزعتري / الأزرق]؟