HUMANITARIAN

IMPROVING HUMANITARIAN PAYMENTS THROUGH DIGITAL INNOVATION

CHALLENGES AND OPPORTUNITIES

AUGUST 2021

BETTER THAN CASH
ALLIANCE

ACKNOWLEDGMENTS

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EXECUTIVE SUMMARY

Digital humanitarian payments have been evolving rapidly. According to CaLP, in 2019, humanitarian agencies transferred a total of US$5.6 billion, double the amount delivered just two years prior. These humanitarian transfers accounted for 17.9 percent of all humanitarian assistance.[1]

The COVID-19 pandemic has accelerated the acceptance of digital payments across the globe. However, in humanitarian crises, digital payments may not always be the most feasible, efficient, and effective solution for organizations if there is not the necessary infrastructure. Furthermore, even if digital payments are possible, with responsible practices that empower women and drive financial inclusion, they may not be the preferred option for many forcibly displaced persons (FDPs) or refugees. To truly be "better than cash", the digital payments experience must be inclusive and responsible and create pathways to financial access for all.

This report focuses on the challenges and opportunities of responsibly digitizing the delivery of humanitarian payments, notably at the last-mile: what has worked, what has not, and what does the future hold. It offers research-based analysis and practical advice for humanitarian agencies on the advantages and areas for growth of five key financial technologies in digital payments: mobile money, artificial intelligence, distributed ledger technology, QR codes, and super platforms. This advice will enable humanitarian agencies to streamline processes and drive responsible digitization of humanitarian payments.

GROWTH IN DIGITAL PAYMENTS

20%

According to CaLP, in 2015, cash and voucher assistance (CVA) made up only

8% of all international humanitarian assistance (IHA). **Today, it accounts for**

20%[2]

50%
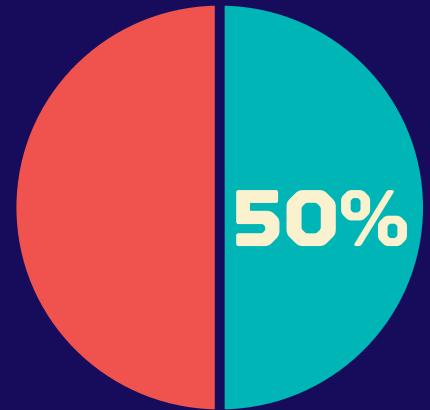
CaLP reports that **HALF** of all humanitarian transfers are delivered by 3 United Nations agencies: World Food Programme (WFP), UNHCR, and UNICEF[3]

COVID-19 has driven a global surge in cash transfers. According to the World Bank, this effort has amounted to

1,400 social protection measures that reached **1.1 BILLION** people[4]

FRAMEWORK FOR EFFECTIVE GROWTH OF DIGITAL PAYMENTS IN THE HUMANITARIAN CONTEXT

Digital payments can be faster, more efficient, more transparent, and safer than traditional methods. Yet in the humanitarian context, a number of barriers raise challenges at the last-mile.

Lack of identification in home or host country

Regulations that prevent forcibly displaced persons (FDP) from being financially included

Limited electricity and connectivity

Merchants not equipped to accept digital payments

To be effective, digital payments depend on an ecosystem to enable them. When considering whether digital payments are viable in a humanitarian context, these four areas are crucial to assess:

1

Regulation and Policy

- Know your customer (KYC) policies
- Consumer protection
- Transaction limits

2

Digital Infrastructure

- Access to electricity
- Mobile network coverage
- Mobile handset ownership

3

Financial Infrastructure

- Proximity and prevalence of bank branches, ATMs, banking, and mobile money agents
- Number of mobile money and payment services

4

User Readiness

- ID documentation
- Ownership of financial account, transaction account, or debit card literacy

REGULATION AND POLICY:

In Jordan and Turkey, refugees cannot own a bank account.

In Turkey and Ethiopia, the government selects the delivery mechanism for large humanitarian transfers.

In Colombia, Venezuelan migrants can now open digital wallets with their migrant ID cards.

DIGITAL INFRASTRUCTURE:

In four of the countries included in this study, over 50 percent of the population does not have electricity.

In five countries, over 50 percent of the population does not have a mobile handset. A digital divide persists, with male phone ownership outpacing female ownership by 7 percentage points.

RESPONSIBLE PAYMENTS

The Better Than Cash Alliance's UN Principles for Responsible Digital Payments identify nine responsible practices for engaging with clients who are sending or receiving digital payments and have previously been financially excluded or underserved.
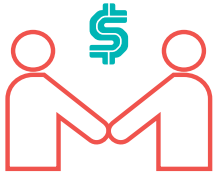
1
Treat users fairly

2
Ensure funds are protected and accessible
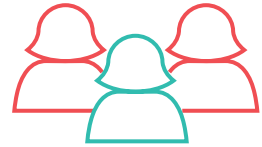
3
Prioritize women

4
Safeguard client data

5
Design for individuals

6
Be transparent, particularly on pricing

7
Provide user choice through interoperability

8
Make recourse clear, quick, and responsive

9
Champion value chain accountability

CATEGORIES OF HUMANITARIAN TRANSFERS

Last-mile humanitarian transfers fall into four categories, on a spectrum from physical cash to full digitization.

CASH-IN-HAND

Humanitarian agencies distribute cash in envelopes directly to beneficiaries. Straightforward, yet with obvious challenges.

CASH-AS-A-SERVICE

Cash distribution is outsourced to a financial service provider (FSP). The transfer from the humanitarian agency may be digital, yet payments are made to beneficiaries in cash.

CASH-BASED SYSTEMS

An FSP serves beneficiaries through a card or mobile money account. Financial structures may outlast the original cash transfers, yet establishing them requires complex operations by the FSP.

COMPLETELY DIGITAL

A cashless system in which beneficiaries receive digital value, with which they can spend with digitally-enabled merchants. Very few examples of this stage appear in the countries studied.

DIGITAL STORIES

In Turkey's Emergency Social Safety Net (ESSN) program, beneficiaries receive digital value on a card, which many spend at merchants via point-of-sale (POS) machines.
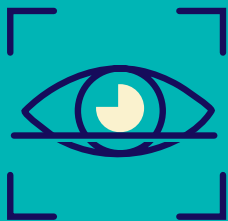
In refugee settlements in Jordan, beneficiaries receive value digitally through WFP's 'Building Blocks' blockchain platform. They spend the value digitally at qualified merchants via an iris scan.

Is Digital Always Best?
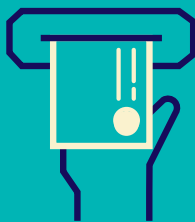
In last-mile humanitarian contexts, digital payments may not always be more efficient than cash-in-hand. In Somalia, one mobile money project cost US$45 (digital method) for every US$100 sent to beneficiaries, while another cost just US$11 (cash).[5] This amount was lessened due to repeat transfers to beneficiaries of large amounts, with no set-up costs and reduced transaction fees. This highlights the importance of user-centricity and developing an ecosystem to keep funds digital.

A key element in digitizing humanitarian payments is beneficiary preference and where the cost is being paid. For instance, an ATM with prepaid cards may be a 'sustainable system', yet if the ATM is 10km from a refugee or internally displaced persons (IDP) camp, and that is the closest it can get given the context's infrastructure, no amount of high set-up cost will offset the fact that the person needs to walk 10km to retrieve their money.

KEY RECOMMENDATIONS FOR HUMANITARIAN AGENCIES ON FIVE FINANCIAL TECHNOLOGIES IN DIGITAL PAYMENTS

These five financial technologies were selected and prioritized by agencies that deliver humanitarian payments. Other exciting developments in digital payments are also on the horizon, including central bank digital currencies (CBDCs).

Mobile Money

Mobile money allows people to transfer digital value from, to, and between mobile phones. It was originally designed in Africa to tackle payment challenges in emerging economies, so most systems work on the most basic handsets, over USSD channels, and only require a 2G network connection. These attributes pique the interest of humanitarian practitioners that want to deliver aid to beneficiaries living in crisis contexts with low levels of infrastructure. In the humanitarian context, approximately 3.5 percent of aid delivered by UN agencies and their partners in 2019 was in the form of mobile money.[6] In Uganda, mobile money accounts for up to 10 percent of humanitarian transfers,[7] and 15 percent in Somaliland.[8]

These deployments are effective because there is already a vibrant mobile money ecosystem in those countries. It is essential to accurately evaluate the potential efficiency of mobile money in each context. In particular, it is crucial for humanitarian organizations to understand the viability of the business case from the standpoint of the mobile money provider. Ongoing challenges include the lack of agents and liquidity in specific locations. Mobile money may not be the best option for a humanitarian organization if the ecosystem around it is not sufficiently developed. A significant proportion of benefits delivered by mobile money is still being cashed out by beneficiaries due to limited options to spend funds digitally. Often in humanitarian contexts, if the 'pillars' of digitization (i.e., infrastructure) are absent or difficult to maintain, beneficiaries' preferences, however promising, may be impeded by the basic lack of services and usage ability.

In Uganda, mobile money accounts for **up to**

10%

of humanitarian transfers, while in Somaliland, this is **up to**

15%

RECOMMENDATIONS:

- Build **commercially sustainable** partnerships
- Assess the **efficacy of mobile money for humanitarian purposes in each context**
- Seek **expert advice** on design and implementation, and aim to be beneficiary-centric
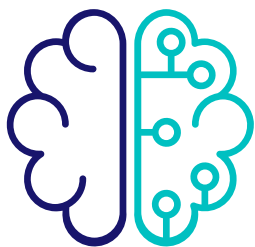
Machine Learning (ML) and Artificial Intelligence (AI)

Humanitarian agencies can use ML and AI to analyze large quantities of digital data quickly. When sufficient data is available, AI analysis can improve transparency and reduce fraud, offer better access to customer support, and provide fair, convenient, and effective recourse systems. AI can also be used to spot trends in programs, evaluate ways to improve product delivery, and make processes smoother. It can help assess how well a humanitarian program is meeting stated goals and identify areas for improvement. Predictive analytics can process data on beneficiaries' financial activities and allow organizations to offer them tools to become more self-sufficient. AI-based interactive platforms can also help humanitarian agencies better understand beneficiaries: their environment, financial situation, and what form of assistance they would prefer to receive.

For instance, in Mozambique, WFP used drones to collect data about on-the-ground conditions in the wake of Cyclones Idai and Kenneth in 2019. AI was used to dramatically cut the time it took to connect and analyze images taken by the drones. AI gave aid workers excellent information about how best to deliver aid in a matter of hours, when traditional data analysis might have taken weeks.[9] Although direct applications of humanitarian transfers are limited at the moment, it is an area that industry participants should be watching.

RECOMMENDATIONS:

- Recognize that ML/AI has **limited current application** in last-mile humanitarian payments

- Build the foundational database for ML/AI to be useful in **streamlining processes** in last-mile payments in the future

- Watch for **the right time** to consider ML/AI solutions
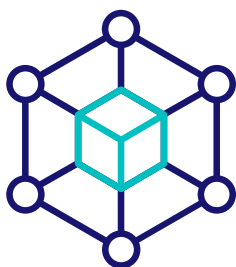
Distributed Ledger and Blockchain Technologies

Notably in the last decade, blockchain has reshaped the conversation on the role of money and transparency in the financial industry. In the humanitarian sector, blockchain can help organizations make payments more transparent. Since its inception, the technology has improved the transfer of remittances and other cross-border transfers, reduced fraud, and facilitated grant management. In last-mile humanitarian delivery, the challenge for Distributed Ledger Technology (DLT) is the actual transfer of value. Presently, there are very few scaled examples of DLT providing end-to-end last-mile humanitarian transfer delivery. The critical factor for humanitarian organizations in choosing this as a payment mechanism remains local ecosystem context.

In 2017, WFP launched a blockchain initiative called "Building Blocks" where cash value from WFP or its partners was stored on a blockchain, which beneficiaries could use to purchase groceries from participating stores with an iris scan at checkout. Beneficiaries did not need smartphones or internet connectivity to make a transaction. As of August 2020, the platform had hosted more than 300,000 interactions.[10] It can now also integrate with UNHCR's existing authentication technology, saving financial transaction fees, and ensuring greater security and privacy for refugees. In 2019, UNICEF launched a CryptoFund to invest in companies developing blockchain-based software solutions that invest in and bolster emerging economies. Among the awardees are companies expanding work to use their technologies to mitigate the hardships of COVID-19 on children and youth.

As of August 2020, the Building Blocks platform had hosted more than

300,000
interactions

RECOMMENDATIONS:

- Consider all options. Perhaps a distributed **database** could work as well as blockchain in the specific context

- Determine infrastructure costs in the analysis and consider **integrating with existing platforms** to reduce costs

- Assess whether the **beneficiary** can or cannot spend the transferred value, because if not, the system is not viable
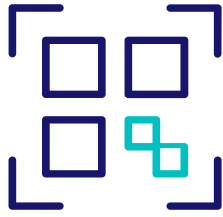
QR Codes

QR codes have been adopted widely, because of their low hardware requirements for both consumer and merchant, and straightforward onboarding. However, QR codes require smart devices and a means of performing know your customer (KYC) on users, which are not always available in humanitarian contexts.

QR codes are also being used for identification and tracking, including in last-mile delivery of payments. In Bangladesh, WFP uses QR codes to store information on vehicles coming in and out of the world's largest refugee camp. Check-in times before QR codes used to run up to 15 minutes. With the codes, they take less than one minute.

QR codes have been integrated into India's Universal Payment Interface (UPI) and now handle over

250 MILLION

transactions monthly[11]

RECOMMENDATIONS:

- Consider QR codes in contexts with **mature technology platforms**

- Create an ecosystem where **beneficiaries and businesses can interact freely**

- **Remember that standardization of processes and interoperability** of FSPs are vital

Super Platforms

Super platforms are apps that offer a variety of financial and non-financial applications on top of a core service, such as ride-hailing, food delivery, or e-commerce. WeChat and Alipay from China lead this segment, followed closely by Paytm India, and Rappi in Latin America. Super platforms require the use of a smartphone and a 2G connection at a minimum. Super platforms also facilitate acceptance of digital payments through a QR code, reducing the need to handle physical cash.

For humanitarian organizations, getting beneficiaries onto a digital platform is often the main battle. To be successful, super platforms must go even farther, to keep users engaged with a platform's various aspects and provide value for beneficiaries.

RECOMMENDATIONS:

- Analyze platform performance with metrics such as monthly active users and average transaction value
- Conduct ethical due diligence of platform management team
- Introduce reasonable measures to protect client data

These five financial technologies offer enormous opportunity to make humanitarian payments faster, safer, and more efficient. Yet context is crucial for success. In any humanitarian setting, the most important factor is always the beneficiaries themselves: their capabilities, needs, and preferences.

When technological innovation in humanitarian payments puts beneficiaries at the center, it will deliver not just the basic benefits of digital payments, but empower beneficiaries and drive responsible digital financial inclusion for all.

INTRODUCTION

Digital innovation has already transformed how the world banks. In 2020, it began to shape the future of humanitarian payments. The potential for beneficial impact is vast, yet this report suggests that work remains to realize that potential.

In recent years, exciting new technologies have emerged that could revolutionize the digital humanitarian payments space. However, familiar barriers of interoperability, physical, and regulatory infrastructure, and beneficiary-centered design endure.

COVID-19 has increased the urgent need for digital payments, yet each need case is unique. The need for gender-intentional delivery mechanisms has never been greater, yet building them is complex. Solutions in this space are not plug-and-play.

THE BACKGROUND IN NUMBERS

In 2019, humanitarian agencies delivered US$ 5.6 BILLION in cash and voucher assistance (CVA) to people living through humanitarian crises. That number doubled CVA over the previous two years, and accounts for roughly a fifth of all international humanitarian assistance (IHA).[12]

In 2015, CVA accounted for only 8 percent of all IHA.[13]

Three United Nations agencies, WFP, UNHCR, and UNICEF, along with their partners, deliver over half of all humanitarian transfers.[14]

HUMANITARIAN TRANSFERS BY VALUE, 2019 (US$)

UNICEF **$241 M**

UNHCR **$645 M**

WFP **$2,132 M**

Source: Interviews with WFP, UNHCR, and UNICEF, Ulana Insights analysis

The transition from in-kind to funds-based approaches

Humanitarian transfers are shifting from in-kind to funds-based approaches. Digital payment solutions provide new opportunities to distribute payments. As a result, in 2016, humanitarian and development agencies collaborated to create the "Barcelona Principles" for the Use of Digital Payments in Humanitarian Response and the WEF Principles on Public-Private Cooperation in Humanitarian Payments.

Building on the Better Than Cash Alliance's 2018 work on UN Collaboration, Coordination, and Harmonization Opportunities, the principals of UNICEF, OCHA, UNHCR, and WFP established the UN Common Cash Statement to guide collaboration on cash and voucher assistance.[15] These global partnerships continue with the aim to accelerate the humanitarian digital financial services agenda.

COVID-19 has accelerated humanitarian transfers by exacerbating existing crises and creating new ones.[16] WFP projected an additional 130 million people would be pushed towards starvation by the end of 2020.[17] UNICEF warned that shifting health resources to respond to COVID-19 could result in an additional 1.2 million extra deaths of children under the age of 5 in just six months.[18]

The economic fallout from the pandemic could push half a billion people into poverty in developing countries. This would represent the first increase in global poverty since 1990.[19] In parallel, a sharp contraction in external sources of financing such as overseas development assistance (ODA)[20] and global remittances[21] is imminent.

Against this backdrop, humanitarian agencies will have to do more with less at a time of greater need. These forces are combining to remake the humanitarian system before our eyes.

Response to the pandemic has driven a scale-up in use of digital transfers and increased calls for novel funding.[22] The Colombian government identified emergency transfers as a priority as part of a suite of responses to mitigate the economic impact of the crisis. They expanded social benefits programs and launched new emergency schemes for the most vulnerable households in collaboration with humanitarian agencies.[23,24] The International Rescue Committee (IRC) estimated that US$1.7 billion in additional funding will be required in 2020 to limit the number of people going hungry in countries affected by fragility, conflict, and displacement.[25] Organizations such as the Global Humanitarian Response (GHRP) and the UN COVID-19 Multi-Partner Trust Fund (MPTF) have been explicit about the need for an immediate scale-up of humanitarian transfers to limit the impacts of the crisis.[26]

A shift to digital delivery mechanisms can increase the speed, efficiency, accountability, and transparency of how aid is delivered. Yet humanitarian crises are prevalent in locations with low levels of infrastructure and antiquated financial systems, so significant investment is required. Design choices also impact the efficacy of the delivery mechanism.

Governments have a vested interest in the type of FinTech used and the identity (ID) of the beneficiaries. Yet not all situations require digitized IDs, and humanitarian work has proven that tiered KYC is effective within the last mile. At this point, KYC might very well consist of "who can vouch for this person?" KYC can also solve problems in the onboarding process, with rapid validation and processing of beneficiaries.

Meanwhile, several low- and middle-income countries, including China, India, and smaller countries such as Somalia, are making exciting progress with FinTech solutions for low-income populations. UNHCR, WFP, and UNICEF are intrigued by the possibility of using these emerging innovations to improve delivery mechanisms in humanitarian contexts. These agencies selected five digital financial services technology solutions that can deliver real impact:

UN Common Cash Statement (UNCCS) focus countries

The seven UNCCS focus countries include Afghanistan, Bangladesh, Central African Republic (CAR), the Democratic Republic of the Congo (DRC), Ecuador, Niger, and Yemen. These countries were selected based on identified collaboration opportunities among the three operational agencies, including feasible and/or existing humanitarian transfers, commitment to collaborate, and the potential for scale.

Mobile money:

allows people to transfer digital value to, from, and between mobile phones. It was designed for use in low-income settings, so most systems work on basic handsets over USSD channels and require only a 2G network connection. An example is M-Pesa, which has over 42 million active customers and 400,000 active agents in seven countries: DRC, Egypt, Ghana, Kenya, Lesotho, Mozambique, and Tanzania.[27]

Distributed ledger and blockchain technologies:

systems of trust and exchange on which users can send value or information directly from one party to another without the need for intermediaries. This is advantageous in scenarios where trust is not abundant.

QR codes:

a more sophisticated form of barcode technology to facilitate and streamline humanitarian transfers.

Super platforms:

smartphone apps that extend beyond one set of products and services to include a variety of financial and non-financial applications. WeChat and Alipay from China are the leaders in this segment, followed closely by Korea's Kakao and Rappi in Latin America (covering Mexico, Costa Rica, Colombia, Peru, Ecuador, Chile, Argentina, Uruguay, and Brazil). Others include PAYTM in India and GoJek in Indonesia.

Machine Learning and Artificial Intelligence (ML and AI):

use of computing power to complete tasks usually associated with humans. The financial industry uses it in financial decision-making, simplifying customer service and analyzing data.

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In order to landscape potential impact, this study has:

- Prepared case studies on 10 countries experiencing humanitarian crises, referred to as as "selected countries".

- Crafted seven mini case studies on the successful use of financial technology in low- and middle-income countries to guide practitioners' understanding of where solutions are working.[28]

- Reviewed over 100 case studies and other publications on delivery mechanisms and the role of technology in humanitarian crises.

- Interviewed 25 experts on humanitarian transfers and financial technology in humanitarian contexts.

The focus of this research was limited to "last-mile delivery". The 10 selected countries were assessed on four digitization readiness dimensions. Despite substantial variation between countries, the levels of readiness were low.

Selected countries

- Afghanistan
- Angola
- Colombia
- DRC
- Ecuador
- Jordan
- Ethiopia
- Turkey
- Yemen
- Zambia

Afghanistan, DRC, and Yemen are also UNCCS focus countries.

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UN Principles for Responsible Digital Payments [29]

Serving vulnerable populations is challenging. The needs of these users differ in the present and change over time. Ensuring service providers act responsibly can add costs and complexity to a project. Often, this results in delays or sustainability challenges.

Many humanitarian agencies are working to strike the right balance between implementing cutting-edge technology and being attentive to the challenges faced by vulnerable persons. Humanitarian digital payments face four key recommendations.

1
PRIORITIZE WOMEN

Governments, international organizations, and companies are increasingly putting money directly in the hands of women through digital transfers. A powerful, recent example is women-focused welfare transfers during COVID-19. Such efforts not only benefit women by supporting their financial inclusion and participation in the digital economy, yet they also drive and accelerate universal digital inclusion.

While these efforts are encouraging, women still face systemic barriers to accessing and benefiting from digital payments. New technologies that anchor payments systems, such as the use of AI in detecting suspicious transactions, can widen the gender gap by amplifying existing biases.

UN agencies can help overcome these challenges by supporting gender intentional programming across all UN Principles for Responsible Digital Payments.

2
SUPPORT USER CHOICE THROUGH INTEROPERABILITY

Interoperability is a critical barrier to the efficient disbursement of humanitarian payments. Many end users become siloed with closed-loop solutions. These silos prevent digital payments from achieving the same convenience, affordability, and utility as older methods.

The solution depends on how effectively governments, companies, international development organizations (IDOs), and providers can converge to seamlessly integrate the digital payments experience, offer greater user choice, and, ultimately, drive stronger demand. To succeed, these ecosystems must be built on a shared digital infrastructure that includes data registries, API-enabled information exchanges, and digital IDs.

3

PROMOTE ACCOUNTABILITY ACROSS THE VALUE CHAIN

The back end of digital payments is becoming more intricate. As the use of innovative technologies expands to meet needs in the humanitarian payments space, the relationships between actors that use digital payments and actors that provide or enable these payments are becoming more complex. This complexity only increases in the last-mile.

It is vital to take a holistic approach and expand perspectives to encompass supply chains. International development organizations and governments can help to align incentives and choreograph all actors.

4

SAFEGUARD CLIENT DATA

The adoption of digital payments is generating data in unprecedented volumes. Leveraging this data to understand user behaviors allows entities to serve their users better and catalyze adoption of digital humanitarian payments.

Increased user data flowing through more institutions heightens the possibility of misuse and discrimination. Innovations such as AI, machine learning, and use of algorithms can expose payment systems to biases. This challenge has supercharged important conversations surrounding data ownership, consent, localization, and bias.

Data controllers must empower users as owners of their personal information. This ownership must be guarded by policies that guarantee users' basic rights.

FRAMEWORKS FOR LAST-MILE HUMANITARIAN TRANSFER DIGITIZATION

Leveraging technology to digitize last-mile humanitarian transfers is often discussed, yet rarely with rigor. This is due in part to the varied status of people affected, across different countries. As a result, frameworks (such as those developed by CaLP, AFI, and Bill & Melinda Gates Foundation) cannot be applied universally. No "one-size-fits-all" solution will work in all cases, yet these factors are useful for organizations to consider when developing effective frameworks:

- Assess financial technology readiness to understand how to best leverage innovations in the current humanitarian environment.

- Use the Four Pillars framework to determine how funding can be focused strategically to ensure a strong return on investment (ROI).

- Evaluate the landscape to evaluate the digitization of delivery mechanisms.

ASSESSING FINANCIAL TECHNOLOGY READINESS

The need for faster response to shocks and emergencies in humanitarian crises is clear. The first step in digitizing last-mile humanitarian transfer delivery is to understand the prerequisites of digitization and benchmark the humanitarian environment accordingly. In analysis of 2019 data from the World Bank, UN, International Monetary Fund (IMF), and GSMA databases, four distinct pillars became apparent.

The four pillars of financial technology readiness

CATEGORY	AFGHANISTAN	ANGOLA	COLOMBIA	DRC	ECUADOR	ETHIOPIA	JORDAN	TURKEY	YEMEN	ZAMBIA
1 ECOSYSTEM										
1.1 Regulation										
GSMA Mobile Money Regulatory Index overall score	91.97	88	90.28	86.9	N/A	79.1	80.83	N/A	N/A	81.5
1.2 Digital infrastructure										
Access to electricity	83	36.3	98.9	11.3	99.9	38.9	100	100	69.6	22.10%
2G population coverage	90	90	100	50	97.1	85	99	99.8	95	93%
3G (or higher) population coverage (%)	30.3	85	95	52	95	85	99	98	95	40%
Mobile handset ownership	51.6	41	70.2	37.2	69.3	41.5	61.9	65.8	43.4	46
1.3 Financial infrastructure										
Number of commercial bank branches per 100,000 adults	2.23	9.46	14.86	1.03	10.09	2.93	14.75	16.8	1.59	3.88
Number of non-branch retail agent outlets of commercial banks per 100,000 adults	N/A	N/A	339.21	N/A	209.98	N/A	N/A	N/A	N/A	N/A
Number of ATMs per 100,000 adults	1.6	18.85	42.34	1.31	34.6	0.46	29.86	78.21	6.28	11.46
Number of registered mobile money services	4	N/A	3	5	N/A	2	5	1	N/A	5
Number of registered mobile money agents per 100,000 adults	9.01	3.48	3.22	N/A	N/A	N/A	10.89	N/A	N/A	536.79
1.4 User preparedness										
Financial services account (% age 15+)	15%	29%	46%	26%	51%	35%	42%	69%	6%	46%
Made or received digital payments in the past year (% age 15+)	11%	N/A	37%	22%	32%	12%	33%	64%	3%	39%
Debit card ownership (% age 15+)	3%	21%	26%	6%	28%	4%	31%	63%	2%	20%
Used a mobile phone or the internet to access a financial institution account in the past year (% age 15+)	1%	N/A	7%	4%	5%	0%	4%	26%	N/A	13%
Mobile money account (% age 15+)	1%	N/A	5%	16%	3%	0%	1%	16%	N/A	28%

These pillars, when combined, provide insight into digital readiness in any context.

1
REGULATION AND POLICY

Variables to consider: Policies regarding KYC, consumer protection, transaction limits, distribution network policies, policies regarding investment in financial technology, and delivery mechanism selection.

In-focus countries: In Angola and Yemen, regulation does not permit mobile network operators (MNOs) to build mobile money systems. In DRC they can, yet digital wallets have restrictive limits, and refugees cannot register. In Jordan and Turkey, refugees cannot own a bank account. In Turkey and Ethiopia, the government selects the delivery mechanism for large humanitarian transfers associated with the social protection systems.

2
DIGITAL INFRASTRUCTURE

Variables to consider: Access to electricity, mobile network coverage, mobile handset penetration, affordability of handsets and data, gender parity in access to infrastructure.[30]

In-focus countries: In four countries, over 50 percent of the population does not have electricity. In five countries, over 50 percent of the population does not have a mobile handset.

3
FINANCIAL INFRASTRUCTURE

Variables to consider: Bank branches, ATMs, banking agents, and mobile money agents per 100,000 adults. The number of registered mobile money services.

In-focus countries: In most countries, the reach of both banking and mobile money infrastructure is limited. Anecdotal evidence suggests that in six countries, banking infrastructure (branches, ATMs) does not extend beyond urban areas.

4
USER READINESS

Variables to consider: Access and ownership of official ID documentation, ownership of a financial account, usage of the internet to pay bills or make purchases, debit card ownership, mobile money account ownership, literacy, school life expectancy, adults receiving government transfers, gender parity in education, and access.

In-focus countries: More than 50 percent of adults in all the countries have an official ID document. In all 10 countries, less than 50 percent of adults have any financial services account. Only in Turkey, did more than a third of adults have a debit card, and in no country did at least a third of adults have a mobile money account.

Within the scope of this research, there were few examples of the metrics from these four pillars being sufficiently high to support a ready-to-use delivery mechanism. Beneficiaries still had to be registered and trained, financial infrastructure had to be extended, and digital infrastructure either continued to be problematic or limited the choice of digital delivery mechanism in the studied countries.

Significant time and investment are needed to build these foundations before digitized humanitarian transfers can be made. These costs of digitization have been repeatedly underestimated and have caused significant delays and unexpected costs in high-profile crises (Philippines [2013],[31] Liberia [2014–2016][32]). Delays in deployment are unacceptable in humanitarian contexts.

Financial technology is not a "leapfrog" solution. It is enabled by step-by-step progress in each of these four pillars. Digital systems need electricity to function. Most mobile phone financial applications require users to hold a financial account. Merchants need hardware to accept digital payments. Finally, users' financial and digital literacy levels are key in deciding to shift to digital channels.

These factors limit the range of financial technology solutions from which humanitarian agencies can choose. The relatively developed enabling environments in Colombia, Turkey, and Jordan offer the potential for more sophisticated solutions. Still, only very selective use cases could be identified for digitization of humanitarian cash transfers.

Given the gravity of these limitations, it is fair to wonder how to best use digital technology to deliver humanitarian transfers. The answer is that agencies have been very pragmatic in only improving the elements necessary to enable rudimentary uses of financial technology in the last-mile.

In situations where elements of one or more of these supportive pillars are weak, it is possible to make strategic investments to strengthen the requisite elements to facilitate digitization. However, ensuring that such investments remain affordable requires delicacy and a local focus.

FRAMEWORK FOR BUILDING FOUNDATIONS THAT ENABLE DIGITAL PAYMENTS IN HUMANITARIAN CONTEXTS

The "Four Ps Framework" can help humanitarian agencies focus strategically on investments to ensure a strong return on investment.

When a transfer program distributes a large value over the long-term, moving currency can present challenges due to security and leakages. The efficiency gains of digital delivery accrue over time, making digital delivery an attractive option.

However, when stopgap solutions plug weaknesses in the enabling environment, those weaknesses are baked into the foundations of the delivery mechanism. For example, in Afghanistan, Yemen, and DRC, firms experience power outages every few days,[33] and regular internet shutdowns in Ethiopia curtail access to financial technology solutions. [34] Despite training programs for beneficiaries with low levels of education, trouble with PIN codes is one of the most cited challenges in humanitarian transfer literature. Stopgap solutions limit the level of digitization achievable.

This framework can help humanitarian agencies identify the most cost-effective approach using the "Four Ps". Strategic investments around **people, places, periods,** and **policy** can result in pockets of digitization in mostly analog environments.

PEOPLE
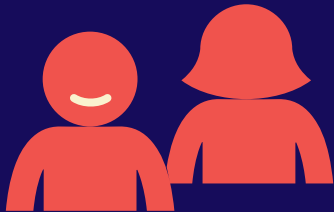
PLACES

PERIODS

POLICY

"The Four Ps Framework" for building foundations that enable digital payments

PEOPLE

Beneficiaries may not have had sufficient formal education to learn how to use digital payments. It is not practical to provide them with general literacy and numeracy training until they become capable of confidently using the system, so targeted training is given to help them memorize the key steps and concepts. Research in low- and middle-income countries indicated that women tend to be less aware than men of digital financial options such as mobile money services. This is particularly true in Asian countries.[35]

PLACES

The quality of digital and financial systems in low- and middle-income countries differs greatly across locations. In many countries, the strength of the network connection is highly correlated to the distance from an urban area. This also applies to the distribution of bank branches, ATMs, and mobile money agents. Rather than advocating for a systematic solution, a piecemeal approach may be more effective. Electricity networks can be extended via solar panels and mobile money agents can be positioned where beneficiaries live.

PERIODS

A key aspect is to temporarily enable factors that enable digital payments. For example, instead of registering a new mobile money agent in a village, an agent from the neighboring village arrives to provide services, or a bank may send out an armored truck. MNOs have also described using movable towers to provide network signals exclusively during distribution periods.

POLICIES

Regulations can be intractable impediments. The most common barrier refugees or people with low income face is challenges in obtaining appropriate identification to register for SIM cards or financial accounts. Solutions include issuing beneficiaries with vouchers or prepaid cards, which attract less regulatory scrutiny. Elsewhere, beneficiaries receive temporary access to a virtual account; in essence, a subaccount owned by the humanitarian agency.

Source: Kapronasia, Ulana

Systematic versus precision FinTech investment

The need to extend, improve, or customize financial systems so that they function as delivery mechanisms for humanitarian payments is clear. How to do it is not. The financial inclusion community has supported the development of the financial sector to better serve low-income and rural communities for over a decade. The goal is often systematic solutions that can extend to the population and will serve their needs sustainably. The Better Than Cash Alliance, the World Bank, and the UN Secretary-General's Special Advocate for Inclusive Finance for Development (UNSGSA) noted the ways financial technology can accelerate progress towards the Sustainable Development Goals (SDGs) in a compendium published in 2018.

Contemporary efforts in financial inclusion recognize that digital economies need to be built in tandem with digital payments systems to ensure that they deliver value. This often means working with governments and other sectors of international development to digitize education and health systems, as well as private sector value chains. Although this is seen as the optimal approach in low-income countries, it is a long-term effort, which often requires high levels of funding.

Humanitarian agencies may agree with this philosophy, yet crises require triage decision-making. Systematic approaches may not be practical or even possible in these contexts. Humanitarian agencies often need to prioritize saving lives, and then build livelihoods once crises have stabilized. In Yemen, although over US$150 million was transferred in 2019, banks are still being used to deliver money to beneficiaries. A large transfer program such as this could make investments to improve the digital financial infrastructure. However, the ongoing war has made it too difficult to make improvements even to rudimentary infrastructure, such as the GSM network. Systematic improvements to financial technology are not currently practical in Yemen.

Humanitarian agencies also note that some governments can be reluctant to approve investments in systems they believe may increase the amount of time refugees remain within their borders. This may manifest in governments limiting refugees' ability to work or access basic financial services.

In these scenarios, humanitarian agencies can use the Four Ps Framework to make precision investments that enable digital delivery mechanisms. They will not yield the same level of impact as a systematic investment in financial technology. Nevertheless, in a crisis, long-term financial infrastructure development is a luxury that humanitarian agencies cannot often afford.

STAGES OF HUMANITARIAN PAYMENTS DIGITIZATION

Stages of Digitization

Cash-in-hand

The humanitarian organization delivers physical cash to beneficiaries directly
Countries using methods: **Ecuador**

Humanitarian Organization → 🚚 → Beneficiary

Cash-as-a-Service

The humanitarian organization hires a financial service provider (FSP) to deliver the cash for them.
Countries using methods: Yemen, Angola, **Zambia, Ethiopia**

Humanitarian Organization → 🔌 → FSP → 🚚 → Beneficiary

Cash-based

The financial service provider's existing infrastructure is used to deliver cash.
Countries using methods: DR Congo, Jordan, **Turkey, Ethiopia, Zambia**

Humanitarian Organization → 🔌 → FSP → 🔌 → Beneficiary → 🚚 → Agent/Branch/ATM ← 🚚
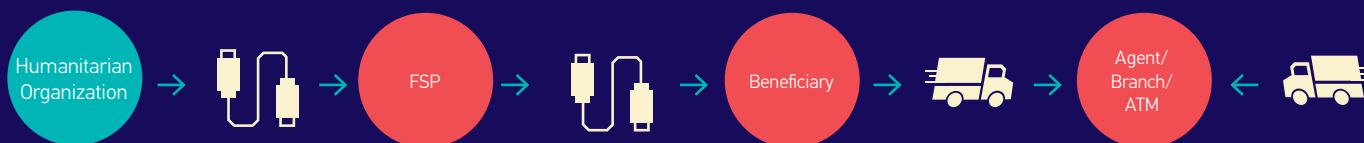
Digital

The beneficiary receives value digitally and uses it digitally. Physical cash is not involved or only to a very limited extent.
Countries using methods: **Turkey**

🔌 → FSP → 🔌 → Beneficiary → 🔌 → Digital merchant
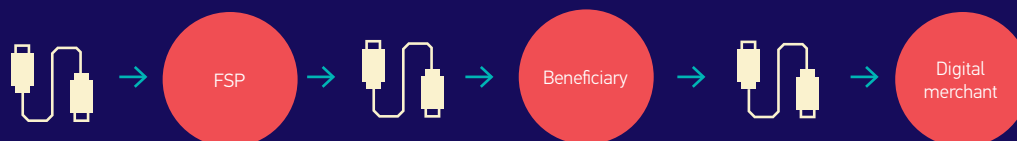
🚚 Physical cash movement   🔌 Digital cash movement

* Countries in bold use multiple methods, and those countries' cash and voucher assistance (CVA) values are allocated evenly between them.
Source: Kapronasia, Ulana Insights analysis

To discuss last-mile delivery, it is useful to understand the stages of digitization. We define a transaction as "digital" when value is transferred to a beneficiary digitally, and the beneficiary uses this value digitally to further transact. The beneficiary could save or spend the value. Either would qualify as a digital transaction.

Delivery mechanisms sit on a spectrum of digitization and therefore involve both digital and cash fulfillment options, as seen in the following framework for the various stages of last-mile humanitarian transfer digitization.
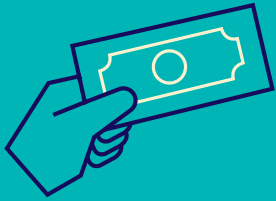
CASH-IN-HAND

Humanitarian agencies distribute cash directly in envelopes to beneficiaries. The simplest method of distribution, it incurs all the obvious challenges, such as moving cash through unstable areas and the potential for robberies.

CASH-AS-A-SERVICE

Cash distribution is outsourced to a financial service or payments provider (FSP). As the humanitarian agency generally makes a digital transfer to the FSP, this is commonly described as digital delivery. Nonetheless, it is essentially outsourcing cash-in-hand delivery. From the beneficiary's perspective it is extremely similar. At this stage, the FSP creates a temporary financial infrastructure for the purpose of the project. This is most commonly an armored truck that stops at the beneficiary's location to deliver cash, or roaming mobile money agents who travel to the beneficiary's location. This technique extends access to finance to beneficiaries artificially, and is unsustainable after transfers cease.

CASH-BASED SYSTEMS

The FSP serves the beneficiaries through a permanent financial infrastructure. In the most common example, beneficiaries are issued a card and withdraw cash from an ATM, or are registered for mobile money and withdraw cash from an agent.

The difference is that investment is made to extend the financial infrastructure so it can be used conveniently and for a period beyond the transfer program. This stage is deemed digital by humanitarian agencies although the success of the delivery mechanism hinges on complex operations executed by the FSP to move cash to convenient locations for beneficiaries.

TRULY DIGITAL

The last stage is cashless. This describes a significant portion of the Emergency Social Safety Net (ESSN) program in Turkey. Beneficiaries of ESSN receive value digitally on a card, which many spend digitally at merchants via point-of-sale (POS) machines. This also describes WFP's voucher program "Building Blocks" in refugee settlements in Jordan. Refugees in this context receive value digitally in a virtual account, then spend it digitally at qualified merchants by scanning their irises (discussed later in this report).

The debate on the legacy benefits of investing in financial infrastructure

Many hope that extending the reach of financial systems can leave a country better prepared for future humanitarian crises, yet the evidence is mixed. The concept of localized solutions and the Four Ps framework can help explain why this may be the case.

Delivery mechanisms are often customized within a country. These localized solutions may not be appropriate for future transfers. None of the 10 selected countries in this study used a sole FSP to deliver humanitarian transfers. In many of the countries featured, combinations of cash-in-hand, debit cards, and mobile payments solutions were all in use.

In Afghanistan, humanitarian agencies that used *hawala* systems as delivery mechanisms explored mobile money as an option to deliver future transfers in response to the COVID-19 pandemic. COVID-19 beneficiaries were located in urban areas where mobile money systems were thought to function best, yet previous beneficiaries lived in rural areas where mobile money was inappropriate. In Jordan, where UNICEF distributes basic needs transfers via ATMs, mobile money was more appropriate to make transfers to teaching assistants. In Zambia, UNHCR uses multiple mobile money providers as their GSM networks have different regional strengths, and UNICEF uses a combination of mobile money when available, and an armored banking truck when not.

Other humanitarian agencies have successfully implemented closed-loop digitized beneficiary payment systems. In Somalia, this solution was used to transfer approximately US$400 million worth of value to beneficiaries in 2019.

The Four Ps Framework can also be used to explain why humanitarian agencies may use temporary solutions to enable delivery mechanisms that cannot be leveraged for future transfers. Some examples include movable GSM towers or provisional cash-out points that are only available on days transfers are made. Solutions that allocate virtual accounts, prepaid cards, or vouchers to beneficiaries are common, as opposed to financial accounts that could be used to reach the beneficiary in the future.

Where repeat humanitarian transfers need to be made, extant delivery mechanisms can be used to save time and money. In Angola, UNICEF had an existing relationship with Bank BAI to open accounts and deliver cash to social protection beneficiaries in rural areas. Under COVID-19, UNICEF was able to use this relationship with BAI to deliver transfers to Angolans in urban areas using their mobile banking platform. Beneficiaries during COVID-19 were different people, in different locations, and a distinct delivery mechanism was used to reach them. Yet UNICEF's pre-existing relationship with BAI was an advantage.

Besides closed voucher systems, very few examples of truly digital delivery mechanisms in the selected countries or in the literature were found.

Digital payments present a value proposition that is better than cash, yet remains context-dependent. Digitization is achieved either through investment in an enabling environment or by restricting use to a controlled environment. Given the choice between using a cash-based mobile money system or a closed-loop digital voucher system, a humanitarian agency may logically choose the former former, as it has reduced set-up costs, gives beneficiaries more choice, and has a higher potential to increase financial inclusion.

Pitfalls often result from the common practice of considering cash-as-a-service and cash-based systems as digital. With both, the humanitarian agency is distanced from the delivery mechanism, and therefore has a limited exposure to the operational complexities managed by the FSP to reach beneficiaries.

Humanitarian agencies are often surprised by FSPs' unwillingness to provide distribution services. A major agency wondered why it was so difficult to get the leading FSPs in a country to respond to requests for proposals (RFPs). Often, the FSP is concerned with the increased costs of moving cash in these difficult environments. It is essential to recognize and understand the cash movement operations in these semi-digitized systems.

Mobile money may still be a superior solution in response to COVID-19, yet it is important to fully grasp the operational complexities involved.

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THE HUMANITARIAN PAYMENTS OPPORTUNITY

Humanitarian interventions aim at restoring the human dignity of vulnerable persons in cases of shocks and emergencies. For convenience and speed, humanitarian agencies have been moving away from in-kind interventions towards cash. Yet cash is expensive, inefficient, insecure, and untraceable. In contrast, digital payments offer cost-savings with speed and efficiency, yet also ensure transparency and promote inclusive growth, including the financial inclusion of women.

The development of financial technology in humanitarian transfer contexts is not even across the world. Where the pillars of digitization are in place, a digitization and innovation agenda is desirable. Where they are not, infrastructure is a limiting factor. Nevertheless, the shift to digital financial technology is inevitable.

The introduction of new technologies can create challenges that must be mitigated. In countries such as Turkey and Jordan, cash-based systems, including ATMs and prepaid cards, are being used despite supportive infrastructure in place that could enable more sophisticated solutions. Project managers in both countries reported that current solutions work satisfactorily and there was no need for innovation.

Insight on problems to be solved through financial technology will come from beneficiaries and field staff on the ground. They can be supported by global innovation centers, yet global innovation centers should never lead the process. They should be guided by reported problems from those using the delivery mechanisms.

The focus should not be on promoting new technologies or increasing levels of digitization. Instead, the target should be to solve systematic problems in delivering humanitarian assistance. Some solutions will involve technology: exactly which technologies remain unclear. This report provides clarity on the current usage of six selected financial technologies to help humanitarian agencies anticipate challenges.

Humanitarian organizations such as WFP, UNICEF, and UNHCR have sophisticated innovation centers that design humanitarian payments digital transformation solutions, which can be costly to implement in a humanitarian setting. It is critical to consider the cost of implementing these last-mile digitized payment solutions to determine if they are suitable in various contexts.

FINANCIAL INCLUSION FOR FORCIBLY DISPLACED PERSONS

According to CGAP, over

75 %

of adults living in countries with humanitarian crises remain outside the formal financial system

Improving financial inclusion for beneficiaries is a complex issue that is beyond the scope of this report. However, given the topic's importance, some insights from the research are offered.

There is clear agreement that greater focus is needed on financial inclusion. The 2015 High Level Panel on Humanitarian Cash Transfers recommended that "humanitarian interventions should link to payment systems that can further financial inclusion, though there may be trade-offs between the cost, speed, and accessibility of different payment systems that need to be considered".[36] In 2017, the G20 advocated[37] for "better access to a broad range of adequate financial services" for forcibly displaced persons (FDP) and host communities.

While the percentage of FDPs who have access to formal financial services is unclear, in 2017, the World Bank found that, "over 75 percent of adults living in countries with humanitarian crises remain outside of the formal financial system".[36] This means that the vast majority of FDPs do not use formal financial accounts. These findings show the high level of interest from policy makers and the humanitarian community in providing beneficiaries with financial accounts, and the magnitude of the challenge.

Solutions in three key areas are needed to advance financial inclusion for FDPs.

Better Data. Evidence is limited on the topic of financial inclusion and crisis-affected persons. There is no clear understanding of the demand for (or use of) formal financial services among FDPs, especially given the diverse set of needs of the different segments of this population. However, it is clear that formal financial services usually do not meet the needs of the most acutely underserved.[38]

Access to Accounts. The literature contains significant discussion of the challenges of providing access to formal financial accounts, mostly citing restrictive government policies for refugees and inadequate financial infrastructure.[39]

Sustainability. It is unclear how financial services can be provided profitably (and therefore sustainably) to FDPs. As a result, financial service providers have been reluctant to invest in providing services to this segment.[40]

The goal of financial inclusion is clear. The pathway to achieving it is not. To find a way forward, the Better Than Cash Alliance's UN Principles for Responsible Digital Payments advocate for a clear understanding of the level of demand, and of how services should be designed and delivered to FDPs. This can give humanitarian agencies clarity on appropriate levels of investment.

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DIGITAL PAYMENTS: GIVING HEALTH WORKERS MORE TIME WITH PATIENTS

© UN World Food Programme

" I am a trained nurse

and was attached to a treatment center during the Ebola crisis. Although the risks were high, I was dedicated to my oath as a health worker. The hazard payment of SLL 2,000,000 that I received was great motivation because I was able to help my family during this difficult time in the history of our country. I was also able to help other people with their basic needs, so that they could stay home and reduce their movement, thus avoiding unnecessary exposure and risks of EVD (Ebola). When I received my payments over the counter in cash, it was tough as most of the time I had to abandon my patients and stand in line, so that I could receive my payment. When my payments shifted to payments via mobile wallet, it was much more efficient and allowed me to receive and carry money in my mobile wallet, which could be cashed out at any identified cash-out post. This new development meant we did not have to leave patients unattended and there was never a rush to go and queue for salary payments. I didn't need to worry about keeping a huge amount of cash at home. Even up until now I still have money in my mobile wallet and I never once had an issue with remembering my Mobile network operator (MNO)'s pin code."

DIGITAL FINANCIAL INNOVATIONS

This report focuses on five FinTech innovations: mobile money, artificial intelligence and machine learning, Distributed Ledger Technology, super platforms, and QR codes.[29]

MOBILE MONEY

1

INTRODUCTION TO MOBILE MONEY

Mobile money allows people to transfer digital value to, from, and between mobile phones. It was designed in Africa to tackle payment challenges in emerging economies. As a result, most systems work on the most basic handsets, over USSD channels, and require only a 2G network connection.

These features interest humanitarian practitioners who want to deliver aid to beneficiaries living in crisis contexts with low levels of infrastructure.

Mobile money and humanitarian crises have interwoven histories, as we can see from M-PESA in Kenya. Shortly after its launch in 2007, Kenya suffered post-election violence that displaced 600,000 people and shut down large portions of the economy and financial system. In this context, M-PESA offered the ability to buy airtime and send money between phones. Observers believe this created the initial network of users that buttressed subsequent growth.[39]

However, mobile money does not always work harmoniously in humanitarian crises. In some instances, governments have ordered temporary service shutdowns for reasons such as national security, hyperinflation, and public safety. This was the case during the 2016 elections in Uganda,[40] and a similar approach was taken in Zimbabwe.[41] High profile attempts to invest in mobile money systems to deliver assistance during crises, as during the 2010 earthquake in Haiti and the 2014–2016 Ebola response in Liberia and Sierra Leone, helped strengthen the infrastructure for better response in future crises, yet did not always spur widespread use of the systems.[42,43,44] Another example of mobile money programming in times of crisis, occurred in 2020 post the social and economic impacts of COVID-19. In DRC for instance, UNHCR began distributing mobile money (emergency financial assistance) to 6,000 vulnerable families already uprooted by conflict, affected by the Ebola outbreak, and now enduring the aftermath of the global pandemic.[155]

Growing evidence shows that mobile money–enabled humanitarian transfers lead to financial inclusion gains. Conventional FSPs typically offer restricted accounts for withdrawing digital payments that are often either closed loop or closed once an assistance program ends. Full-fledged mobile money accounts, on the other hand, can link people to formal financial services with a suite of use cases, such as person-to-person (P2P) transfers and bill payments. They can also offer users more advanced use cases, such as merchant payments, savings, credit, and insurance. GiveDirectly, a U.S.-based startup involved in digital humanitarian transfers found considerable improvement in financial inclusion gains by the end of a cash transfer program via mobile money in Uganda.[45] Elan RDC's study of multi-purpose humanitarian transfers delivered through mobile money showed similar outcomes.[46]

Mobile money seems better designed for challenging contexts than other delivery mechanisms, yet potential users should expect to invest in extending or improving its application. Mobile money was not designed for cash transfer programs targeted at vulnerable and crisis-affected people. Mobile money has low infrastructure needs, yet does rely on infrastructure and enabling policies that elude some emerging economies. Furthermore, mobile money is currently prevalent in cash-based economies where a significant proportion of government and business activities are not fully digitized. Therefore, systems rely on a network of agents responsible for onboarding, supporting, educating customers, and exchanging digital and physical value. These agents are the backbone and ambassadors of the mobile money service, yet improving the service quality of these agents remains a significant challenge.

The platforms mobile money providers offer for bulk payments (i.e., large unidirectional payment flows) differ in sophistication. They do not commonly meet the customization needs of humanitarian organizations in terms of approving payments, monitoring their delivery, or providing reporting metrics for donors. As a result, some humanitarian organizations have invested in developing bespoke platforms. These platforms typically integrate with multiple mobile money services, thus assistance can be delivered to beneficiaries in a service-agnostic manner. A case in point is SCOPE, WFP's end-to-end web-based application beneficiary and transfer management platform. Increasingly, startups and innovators have filled this service gap. Technical service providers (TSPs) such as Beyonic and Segovia/GiveDirectly have partnered with mobile money providers to offer tools that cater to this specific need of humanitarian agencies.[47]

Those considering mobile money as a delivery mechanism need a nuanced understanding of the variables that will drive success in the many demanding operating environments, in which humanitarian transfers are made.

To understand the adoption rates of mobile money and the implications for humanitarian cash transfers, this report considered 29 case studies, analyzed data provided by UNICEF, WFP, and UNHCR, and conducted numerous expert interviews.

The following section describes existing best practices with this delivery mechanism, and identifies areas for improvement. An overview of how mobile money functions is followed by a discussion of its suitability for humanitarian payments.

REGULATION AND CORE OPERATIONS

Mobile money providers are often regulated as "e-money issuers" by a country's regulatory authority (the central bank), which means they must follow KYC, anti-money laundering (AML), and counter financing of terrorism (CTF) regulations. They can only offer payment services and are not permitted to intermediate customer funds, unlike banks, which are subject to stricter risk controls relating to financial intermediation. This risk-based approach is quite common across sub-Saharan Africa, yet some markets have not implemented a risk-based approach. In this case, the requirements for money market providers are the same as those for banks.

Regulations generally stipulate that all customer funds must be ring-fenced from the service provider's own funds to protect against insolvency. Commonly, customer funds are kept in a trust account at a licensed bank. The provider is not allowed to earn revenue from those deposits, and is only able to issue e-money reflected at a 1:1 ratio with deposits in the trust account. Therefore, mobile money does not create money, yet simply facilitates its use. Most importantly, this ensures that a service provider's proximity to funds is so remote that even upon insolvency, creditors cannot attach customer funds.

However, regulations complicate which entities can obtain a license. In some countries, the MNO (mobile network operator) qualifies for a license. Elsewhere, third party technology companies and/or banks can offer mobile money services. Banks have had some success in this area, yet bank-led services are still much more limited than MNO-led services.[48]

System scale and reach

The GSMA reports that by the end of December 2019, there were 290 mobile money services in 95 countries, with over 1 billion accounts transacting close to US$2 billion daily.[49] These are admirable figures, especially for an industry that is just over a decade old. To plan and execute assistance projects, humanitarian agencies need a granular understanding of the trends behind these headline figures.

Geographical concentration of success

Globally, of the 1.04 billion registered mobile money accounts, 469 million (45 percent) are in sub-Saharan Africa (mostly Kenya, Uganda, Tanzania, Rwanda, Somalia, Ghana, Zimbabwe) and a further 30 percent (315 million) are in South Asia (India, Pakistan, Bangladesh). The rest of the world accounts for only 25 percent of registered accounts. In the Middle East and North Africa, where significant humanitarian transfer value is delivered, there are only 51 million registered accounts (5 percent of the global total).[50]

Prevalence of mobile money in different markets

Ideally, humanitarian organizations aim to distribute assistance through a system that people are already using. However, in only two countries – Kenya and Uganda – over 50 percent of adults are registered for mobile money. More than a third of adults are registered in only eight countries.[51] Research from Kenya shows that those not registered are primarily the most vulnerable – the poorest and most rural, who are commonly the beneficiaries targeted for assistance.[52] In the selected countries, adults in both Zambia and DRC were more likely to have a mobile money account than a debit card, which means mobile money competes well there in terms of beneficiary usage.

Digitization levels

The mobile money industry has experienced a gradual shift from cash to digital payments in the past five years. In 2019, for the first time, digital transactions accounted for the majority of mobile money flows (57 percent). The ratio of digital to cash-based transactions (cash-in and cash-out transactions facilitated by agents) has increased by nearly 50 percent since 2017.[53] This means that a larger proportion of money enters and leaves the system in digital form as a result of increased partnerships. Yet there is still considerable opportunity to increase digitization and expand other use cases.

Active unique agent outlets

Mobile money agents typically earn a commission for trading digital value and physical cash with users. Some agents used to sell airtime and shifted their core business activity to mobile money, and some are small retail shopkeepers. The number of mobile money agent outlets has almost tripled over the past five years, to 7.7 million in 2019. But only 54 percent of these agents (4.2 million) are active on a 30-day basis.[54] In many markets, individual agent outlets serve several mobile money service providers. This practice is more common in mature mobile money markets, particularly where there is competition among service providers. This means that individual agents may be counted more than once and figures should be interpreted carefully.

2

PREREQUISITES FOR MOBILE MONEY

The appeal of mobile money for humanitarian transfers is that in many countries (including all target countries in this study), adults are more likely to own a mobile phone than a debit card. This means that it should be easier to deliver a payment by mobile phone than through the banking system.

Mobile handsets versus debit cards (2017)

Mobile handset ownership
Debit card ownership (% age 15+)
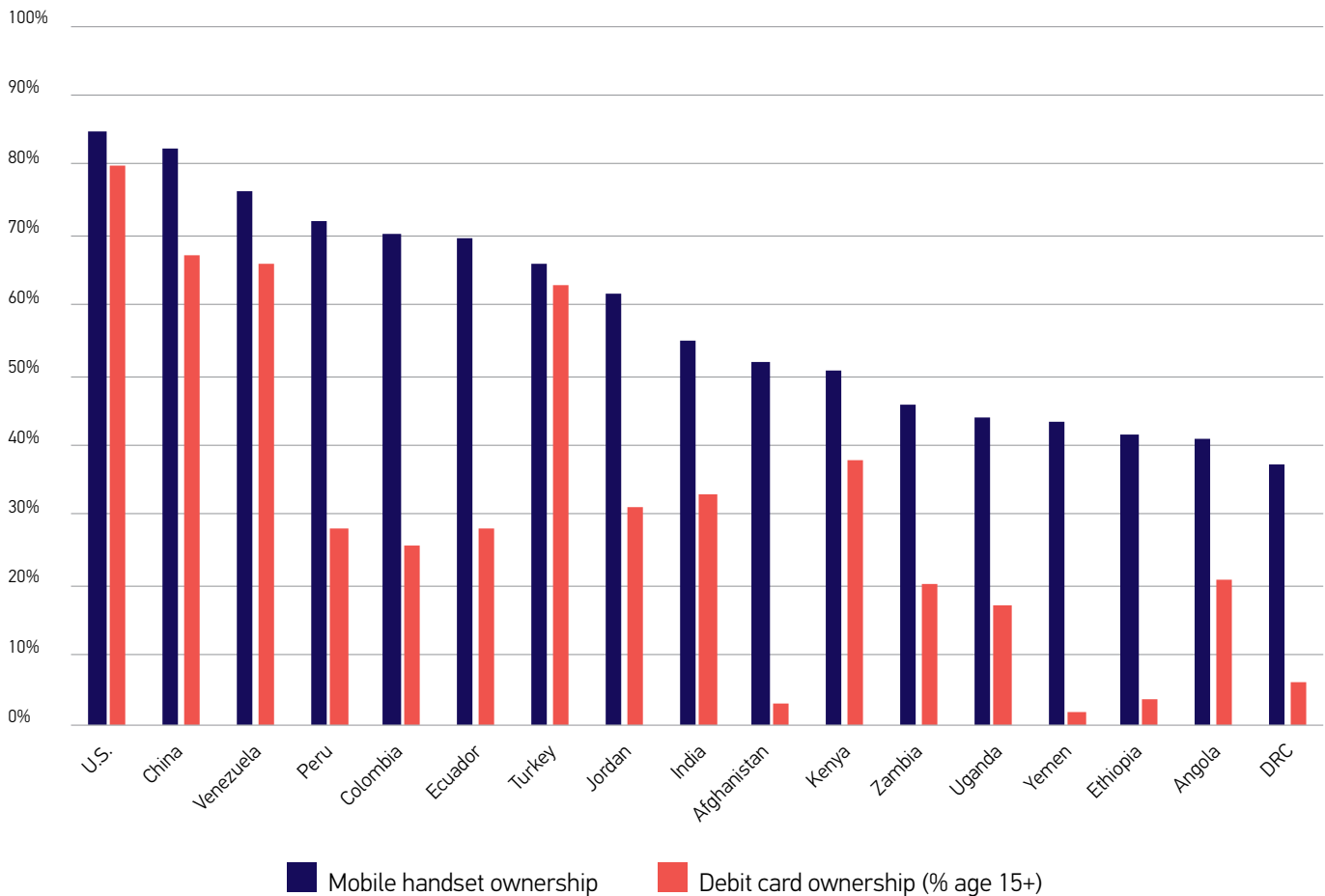
However, the reality is far more complex. Those interested in using mobile money as a delivery mechanism can find country-specific detail in the GSMA Regulatory Index for a country of operation,[55] and by reviewing GSMA publications.[56] The highlighted takeaways below give a general overview of the supportive policy, infrastructure, and beneficiary preparedness needed to enable mobile money as a delivery mechanism in any context.

POLICY ENVIRONMENT

Mobile money policy is dependent on regulatory authorities who deal with infrastructure, broadband, and financial services. The most common policy issue is consumer protection. Understanding how systems are mandated to protect customer funds and redress mechanisms for customers who have issues with the system is crucial.

Customer protection

Customer protection is a key element of the Alliance's UN Principles for Responsible Digital Payments. CGAP (part of the World Bank) also highlights some of the most common customer protection issues with mobile money, including the increasingly discussed topic of data privacy.[57]

Identification for KYC

Some people do not have the necessary identification to be allowed to register for a SIM card or a mobile money account. Refugees were frequently prohibited from using these services, although that has since changed in DRC, Uganda, Jordan, and Rwanda. In other cases, such as in Kenya, refugees are not allowed to own a mobile money account without an ID registered with the authorities. Different countries have instituted different measures that govern how refugees and IDPs can obtain proper documentation to become a mobile money customer. Depending on the context, humanitarian organizations have advocated to regulators, created their own ID systems (i.e., Somaliland), and relied on community systems to verify beneficiary identities.[58]

Remote registration restrictions

Which entities are permitted to register customers, and how they can do it, impacts operations. In some countries, customers can only be registered at official offices. Elsewhere, agents can register new customers. Not all countries allow "e-KYC," which allows people to register remotely without traveling to an approved location.

Uncertain policy environments

In some countries, regulations regarding mobile money have a history of change (i.e., Uganda, Jordan), or have been unclear on critical elements (i.e., Somalia).[59] As a result, mobile money providers have been reluctant to provide services that could invite fines. Humanitarian organizations have also limited their use of services that do not have transparent oversight.

Barriers to agent and merchant registration

Regulations that stipulate that agents must have business licenses and pay taxes restrict many informal businesses in low-income and rural areas from offering mobile money services. They also generally prohibit refugees from offering merchant services, even when refugees may be the only individuals trusted by beneficiaries, and who share a language.

Transaction and storage limits

Policies called "tiered KYC" or "reduced-risk regulations" can make it easier for customers to register for mobile money services. Yet they often limit the amounts users are able to store and transact on the system. Even for the highest-tier accounts, where full KYC compliance is required, limits can prohibit larger transfer programs for items such as staff salaries (i.e., DRC).[60]

SIM card dormancy

National regulations regarding SIM cards require that they be disconnected after periods ranging from three to six months if they have been dormant. If beneficiaries are registered, but payments do not begin within 90 days, anyone who has not used the SIM yet, may have to be re-registered.

Interoperability

Often, the digital value for which the provider issues can only be used in the system from which it was issued. Users are unable to send money between service providers. Limited interoperability can occur at different levels of the system. Even if transfers between customer phones are enabled, it is still likely that users have to seek out agents of their provider to withdraw cash.

Reversals and "clawbacks"

It is common for humanitarian agencies to want to retrieve value from beneficiary accounts if it is not withdrawn after a period of time, as in Jordan.[61] Humanitarian agencies may also reverse a transaction that has been erroneously misdirected. However, mobile money services have different policies and technical capabilities to facilitate this.

FINANCIAL AND DIGITAL INFRASTRUCTURE

Mobile money only requires rudimentary digital and financial infrastructure, yet beneficiaries are often located in places that lack this infrastructure. The complex field operations that register customers, build agent networks, and ensure they are liquid drive mobile money's success. These are more difficult in remote areas and in contexts where beneficiaries face language or literacy barriers.

Electricity

Handsets and the GSM towers that provide network coverage require charging. In five of the ten selected countries, under 50 percent of the population had access to electricity (see Table 1 in "The four pillars of financial technology readiness"). Solar solutions can address this problem, yet their costs need to be factored into projects.

Network coverage

Nearly all countries had 2G population coverage of 80 percent or higher (see Table 1 in "The four pillars of financial technology readiness"). However, a "spotty network" was cited as a challenge in both Zambia and Afghanistan.[62] Country-level statistics obscure the quality of coverage within countries. Often, different providers cover different parts of a country, so network coverage needs to be evaluated at a local level.

Handsets

In six of the selected countries, fewer than half the population owned a handset (see Table 1 in "The four pillars of financial technology readiness").[62] This necessitates a set-up cost for those who want to use mobile money as a delivery mechanism. Note that this metric or "GSM connections" is often used as a proxy for mobile money usage, yet as shown in the chart below, most people with a handset did not use mobile money in the selected countries.

Mobile Handset Ownership vs. Mobile Money Accounts

Mobile handset ownership   Mobile money account (% age 15+)

Source: GSMA Mobile Connectivity Index (2019), World Bank (2017)
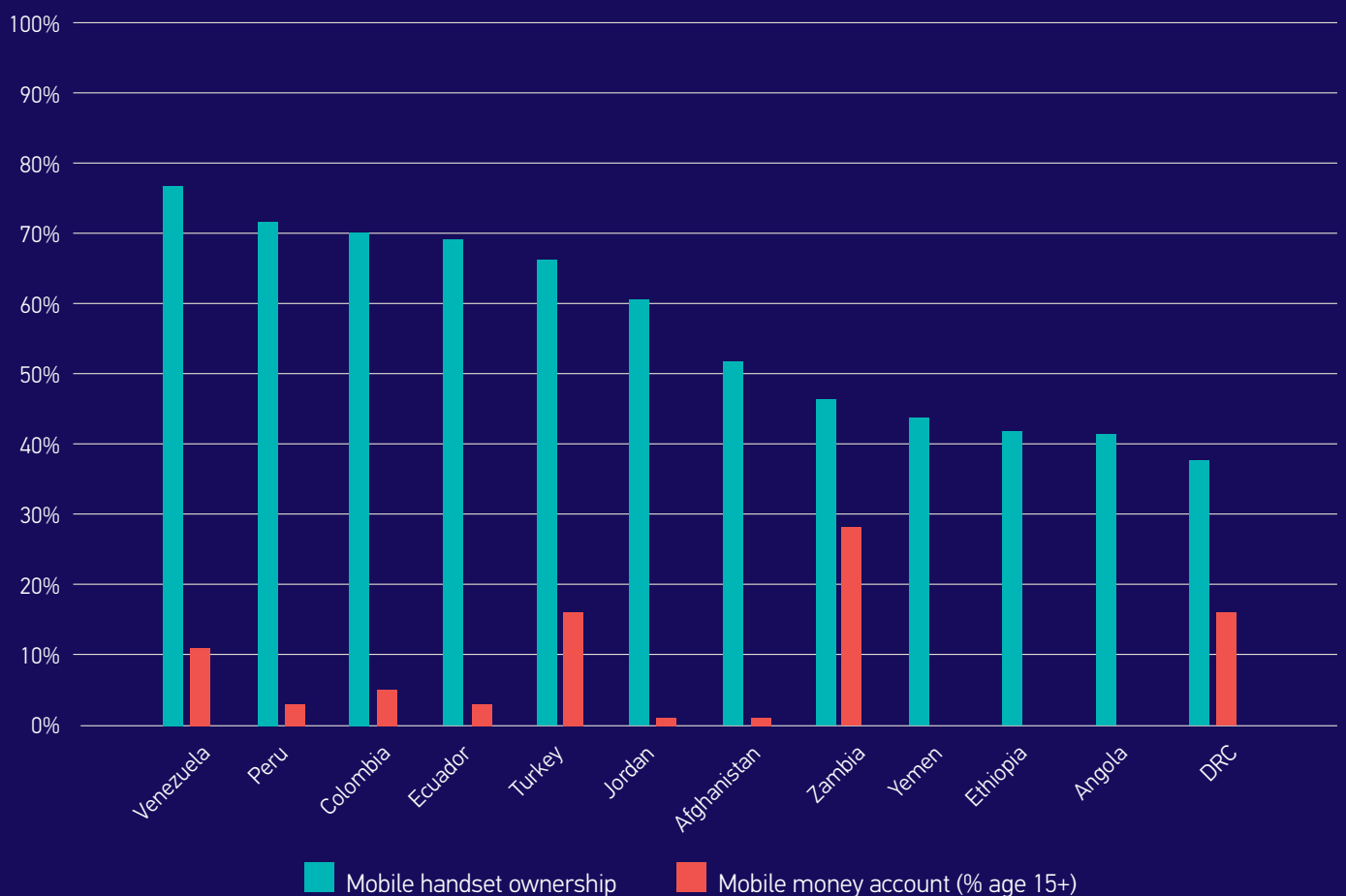
Available agent outlets

Agent outlets not only need to be proximate to beneficiaries, yet they also need to be reliable and have trained, trusted staff. Verification can be achieved through conducting a field audit in the areas in which the beneficiaries will be using their services. Providers and regulators often collaborate to combat fraud at the agent level by sharing critical details such as KYC and compliance history through a central database. This can also help identify fraudulent agents.

Liquidity infrastructure

Agents should maintain sufficient e-value and cash to provide reliable cash-in and cash-out services. Agents typically need to rebalance by trading for e-float or cash. The approach to this differs across markets. Some mobile money services require the agent to go to a bank or another location to rebalance, while others have liquidity runners that will deliver the rebalance. Liquidity issues are less common among urban agents than rural agents, especially in markets in which there is greater access to rebalancing points – banks, agent network managers, and agents.

BENEFICIARY PREPAREDNESS

Beneficiary preparedness can be measured by two key assessments. Mechanical assessment determines if it is possible for beneficiaries to use the service. Suitability assessment gauges a service's convenience.

Mechanical assessment

Digital and financial literacy: A beneficiary's mastery of digital and financial literacy needs to be assessed before distribution, and most humanitarian organizations provide hours of training before transfers are made. This is only possible if the crisis scenario allows time for the development and deployment of such training. During COVID-19, face-to-face training can be challenging. When one or more of these skill sets is low among beneficiaries, humanitarian organizations may want to consider designing support and monitoring mechanisms during the project.

Suitability and assessment

Client choice: Ideally, beneficiary preference would drive humanitarian efforts. In practice, it is inefficient. Beneficiary preference should be valued, yet a weighing of wider factors also influences the decision of the delivery mechanism. If one option is 10 percent less expensive than another, it may be a practical choice even if it is less convenient for beneficiaries. Post-project reviews should capture beneficiary satisfaction with delivery mechanisms to guide future projects. Where time allows, delivery mechanisms should be piloted, and beneficiary feedback should be considered before they are scaled.

3

MOBILE MONEY IN HUMANITARIAN EFFORTS

In Uganda,
an estimated
5-10%
of humanitarian
transfers are
delivered through
mobile money.
In Somaliland,
the figure is
10-15%

GENERAL USAGE

According to GSMA, mobile money has been used to deliver cash and voucher assistance (CVA) in at least 44 countries since 2017.[63,64] Of the mobile money providers who participated in GSMA's 2019 Global Adoption Survey, 60 percent reported partnering with a humanitarian organization to deliver mobile money–enabled humanitarian transfers. In doing so, these organizations have enabled digital assistance to be delivered to over 2.7 million unique mobile money accounts during crises.[65] Mobile money's ease of use and prevalence for digitizing transfers is debated. Case studies reach conflicting opinions, yet seldom provide the level of detail needed to ascertain the drivers of difference. The disparity in these opinions cannot be resolved without more case studies that use holistic analyses to describe the details of operations and dedicated resources. However, some prescriptions on the current prevalence and reach of these systems is possible.

Limited geographical alignment

The top five countries receiving humanitarian aid are Syria, Yemen, South Sudan, Somalia, and Iraq.[66] Mobile money services are only available in four of these five countries: Yemen, South Sudan, Somalia and Iraq. Somalia, is the only mature mobile money market among the five.

Limited use of leading systems

Sizable humanitarian transfer programs and world class mobile money systems coexist in areas of East Africa such as Kenya, Uganda, Rwanda, Somaliland, and Tanzania, as well as in Colombia and Bangladesh. However, mobile money is likely not the primary delivery mechanism in any of these countries. In Kenya[67] and Rwanda,[68] the large humanitarian transfer programs are distributed through Equity Bank. In Uganda, an estimated 5–10 percent of humanitarian transfers[69] are delivered through mobile money. In Somaliland, the figure is 10–15 percent.[70]

UN agencies' usage of mobile money is limited. UN agencies and their partners delivered 63 percent of humanitarian transfers worldwide in 2019. Figures from WFP show approximately 3.5 percent of that value was delivered through mobile money, and UNICEF figures show it was closer to 3 percent.[71] UNHCR analyzes their data differently, reporting that they use mobile money in 15 percent (15 out of 101) of the countries in which they have humanitarian transfer programs. Given that only Somalia has a well-functioning mobile money system, a figure well below 15 percent of total value should be expected when humanitarian transfers are measured.

SYSTEM EFFICIENCY AND VIABILITY

In the debate on using technology for humanitarian transfers, proponents emphasize operational benefits such as increased speed of transfers, transparency, and reduced paperwork, while skeptics highlight the burdens of enabling a system to work. Very few studies give a full account of the time and money spent both preparing for the transfer and administering it.

Oxford Policy Management conducted research into delivery mechanisms used between 2009 and 2013, including four mobile money systems in Kenya, Somalia, and Haiti.[72] They found that in Kenya, it cost US$64 for every US$100 received by a beneficiary. This cost decreased as more transfers were made, yet remains high, considering it accounts for 18 months of transfers. In Haiti, mobile money was found to be 35 percent more expensive than cash-in-hand, even after nine payment cycles. However, users were optimistic that the economics would favor mobile money if future payment cycles were conducted.

In Somalia, one project cost US$45 for every US$100 sent to beneficiaries. However, another project incurred costs of only US$11 per US$100 received by beneficiaries.[73] This relatively low cost was achieved by making repeat transfers to beneficiaries of large amounts, which required no set-up costs and reduced transaction fees.

More recently, a self-evaluation from GiveDirectly in Uganda (2016–2018) reported a cost-effective use of mobile money. In a remote rural area, they incurred a cost of US$28.50 per US$100 received by beneficiaries,[74] and in another project, they spent US$16.60 per US$100 delivered.[75]

Cost is not the only factor to consider. The difficulty of the business case for mobile money providers also affects the experience of beneficiaries. In Bangladesh (2015), a provider noted it took ten times as long to register humanitarian customers compared with regular customers, perhaps due to a weak incentive for service providers.[76] In Sierra Leone and Liberia (2014–2016), USAID reviewed humanitarian cash transfers from seven humanitarian agencies and found it was not financially viable to extend network coverage to low population density areas. They concluded that "mobile money will not be a popular delivery mechanism in such areas for the foreseeable future".[77]

In summary, the efficiency of mobile money is relatively low compared with other delivery mechanisms in some clear cases. Humanitarian organizations also need to understand the viability of the business case from the mobile money provider's standpoint. To evaluate the efficiency of mobile money as a delivery mechanism, **humanitarian organizations need to commit staff time and pre-distribution resources to reach an accurate conclusion**.

Efficiency rates also vary widely, depending on the context of the crisis and operational design decisions with the delivery mechanism. Since case studies do not provide sufficient details on operations to make direct comparisons, it is hard to draw conclusions. However, these design decisions must not save money by simply shifting the costs of distribution to beneficiaries.

When the ecosystem around mobile money is insufficiently developed and beneficiaries have to **cash-out** the transfer they receive, **mobile money** may not be the best option

OPERATIONAL DESIGN AND CHALLENGES

One of the most surprising conclusions from this study is that mobile money is not always more efficient than cash-in-hand. When the ecosystem around mobile money is insufficiently developed and beneficiaries have to cash-out the transfer they receive, mobile money may not be the best option.

Using mobile money is sometimes more cost-effective than simply handing beneficiaries cash, especially over time as the set-up costs are amortized. In other instances, it is not. Either way, considerable work is often required before transfers can be deployed. The mobile money system must often be extended or customized for use in humanitarian cash transfers.

This set-up period receives less attention than operations surrounding distribution. Tasks such as contracting and registering beneficiaries, training them, distributing handsets/SIM cards, and designing agent solutions are highly time-consuming.

In response to the Ebola crisis in Sierra Leone (2014–2016), all seven NGOs funded by USAID planned to use mobile money as a delivery mechanism. Digitizing payments during the crisis resulted in compelling outcomes such as significant cost-savings, noteworthy reduction in payment times, fraud reduction, security and efficiency gains such as preventing loss of working days, and reduction in travel costs for response workers.[78] In contrast, in response to Typhoon Haiyan in 2013, forty-five humanitarian agencies disbursed US$338 million, yet only three agencies managed to use mobile money due to poor GSM and low agent liquidity. The system set-up took 4–12 months, meaning most funds were only distributed in the recovery period.[79]

Agent location or lack of liquidity are consistent operational challenges

In Niger (2010)[80] and Malawi (2012),[81] these problems were so severe that the projects ceased using mobile money. Rather than extend the existing agent network or improve its liquidity system, many humanitarian agencies prefer to design systems where temporary agents are sent to beneficiaries on distribution days.

These strategies are essentially cash-in-hand, using a mobile money provider to deliver it. This observation also applies to the use of mobile money systems to deliver commodity vouchers to beneficiaries, which they can only spend at select merchants. The set-up costs, operational costs, and limited sustainability of these systems should remain in consideration.

BENEFICIARY EXPERIENCE AND PREFERENCE

Beneficiary preference and experience are often deciding factors when selecting a particular delivery mechanism, yet beneficiary feedback is not usually included in case studies. This report considers data on beneficiary experience from three essential angles.

Data on how funds are used during and after a program

A key observation is that beneficiaries typically cashed-out the transfer immediately (Niger 2010, Malawi 2012, DRC 2014, and Zimbabwe 2014–2015). However, in Ethiopia (2016), beneficiaries used other features of the mobile money system. The humanitarian organization required beneficiaries to store US$4.50 in their accounts, yet 43 percent kept more than this (an average of US$6.50, which was equal to 5 percent of the transfer). Seventy-five percent of these beneficiaries used funds to buy airtime, 17 percent transferred money, and 2 percent cashed-in to the system, yet made no purchase of goods (merchant payments).

In Zimbabwe (2015–2017), a national liquidity crisis and low levels of agent liquidity caused the number of beneficiaries making merchant payments to increase from 17 percent to 70 percent.[82] Beneficiaries also made merchant payments in Somaliland and during a pilot in DRC. However, merchant payments form one of the more complex mobile money use cases, and these uses are not scaled globally compared with other use cases, such as bill payments.

Mobile money offers the promise to enhance the financial inclusion of beneficiaries. However, studies and documented cases of continued use of mobile money post-humanitarian transfers are limited. In Zimbabwe (2014–2015), surveys conducted pre- and post-transfer indicated that mobile money usage increased from 17 percent to 76 percent, maintaining a balance in the account rose from 0 percent to 27 percent, P2P transfers increased from 11 percent to 74 percent, and merchant purchases grew from 8 percent to 26 percent.

Data on satisfaction with the service

The most positive reviews of mobile money were collected in user journey studies by Ground Truth Solutions in 2018. They found that in Kenya 91 percent of beneficiaries, and in Iraq 87 percent of beneficiaries, were at least "mostly satisfied" with mobile money.[83]

In Somalia (Puntland) (2016–2017), beneficiaries said that they preferred mobile money to other delivery mechanisms. In Zimbabwe (2014–2015), 62 percent of beneficiaries stated they would prefer mobile money to cash-in-hand in the future.

These high levels of satisfaction show that mobile money systems can be used to meet beneficiary needs. It is encouraging to see high levels of satisfaction in Iraq, where mobile money systems have yet to mature, and in Somalia and Zimbabwe, where the supportive infrastructure is still weak. Detailed operational analyses of the project designs would be useful, as these high levels of satisfaction are not reported consistently. In Ethiopia (2016), mobile money was used beyond cash-out, yet only 41 percent of beneficiaries reported preferring mobile money as a channel of choice for future transfers, and 54 percent preferred cash-in-hand. These preferences might change after the COVID-19 outbreak due to a desire to be socially distanced. **Insights from Bangladesh (2015) show that the quality of the operational design is likely a driver of satisfaction. In one area where beneficiaries had agents nearby, 92 percent of the beneficiaries wanted to use mobile money in the future**. In contrast, in an area with poor access to agents, only 24 percent wished to use the service in the future.

FULLY DIGITIZED PAYMENT ECOSYSTEM AND MERCHANT PAYMENTS

Mobile money offers many benefits. However, **a notable proportion of transferred funds is still being cashed-out by beneficiaries. This is due to the limited options for spending funds digitally**.

In mature mobile money markets, millions of consumers use mobile money in their daily activities, to pay for school fees, to access loans to invest in farming activities, and to anticipate and mitigate financial setbacks and shocks. However, building an expansive digital ecosystem to reach the last-mile is extremely challenging. Low financial and digital literacy continue to impede efforts to reach last-mile consumers.

Tackling these challenges will require a collective and collaborative effort across the digital ecosystem. For instance, payments for essential utility services require partnerships with centralized utility providers or off-grid pay-as-you-go (PAYG) providers. Driving these implementations and integrations can take months due to limited bandwidth or the technical readiness of all entities. Additionally, last-mile micro, small, and medium-sized enterprises (MSMEs) tend to prefer cash, thus incentivizing them to accept digital payments requires offering benefits that cash cannot compete with.[84]

Before beneficiaries can make digital purchases, infrastructure must be in place. Yet merchant payments rank among the least scaled use cases of mobile money. The latest monthly data from GSMA (December 2019), show that **mobile money merchant payments account for only 5 percent[73] of the volume (or 3.03 percent of the value) of mobile money transactions globally**.[85] These figures are likely even lower for low-income and rural populations. Stickiness of cash for retailers is driven by a confluence of factors including the informality of the MSME sector, low levels of ownership of necessary documentation, frictions in the user experience for merchants and customers, and the lack of a compelling value proposition.

Mobile money merchants and mobile money agents are often seen as interchangeable, yet they function differently. Agents primarily offer cash-in and cash-out (CICO) services for customers and receive a commission for providing the service. In contrast, mobile money merchants accept digital value via QR codes or use the USSD menu in exchange for the goods and services they sell. GSMA reports that 90 percent of mobile money transactions in sub-Saharan Africa are still over USSD, and 76 percent of mobile money providers offer USSD interfaces as an acceptance mechanism for merchant payments.[86]

Few examples exist of scaled usage of mobile money merchants linked to humanitarian payments. Nevertheless, two interesting success stories are worth highlighting.

DRC shows promising preliminary results for a humanitarian cash transfer pilot.[87] Like Zimbabwe and Somaliland, DRC has had a complicated history with its local currency, which is commonly understood as a driver of merchant payment adoption in those countries. A UNHCR pilot in Eastern DRC managed by VodaCash reached 3,000 households. However, a lack of agents in the area led the project to pilot mobile money merchants as a solution. Beneficiaries were given training on how to use mobile money, with an emphasis on using it digitally first. **Beneficiaries were also encouraged to save digitally or make digital payments at schools, health clinics, or shops**.

Project staff mapped the payments value chain for small retailers and worked with suppliers to accept mobile money from the retailers. They also worked with utility companies to encourage them to accept digital payments. In addition, VodaCash offered beneficiaries discounts for making purchases digitally. Project staff noted that when making purchases at rural merchants, change is usually given in Congolese francs, because rural agents often only have Congolese francs to disburse. Yet people generally prefer U.S. dollars. Digital payments allow the beneficiary to hold U.S. dollars, which is a significant benefit. For the first payment cycle, a third of the value was spent digitally at merchants, and for the second, this rose to 50 percent, which is an encouraging sign.

EcoCash was launched in 2012, three years after the Zimbabwean economy dollarized due to hyperinflation. However, a lack of coins meant the minimum purchase at stores was US$1, a significant amount for the average Zimbabwean, who was living on less than US$2 per day. EcoCash, a local mobile money provider, sought to offer a solution by building a mobile money merchant system where exact change could be made.[88]

EcoCash integrated with the banks and bought 10,000 USSD-and SMS-enabled POS devices for larger merchants at a time when Zimbabwe had only 4,800. This allowed customers to use their handsets as "virtual debit cards." Smaller merchants were given five digital merchant codes that customers could use to transact.[89] Merchants had to pay fees for accepting mobile money, so EcoCash set up two new companies: PayBay to convince merchants to take mobile money, and TPS to support larger merchants with POS machines. EcoCash also spent US$600,000 on a customer marketing campaign.[90]

From 2014 through 2017, a drought across Southern Africa led to famine and a national liquidity crisis in Zimbabwe. Save the Children administered a humanitarian transfers program (2014–2015). During the course of that program, use of mobile money merchant payments increased from 8 percent of beneficiaries before the project was implemented to 26 percent afterward.[91] Subsequently, World Vision and CARE also implemented a humanitarian transfer program (2015–2017), during which the percentage of beneficiaries making mobile money merchant payments increased from 17 percent to 70 percent.[92]

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4

THE FUTURE OF MOBILE MONEY IN HUMANITARIAN TRANSFERS

Use of mobile money as a delivery mechanism for humanitarian transfers is promising. However, despite the growth in adopting mobile money for digitizing CVA, implementation remains a challenge.

The efficacy of mobile money for humanitarian organizations and beneficiaries depends on context. Future case studies should offer more insight on the system's ability to reduce costs, speed up transfers, and provide beneficiaries with a useful financial tool.

Humanitarian organizations can better understand how mobile money systems operate and what their limits are by increasing their familiarity with mobile money and the circumstances for which it was designed. Important contexts for mobile money include the following.

Urban and peri-urban environments. These locations offer supportive infrastructure such as GSM coverage and ease of rebalancing, as well as economic activity and population densities that drive the business model for mobile network operators.

Long-term, large value transfers. Set-up costs become less of a deterrent as they are distributed over large numbers of transfer cycles or as a percentage of larger value programs.

Recommendations for humanitarian agencies working with mobile money providers

1. **Frameworks for analysis.** Use frameworks to guide decision-making and carry out a holistic analysis of the implementation. The efficacy of mobile money for humanitarian organizations and beneficiaries depends on context.

2. **Client centricity.** Technical experts can help design and implement mobile money solutions and operations. However, beneficiary choice and experience are guiding factors when selecting a delivery mechanism.

3. **Share knowledge.** Share inter-agency good practices and results from existing mobile money implementation.

4. **Literacy and trust.** Work with government bodies including ministries of finance and the central banks, and providers to implement digital finance literacy programs among beneficiaries to increase trust and adoption.

5. **Sustainability.** Understand the viability of the business case from the provider's standpoint.

Large value programs are the most likely to attract interest from market-leading providers. If incentivized, these market leaders will be the best at customizing operations.

In contexts where one or more of these elements are not fulfilled, humanitarian organizations can invest in having experts available who can help with design and management of new mobile money operations. The digitization of humanitarian payments provides an opportunity to identify gaps for the attainment of a fully digitized ecosystem, including refining the existing local infrastructure, capacitating local ecosystem players with digital finance literacy skills, and merchant acceptance of digital transfers.

Examples of strategic partnerships between humanitarian organizations and mobile money providers remain elusive. Better coordination will significantly assist with sharing lessons learned and brokering better deals with mobile money providers that spur long-term investment. The UN Common Cash Statement (UNCCS)[93] pilot countries are excellent places to start these efforts. Partnerships with providers can enable investment in improving systems to become sustainable over the long-term.

MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE

1
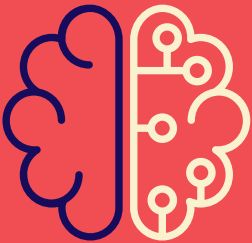
INTRODUCTION TO ML AND AI

Artificial intelligence (AI) is a term that describes a machine's ability to acquire and apply knowledge and mimic the typical cognitive functions that humans associate with other human minds.[94] Machine learning (ML) can be considered a subset of AI, concerned with enabling machines to extract knowledge from past data or experiences without being explicitly programmed to do so.[95]

Using ML and AI, humanitarian agencies can analyze large volumes of data in a much quicker and more targeted manner. This helps ensure transparency by making incidents of fraud easily detectable. It also enables field workers to search and synchronize large databases and verify identities of beneficiaries by linking them to identity systems.

These terms have only become buzzwords in recent years, yet these concepts have been around for decades. Intelligent voice response (IVR) technology, commonly used in call center automation, appeared in its earliest forms in the 1970s. Today, ML and AI solutions are widely used in the financial industry for trading of stocks, bonds, and other assets, compliance (KYC, AML), and treasury functions, to name a few examples. As processing power continues to increase exponentially, computers can follow complex chains and even layers of algorithms in neural networks, mimicking the way the human brain operates.

The relationship between data, ML, and AI applications is shown as a set of three interlocking gears. Data serves as the foundation of ML/AI systems, and decisions about data affect the function of higher-level systems. ML is a subset of AI that uses models to make data-driven predictions. AI applications can rely on an ML model to translate data into usable predictions to make, plan, or do something in the real world.

1 DATA
Text, numeric, audio, image, video

3 ARTIFICIAL INTELLIGENCE
Computer vision, natural language, processing chatbots

DATA

MACHINE LEARNING

ARTIFICIAL INTELLIGENCE

2 MACHINE LEARNING
Supervised, Unsupervised
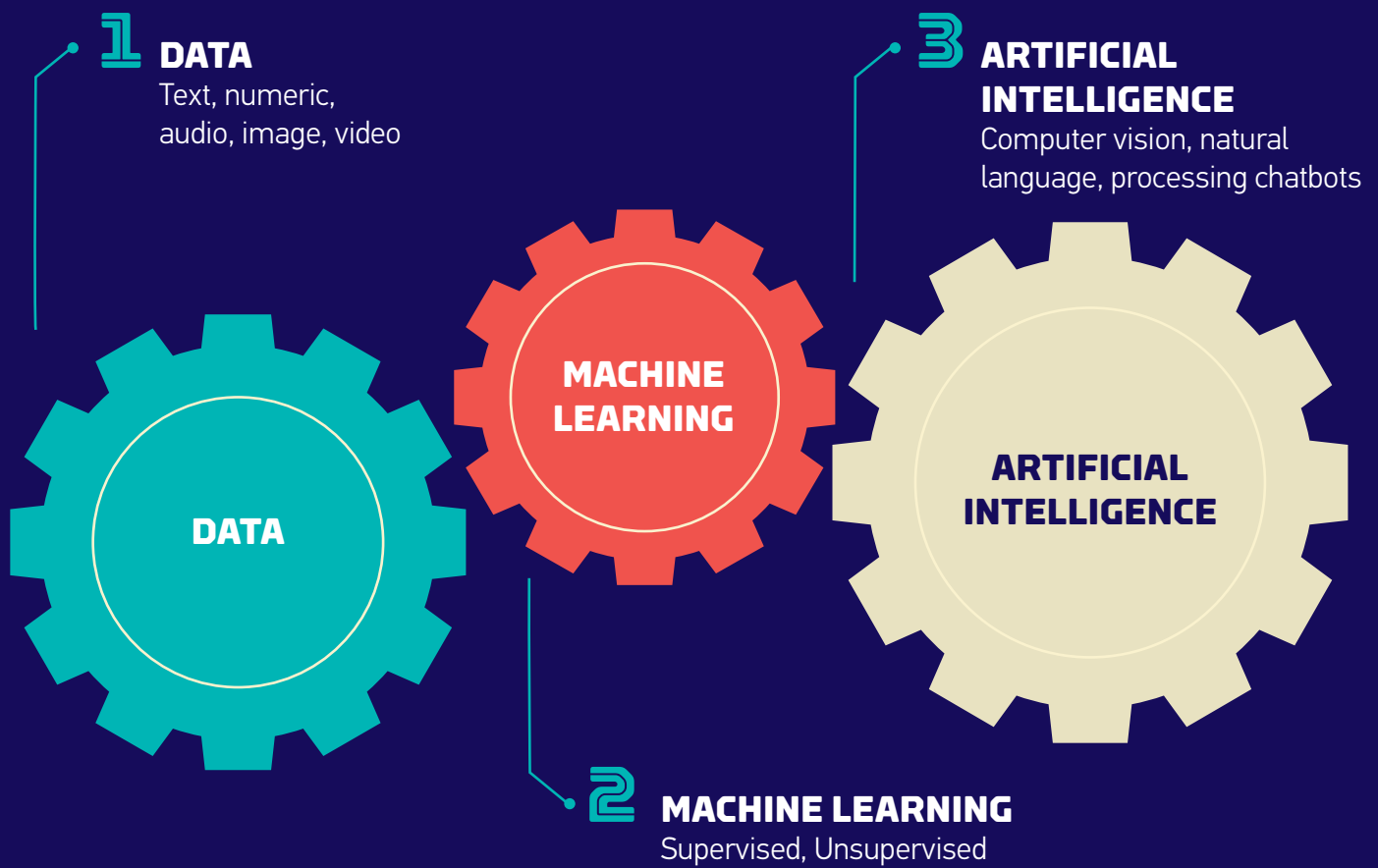
Source: USAID

2

PREREQUISITES FOR ML AND AI

Some AI solutions, such as chatbots and IVR, do not require high-speed internet connections to serve beneficiaries. With a telecom provider's 2G connection, even an intermittent one, recipients can fully utilize a chatbot messenger. **However, ML and AI solutions do require computing power sufficient for analysis of large data sets, as well as an adequately trained team to manage the system**.

The real challenge lies in onboarding beneficiaries onto an AI platform and ensuring that they are engaging meaningfully. In-person contact points in the community are necessary to build trust with beneficiaries and help them to understand the technology's benefits. Donor organizations need teams trained in community outreach and a well-thought-out plan to interact with beneficiaries. When done correctly, this can increase onboarding rates and a greater depth of engagement by beneficiaries on the AI platform.

3

ML AND AI IN HUMANITARIAN EFFORTS

ML and AI solutions are increasingly embedded in humanitarian use cases, such as those with automated chatbots. Newer approaches are also being explored. One of the benefits of AI solutions is that they can relieve humanitarian aid workers and agencies from the burden of basic and repetitive tasks. Automating such tasks gives humanitarian aid workers more time to engage productively with activities such as community outreach efforts to onboard potential beneficiaries. Currently, ML and AI solutions are mainly related to the operations surrounding last-mile cash delivery.

Humanitarian efforts that employ ML and AI solutions have the added benefit of providing clients, even those in remote areas, with easier access to customer support, which can be provided by an automated system.
A system can be programmed to handle the first level of customer complaints or disputes. If necessary, the situation can be escalated to a human operator.
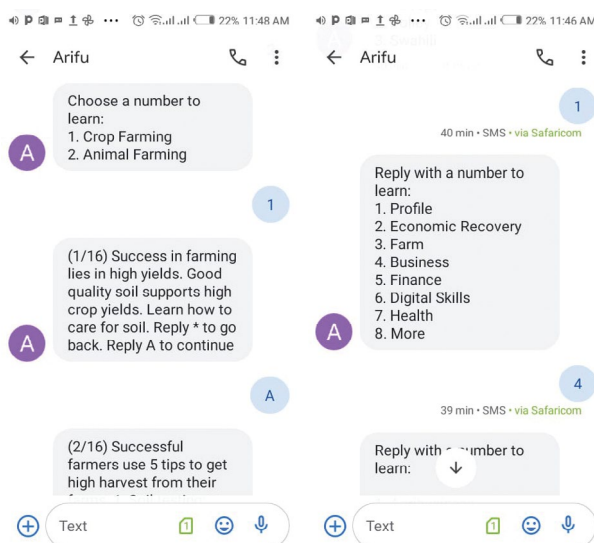
Arifu Chatbot screen.

Incorporating **ML and AI solutions** can potentially provide clients with access to a fair, convenient, and effective recourse system[96]

CHATBOTS AND IVR

Chatbots are currently used in the humanitarian context to provide automated text messages to beneficiaries. For instance, Arifu, a Kenyan-based social enterprise, offers an automated personal learning platform that trains and educates the rural population in agricultural best practices and financial literacy. Arifu started with an SMS-based service and developed to include WhatsApp and Facebook Messenger as platforms for its interactive chatbot. **Today, Arifu has successfully helped Kenyan farmers increase their income by 55 percent per acre, and its financial literacy program has led to a 500 percent increase in savings deposit value from rural villagers.**[97]

A similar interactive platform could be used to educate beneficiaries about an aid program. By matching questions asked with automated responses, recipients can learn more about the humanitarian transfer collection procedure, such as who qualifies for it and the documentation required. This can be taken a step further to inform the population about other programs, products, or services that could be helpful for them, even if they do not qualify for the transfer.
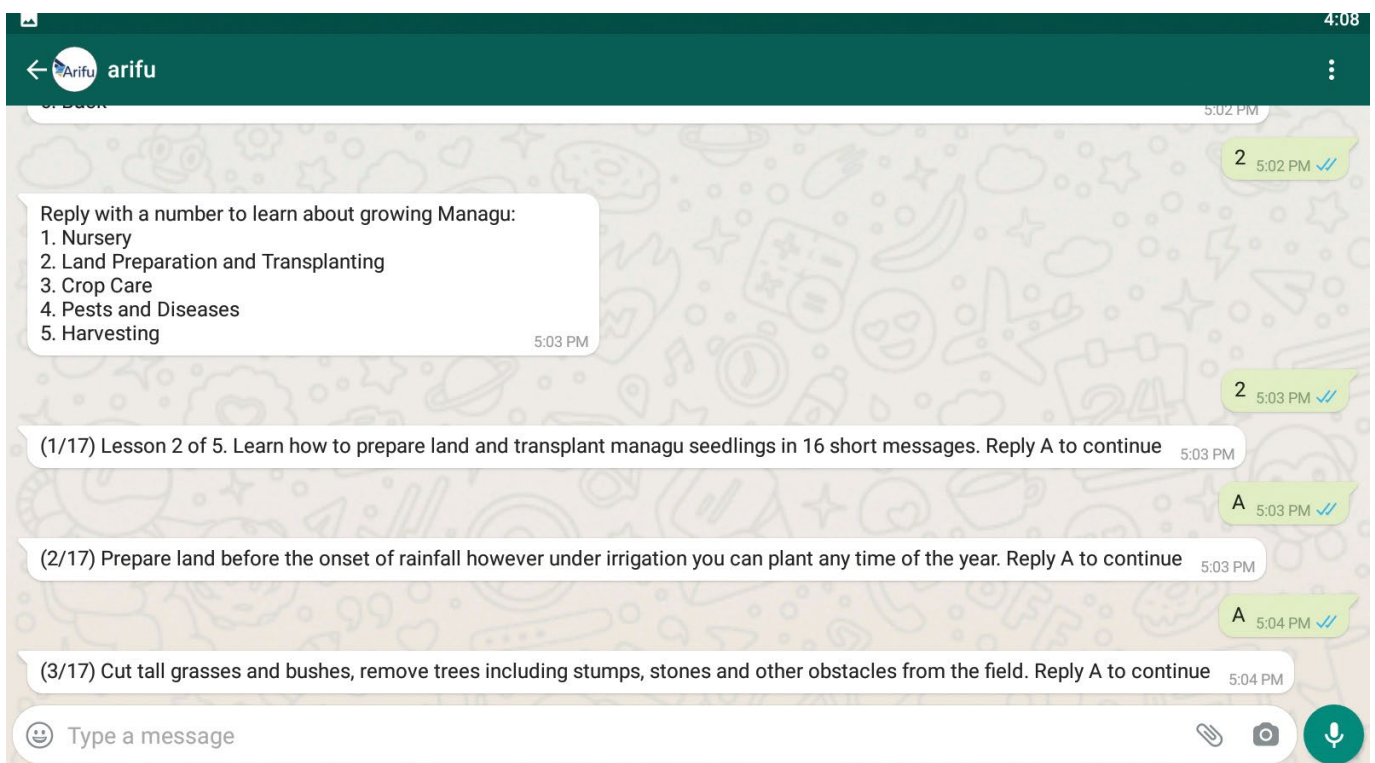
Arifu Chatbot question and response screens – *Source: Arifu*

Chatbots are currently used for education, information-gathering, and relief aid by WFP, the Norwegian Refugee Council, and SOS Children's Villages.[98] **In 2017, in Somalia and DRC, WFP launched the "Food Bot," a chatbot that assessed which areas were most in need of food using a combination of in-person interviews and text messaging.**[99] The Norwegian Refugee Council is developing an AI-powered educational chatbot[100] that searches for high-quality learning resources for refugees in war-torn areas without formal education. Meanwhile, SOS Children's Villages has recently launched its Digital Care Assistant, which supports SOS caregivers with information about pedagogical topics and helps SOS youth to find answers regarding care, education, and employability.[101]

An added benefit of interactive platforms is the ability for the humanitarian agency to gauge beneficiary preference regarding the format of assistance. A clearer understanding of the beneficiary's environment and financial situation can be achieved through interactions on the platform. Some recipients prefer to receive physical currency because it enables transactions with micro-merchants who do not accept digital payments yet. If the cash voucher were delivered digitally, the beneficiary would have to take additional steps to withdraw the cash. This can be complicated by a lack of liquidity at withdrawal locations. Chatbots create a channel for beneficiaries to share concerns like these with the humanitarian agency.

Arifu has observed that **IVR offers a more conversant structure of interaction that helps promote better learning outcomes**. Other factors, such as the tone of messaging and language, can also be tailored based on beneficiary preference.

DECISION OPTIMIZATION (PRESCRIPTIVE ANALYTICS)

Using prescriptive analytics can help organizations choose a course of action based on computer predictions. **In the context of humanitarian payments, AI can be used to assess how well a humanitarian support program is meeting its stated goals, and identify potential areas for improvement**.

Consider a program that aims to educate farmers in rural areas about financial management for their farm and household. When beneficiaries engage with a chatbot, the computer can track how well the user is learning a given concept based on their interaction with quizzes or other decision moments. This can be achieved by building algorithms based on frameworks for learning that act as a way to gauge and evaluate a user's progress in learning. The chatbot platform can then connect the user to financial products and services, or others that are aligned with the user's level of financial literacy.

Furthermore, **prescriptive analytics can potentially be used to evaluate a cash distribution program and identify ways to improve product delivery or make the process smoother**. For instance, analyzing data on the number of beneficiaries reached through various outreach channels can provide feedback on the effectiveness of the channels. Based on the data, the organization can further optimize the program to make full use of the most effective channels. **To implement such an approach, the humanitarian agency requires staff trained in Big Data analysis** using software such as Tableau or Konstanz Information Miner (KNIME). **Ideally, staff would also be comfortable dealing with programing language such as Python or SQL**.

PREDICTIVE ANALYTICS

AI-enabled predictive analytics makes predictions about future events. In the humanitarian payments setting, **data on factors such as when and where humanitarian withdrawals happen, can be run through AI models to gain insights about trends. This knowledge can be used to improve liquidity management so that cash points are adequately stocked to meet predicted withdrawal volumes at specific times**.

Predictive analytics can be used to process data on beneficiaries' monthly spending, savings, and loan repayment. Based on that analysis, humanitarian agencies can partner with service providers of financial management tools to enable beneficiaries to become more self-sufficient, with the capability to track and manage expenses. These tools could be in the form of reminders to save a predetermined portion of income or alerts when a preset monthly spending limit is about to be reached.

Data gathered on beneficiaries' use of humanitarian transfers can be used to predict how that assistance will affect the individual's finances. These predictions can be used to adjust the amount of cash assistance distributed or to provide financial management guidelines for beneficiaries to enable them to become more self-sufficient.

4

THE FUTURE OF AI IN HUMANITARIAN PAYMENTS

The increase in distribution of loans in the developing world has led to rising indebtedness, partly caused by factors such as aggressive lending tactics by creditors and lack of financial literacy of debtors

AI solutions can enable small teams to organize and implement humanitarian efforts on a much larger scale than previously imagined. More use cases are currently being examined, even as technology continues to improve. ML and AI are value-adding technology solutions that can bring efficiencies to any channel used, including banks, mobile banking and mobile money.

Natural language processing (NLP) creates a more "human feel" to the process of interacting with AI. With a machine capable of NLP, a user can type or speak a question to the AI, which then uses the same words, sentence structure, and tone of voice as in a conversation with another human. This is especially important in the humanitarian context, where the human feel of an **AI can help to build trust and improve communication with beneficiaries, leading to more engagement and uptake rates**.

Beyond humanitarian payments, ML and AI can be used in other ways to support both urban and rural populations. ML is increasingly used for credit scoring in financial inclusion to provide digital microloans to individuals and micro-merchants. Credit scoring itself is an entry point for other financial services such as micro-insurance and remittances. **The increase in distribution of loans in the developing world has led to rising indebtedness, partly caused by factors such as aggressive lending tactics by creditors and lack of financial literacy of debtors**.

Research and surveys conducted by CGAP in 2018 show that nearly a third of digital borrowers in Tanzania have defaulted and more than half have repaid late.[102] Moreover, nearly 10 percent of borrowers in Tanzania report having reduced food purchases to repay a loan.[103] **Thus, digital lending programs should be undertaken with the utmost caution and be monitored very closely to ensure that the borrower is not disadvantaged**.

ML and AI solutions play a supporting role around last-mile payment operations, and it is a role that will endure. This is because they serve an analytical function, such as helping to identify trends in past data or making predictions based on observed activity. The use cases of AI in payments have also primarily been related to support functions, such as customer service chatbots and automated KYC functions.

ML and AI solutions may not feature prominently in the actual last-mile disbursement mechanism, but humanitarian agencies should continue to look for innovative ways to implement ML and AI to support operations around last-mile payments. These may include liquidity management and prediction, and channel optimization using a feedback loop.

Key recommendations for agencies in dealing with ML/AI payments

1. **Monitor developments.** ML/AI is promising technology, yet so far most of the solutions are not specific to last-mile payments, and thus there is limited applicability of ML/AI in last-mile payments. Nevertheless, it is important to monitor developments in the space.

2. **The right time.** The frameworks suggested in this report can identify if/when it becomes appropriate to consider an ML/AI solution.

3. **Current uses.** Current ML/AI solutions rolled out with last-mile payments can be considered to streamline processes pre- and post-distribution.

BLOCKCHAIN AND DISTRIBUTED LEDGER TECHNOLOGY

1

INTRODUCTION

In 2008, a programmer using the pseudonym Satoshi Nakamoto, published a white paper entitled "Bitcoin: A Peer-to-Peer Electronic Cash System." The paper defined a platform that allowed for the trusted exchange of a completely decentralized cryptocurrency called "Bitcoin." Debate continues as to the actual value of Bitcoin as well as on the identity of Satoshi Nakamoto. Still, the technology underlying Bitcoin, the blockchain, has reshaped conversations in the financial industry, perhaps more than any other single innovation in the past two decades.

Defined simply, a blockchain is a series of digital transactions that are grouped into "blocks" of information and shared securely across computers on a network. When a new block is added, it is connected or "chained" to the previous block. If Bitcoin is separated from Bitcoin's blockchain, a technology remains that can be leveraged in environments that require systems of trust and exchange, so that users can send value or information directly from one party to another without the need for intermediaries.

A report commissioned by the Global Alliance for Humanitarian Innovation (GAHI) found that **blockchain and distributed ledger technology (DLT) can assist humanitarian agencies to disburse payments transparently**. Where blockchain and DLT have been rolled out, for example with WFP in Jordan and the IFRC and Red Cross in Kenya, these payment solutions have promoted social equity such as financial inclusion. **They have also improved transfer of remittances and transparency of donations, reduced fraud, improved beneficiary management disbursements, and facilitated cross-border transfers, humanitarian transfer programming, and grant management**.[104]

Blockchain technology is a type of DLT. DLT refers to a replicated, shared, and synchronized digital "database," geographically spread across multiple sites, countries, or institutions. Within blockchain, data are organized in a ledger of logically linked transactions.

Since much of today's global financial industry is based on trust established through a network of intermediaries, DLT has numerous potential applications within the financial sector. For example, a typical cross-border payment relies on a network of correspondent banks that work together to move money from one account and currency to another. For the transaction to be completed successfully, each bank needs to trust that the other has the money that is necessary to complete the transaction, a concept known as "counter-party risk." Counter-party risk is not limited to cross-border payments and is a concern for securities transactions, trade finance, lending, and many other products and services within the financial industry.

Organizations face other similar challenges. Financial institutions frequently rely on a patchwork of different technology platforms within siloed organizational structures. Different parts of the business may have conflicting sets of data on transactions or customers. The use of blockchain technology has the potential to help organizations to consolidate this information and ensure that data are consistent and accurate.

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PREREQUISITES

For businesses or organizations, the prerequisites of DLT are similar to those of any other technology system or platform. An organization would need to have a technology stack either on-premises or hosted in a cloud environment. The system would require network connectivity and an IT support team. In addition to building the platform internally, many third party providers offer blockchain-as-a-service platforms to give users a "buy" as well as a "build" option. Since the technology is designed to provide consensus among multiple entities, these entities would also need to be able to connect through a network, most often through either a company's intranet or the external internet.

For individuals in the humanitarian transfer context, requirements can vary. Typically, **a beneficiary using a DLT-based system to receive a humanitarian transfer would need to have a digital wallet that could be accessed through, or installed on, a smart device such as a smartphone or computer**. These requirements are not easily met in humanitarian settings, yet some companies are working to address these challenges.

In addition to the technical requirements, **having appropriate regulatory frameworks in place is also essential**. Regulators have not been particularly open towards digital currencies in the past, yet regulation now encompasses blockchain technology itself, especially in the financial sector.

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DLT IN LAST-MILE HUMANITARIAN TRANSFER DELIVERY

The drivers for use of DLT for last-mile delivery of humanitarian transfers are similar to those in the traditional financial industry, yet vary by type. Last-mile humanitarian transfer delivery typically involves multiple parties and systems in a network of actors who may or may not fully trust each other. The use of DLT could help provide a platform to simplify the exchange of information or value within these contexts.

However, **the challenge around DLT in last-mile delivery is the actual transfer of value**. Bitcoin was created as a peer-to-peer payments platform that allowed for the decentralized exchange of value between individuals. As a result, digital currencies would be ideal for last-mile delivery. Indeed, many digital currencies have been created in the last few years, specifically focused on financial inclusion and use in humanitarian or emerging market contexts, such as the OMG Network.

Despite this, global regulators have remained cautious to the idea of crypto-based digital currencies. Since they typically exist alongside traditional national currencies, digital currencies can present challenges for governments and economies, and include the potential for tax evasion and money laundering. Further, digital currencies may undermine monetary or fiscal policy in countries with capital controls or less-developed financial markets. For these reasons, most governments have tightly regulated digital currencies, and few accept them as legal tender.

The characteristics of some digital currencies are not always favorable in humanitarian contexts. For instance, the Bitcoin blockchain is entirely public, so all Bitcoin transactions made since 2008 can be seen by anyone who has access to a web browser. Although only the wallet addresses are shown, linkages can be made back to the entity receiving Bitcoin, which could potentially impede beneficiary privacy. Many digital currency transactions are irreversible, meaning that if a transaction is made in error, another transaction must be made to correct the mistake, rather than amending the original transaction.

Finally, the value of digital currencies tends to be volatile. It is not uncommon for the value of crypto-assets to increase or decrease by 25 percent or more in a single day. This instability makes it very difficult to use in a humanitarian setting where stability and trust are critical. Stable coins address this volatility and may present a viable alternative. Yet at this point, there are very few examples of DLT providing scaled end-to-end last-mile humanitarian transfer delivery. Most current DLT implementations and proofs of concept (POCs) rely on a hybrid approach where a DLT tracks the exchange of value, yet does not directly represent value on the DLT itself. WFP's work in Jordan is one example of this.

EXCHANGING VALUE USING DLT

In 2017, WFP launched a POC in Pakistan's Sindh province, called "Building Blocks," which leveraged DLT to authenticate and register beneficiary transactions. Building Blocks is built on "permissioned DLT," which allows for direct, secure, and fast transactions between participants and WFP without requiring a financial intermediary to connect the two parties.[105] After some initial trials, Building Blocks was launched in two refugee camps in Jordan later that year.

Cash value from WFP or other partners is stored in a beneficiary account maintained on the permissioned Building Blocks blockchain. Beneficiaries living in the camps can then purchase groceries from participating stores. At checkout, the beneficiary's iris is scanned to authenticate them and authorize the transaction. The cost of the goods purchased is then deducted from the beneficiary's Building Blocks account. WFP settles on a regular basis with the merchant in cash, often through a commercial financial service provider.

WFP'S BLOCKCHAIN-ENABLED HUMANITARIAN CASH TRANSFER PROCESS

STEP 1
WFP creates profile for the refugee on Building Blocks, notifies refugee

WFP → Building Block
WFP → (refugee)

STEP 2
Refugee transactions are verified by Building Blocks at the point of sale; this record is instantly visible to WFP

WFP ← Building Block ← Merchant ← (refugee)
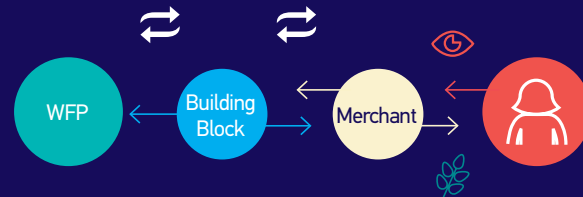
STEP 3
WFP reimburses the merchant

WFP → Merchant

WFP'S TRADITIONAL HUMANITARIAN CASH TRANSFER PROCESS

STEP 1
The bank receives WFP disbursement and entitlement information, notifies refugee

WFP → BANK → (refugee)

STEP 2
Refugee transactions are verified by the bank at the point of sale

BANK ← Merchant ← (refugee)
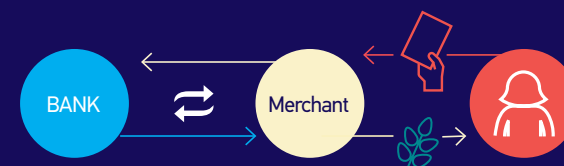
STEP 3
The bank reimburses the merchant and provides a summary report to WFP

WFP ← BANK → Merchant

The Building Blocks system effectively addresses the challenge of how to exchange value in a beneficiary context, without relying on digital currency. **Because the beneficiary's "wallet" exists on the blockchain and the transaction is authorized using biometrics, there is no need for the beneficiary to have a smart device or internet connectivity with them to complete the transaction**. The merchant, however, does require connectivity and a POS device.

Initial trials of the Building Blocks platform have been successful, and **as of August 2020, the platform had served more than 300,000 interactions**.[106] The system has the potential to lower transaction costs as there are no intermediaries involved. At the same time, it ensures greater security and privacy for the beneficiaries. No beneficiary-specific information is shared with the merchant directly. Instead, **the platform is integrated with UNHCR's existing authentication technology. This saves on financial transaction fees and ensures greater security and privacy for refugees**.[107]

The Building Blocks system is a "closed-loop" system insofar as it can only be used within a subset of merchants, yet it is a promising development in the use of DLT in last-mile delivery. WFP is now expanding the program both in terms of venues and channels, including ATMs and mobile money.[108] **Usage has also expanded to Cox's Bazar in Bangladesh, where the system is helping in the fight against COVID-19 by minimizing physical proximity**.[109]

COMMUNITY INCLUSION CURRENCIES

In addition to DLT-based voucher systems, some work has also focused on DLT-based community inclusion currencies (CICs).

CICs are a type of value exchange that has existed for centuries. CICs are typically used by groups with a common bond, and are designed to meet the group's typical daily needs. A CIC may be geographically or business-based, or built into an online community, and could be based on a physical token or a digital token.

In practice, CICs operate like a national currency, yet with limitations. Typically, CICs are issued by a community organization and are historically semi-closed-loop. These cannot be used outside the community, yet encourage spending within the community, and incur a zero-interest rate.

Within the community, CICs allow merchants, customers, and other actors to engage in commerce and build their own economic conditions without being dependent on national currencies, which in some contexts can be unstable or difficult to obtain. Depending on the structure of the CIC, lending may also be possible, enabling micro-finance activities within either smaller groups or the broader community.

Although community currencies have long been in existence, they have faced several challenges. First, although studies show that CICs help to encourage intra-community commerce, they are difficult to scale because of a lack of interoperability. For example, one community may use paper as its currency, while another uses coins. Second, acceptance can be an issue, both within and outside the community, because not all parties may accept the CIC. Finally, the security and transparency of CICs are potential weaknesses.

LOOKING OUTSIDE THE LAST MILE

Beyond last-mile payments, DLT has potential in many additional applications, especially when it comes to capturing, storing, and accessing data.

DLT functions like distributed databases, which take various pieces of data and store them for later retrieval or modification. The data can then be replicated to other DLT nodes. In the case of crypto-assets, this information is primarily transaction data, but other data could easily be used.

Within the humanitarian context, several data points need to be checked or captured as humanitarian transfers are delivered. Organizations must ensure that a beneficiary's ID can be verified and that they receive the correct humanitarian transfer amount. A record of transactions is also needed to ensure that programs are working and a report is sent to donors on how the money was used.

The multiple players in a humanitarian transfer delivery scenario add to the complexity. A humanitarian program involves donors, the humanitarian organization itself, global financial institutions, local banks or agents in the destination country, and beneficiaries. Sharing information between these entities is not straightforward. Multiple systems are involved in any transaction and not everyone has access to all the systems.

In theory, DLT could bring these disparate sources of data and participants together on a platform to share information securely. Many types of crypto-assets have been designed as 'permission-less' blockchain, in which anyone can download a crypto-wallet or view the entire chain of transactions. **However, many companies and organizations opt for "permissioned" DLTs, in which access can be controlled to view specific pieces of data or interact with specific entities**. For example, Building Blocks is a permissioned DLT platform and does not expose any beneficiary information to merchants on the platform, keeping all private information "hashed" so that only certain entities can access it.

In humanitarian transfers, this could mean giving each participant selected access to a DLT database of beneficiary information. Donors could be given access only to programs in which their funding has involved. Banks and agents in-country may only have access to payment details of beneficiaries.

Beneficiaries themselves may only have access to their own account. This would allow for real-time viewing and editing of data across geographies and organizations.

Sharing information facilitates coordination and creates harmony between organizations. Insufficient coordination between humanitarian agencies is often cited as one of the sizeable impediments to the further development of digitized humanitarian transfer. *The State of the World's Cash 2020* report from CaLP stated that 90 percent of respondents felt that the current struggles on cash coordination continue to have real operational impacts, limiting opportunities for collaboration, and for improving the quality and impact of humanitarian transfers.[110]

A permissioned DLT system would provide the common basis to coordinate and run humanitarian efforts. WFP has already invited other organizations to join the Building Blocks platform. The challenge is governance. The idea of having a completely decentralized digital currency appeals to many. However, in humanitarian efforts, at least one point of control is necessary to ensure everything runs smoothly. Deciding who will be the overall owner of the platform can be a challenge.

4

THE FUTURE OF DLT IN HUMANITARIAN EFFORTS

For many of the reasons just stated, very few DLT-based last-mile delivery solutions have reached any sort of scale, despite ample discussion over the last decade regarding theoretical applications of blockchain and DLTs.

Progress has been made, with Building Blocks being one of the most prominent examples. Yet substantial work remains to address the prerequisites identified in using DLT to solve last-mile delivery.

TACKLING DLT INFRASTRUCTURE CHALLENGES

A major challenge to the adoption of DLT in humanitarian transfers is technology infrastructure. Users typically require a smart device, which requires suitable connectivity to support transactions.

Although a smart device is most commonly used, other solutions implement gateways to interface with feature phones. In these use cases, a feature phone sends an SMS to a gateway, which then translates that message into a DLT.

Work is underway to improve connectivity. GoTenna is a U.S.-based provider of technologies for off-grid and decentralized communications. GoTenna devices pair with smartphones and enable users to send texts and share locations on a peer-to-peer basis, forgoing the need for centralized communications infrastructure. Data hops from one mesh user to another until it reaches a user with internet connectivity. The company has developed a crypto-wallet that allows a user with no internet connectivity to complete a transaction through the GoTenna mesh network.[111]

STABLE COINS

To address concerns on the volatility of digital currencies, the industry has focused on the idea of "stable coins." Any volatility in the price of the stable coin can be minimized relative to another asset or basket of assets. A stable coin can be pegged to another digital currency, fiat money, or to exchange-traded commodities. **Numerous stable coins have been launched in the past decade, yet one of the most prominent is Diem (formerly known as Libra)**.

Diem is a permissioned blockchain digital currency originally proposed by Facebook. The project, currency, and transactions are to be managed by, and cryptographically entrusted to, the Libra Association. This organization consists of members from payment, technology, telecommunications, online marketplaces, venture capital, and non-profits. The G7 recently made a decision not to allow the use of Libra until it is properly regulated.[112]

The original Libra white paper suggested the creation of a new eponymous digital currency not unlike Bitcoin. Similar to other stable coins, the Libra token was originally to be backed by financial assets such as baskets of currencies and U.S. Treasury securities to minimize volatility.

In September 2019, Facebook announced that the reserve basket would be made up of 50 percent U.S. dollars, 18 percent Euros, 14 percent Japanese yen, 11 percent Pounds sterling, and 7 percent Singapore dollars.[113]

The original idea was met with a tepid response from regulators, for many of the same reasons already mentioned concerning digital currencies. The perceived threat was even greater considering the footprint of Facebook properties within which Diem would be likely to be integrated – the combined WhatsApp, Instagram, and Facebook accounts for 5.6 billion monthly active users globally.[114] While the initiative had significant potential, the regulatory pushback left it at a standstill.

To their credit, the Libra Association adapted to circumstances. In January 2020, they dropped the idea of a mixed currency basket in favor of individual stable coins pegged to individual currencies, effectively becoming more of a payment platform than a unique digital currency.[115] A second version of the Libra white paper, published in March 2020, describes the new approach.

The Libra 2.0 platform functions like a DLT-based stable coin. Libra Association partners will create new currency units based on demand for a particular stable coin or else retire currency units as they are redeemed for conventional currency. Initial reconciliation of transactions will be performed by each service partner, and the blockchain's distributed ledger will be used for reconciliation between service partners.

Despite Diem's intention to reach the banked and underbanked population, some of the previously mentioned challenges are likely to limit its intended reach. For instance, Diem will not be able to reach geographies where cryptocurrencies are banned. Two markets that host the largest unbanked populations, India and Indonesia, have either banned cryptocurrencies or outlawed them for humanitarian payments.[116] Issues such as low ownership of official documentation will also pose challenges for market-level KYC regulation. Like other digital solutions, access to smartphone and mobile internet is a prerequisite, curtailing its reach among marginalized populations. Finally, unless Diem is widely accepted by an ecosystem of partners including enterprises, governments, and MSMEs, its usage will be limited to domestic and cross-border remittances.

Although Diem has significant support many of the same prerequisites identified in this report apply. The user and merchant need to have some sort of internet connectivity and device to handle the transaction, and regulators seem hesitatant to the idea.

It is also unclear what kind of privacy provisions are included. Given that many of today's tech giants are coming under fire for their usage of consumer data, having Facebook as the key proponent did not help the initial market reception. **Protecting beneficiary information is a key element of humanitarian transfers** – This would need to be ensured.

CENTRAL BANK DIGITAL CURRENCIES

In addition to stable coins, countries around the world have been researching and developing their own central bank digital currencies (CBDCs) including China, Cambodia, and the U.S. A CBDC is simply a digital form of official fiat money, and although the approaches and goals of different countries differ, the end goal is generally to supplant and potentially even replace cash (M0) in their economies. The public information about these systems thus far indicates that while many of them may have a DLT element, they are not solely reliant on DLT, especially when it comes to last-mile exchanges.

The CBDC project with the most progress is China's Digital Currency Electronic Payments (DCEP) platform. Not much has been published about how the platform works from a technical perspective. It is clear, however, that DCEP will be managed by the People's Bank of China (the central bank), which will distribute DCEP Digital renminbi (also known as RMB) to commercial banks, who will then distribute to individuals and companies.

Given that China is already heavily digital, the impact on the average individual will likely be minimal. Instead of paying through their traditional Alipay or WeChat Pay RMB wallet, they would pay through a DCEP RMB wallet that may or may not be part of the Alipay or WeChat Pay platforms. For the Chinese government, this cuts down the cost of cash and helps monitor how money is being used.

In the humanitarian context, **the primary advantage of CBDCs is that, in most cases, they would be pre-approved by the issuing government**. Using the DCEP in China would be completely legal, unlike a cryptocurrency. Also, some implementations of CBDCs, such as China's DCEP, accommodate for completely offline transactions where neither the merchant nor the consumer is online. There would, however, still be a requirement for some sort of device to initiate the transactions – smartphone or otherwise. The system would also allow for transfers to wallets such as a bank transfer with no requirement for the beneficiary to be online.

5

CONCLUSIONS

DLT and its potential applications in the humanitarian space are exciting, yet excitement must be tempered with reality. The local context is the most critical factor in driving payment mechanisms. Many field offices were happy with the existing payment mechanisms and did not see the need for change.

Necessity is also a question. Blockchain technology can be considered a database with unique characteristics. Within the traditional financial industry, many organizations have pushed initiatives based on blockchain technology, only to find that a regular database does the job well and there is no need for a blockchain.

With either stable coins or CBDCs, the challenge remains: how does the beneficiary use the underlying value? If the recipient can use the value in either an open or closed-loop ecosystem, that provides one mechanism of exchange. Also, as initiatives such as CBDCs or Diem/Libra move closer to cash-like equivalents, they could spur uptake.

Regulations may be the most significant impediment to DLT. Government response to digital currencies has been mixed. Some have entirely banned trading in digital currencies. Others, such as the U.S., do not accept digital currency as legal tender, yet do consider it an asset, the trading of which is subject to taxes and capital gains.

Regardless of the payment mechanism, **a major challenge for DLT-based solutions in humanitarian contexts is beneficiary trust. The concept of DLT may not be easy to understand, and the final problem in all scenarios is beneficiary choice. A user must be comfortable with the DLT-based solutions regardless of whether DLT or digital currency is involved.**

Key recommendations for agencies dealing with DLT

1. Blockchain vs. database. Despite public interest in DLT and blockchain technology, it is crucial to understand the technology fully. Frameworks can help determine whether the technology is essential, or if a distributed database will work just as well.

2. Integration with existing platforms. Because of the infrastructure and expertise required to develop a DLT-based humanitarian transfer platform, it is better to integrate with an existing platform that has already started to refine the technology and has a functioning ecosystem.

3. Crypto vs. DLT. Separating the crypto and DLT conversations is important. Exchanging "near money" through crypto-platforms is not suitable for humanitarian assistance for both regulatory and infrastructural reasons. It would be better to focus on DLT-based exchanges of value.

4. Consider CBDCs. More CBDCs will inevitably be launched and warrant consideration. CBDCs will have regulatory approval in the destination country, yet may not necessarily meet the privacy needs of humanitarian beneficiaries.

5. Beneficiary choice. Building an ecosystem around any solution is vital. If the beneficiary is not able to "spend" the value that is transferred through the system, it is not viable.

SUPER PLATFORMS

1 INTRODUCTION

Although they are a relatively new phenomenon, super platforms such as Alipay, Grab, Gojek, and Rappi have expanded beyond their core offerings and play increasingly influential roles in the financial services landscape. Alipay has a global footprint with acceptance points in countries such as Bangladesh, Australia, the United States, and the UK. Grab and Gojek are predominantly focused on Southeast Asian nations such as Indonesia, Malaysia, Thailand, and the Philippines, while Rappi mainly operates in eight Latin American countries including Colombia, Mexico, and Argentina. What separates any other app from these super platforms is the combination of seemingly disparate services within a single app interface. **As users gravitate towards the concept of an all-in-one app, super platforms have leveraged their user bases to launch complementary services that build on the core service, be it ride-hailing, food delivery, e-commerce, or payments.**

2 PREREQUISITES FOR SUPER PLATFORMS

The use of super platforms requires a smartphone as well as a connection to a 2G network for chat messaging and basic payment features. However, more advanced features, such as ride-hailing or food delivery, will require a connection to a stable 3G network. These advanced features need to provide updated, real-time information to the user and merchant. An environment with low or unstable connectivity would render them unfeasible.

To perform payment functions relevant for most super platform services, users need to submit basic personal ID information. For the individual, this would typically be a pre-existing bank account or a form of government or national ID. For a business, the owner would generally need to provide personal identification, bank account information, and business registration certificates. In cases where remote onboarding is allowed, owning a phone with a camera and access to mobile internet is essential.

In some cases, **temporarily relaxing KYC regulations has shown regulators the significant positive benefits that super platforms offer, and driven uptake**. In February 2020, the Reserve Bank of India postponed regulations to cancel almost 200 million e-wallets, provided by platforms such as Paytm and PhonePe, that were deemed to be non-compliant. Instead, the Reserve Bank of India introduced "low-KYC" prepaid instrument accounts with a minimum transaction limit to allow more time for such accounts to become KYC compliant.

To gain full KYC compliance, users would have to submit official government identification, otherwise known as Aadhaar, remotely.

In other instances, for example in Indonesia, KYC tiered accounts for both Grab and GoJek allow different levels of access and usage based on accounts being fully KYCed or partially KYCed.

Super platforms are built on top of banks' access and connectivity infrastructure. They often provide another channel for banked customers to access their pre-existing accounts. Therefore, bank accounts, smartphones, and access to mobile internet are prerequisites. Given the breadth of services available through super apps, they act as catalysts for digitizing the payment ecosystem. However, some previously mentioned barriers, such as reliance on cash in remote and rural areas, limited mobile internet coverage, or access to electricity, are channel agnostic. Their effectiveness in complex settings and for digitizing CVA should be considered with care and requires further research and investigation.

3

SUPER PLATFORMS IN HUMANITARIAN EFFORTS

Successful super platforms have gained multi-billion-dollar valuations, a testament to their influence in the economy and their potential for expansion. The most attractive use cases for super platforms tend to be in more developed cities, driven by the need for convenience and speed typical of urban life. In the context of humanitarian payments, the wide-ranging services and sizable user base of super platforms present significant opportunities.

AGGREGATION OF USER DATA

One of the key benefits provided by super platforms is consolidation of extensive user data on a single platform. This includes details on individual users' spending and saving habits, as well as small and medium-sized enterprises' (SMEs) revenue streams and operating expenses. Access to this data has been vital in enabling super platforms to deliver personalized interactions such as discounts, offers, and loans.

In the humanitarian setting, this could enable donors to better understand how beneficiaries prioritize expenditures when they receive cash disbursements. Through the super platform, donors could then introduce discounts on high priority items for more vulnerable groups, such as pregnant women or families with young children.

The aggregation of user data also provides opportunities for super platforms to provide financial services such as micro-loans and micro-insurance to their users. The data collected on users' financial habits allows super platforms to discern which users to lend to and how much to lend. Super platforms can also gather data to continuously evaluate and improve products.

USER ONBOARDING AND EXPERIENCE

The quick registration process for super apps, which usually requires fewer than five minutes, has fueled their growth. Many super platforms have also gone to great lengths to develop straightforward user interfaces with interactive features (such as token reward systems) to keep users engaged. Donors can use these interactive features to push educational content to beneficiaries such as mini-courses on personal finance or how to make the best use of financial technology.

Onboarding beneficiaries onto a digital platform is often half the battle. The successful super platform approach goes one step further, to keep recipients interested and engaged with more aspects of the platform.

KEEPING FUNDS DIGITAL IN THE ECOSYSTEM

Another benefit of super platforms is the accompanying e-wallet, which allows users to transact digitally. For business users, **super platforms facilitate acceptance of digital payments through a QR code, reducing the need to handle physical cash**. To bring more merchants onto the platform, many super platforms have also introduced features such as instant settlement and merchant rebates.

In the humanitarian setting, a super platform ecosystem that allows customers and merchants to transact digitally reduces the need for beneficiaries to withdraw physical cash. Transactions would be traceable, to prevent humanitarian payments going awry. However, the ability to transact with an e-wallet on a super platform will be limited by merchant acceptance levels.

4
THE FUTURE FOR SUPER PLATFORMS

Following the success of super platforms in China, others have tried to emulate their strategic approach, with various degrees of success. The transition from a single-service app to a super app requires foresight and strong leadership to coordinate widely differing departments. As a result, attempts to branch out into more verticals can backfire rapidly. Mistakes accrete too quickly to be fixed in real time.

For instance, OPay in Nigeria has halted its ride-hailing and logistics services to focus on its core payment platform. Previously, OPay had been expanding aggressively and launched business-to-business (B2B) and business-to-customer (B2C) ecommerce services. Now it is uncertain whether those business units will continue to exist as the company re-evaluates its focus.

Existing super platforms will integrate financial products and services onto their platforms. Retail investment, insurance, personal loans, and buy-now-pay-later services complement the super platform's payment feature. Super platforms also have extensive opportunity to personalize these services based on financial and transaction data gathered on users. This will likely drive further engagement. Paytm in India has been building its offerings for financial services, which now include retail investment products and stockbroking, as well as consumer and merchant loans through a partnership with non-banking financial company Clix Finance. More recently, Alipay in China partnered with Vanguard to launch a retail investment service on the platform, and Tencent (the owners of WeChat) rolled out an embedded buy-now-pay-later feature allowing WeChat users to pay in interest-free installments.

Another area of growing interest is cross-border payments using e-wallets. Super platforms with footprints crossing multiple geographies are keen to offer more options for both B2C and B2B concerns. Ant Group, the owner of Alipay, is already working to this end, with the ambition to build an international cross-border wallet platform. In early 2019, Alipay announced a partnership with SnapPay, a intranational payment gateway. In June 2020, an Ant Group–backed fund invested in Wallex Technologies, a FinTech focused on serving foreign-exchange and cross-border payment needs of SMEs.

A humanitarian agency looking to work with a super platform can consider several key factors related to the operational, financial, and management aspects of the platform. First and foremost, does the platform have the ability to execute digital transfers effectively on a scale large enough for humanitarian efforts? Metrics to assess this factor include the platform's successful to unsuccessful transactions ratio, monthly active users (MAU), churn rate, and average transaction value. A thorough analysis of these metrics can give a good baseline measurement of the platform's outreach and capabilities.

Other essential aspects to consider include the amount of funding the platform has received and the effectiveness of the management team. Super platforms backed by deep-pocketed investors have a better chance of surviving economic downturns and other challenging situations, making them attractive to work with. Although evaluating a management team is undoubtedly a highly subjective exercise, certain red flags signalling unethical behavior or lack of good business judgment may be visible. Analysis of the management team's track record and internal governance standards are good starting points. It is good practice for humanitarian agencies to conduct due diligence on the above factors before initiating partnerships with super platforms.

Key recommendations for partnering with super platforms

1. **Role attribution.** Is the super platform willing to let the humanitarian organization lead the cash distribution efforts, potentially with the short-term loss of some commercial profit?

2. **Profitability.** Super platforms are primarily profit motivated, and want to see a business case with substantial financial incentive.

3. **Metrics.** The super platform's operational performance should be analyzed using metrics such as the ratio of successful to unsuccessful transactions, monthly active users (MAU), churn rate, and average transaction value.

4. **Ethical due diligence.** The management team of the super platform can be evaluated by looking at team members' track records, and for red flags in the management's internal governance standards.

5. **Liquidity and funding.** Funding status and access to capital are crucial considerations for a super platform's long-term viability.

QR CODES

1
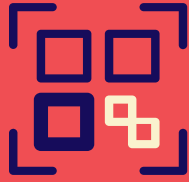
INTRODUCTION

A QR code is a square-shaped pattern that consists of a set of unique white and black blocks, typically representing information or data. The idea of a QR code was initially developed in Japan in 1994 by Denso Wave, a Japanese company that used the codes to track motor vehicle factory production lines.[117]

While traditional one-dimensional barcodes can represent only 20 alphabetic characters, a two-dimensional QR code can store 7,000 alpha-numeric characters as well as present those characters in multiple languages. QR codes can be read at a higher speed than their one-dimensional barcode counterparts. Scanning a QR code is 10 times faster than scanning a traditional barcode.[118] QR codes can also be scanned by nearly any smart device, including most smartphones, tablets, and POS terminals.[119] These characteristics have driven adoption and usage of QR codes in logistics, storage, and transportation.

The financial industry is exploring use of QR codes in the payments space. Before Alipay in China launched QR code payments in 2011, most POS transactions were reliant on hardware, whether that was a magnetic stripe or chip in a card, or a near-field communication antenna in a phone.[120]

Customers therefore required a near-field communication–enabled phone or a chip-enabled card. Merchants needed suitable POS terminals. As QR codes are mostly hardware-independent and can be used on even the most basic smartphone, they provided Alipay with a secure, ubiquitous, and cheap method of enabling offline retail transactions.[121] Merchants and consumers could register themselves quickly using an app, either for accepting or paying using QR code technology. Onboarding for both merchants and consumers was enabled by leveraging pre-existing bank KYC or a mobile number.

In general, a QR code payment can be completed in two ways: a merchant-presented static QR code, or a customer-presented dynamic QR code.

• For a static QR code, the customer will scan a static QR code (often a printout or sticker) and enter the amount to be paid. The customer confirms the transaction, and the payment is then "pushed" from the customer's account to the recipient's account (typically a merchant).

• In a customer-presented dynamic QR code payment, the customer presents a dynamic QR code on their phone, which is then scanned by the merchant, and the money is effectively "pulled" from the customer's account and deposited in the merchant's account.

Use of the merchant-presented versus customer-presented QR codes depends on the specific situation. Third party payment providers facilitate the transaction and communicate with the consumer and merchant banks to transfer funds. They are intermediaries in the process, as might be expected in a typical closed-loop card model where the processor acts as the acquirer, payment scheme, and issuer.

Static QR codes are more convenient and cheaper for merchants. They only need to print out the code and it works without additional POS hardware. At a street food stand with a printed QR code, the owner can keep cooking and does not need to stop to clean their hands and collect payment. Yet static QR codes are less secure than dynamic QR codes. Static QR codes may be replaced by criminals and require more customer diligence to ensure they are paying the correct amount to the correct merchant. Dynamic QR codes do contain specific payment amounts and may not require further customer confirmation before the payment is completed.

2
QR CODE PREREQUISITES

In markets such as China, QR codes have been adopted quickly due to low hardware expectations for both consumer and merchant. Onboarding was straightforward as Alipay and WeChat Pay, the two leading QR code payment platforms, used existing KYC data.

In humanitarian contexts, these prerequisites are not always available. Smart devices are not as prevalent. Beneficiaries may have a national ID, yet from their country of origin rather than the host country, which means that leveraging an existing bank KYC process may not be an option.

Smartphones make performing KYC through biometrics and more sophisticated authentication methods easier, yet not perfect. Many territories lack a comprehensive national identification system, which makes identification of individuals challenging. Where QR codes are successful in the rest of Asia, the system has leveraged KYC that was already completed through a bank or another digital wallet.

Depending on the implementation, QR codes may require either the merchant or the consumer, or both, to have internet access.[122] In Laos, 96 percent of the population is covered by mobile networks. In Indonesia in 2018, some 64 percent of the population owned a mobile phone, with just 45 percent owning a smartphone.[123]

Some payment providers can provide completely offline payments (e.g., on a plane), yet in most cases, if no mobile data is available, completing a QR code transaction is not possible.

3

QR CODE TECHNOLOGY IN HUMANITARIAN EFFORTS

Contactless card/mobile transactions are easy and swift. Yet contactless is only prevalent in more developed payments markets where chip transactions are more common, and often, yet not always, require the entry of a PIN or PIN and signature. This lengthens card transactions to over a minute.

QR codes are much faster. The QR code digital payment provider handles the entire payment process, so all messages and money flows through one party, which streamlines transactions. Not only are they faster than chip transactions, QR codes are often faster than cash.

This higher efficiency is likely to lead to a more satisfying consumer experience. The speed at which a store can complete retail transactions increases, which results in shorter queues. QR codes can be physically safer for individuals making financial transactions, as they do not need to carry cash.

Finally, QR codes are cheaper and easier to set up for both merchants and consumers. For a merchant to start accepting POS card payments, they need to engage an acquiring processor (either a third party or bank) and install new hardware at the retail POS. To accept QR codes, all that is needed is some type of smart device. Merchants simply need to download the apps and sign up for a merchant account on the device. When QR code payments were first launched in China, it was not uncommon to see a smartphone sitting next to the cash register. Many merchants opt to have a "smart-POS" that can handle QR code payments as well as enable couponing, loyalty, and other merchant value-added services.

QR codes have been integrated into existing national payment systems to facilitate transactions. In Singapore and Mexico, they connect into the national fast payment system through a standardized "overlay" service. Payments between businesses, or between businesses and consumers, can all be handled through the system, which is interoperable between banks.

QR codes have also been integrated into India's Universal Payment Interface (UPI) and are now handling over 250 million real-time transactions monthly.[124] Although this volume is impressive, a lack of standardization and interoperability currently hampers further adoption.

Interestingly, QR codes are being used for identification and tracking purposes outside of last-mile delivery. WFP in Bangladesh uses them to store information about vehicles coming in and out of the world's largest refugee camp. Previously, vehicles entering the camp would often need to wait up to three hours for access. Checking one car would take anywhere between five and fifteen minutes. Leveraging QR codes has decreased the wait time significantly. That time has now been reduced to under one minute.[125]

4

THE FUTURE OF QR CODES

In many of the geographies where QR codes have become a key payment interface, they have led to mass adoption of digital payments in general. These payment platforms have then served as the on-ramp to other financial products and services in those digital wallets. As an example, in China, Alipay and WeChat Pay users can access a variety of financial products and services all within the Alipay and WeChat Pay apps.

STANDARDIZATION AND INTEROPERABILITY

In many of the markets in which QR codes are used, dozens of digital wallets or platforms may be available to make a code-enabled payment. China's digital payments market has primarily consolidated to just two players (Alipay and WeChat Pay), yet other QR code markets are incredibly fragmented.

Eventually, they will need to consolidate into fewer wallets, or harmonize standards. In other markets, such as Africa and Latin America, the use of QR codes is nascent, yet there has been a push for standardization. In 2020, Brazil announced QR standards that went into effect in September 2020.[125]

Singapore is a forerunner in QR code standards, and many merchants will have one static QR code that can be scanned by multiple different payment apps. As QR code providers mature, this should be more common in the future across the region.

Beyond standardization is interoperability. Today, scanning an Alipay QR code with a WeChat Pay app will likely result in an error. In an interoperable QR code environment, the consumer and merchant do not need to be on the same payment network. Leading markets in QR code use are at various stages of QR interoperability at both the domestic and cross-border levels, Leading markets in QR code use, for example China, Japan, Republic of Korea, and Taiwan, are at various stages of QR interoperability at both the domestic and cross-border levels.[126]

5

CONCLUSIONS

QR codes have become a part of everyday life for billions of individuals across the globe, with China and India leading the way. Although they offer efficient technology in terms of costs and ease of implementation, they are typically used as an overlay service on top of existing infrastructure. For this reason, they may not be appropriate in all humanitarian contexts yet would be useful in those where there is some level of extant financial and technology infrastructure. In the absence of smart phones, QR codes can be supplemented by using randomly generated numeric codes on USSD capable phones.

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Key recommendations for agencies dealing with QR codes

1. Consider context. Cost-effective and quick-to-implement QR codes should be considered in contexts where the technology platforms are mature and FSPs facilitate interoperability.

2. Establish ecosystem. Consider how to establish a QR code ecosystem around the implementation so that beneficiaries and businesses can interact freely. Overlay services such as PayNow in Singapore and UPI-QR in India are good examples of how QR codes integrate with existing platforms.

3. Clear communication. Standardization and interoperability are vital.

The following UN Principles for Responsbile Digital Payments are applicable to all the above technology solutions.

• To expand outreach to women, first-time users, and other marginalized groups, outreach can be conducted through multiple channels informed by user choice #rdpg4B

• Institute service level agreements (SLAs) with Payment service providers (PSPs)/banks and require them to create options for alternate onboarding mechanisms for marginalized users with differing needs #rdpg4B

• Co-create solutions with PSPs/banks centered around the needs of marginalized users #rdpg4A

• Conduct dedicated research to gather insights on user behavior #rdpg4A

• Develop data systems and technologies with ability to track and analyze user data #rdpg4C

• Consider product design and distribution regulations to ensure payments products meet the needs of target markets and are proportional per product and market context #rdpg4B

• Provide product intervention powers to regulators #rdpg4B

• Provide technical assistance and play a convening role for PSPs/banks #rdpg4A #rdpg4B

• Fund research/reports on user perspectives and needs #rdpg4C

OVERALL RECOMMENDATIONS

This report focuses on five FinTech innovations: mobile money, artificial intelligence and machine learning, DLT, super platforms, and QR codes.[29]

MOBILE MONEY

1 **Frameworks for analysis.** Use frameworks to guide decision-making and carry out a holistic analysis of the implementation. The efficacy of mobile money for humanitarian organizations and beneficiaries depends on context.

2 **Client centricity.** Technical experts can help design and implement mobile money solutions and operations. However, beneficiary choice and experience are guiding factors when selecting a delivery mechanism.

3 **Share knowledge.** Share intra-agency good practices and results from existing mobile money implementation.

4 **Literacy and trust.** Work with government bodies including ministries of finance and the central bank, along with providers, to implement digital finance literacy programs among beneficiaries to increase trust and adoption.

5 **Sustainability.** Understand the viability of the business case from the provider's standpoint.

ARTIFICIAL INTELLIGENCE

1 **Monitor developments.** ML/AI is promising technology, but so far most of the solutions are not specific to last-mile payments and there is limited applicability of ML/AI in last-mile payments. Nevertheless, it is important to monitor developments in the space.

2 **The right time.** The frameworks suggested in this report can identify if/when it becomes appropriate to consider an ML/AI solution.

3 **Current uses.** Current ML/AI solutions rolled out with last-mile payments can be considered to streamline processes pre- and post-distribution.

DISTRIBUTED LEDGER TECHNOLOGY

1 **Blockchain vs. database.** Despite public interest in DLT and blockchain technology, it is crucial to understand the technology fully. Frameworks can help determine whether the technology is essential, or if a distributed database will work just as well.

2 **Integration with existing platforms.** Because of the infrastructure and expertise required to develop a DLT-based humanitarian transfer platform, it is better to integrate with an existing platform, such as Building Blocks, that has already started to refine the technology and has a functioning ecosystem.

3 **Crypto vs. DLT.** Separating the crypto and DLT conversations is important. Exchanging "near money" through crypto platforms is not suitable for humanitarian assistance for both regulatory and infrastructural reasons. It would be better to focus on DLT-based exchanges of value, as WFP has with Building Blocks.

4 **Consider central bank digital currencies (CBDCs).** More CBDCs will inevitably be launched and warrant consideration. CBDCs will have regulatory approval in the destination country, yet will not necessarily meet the privacy needs of humanitarian beneficiaries.

5 **Beneficiary preference.** Building an ecosystem around any solution is vital. If the beneficiary is not able to "spend" the value that is transferred through the system, it is not viable.

SUPER PLATFORMS

1 **Role attribution.** Is the super platform willing to let the humanitarian organization lead the cash distribution efforts, potentially with the short-term loss of some commercial profit?

2 **Profitability.** Super platforms are primarily profit motivated, and want to see a business case with substantial financial incentive.

3 **Metrics.** The super platform's operational performance should be analyzed using metrics such as ratio of successful to unsuccessful transactions, monthly active users (MAU), churn rate, and average transaction value.

4 **Ethical due diligence.** The management team of the super platform can be evaluated by looking at team members' track records, and for red flags in the management's internal governance standards.

5 **Liquidity and funding.** Funding status and access to capital are crucial considerations for a super platform's long-term viability.

QR CODES

1 **Consider context.** Cost-effective and quick-to-implement QR codes should be considered in contexts where the technology platforms are mature and FSPs facilitate interoperability.

2 **Establish ecosystem.** Consider how to establish a QR code ecosystem around the implementation so that beneficiaries and businesses can interact freely. Overlay services such as PayNow in Singapore and UPI-QR in India are good examples of how QR codes integrate with existing platforms.

3 **Clear communication.** Standardization and interoperability are vital.

CONCLUSIONS

Technology has transformed the way that billions of consumers and businesses handle their finances. The financial industry continues to be influenced by waves of innovation from both banks and non-banks.

The emergence of COVID-19 has super-powered digitized payments. According to a CapGemini 2020 research study, during the pandemic, at least 41 percent of cash users tried a contactless bank, 35 percent who owned a bank card added it to a digital wallet, and 27 percent of customers interviewed experimented with QR code payments.[127]

It is vital to design programs that support the digital transformation of merchants and agents so that they fit into the economic ecosystem, in which humanitarian interventions operate. One solution does not fit all, and the quality of last-mile implementations will be determined by factors such as regulatory regimes and the maturity of the infrastructure.

As a result, it is important for organizations to take a structured, realistic approach to the adoption of new technologies. The frameworks discussed in this report can guide humanitarian organizations to better understand the critical prerequisites for innovation and the mechanics of their implementation at the local level.

Advancements in technology will have a significant impact as the pillars of financial innovation continue to stabilize globally. Technology can have a profound effect on the last-mile humanitarian payments reviewed in this report. Yet its potential to transform the rest of the humanitarian transfer value chain may have an even greater impact.

Amidst all of these advances, the central concern is always the impact upon beneficiaries. Some of these technologies will flourish. Others will atrophy. New technologies will follow. Yet how they will be used is paramount. The Alliance's UN Principles for Responsible Digital Payments offer recommendations on how to to ensure new technology helps and protects the most vulnerable segments of society, through inclusive and responsible application.

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APPENDIX.
HUMANITARIAN MOBILE MONEY
CASE STUDY KEY INSIGHTS

SYSTEM EFFICIENCY

SIERRA LEONE AND LIBERIA 2014-2016: US$27 million was transferred to 95,081 households in response to Ebola. It is not financially viable for telecommunications companies alone to extend coverage to areas with low population density, which means mobile money will not be a popular delivery mechanism in such areas for the foreseeable future. Digital technology can and does increase program efficiency and minimize challenges, yet this must be weighed against rapid response, risk mitigation, and feasibility.[129]

BANGLADESH 2015 : Funds were transferred to 1,334 beneficiaries in Cox's Bazar, and 2,300 in Satkhira after flash floods. The provider noted that the support required for acquiring humanitarian clients is about 10 times that for regular customers, and there is a weak business case for service providers.[132]

2014

2015

DRC 2014 : US$272,000 was transferred to 3,335 people through e-vouchers, mobile money or cash-in-hand. E-vouchers were the most expensive, mobile money was the second most expensive (driven by staff time), and cash-in-hand was the most cost-effective. The cost–transfer ratio for mobile money was 1.46. Mobile money was also the slowest of all methods and required more time from the beneficiaries than cash-in-hand.[128]

SIERRA LEONE AND LIBERIA 2015: An analysis in Liberia estimated that the Government of Liberia would save US$6 million annually by paying their 22,000 health workers via mobile money.[130] In Sierra Leone, 78 percent of the 21,000 health workers in urban areas were paid digitally.[131]

UGANDA 2017-2018:

US$2.65 million was transferred to host nationals and refugees: 3,424 received transfers through mobile money and 947 received cash delivered by a bank using an armored vehicle.

Overall, the total transfer budget divided by the total program budget was 0.834 percent. Mobile money had a more secure and robust platform than the bank (a government bank), yet mobile money was more exposed to governmental policy risk.[134]

2016

2017

2018

UGANDA 2016-2017: US$486,000 was sent to 555 beneficiaries. Operational efficiency (total transfer value as a percentage of overall project cost, including indirect and direct costs) was 71.5 percent and the organization estimates they could have reached 80 percent at a large scale.[133]

ZAMBIA 2018: US$10 per month was distributed to 3,022 beneficiaries. Distribution time went from 13 days with an armored banking truck to 2.5 days with mobile money.[135]

OPERATIONS

NIGERIA 2014-2016: Mobile money agents were not at distribution points and did not have adequate cash, so humanitarian agencies wanted to search for a different partner to deliver the aid.[137]

SIERRA LEONE AND LIBERIA 2014-2016: While all seven humanitarian agencies receiving funds from USAID planned to use mobile money, only 7 percent of funds ended up being delivered through the system. A "clustering approach" was used in Liberia, where the humanitarian agency established 44 pay points near the communities on appointed days.[138]

BANGLADESH 2015: Contracting took four months. The humanitarian organization registered everyone. The first distribution was manual because of delays. Beneficiaries had to bring their SIM card to agents on designated days and insert their cards into the agent's phone. Only one of 50 beneficiaries could explain the cash-out process. Locked SIMs, forgotten PINs, system errors, lack of agents, and agents without liquidity were common problems.[139]

2014   2015   2016

ZIMBABWE 2014-2015: US$28 per month was transferred for six months to 6,750 households in northern Zimbabwe to cover food needs. The humanitarian organization collected all documents for registration. Large group training sessions were conducted with the mobile money provider, and help desks were set up at cash-out points. PIN numbers were a problem. Agent liquidity constraints often forced beneficiaries to purchase at merchants. Of beneficiaries who had some balance in their wallets, 40 percent said it was because there was not enough agent liquidity to cash them out. Distant agent locations and queuing were two of the biggest complaints.[136]

ETHIOPIA 2016: US$675,000 was transferred to 5,000 pastoralists, 2,067 of whom received funds through mobile money to "increase financial inclusion," as 99 percent of beneficiaries were illiterate. Only 10 percent had handsets and nobody was currently using mobile money. Handsets were subsidized (50 percent of cost) and "considerable time was spent" introducing mobile money. Most beneficiaries did not have ID, which took time to solve. Some 86 percent of beneficiaries reported at least one problem, the most common being that 61 percent had trouble with their handset, 55 percent reported network issues, 53 percent had issues with their PIN, and 42 percent said the queues at agents were too long. There were no agents, so some had to be established.[140]

SOMALIA (PUNTLAND) 2016-2017: Transfers were made to 10,074 households with monthly transfers via mobile money in the Bari, Mugaal, and Hiran regions. In Hiran, 94 percent of household members used mobile money regularly before the project, whereas in Puntland 63 percent reported they did not use mobile money regularly. Shopkeepers in Puntland reported that 50–75 percent of their total customer payments were made with mobile money.[141]

UGANDA 2016-2017: First a pilot transfer was made, which was 10 percent of the overall value delivered. Two subsequent transfers were made, each equal to 45 percent of the total value. Beneficiaries were rural and remote. Only 15 percent had phones. Six percent had bank accounts and network coverage was "limited to non-existent." Many beneficiaries traveled considerable distances to cash-out.[142]

ZAMBIA 2018: Temporary roving agents were used for cash-out.[144]

2017 **2018** **2019** **2020**

UGANDA 2017-2018: Agents were engaged prior to payment to ensure they had cash for beneficiaries, and a call center was established. The government banned all new SIM card registrations and parliament passed a bill to tax 1 percent of all mobile money transactions. Both of these factors added difficulty to the project.[143]

TOGO 2020: Qualifying women received about US$22 and men received US$18.50 per month. The last payment was made to 456,420 beneficiaries for a total of US$4.1 million. A USSD short code was used to register people. A call center was set up and attempts were made to recruit mobile money merchants. Postal workers were deployed by the government into markets to help people cash-out.[145]

BENEFICIARY USAGE AND EXPERIENCE

BANGLADESH 2015: People had more profitable and accessible savings alternatives to their mobile wallets. Beneficiaries did not use mobile money widely before or after the project. Overall, 6 percent purchased some goods, and 8 percent purchased some airtime. After the project, 12 percent still had some balance on their accounts. Ninety-two percent of beneficiaries in Satkhira and 24 percent of beneficiaries in Cox's Bazar wanted mobile money to be used in the future for transfers – the difference is likely explained by poor access to agents in the latter location.[146]

2015

2016

ZIMBABWE 2015-2017: US$40 million was transferred to 73,718 households to meet food needs. As the liquidity crisis increased, merchants began accepting mobile money. By March 2017, seventy percent of beneficiaries were making purchases with mobile money compared with 17 percent at the beginning of the project.[147]

ETHIOPIA 2016: Beneficiaries were required to save US$4.5 in their mobile money account, and 43 percent saved more than that required amount (US$6.5 on average, which was 5 percent of the total transfer). Seventy-five percent of beneficiaries bought airtime while 17 percent transferred money. Two percent cashed in and none made merchant payments. No sustained account usage was researched, and no gender differences were recorded. However, two months after the final transfer, the average balance decreased to US$2.28, with only 13 percent of beneficiaries still showing a balance above the required amount. Only 41 percent wanted mobile money for future transfers; 54 percent preferred cash-in-hand.[148]

SOMALIA (PUNTLAND) 2016-2017: Even though there was a lack of electricity, network coverage, and agent liquidity, beneficiaries preferred mobile money to other delivery mechanisms: 77 percent used all cash immediately, 21 percent used it throughout the month, and 2 percent carried a balance beyond that.[149]

2017

ABBREVIATIONS AND GLOSSARY

AI/ML	artificial intelligence and machine learning
Asylum seeker	An individual whose request for sanctuary has yet to be processed[1]
Blockchain/distributed ledger technology (DLT)	An umbrella term to designate multi-party systems that operate in a "trust-less" environment with no central operator or authority
CaLP	The Cash Learning Partnership
CBDC	central bank digital currency
CIC	community inclusion currency
CICO	cash-in and cash-out
CVA	cash and voucher assitance
DCEP	digital currency electronic payments
Digital wallet	An electronic service on a device or online that holds assets (funds, tokens, vouchers, or cryptocurrencies) on behalf of a user. The same device or system often allows the individual to make electronic transactions
DLT	distributed ledger technology
DRC	Democratic Republic of the Congo
FinTech	financial technology
Forcibly displaced persons (FDPs)	In line with the UNHCR definition, these are people or groups forcibly moved from their locality or environment and occupational activities as a result of conflict, persecution, violence, or human rights violations
FX	foreign exchange
Humanitarian beneficiary	A recipient of benefits through policies and programs designed to prevent or improve situations that have had a detrimental effect on livelihoods
Humanitarian transfers	Term equivalent to "cash and voucher assistance (CVA)"
ID	identity

IDO	international development organization
Internally displaced persons (IDPs)	People who have not crossed the border of their own country to find safety. They remain within their own country and under the protection of its government, even if that government is the reason for their displacement
KYC	know your customer
Last-mile	A term borrowed from the telecommunications industry, which refers to the final "mile" between the business and the customer. For this study, the term refers to the last stretch of a humanitarian transfer journey to reach the beneficiary
MENA	Middle East and North Africa
MNO	mobile network operator
Mobile money	A basic payments system designed for cash-based economies that allows users to transfer digital value between mobile phone handsets
MSME	micro, small, and medium-sized enterprises
OCHA	Office for the Coordination of Humanitarian Affairs
POS	point of sale
RDPG	Responsible Digital Payments Guidelines
Refugees	People who have fled war, violence, conflict, or persecution and have crossed an international border to find safety in another country
RMB	Ren Min Bi is the official currency of China. Yuan is the base unit for RMB, just as the Dollar is the base unit for USD
SDG	Sustainable Development Goals
UNCCS	United Nations Common Cash Statement
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
USSD	Unstructured Supplementary Service Data, a communications protocol used by cellular telephones to communicate with the mobile network operator's computers
WEF	World Economic Forum
WFP	World Food Programme

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