



# ➤ BULK PAYMENTS AND THE DFS ECOSYSTEM

ITU-T FOCUS GROUP ON DIGITAL FINANCIAL SERVICES



International Telecommunication Union

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## **Bulk Payments and the DFSs Ecosystem**

Focus Group Technical Report

ITU-T

## **FOREWORD**

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# **Bulk Payments and the DFSs Ecosystem**

### **About this report**

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## **Executive summary**

Government-to-person (G2P) and employer-to-person payments of all sorts, often referred to as “bulk payments”, are seen by many as key enablers for the growth of the digital financial services (DFSs) ecosystem. In this paper, we examine ways in which bulk payments have been made in the past and look at ways in which this has improved over recent years. We also analyse the remaining challenges which have stymied bulk payment rollouts in many countries.

We then look forward and anticipate ways in which bulk payments may be made in cases where the infrastructure has developed to a point where digital transaction accounts are pervasive, a biometric national ID system is in place, and interoperability among DFSs providers is common. We propose a model of how bulk payments might be made when those conditions are met. Finally, we take a look at three countries: India, Nigeria, and Peru, which all show particular promise of developing in these directions.

## 1 What are bulk payments?

The DFSs ecosystem, in many developing countries around the world, is entering into a second, post-introduction phase. Many DFSs are available for the unbanked and underserved, and in some countries a significant penetration of these products among the underserved has been achieved.

Many countries, however, suffer from very slow adoption rates with new financial services and products, and even those countries with higher adoption rates suffer from low product usage. It is a common point of view that so-called “bulk payments” could accelerate the adoption of and usage of digital wallets by the underserved by providing an incentive to consumers to open their wallets.

Bulk payments are one-to-many payments that go from one paying agency to many beneficiaries at once. There are always at least three roles in cash payments:

- **Paying agency:** This is the party that initiates the bulk payment. This could be a non-governmental organization (NGO), government agency, or private company.
- **Implementing partner:** This is the organization that enrolls beneficiaries and records the address to where the payment should be sent. This role may be done by the paying agency, but is often fulfilled by a NGO or other third party.
- **Payment provider:** This organization routes money from the paying agency and to the beneficiaries. This may be a bank or a third party.

The term “bulk payments” includes a variety of different kinds of payments. Some common types of payments include:

- Salary payments and expense reimbursements;
- Pension contributions;
- Unconditional cash transfers and crisis payments;
- Conditional cash transfers.

One organization could fulfil multiple roles inside of the same cash transfer program. For example, a government could fulfil the role of the paying agency in a disaster relief payment by paying money into the program, and also act as the implementing partner that enrolls all of the beneficiaries.

Throughout much of the world, cash is nearly the only option for making these bulk payments. The purpose of the current study is to examine how bulk payments are made in a selected number of countries where digital wallets are either well established or on the brink of expansion.

Much of this report will focus on government-to-person (G2P) payments, because that is one of the most common use-cases for bulk payments in the developing world. However, in the suggestions, this report will outline a bulk payments ecosystem that would serve the needs of all bulk payers, including NGOs, governments, and businesses.

## 2 History: How bulk payments are made

The bulk payments ecosystem is highly fragmented. In developed payments markets, bulk payments are almost entirely electronic. Governments and businesses have access to efficient electronic payment systems through which they can send transfers. In the United States, for example, the Social Security Administration went entirely digital and stopped sending out paper checks in 2013.<sup>1</sup> Recipient identities are digitized and remain with the government.

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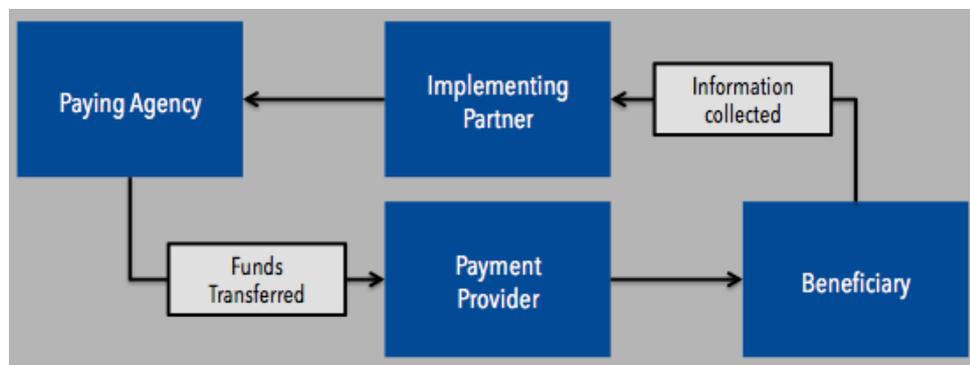
<sup>1</sup> HICKEN, MELANIE. NO MORE PAPER SOCIAL SECURITY CHECKS COME MARCH. CNN MONEY. JANUARY, 2013. [HTTP://MONEY.CNN.COM/2013/01/09/RETIREMENT/SOCIAL-SECURITY-CHECKS/](http://money.cnn.com/2013/01/09/retirement/social-security-checks/).

Electronic payments are often unavailable to bulk payers in less developed payment ecosystems. Many recipients lack bank accounts and records may not be sufficiently digitized. In many countries with limited payments infrastructure, payers are forced to send physical cash to recipients.

Bulk payments begin with a paying agency hoping to transfer funds to beneficiaries. In private companies, the beneficiaries are often well known. In cash transfer programs, on the other hand, paying agencies rely on “implementing partners” to survey potential beneficiaries and collect addressing information. This information may be collected through digital tools or with pen and paper. The implementing partner then compiles the information into a registry, often stored on Excel, or in more complex database software.

The paying agency then uses the registry to create a list of beneficiaries. In the case of a cash transfer from a national government, the money is often transferred to a state government, along with the list of beneficiaries. The state governments then contract with a payments provider who coordinates the delivery of cash to the beneficiaries.

**Figure 1 – Typical cash program**



Example:

In response to the 2009/2010 floods in Niger, for example, Concern Worldwide sent cash transfers to beneficiaries in physical envelopes. In this program, Concern Worldwide acted as the paying agency, the implementing partner, and the payment provider. In their role as implementing partner, the NGO registered beneficiaries and classified their eligibility to receive cash transfers. Then, as the paying agency, the NGO delivered envelopes of cash to distribution points that were near to the beneficiaries. The distribution points (contracted by the NGO), then distributed the cash to recipients.<sup>2</sup>

### 3 Challenges

Delivering cash to thousands of beneficiaries is an enormous technical, logistical, political, and identification challenge. Together, these issues create “leakage” inside of the cash transfer program. For the purposes of this paper, we define “leakage” as money that could potentially reach beneficiaries, but is instead lost in delivery. Studies have estimated that leakage is as high as 70 to 85 per cent of the total funds in some cash transfer programs.<sup>3</sup>

<sup>2</sup> AKER, JENNY, RACHID BOUMNIJEL, AMANDA MCCLELLAND AND NIALL TIERNEY. PAYMENT MECHANISMS AND ANTI-POVERTY PROGRAMS: EVIDENCE FROM A MOBILE MONEY CASH TRANSFER EXPERIMENT IN NIGER. TUFTS UNIVERSITY. AUGUST 2014. [HTTP://SITES.TUFTS.EDU/JENNYAKER/FILES/2010/02/ZAP\\_-26AUG2014.PDF](http://sites.tufts.edu/jennyaker/files/2010/02/ZAP_-26AUG2014.PDF)

<sup>3</sup> MURALIDHARAN, KARTHIK, PAUL NIEHAUS, AND SANDIP SUKHTANKAR. BUILDING STATE CAPACITY: EVIDENCE FROM BIOMETRIC SMARTCARDS IN INDIA. UC SAN DIEGO. JULY 2015.

### **Technical issues:**

The technological challenges in cash transfers begin with identification. Many NGOs and governments continue to record beneficiary information by hand on paper. Accessing the information is inefficient and costly, and the process of digitizing that information (if the information is digitized) is cumbersome.

Data on the efficacy of cash transfer programs is also difficult to collect when people receive benefits in cash. Cash is notoriously difficult to track, and does not leave a digital trail. NGOs have, at times, contracted outside auditors to conduct surveys on the effects of the cash transfer program. While data from surveys is better than no data, the process of auditing and collecting data is costly.

If beneficiaries were to move away from the village, change names, or die, this information would be difficult to change inside of the registry. Digital survey tools can make the process easier, but survey teams would still need to travel to people's homes and collect information. This is a costly process.

### **Logistical issues:**

Cash transfers can also be a logistical nightmare.<sup>4</sup> Transportation infrastructure in many countries is severely lacking, making the journey to beneficiaries costly and difficult. Then, once the cash is delivered, beneficiaries often have to wait to receive the cash. In the Concern Worldwide example, beneficiaries had to wait an average of three hours to receive their money.<sup>5</sup>

Employees or volunteers travelling with large amounts of cash are easy targets for thieves. Improved security and theft protection imposes extra costs onto the cash transfer program. Some cash transfer programs buy insurance and contract with 3<sup>rd</sup> party transportation and security companies to ensure safety. This raises the overall cost of the program.<sup>6</sup>

### **Political issues:**

Cash transfers can also create political problems. The most basic political problem arises when the paying agency decides which citizens are eligible for benefits. Identification problems can compound this issue. Conflicts of interest can also surface between national governments and state governments over where to disburse cash, and which entity receives the political credit. Finally, cash is notoriously difficult to track. Therefore, transfers in untraceable bills could promote corruption. This could include overpayment to "ghost" beneficiaries, who may not exist, or underpayment to beneficiaries who are entitled to more funds.

## **4 The last 10 years: New ways of making bulk payments**

Bulk payments have taken a step forward in recent years with the introduction of various new capabilities and technologies. These innovations have made it possible to collect more information on the efficacy of the cash transfers, and have made some bulk payment programs more efficient.<sup>7</sup>

The technology advances begin with the collection of addressing information. Implementing partners have begun to make use of digital data collection tools, such as iFormBuilder,<sup>8</sup> RedRose,<sup>9</sup> and Last Mile Mobile Solutions.<sup>10</sup> These tools ease the burden on field teams who collect information on

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4 ZIMMERMAN, JAMIE, KRISTY BOHLING, AND SARAH ROTMAN PARKER. ELECTRONIC G2P PAYMENTS: EVIDENCE FROM FOUR LOWER INCOME COUNTRIES. CGAP. APRIL 2014.

5 AKER, ET AL. 2014.

6 PASRICHA, NICOLE AND KHURRAM REVZI. AFTER WATAN: THE CONTRIBUTIONS OF A G2P PAYMENTS PROGRAM TO BUILDING A BRANCHLESS BANKING INDUSTRY. MENNONITE ECONOMIC DEVELOPMENT ASSOCIATES. SEPTEMBER 2013.

7 PICKENS, MARK. DAVID PORTEOUS AND SARAH ROTMAN. BANKING THE POOR VIA G2P PAYMENTS. CGAP DECEMBER 2009.

8 IFORMBUILDER WEBSITE: [HTTPS://WWW.IFORMBUILDER.COM](https://www.iformbuilder.com).

9 RED ROSE WEBSITE: [HTTPS://WWW.REDROSECP.COM/](https://www.redrosecp.com/).

10 LAST MILE MOBILE SOLUTIONS WEBSITE: [HTTP://WWW.LASTMILEMOBILESOLUTIONS.COM](http://www.lastmilemobilesolutions.com).

potential beneficiaries. They also help make the data more usable for paying agencies by storing it in a digital format.

Various payment technologies have come into wider use in the past decade, including prepaid cards, vouchers, and eMoney. These advances allow cash transfer programs to scale up more quickly and deliver money to beneficiaries more efficiently.

### **Players remain the same:**

New cash advance programs still require an implementing partner to collect addressing information on beneficiaries. However, new tools make that process more efficient. Survey building tools can automatically collect information into databases that are easily accessible by paying agencies. For example, iFormBuilder can help implementing partners collect information on beneficiaries through survey forms and GPS data. It can also help scan IDs and barcodes. Similarly, WorldVision International has created a tool called Last Mile Mobile Solutions to enable NGOs to collect information on vulnerable populations.

Paying agencies have also begun to incorporate different technologies into funds disbursements. The most basic technological advancement is the introduction of prepaid cards, including smart cards. Paying agencies are able to distribute cards to beneficiaries, loaded with value, instead of cash in envelopes. Beneficiaries then use the cards at ATMs or “cash-out” points to collect the money.

There have been some efforts to incorporate these prepaid cards into the merchant payments ecosystem. Red Rose, for example, offers an “end-to-end payment solution” targeted at helping merchants accept payments from cash transfer programs. In most countries, however, merchants still prefer cash to card payments.

### **eMoney:**

The popularization of eMoney holds massive potential to make bulk payments more efficient. “Electronic payment systems involving smart cards or mobile phones can significantly reduce costs and leakage,” according to the UK development agency, “while promoting financial inclusion of the poor.”<sup>11</sup>

In Kenya, where eMoney is now ubiquitous, cash transfer programs are proving effective. Evidence comes from Give Directly, a nonprofit that specializes in unconditional cash transfers using mobile phone technology. Innovations for Poverty Action found that Give Directly’s cash transfer program increased consumption, assets, food security and improved psychological wellbeing.<sup>12</sup>

### **Systems integrators:**

As cash transfer programs incorporate more technology, systems integrators have begun offering services to governments and NGOs to make the programs more efficient. These companies help the paying agencies, implementing partners, and payment providers work together to construct efficient cash transfer programs and minimize leakage.

Segovia, for example, provides the technology behind many cash transfer programs around the world. The company was started by the co-founders of Give Directly. In Liberia, Segovia is helping United States Agency for International Development (USAID) and Save the Children distribute cash transfers to communities affected by the Ebola crisis. USAID (the paying agency) contracts with Save the Children to act as the implementing partner, collecting information on beneficiaries. The

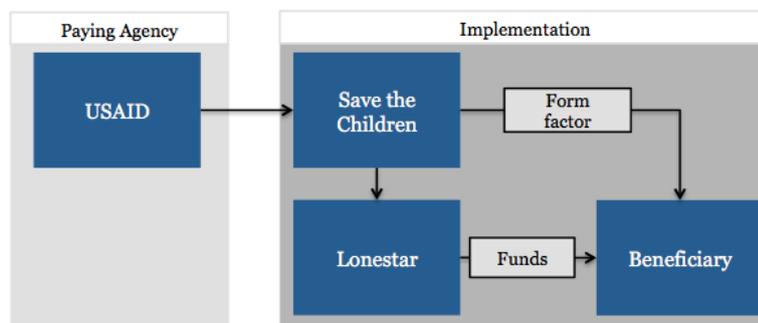
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11 ARNOLD, CATHERINE, TIM CONWAY, AND MATTHEW GREENSLADE. CASH TRANSFERS EVIDENCE PAPER, DEPARTMENT FOR INTERNATIONAL DEVELOPMENT. APRIL, 2011.

12 HAUSHOFER, JOHANNES, AND JEREMY SHAPIRO. HOUSEHOLD RESPONSE TO INCOME CHANGES: EVIDENCE FROM AN UNCONDITIONAL CASH TRANSFER PROGRAM IN KENYA. INNOVATIONS FOR POVERTY ACTION. APRIL, 2015.

telecommunications company Lonestar Cell MTN acts as the payment provider, sending eMoney to beneficiaries. Segovia provides technology, including data analytics, to ensure that beneficiaries are paid in an efficient manner.

**Figure 2 – Systems integrators**



## 5 Remaining challenges

New technology has improved bulk payments efficiency. However, various technical, logistical, and political challenges remain. Many of these problems cannot be solved in isolation, but require an ecosystem-wide solution.

### Technical issues:

Cash transfer program administrators often underestimate the technological barriers to switching from cash to e-payments, according to a study by the Consultative Group to Assist the Poor (CGAP). These barriers include:

- (i) Cleaning enrolment data;
- (ii) gathering information for know your customer (KYC), and other regulatory standards, as well as;
- (iii) reconciling payment records among implementing partners.<sup>13</sup>

The basic elements of technology, including network coverage and electricity, remain unreliable in many parts of the world. This can cause serious problems for payment systems other than cash. If payments are consistently delayed or made impossible due to insufficient infrastructure, many beneficiaries will choose cash payments over a more technologically advanced solution. Even in Kenya, one of the most popular eMoney markets in the world, the World Food Program was forced to abandon eMoney in favour of a card-based program due to technological issues.<sup>14</sup>

Collecting more data can also create data security challenges. Information on refugees and cash transfer recipients can be dangerous if not secured properly. Some companies, including First Mile Geo, have created tools that automatically delete addressing information as soon as it is uploaded into the cloud.<sup>15</sup> Overall, however, organizations should minimize the amount of data that they collect, and be sure not to collect more data than they can secure.

<sup>13</sup> CGAP 2014.

<sup>14</sup> ZIMMERMAN, JAMIE AND KRISTY BOHLING. CASH FOR ASSETS: WORLD FOOD PROGRAMME'S EXPLORATION OF THE IN-KIND TO E-PAYMENTS SHIFT FOR FOOD ASSISTANCE IN KENYA. CGAP. SEPTEMBER, 2013.

<sup>15</sup> FIRST MILE GEO WEBSITE: [HTTPS://WWW.FIRSTMILEGEO.COM/](https://www.firstmilegeo.com/)

## **Interoperability:**

Interoperability is one of the biggest technical issues facing bulk payment providers. Closed-loop systems, where funds are limited to a single payment provider, provide limited utility. “The system should be an open loop,” according to the Gates Foundation’s Level One Project, “with the objective of encouraging all qualified participants to join.”<sup>16</sup>

When beneficiaries are able to use their own payment system, instead of being forced to use a closed-loop system, training is much easier. And if mobile operators have already enrolled beneficiaries, the job of enrolment is much easier. In this way, interoperability can improve leakage within bulk payment systems by making the system more efficient.

Without interoperability, the task of routing payments becomes much more complicated. For example, paying agencies may have to know the addressing information on the beneficiaries and their preferred financial institution in order to send the payment. If the beneficiary were to change financial institutions, that payment could get lost.

## **Logistical issues:**

The first logistical issue faced by bulk payment providers is how to enrol beneficiaries in the system. New tools have made enrolment more efficient, but sending workers into the field to collect addressing information is still challenging.

Once that information is collected, organizations are forced to consider where to house and how to update the data. For many organizations, the data simply sits in Excel format on the internal servers. These databases can be difficult to access and update. Also, organizations often face a tradeoff between accessibility and security – the more accessible data is, the more difficult it is to secure that data.

Cash transfer programs can also require a massive staff. In the Philippines, cash transfer administrators were forced to hire 10,000 staff in order to manage the program.<sup>17</sup> Managing and training that many people on payments technology and procedures can be difficult.

Staff are not the only parties that require training. Beneficiaries, especially those with high illiteracy rates, may not understand basic security functions, including PIN or passwords.<sup>18</sup> Training is required, both in the technology and on the purposes of the program itself. In some contexts, beneficiaries saw the cash transfers as a “gift” and were loath to complain when the transfer didn’t arrive, or if there was misconduct at the pay points.<sup>19</sup>

## **Liquidity**

Providing liquidity - usable money - is a difficult but necessary aspect of an efficient bulk payment program. Generally speaking, beneficiaries receiving benefits through eMoney, smart cards, or vouchers – will immediately want to “cash out” the electronic payment. This is understandable, given that beneficiaries often live in a situation where the eMoney – on a card or in an eMoney wallet – cannot be spent at the merchants (shops or service providers) they patronize. (Note, the ITU DFS Focus Group has a number of reports addressing the particular problem of merchant payment enablement.)

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16 THE LEVEL ONE PROJECT GUIDE. THE BILL AND MELINDA GATES FOUNDATION. 2015.

17 ZIMMERMAN, BOHLING, AND ROTMAN PARKER. CGAP. 2014.

18 MURALIDHARAN, NIEHAUS, AND SUKHTANKAR. UC SAN DIEGO. 2015.

19 ZIMMERMAN, BOHLING, AND ROTMAN PARKER. CGAP. 2014.

This can create a logistical problem of how to reliably provide cash to recipients.

Many cash transfer programs rely on agents to act as intermediaries. In Malawi, Airtel Money relies on its banking partners to provide liquidity to agents during pre-determined days used for distribution. This process is resource-intensive and expensive.<sup>20</sup> The agents may be necessary to help beneficiaries. In this situation, however, “beneficiaries remain only passive users of the technology used to make payments,” according to the CGAP.<sup>21</sup>

### **Political issues:**

The question of beneficiary enrolment is greatly eased in the presence of an effective and pervasive national ID system. National IDs enable more effective beneficiary identification, and provides a building block on which payment systems can build the “know your customer” (KYC) procedures. That said, national ID systems are inherently political. The Aadhaar system in India, for example, has faced pushback in the Indian courts over privacy concerns.<sup>22</sup>

Some countries have created tiered KYC regulations that ease beneficiary registration. Low-value transactions present a small risk to the overall financial system, so minimizing regulatory barriers to registration would allow better identification with very little downside. Colombia, for example, allows remote, paperless account opening for low-value accounts.<sup>23</sup>

The final issue is that governments are often slow to adopt new technology. Governments budget in cycles, and it is difficult to forecast budgets five years into the future. This makes it difficult to pay large amounts of upfront costs for technology. Segovia tries to overcome this hurdle by pricing based on usage, a structure that allows governments to pilot new bulk payment programs and grow the programs incrementally.

### **Risk management issues:**

Systemic risk could become a substantial issue, especially as smaller or less structured entities seek to make bulk payments. Enabling relatively easy electronic disbursements from a central bank account creates a powerful target for others to unlawfully gain access to the cash. For example, an employee could transfer funds to multiple phones in small amounts that could then be cashed out relatively anonymously, or could transfer funds to numerous accounts in such small amounts that they may evade high level audits. External parties could also hack bulk payment systems. Payment system operators, DFSs providers, and regulators should cooperate to ensure appropriate controls against this risk. Note that biometrically authenticated end-user transaction accounts are a powerful mitigant of this risk.

### **Summary:**

The biggest challenges still facing bulk payment programs include:

- 1) Liquidity: How to get usable money to beneficiaries, either through agent or ATM networks, or by enabling merchant payments acceptance.
- 2) Logistics: How to enrol beneficiaries.
- 3) Data management: How to build and maintain a digital registry of beneficiaries.

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20 Almazan, Mireya. G2P payments & Mobile Money: Opportunity or Red Herring? GSMA. September, 2013.

21 Linking Electronic Payments and Social Cash Transfers in India. CGAP. December, 2013.

22 Anand, Utkarsh. Right to privacy concerns: Aadhaar holder can block his biometric info, Govt tells Supreme Court. The Indian Express. October, 2015.

23 Almazan. GSMA. 2013.

- 4) Systems integration: How to integrate the digital registry from the implementing partner into the payment provider network.

## **6 The next ten years: Using the DFSs ecosystem**

New technologies will undoubtedly change how bulk payments are made over the next ten years. This section imagines what a bulk payment program could look like in the future.

There are three aspects of payment ecosystems that, for the purpose of this analysis, we assume will become widespread over the next ten years. Assuming they will be solved, countries could structure more efficient bulk payment programs. Those three aspects are:

### **Reliable and widespread biometric identification**

Governments and bulk payment programs have already begun to incorporate fingerprint IDs and even iris scans into national IDs around the world. Since many poor people lack any other documentation, providing poor people with biometric IDs has become a building block for a bulk payments ecosystem. One study found that 230 programs in more than 80 countries are now deploying biometric information and payment systems.<sup>24</sup>

The Aadhaar program in India, for example, has collected biometric information on millions of people and assigned each person a unique identification number that corresponds to a government registry that includes the majority of Indian citizens. This identification number has already begun to enable payments through mobile wallet payment solutions like Oxigen.<sup>25</sup>

Though biometrics can help collect addressing information on nearly anyone, this data can be difficult to collect reliably. Machines that collect fingerprints and iris scans need to be kept clean, and field workers may require technical training. Once biometric data is collected, systems integrators are often needed to ensure the quality and accuracy of the data.

The consulting firm, Accenture, for example, has developed software for Biometric Identity Management Systems (BIMS) that eliminates duplicate entries from biometric databases, including face, finger, and iris. The Government of India uses Accenture for authentication in the Aadhaar program. The United Nations High Commissioner for Refugees also contracted with Accenture to create the Unique Identity Service Platform (UISP), a biometric identity management system for registering refugees.<sup>26</sup> UISP integrates various biometric technology vendors into a single system that creates registries of refugees.

Over the next ten years, biometric national identification will be far more widespread. As technology improves, the collection of biometric information will be cheaper and easier for national governments. This information will also be used to make national payment systems more efficient.

### **Pervasive digital wallets reaching banked and unbanked customers**

Digital wallets are already commonplace in many countries. At least 19 markets already have more digital money accounts than bank accounts, and the number of registered accounts grew by 47 per cent last year.<sup>27</sup> The number of registered digital wallets will likely continue to grow in the coming years as governments and mobile operators invest in digital money markets outreach.

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24 Muralidharan, Niehaus, and Sukhtankar. UC San Diego. 2015.

25 Oxigen Website: <https://www.oxigenwallet.com/>

26 UNHCR: Identity management system uses biometrics to better serve refugees. Accenture. <https://www.accenture.com/us-en/success-unhcr-innovative-identity-management-system.aspx>

27 2015 State of the Industry Report Mobile Money. GSMA. February, 2016.

To solve this issue, payment networks will likely have to incorporate merchants into any digital money system. Until digital money is widely accepted by merchants, beneficiaries will likely “cash out” any money transferred into their accounts. Making sure that cash is available to beneficiaries is one of the biggest logistical issues in cash transfers.

Once digital money is widely accepted, beneficiaries will be more likely to leave value inside of their digital wallets. This “digital liquidity” will allow all payment systems to operate more efficiently. Solving this problem will also make the job of payment providers much easier, by reducing the amount they have to spend on transporting cash to beneficiaries.

This analysis assumes that digital wallets will gain popularity over the next ten years. It also assumes that digital networks and electricity will be sufficient to handle pervasive digital wallets.

### **Interoperability between digital finance providers**

At the end of 2015, seven markets had achieved some form of interoperability between digital money services. Over the next ten years, we anticipate that more countries will foster some type of interoperability between mobile money systems. Some markets may pursue bilateral approaches, while others may create centralized switching.

This analysis assumes that interoperability, pervasive digital wallets, and biometric identification will be commonplace. The question facing policymakers is how to structure a system that incorporates these technological changes to make bulk payment more efficient and effective.

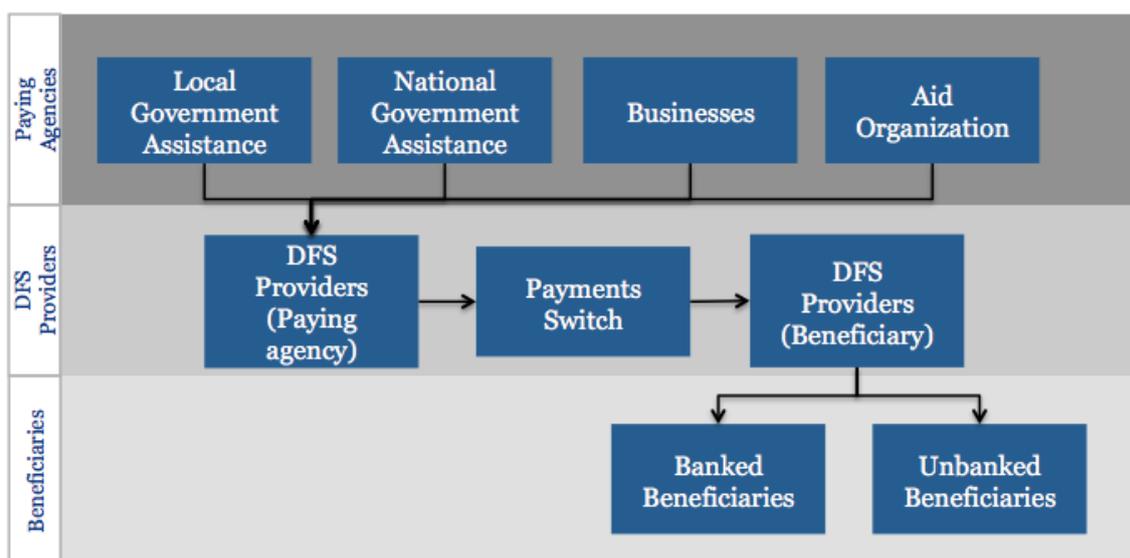
## **7 Structuring the future**

If countries are able to create the assumed changes, financial service providers could pool resources to create a centralized registry for addressing payments and national IDs. For example, when a payer sends a low-value bulk payment through the centralized switch, that switch could keep a constantly updated database of national IDs mapped to the beneficiary’s preferred financial service provider. In that way, the paying agency would need to know only the phone number or the national ID number to send the payment.

This centralized system could then be available to all players in the digital payments ecosystem. While G2P payments are the most likely first step toward growing the ecosystems, businesses with financial service providers could also connect through the same pathway to make salary payments and bulk payments to vendors.

There are a number of different ways this system could be structured. The most logical would be a centralized, cost-covering model, similar to what is envisioned with India’s Aadhaar and “JAM Trinity” program.

**Figure 3 – Addressing payments**



## 8 Country stories

Peru, Nigeria, and India are all pursuing payment ecosystems that resemble, in some way, this paper’s vision of an ideal bulk payment system. All three have created centralized switches enabled by national IDS. This section dives deeper into these three countries. The table below allows people to compare different systems, and to see how they compare to an ideal system. The similarities could point to models of how to structure bulk payment systems, while the differences could signal roadblocks or stepping stones on the road to an efficient system.

**Table 1 – Country examples**

	Peru	Nigeria	India
Enabling platform	Billetera Movil (BiM)	Nigeria Inter-Bank Settlement System (NIBSS)	Immediate Payment Service (IMPS) and the Unified Payments Interface (UPI)
Bulk payment structure	Centralized switch	Centralized switch	Centralized switch
Platform structure	Immediate Push-Payment System	National electronic funds transfer (NEFT): Settled three times per day, NAPS <sup>28</sup> : Instant Payments via USSD	Immediate push-payment system

<sup>28</sup> NAPS : Nigeria InterBank Settlement System Automated Payment Service

	Peru	Nigeria	India
Enabling identification	Documento Nacional de Identidad (DNI, national ID)	Bank Verification Number (BVN)	Aadhaar National ID
Data collected in system	Phone number, national ID number, issuer code	BVN, bank account number	Phone number, Aadhaar (ID) number, bank account number, biometrics
Biometrics?	Collected on ID, not used in system	Fingerprint and facial image collected with BVN	Ten fingerprints and two iris scans collected with National ID
Database to map IDs to the financial institutions	Information collected at registration, held within BiM	The BVN database is owned by the central bank, housed inside NIBSS	The National Payments Corporation of India (NPCI) maintains a “central mapper” database that connects Aadhaar, mobile numbers, and bank account numbers
Ownership structure	51 per cent owned by the Peruvian Bankers Association (ASBANC), 49 per cent owned by participating banks	BVN database is housed in NIBSS. NIBSS is owned by all banks, including Central Bank.	Run by the NPCI, a nonprofit organization
Participation	Voluntary	Required for all banks and mobile money institutions	Voluntary
Open participation	Bank-led mobile money	Settlement to commercial banks only	Open to payments banks and regular banks
Platform providers	Ericsson	In house	In house
Financial service providers	15 e-money issuers are connected to the platform. All three major MNOs	All banks and e-money issuers are required to integrate	At least 29 banks have partnered with the NPCI
Current bulk payments usage	Testing platform for G2P payments, but requires agent-network growth	Not yet available for bulk payments to mobile wallets, but functionality planned	Plans to transition in-kind transfers into cash payments via the IMPS/UPI

**Peru summary:**

Peru’s mobile money network, called BiM, or mobile wallet in Spanish – has been hailed as the first fully interoperable mobile money platform. The system operates as a central switch, connecting

mobile networks and financial institutions in a way that closely resembles this report's vision of an ideal bulk payments system.

Users of any of the three major telecommunications operators (Movistar, Claro, and Entel) can sign up with BiM. Participants are able to accept the BiM terms of service and choose their financial institution remotely from their phones when they register for the service.

The mobile network operators act as the implementing partners for the service, while the participating financial institutions act as the payment provider. Paying agencies will be able to route payments into the BiM system using a phone number or a national ID number. The BiM system will then map that information to the appropriate financial institution, using the issuer code based on the financial institution that participants chose during registration. A database held within BiM associates bank account numbers, phone numbers, and issuer codes.

Once the payment is received, all three MNOs share cash-in-cash-out points, so that the beneficiaries can exchange the credit for cash. The BiM system is currently working on building up this cash-in-cash-out network to enable better payments.

#### **Nigeria summary:**

Instead of creating an entirely new central switch, Nigeria chose to build off of the existing Nigerian Inter-Bank Settlement System (NIBSS). This system uses the BVN as the central identifier for payments routed through the system. All bank accounts in Nigeria must be associated with a BVN. In fact, banks deactivated millions of accounts in 2015 in a registration drive to ensure that all bank accounts are associated with a BVN.

To send a bulk payment, a paying agency would simply have to know the BVN of the beneficiaries. The payment would then be routed to the NIBSS in a standardized format. The NIBSS maps that BVN to the appropriate account number by checking it against the BVN database, which is held within the NIBSS. NIBSS would then send the payment to the financial institution associated with that BVN.

Interestingly, while mobile wallets are connected into the NIBSS system, only commercial banks can perform the receiving function. There is no current way to send a bulk payment to a mobile wallet, though that is planned.

#### **India summary:**

The best known of the three systems is the IMPS in India. The massive biometric identification program known as Aadhaar, run by the Unique Identification Authority of India, acts as the implementing partner for bulk payments sent through the IMPS system. There are now at least 29 financial institutions currently acting as payment providers and enabling the payments.

With the release of the Unified Payments Interface, paying agencies now have a variety of choices when routing payments, including the bank account number, the phone number, the Aadhaar (national ID) number, and a "virtual payments address." Virtual payment addresses give beneficiaries an identifier designed to mask people's payment information for greater security. Hypothetically, the government could use any of these functions, or possibly biometric functionality (captured in Aadhaar) to route payments to beneficiaries.

Any one of these identifiers could be sent to the IMPS to affect a bulk payment. The IMPS then takes advantage of the NPCI's "central mapper" to identify the beneficiary's bank account number. Then, the IMPS could route that payment to the appropriate financial institution and account. Direct benefit

transfers are one of the primary goals of the Aadhaar system, and the IMPS is already being used to disburse bulk payments.<sup>29</sup>

**Overall:**

The general use of a centralized, interoperable switch across all three markets points to a preference toward shared services in bulk payments. All three of these countries allow financial service providers to share the infrastructure of the centralized switch. This has the potential to create a more efficient system, where networks don't need to create new bilateral connections to connect to different financial service providers. It could also allow for more competition in the system, if all financial service providers were to connect.

The three countries are pursuing different approaches to encouraging financial service providers to connect to the system. In Peru, the fact that the switch was created by the ASBANC encourages banks to connect. In Nigeria, the central bank simply mandated the connection. And in India, the immense magnitude of the Aadhaar project will encourage financial service providers to connect.

Finally, the fact that the Nigeria system does not currently allow payments to mobile wallets points to a roadblock on the way to an efficient system. Mobile wallets are expected to become important financial service providers for poor people around the world in the coming years. However, the difficulty in identifying mobile wallet users has prevented the NIBSS from sending money to these beneficiaries so far. That said, the country expects to roll out that functionality soon.

**9 Considerations for financial policy makers**

- A functioning national ID system appears to be the building block for any bulk payments ecosystem. Incorporating biometrics into the national ID system may be important for avoiding ghost beneficiaries and creating a more efficient bulk payment system. A financial industry ID system, such as in Nigeria, is a good alternative (or complement) to this.
- Governments should consider the value of creating a centralized directory to map national ID numbers to payment system account numbers. This system could incorporate all digital financial service providers, including banks and digital money systems run by mobile network operators. The directory could then update if the beneficiary were to change their preferred financial service provider. This would allow payers to more efficiently direct payments to beneficiaries.
- The “cash-out” problem of digital liquidity will likely remain a logistical issue for bulk payment programs. In the short-term, policymakers may consider ways to encourage the expansion of agent networks throughout markets. The best long-term solution for digital liquidity is that merchants need to accept digital money. Policymakers may want to consider means to encourage merchant acceptance of digital money by subsidizing credit through digital money or giving tax breaks to merchants that accept digital money.
- While the “cash-out” problem remains, governments and other paying agencies should be judicious in choosing the targets for bulk payment programs. Choosing to make supplemental payments, rather than critical-use payments, is a good entry point. Targeting beneficiary populations who live in urban areas, or areas where there are sufficient agent locations and/or ATMs, may also be useful.

Finally, it should be noted that the potential for digital bulk payments is actually much greater than the current volume of bulk payments being made. Many government and other paying agencies today

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29 UNIFIED PAYMENTS INTERFACE, API AND TECHNOLOGY SPECIFICATIONS, NATIONAL PAYMENTS CORPORATION OF INDIA, FEBRUARY, 2016.

provide benefits in kind (gas canisters, price supplements at merchants, etc.) rather than making cash payments, with all of their costs and complexities. As the digital financial ecosystem evolves to support fully electronic bulk payments, we expect to see some of these programs convert from in-kind benefits to payments.

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