The Level One Project is an initiative of The Bill & Melinda Gates Foundation
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What Is This Guide?

**For Stakeholders**

*An orientation for interested stakeholders on the “global team” working in digital financial services.*

**This Guide Answers**

- What is the Level One Project (L1P)?
- What does an L1P system look like in action?
- What are the key design choices, scale opportunities, and challenges in implementing a Level One system?

**For Practitioners**

*A practical field guide for implementers seeking to build an L1P-aligned payments system.*

**This Guide Answers**

- How might I implement an L1P system in my country?
- What Are Other Countries Doing?
Financial Services for the Poor

The Financial Services for the Poor (FSP) team is guided by one overarching goal:
To help people in the world’s poorest regions improve their lives and build sustainable futures by connecting them with digitally-based financial tools and services.

Increasing poor people’s capacity to weather financial shocks and capture income-generating opportunities

Generating economy-wide efficiencies by digitally connecting large numbers of poor and low-income people to one another and to financial services providers, government services, and businesses

Reducing the amount of time and money that poor people must spend to conduct financial transactions

Leveling the payments playing field is a critical next step in delivering on FSP’s goals and those set out by the Sustainable Development Goals (SDGs)
Aligning Around Global *Principles*

FSP’s goals align around the G20’s commitment to financial inclusion, which recognizes the “overarching and cross-cutting nature of financial inclusion and, therefore, has [focused on] financial inclusion as one of the main pillars of the development agenda.”

Outlined below are the G20’s principles for innovative financial inclusion.

### How Digital Systems Enable Financial Inclusion

- Provide the ability to store, receive, and use funds safely and privately
- Enable the use of a broad range of digital services that rely on electronic payments: These include both financial services (e.g., loans, investments, insurance) and commerce services (e.g., mobile purchases, pay-as-you-go services)
- Allow consumers to build a transaction record that can be used for loans and other financial services

### G20 Principles for Innovative Financial Inclusion

*As a part of it’s effort, the G20 has outlined a set of nine adaptable principles to drive innovative financial inclusion*

1. **Leadership:** Cultivate a broad-based government commitment to financial inclusion to help alleviate poverty.
2. **Diversity:** Implement policy approaches that promote competition and provide market-based incentives for delivery of sustainable financial access and usage of a broad range of affordable services (e.g., savings, credit, payments and transfers, insurance) as well as a diversity of service providers.
3. **Innovation:** Promote technological and institutional innovation as a means to expand financial system access and usage, including by addressing infrastructure weaknesses.
4. **Protection:** Encourage a comprehensive approach to consumer protection that recognizes the roles of government, providers, and consumers.
5. **Empowerment:** Develop financial literacy and financial capability.
6. **Cooperation:** Create an institutional environment with clear lines of accountability and coordination within government; also encourage partnerships and direct consultation across government, business, and other stakeholders.
7. **Knowledge:** Utilize improved data to make evidence-based policy, measure progress, and consider an incremental “test and learn” approach acceptable to both regulators and service providers.
8. **Proportionality:** Build a policy and regulatory framework that is proportionate with the risks and benefits involved in such innovative products and services and is based on an understanding of the gaps and barriers in existing regulation.
9. **Framework:** Consider the following in the regulatory framework, international standards, national circumstances, and support for a competitive landscape: An appropriate, flexible, risk-based Anti-Money Laundering and Combating the Financing of Terrorism (AML/CFT) regime; conditions for the use of agents as a customer interface; a clear regulatory regime reflecting for electronically-stored value; and market-based incentives to achieve the long-term goal of broad interoperability and interconnection.
INTRODUCTION

Aligning Around Global Goals

FSP’s goals are shared by a broader community working on the SDG (Sustainable Development Goals), like the GoalKeepers, who recognize digital financial services as a critical input to these goals. There is also a broad community working specifically on financial inclusion, and who have committed to the goals of UFA (Universal Financial Access).

Universal Financial Access

By 2020, adults who currently aren’t part of the formal financial system will instead have access to a transaction account to store money and send and receive payments as the basic building block to manage their financial lives.

Sustainable Development Goals

In the fall of 2015, as part of a United Nations effort, UN members agreed to adopt a series of sustainable development goals with specific 2030 targets. Digital financial services impact five of the SDGs (shown below).
Progress, but Action Still Needed

The Challenge
Two billion adults do not have a bank account or use other formal financial services—not only because of the challenges of living in poverty, but also due to costs, travel distance, and other barriers.

The Opportunity
With the proliferation of mobile technology and the opportunity of digital technologies to drive costs down, this challenge can be addressed.

The Impact
Access to financial services help people protect their earnings, weather personal financial crises, send and receive payments, and better manage farms and small businesses. Moreover, evidence suggests that improvements are even greater for women and female-headed households than for those of their male counterparts.

"Mobile money has, therefore, increased the efficiency of the allocation of consumption over time while allowing a more efficient allocation of labor, resulting in a meaningful reduction of poverty in Kenya."

T. Suri and W. Jack
The Long-Run Poverty and Gender Impacts of Mobile Money (Science, 2016)
FSP + The Level One Project

The Gates Foundation: FSP Program

The Gates Foundation’s Financial Services for the Poor program, in coordination with global partners, aims to play a catalytic role in:

• Broadening the reach of robust, open, and low-cost digital payment systems, particularly in poor and rural areas.

• Expanding the range of services available on these platforms.

Attaining a level payments-playing field contributes directly to the FSP goals, which also support the UN Sustainable Development Goals and the UFA goals in measurable ways.

To help facilitate this, the FSP program created The Level One Project.

The Level One Project: Alignment to FSP Goals

1. Weather Shocks; Better Incomes
L1P can increase the utility of transaction accounts, improving ways people access and spend funds and enhancing benefits of income generation via potential for digital liquidity.

2. Systemic Efficiencies
Integrated national systems encourage operational and cost efficiencies, and offer connectivity for all citizens.

3. Reduced Transaction Time
With increased access and connectivity, transactions happen instantaneously and with greater transparency, reducing transaction time and time spent disputing. With increased likelihood of bulk payments and merchant acceptance, time spent physically traveling to pay and be paid is substantially reduced.
## Level One Project Evolution

### 2014 - Research
The Level One Project evolved from a set of inquiries and lessons learned from traditional and emerging payment systems, and from engaging with several hundred stakeholders in more than 25 countries over a number of years.

### 2015 - Introduction
Introduced in 2015, the Level One Project is the Bill & Melinda Gates Foundation’s contribution to the efforts underway to increase financial inclusion by numerous stakeholders.

### 2016 - Advocacy
The Level One Project created leveloneproject.org, a workshop series, and numerous assets to help scale and sustain access to low-cost digital financial services.

### 2017 - Implementation
In 2017, the Level One Project plans to work with multilateral and in-country stakeholders to develop and implement low-cost payments systems that are designed to meet the needs of the world’s poor.

### 2018 - Acceleration
As the Level One Project team looks forward, it intends to find opportunities to scale low-cost digital systems that promote pan-continental interoperability.
A team of diverse and global stakeholders have come together, working at local and international levels to advance digital financial services for the benefit of the world’s poor.

**More than the Sum of its Parts**
The global team advocating and implementing DFS activities sums to a greater global value than the mere collection of its discreet activities. Intentional collaborations and simultaneous efforts yield exponential results, including sustained attention, strategic alignment, rapid learning, iteration, and scale.

The Level One Project has drawn from and works with many partners in both the public and private sectors.
Level One Hub Services are an important, central element of a country’s journey to achieve financial inclusion. But a Level One system exists within a larger ecosystem. The services are at the center, but the governance structure—the Scheme and Operating Rules—are an equally important component, together making the platform.

The Level One Scheme depends on a large number of other initiatives, capabilities, and programs that require the participation of many players—including government and the providers within the private sector.
Section 1

The Level One Project

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“Payments are the connective tissue of a financial system”

The Level One Project Guide is an articulation of the strategy of the Financial Services for the Poor team at the Bill & Melinda Gates Foundation. The guide presents a model for how an inclusive digital payments platform—based on modern technology and intended to serve the poor—could be constructed within a country. This platform is a necessary enabler for the many different products and services that, together, create a system that will help us reach financial inclusion.

We recognize that different countries will adopt different structures and models for payments systems that support the goals of financial inclusion. That’s why we don’t call Level One a “standard.” But we do believe that the design principles of the Level One Guide are broadly applicable across a range of different structures.

The Level One Project Guide specifies design principles, goals, and an overall optimal architecture for such a system.

Today, many countries are in the process of implementing modern digital systems that align with Level One principles, and others are in various stages of consideration. This paper provides an update to the project guide and documents resources available to countries and regions interested in implementing the Level One Project.

Why do we call it the Level One Project?

‘Level’ means a level playing field, with multiple digital financial services providers competing to serve the poor. ‘One’ means a single system, serving everyone: an inclusive economy includes all. ‘Project’ means it it is something that can be built—immediately!"

Kosta Peric
Deputy Director, Global Development: Bill & Melinda Gates Foundation
A Focus on the Poor

Meeting User Requirements

The Level One Project keeps the focus on the end users of the system—the people who are making and receiving payments, and the people and enterprises they interact with. The poor, like everyone else, have complex financial lives and needs. From the perspective of a payments system, the poor are sometimes in the role of “consumer”—buying goods and services. At other times, they are merchants or laborers receiving pay for goods and services, or beneficiaries of government and NGO programs providing aid. Often, they are exchanging “person to person” transactions with other people.

Core user requirements are the same across all segments of consumers, businesses, governments, and other participants in the ecosystem—but what each requirement means (for example, what is “affordable”) will vary by segment.

Additional user requirements are specific to use cases. These requirements may be met by the user’s own DFSP, or by one of the value-added aggregators or facilitators that are providing enabling programs.

Secure
Money and data is safely held

Affordable
Cost is acceptable in comparison to available alternatives

Convenient
Easy to access and use

Open
Anyone can enroll and send money or receive money from anyone else

Robust
There when you need it
What is the Level One Project?

A Vision
A vision for a new, real-time digital payments system that supports inclusive, interoperable digital economies, and the design principles to achieve this.

A Blueprint
A blueprint for how such a system could be configured within a country. Any given country might implement the entire Level One blueprint, or may find that only certain elements of it apply. (Refer to Resources/Technology Focus section for more information.)

A Set of Resources
A set of tools and resources to enable the implementation of a Level One System. The website www.leveloneproject.org is a starting point.

Serving the Unbanked with Digital Payment Technology
The Level One Platform

A Modern Digital Platform to Serve the Unbanked

The Level One Platform is a digital platform to facilitate immediate and real-time digital payments. It optimizes the ability of the excluded to participate in the overall financial ecosystem. The platform enables a system that exists along with—and among—other payments systems in the country.

End users are people, businesses, and governments. Level One includes more people.

DFSPs are banks and other licensed providers of transaction accounts. Level One includes more providers.
Fundamentals

The FSP team worked on refining design principles for a Level One system and key enabling concepts that together contribute to desired financial inclusion outcomes. The following pages provide information about these principles, concepts, and desired outcomes.
A. Design Principles

Overview

Key principles govern the design of a Level One System:

- An open-loop system, available to any licensed DFSP in the country. This includes banks and licensed non-banks.

- Payments that are real-time and “push” only. This removes many of the risks and costs inherent in batch processed and “pull” payments systems. Payments that are irrevocable.

- A system that is governed by the DFSPs that use it and regulated by a government financial authority. This well-tested model creates a feeling of fairness among participants. A system that allows same-day settlement among participants.

- A system that operates on a “not-for-loss” or “cost-recovery-plus-investment” basis. This does not preclude DFSPs—or other service providers in the ecosystem—from earning profits through use of the platform.

- A shared investment in fraud detection and management services. The compliance burden remains with the DFSP, but they share in a less costly, more efficient fraud service.
**A. Design Principles**

**Open Loop and Interoperability**

The ability to pay anyone and be paid by anyone is a necessary condition for a useful payments system. In a Level One system, the ability to reach counterparties is not the basis of competition among service providers. The Level One platform provides the ability to reach any counterparty; service providers should and will compete on other dimensions of their service.

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**What does “open loop” mean in the context of Level One?**

- An open-loop payments system is one in which any licensed DFSP provider may participate. Membership conditions are specified in the operating rules of the Level One Scheme.
- An open-loop system will not discriminate against categories of DFSPs, or protect the interest of one category (e.g., large providers) against others.

**Does “open loop” mean the same thing as “interoperability?”**

- An open-loop system implies interoperability: The system exists to exchange transactions among participating DFSPs. Every open-loop system is interoperable.
- Not all interoperable schemes, however, are open loop. An interoperable scheme might exist among a set of providers, but the rules of that scheme might exclude some classes of DFSPs.

**What are the challenges in managing an open-loop system?**

- Countries may achieve the effect of a single open-loop system by interconnecting two or more systems. Connected schemes will need to have the same basic rules for transaction timing and treatment. (Refer to Implementing the Platform/Design Choices/Interconnected Systems section for more information.)
- Balancing the needs of differing constituents (e.g., banks vs. non-banks, large providers vs. small) is difficult. That is one reason why Level One advocates for a “skinny” payments platform—with minimal functionality embedded at the platform level. This is a “lowest common denominator” approach to the value transfer function of the platform. Level One further specifies an open API protocol to access the platform. We expect DFSP providers and their partners (e.g., non-DFSP service providers) to compete based on “apps” and “accounts” that use this platform.
A. Design Principles

Push Payments

What are “push” payments?
Push payments are those in which the paying party’s DFSP first enters the payment order into the payment platform. The receiving party’s DFSP then receives the payment order and credits the payee’s account. Wire transfers and ACH payroll transactions are examples of push payments.

Push payments contrast with pull payments. In pull payments, the receiving party’s DFSP enters the payment order into the payment platform, and then the paying party’s DFSP receives the payment order and debits the payer’s account. Checks, debit cards, and direct debit transactions are examples of pull payments.

Push payments are superior to pull payments for risk control issues of many kinds. A push transaction can’t bounce and doesn’t need an authorization message; the DFSP who knows the payer’s account balance is sending the payment instruction. Push address credentials, if stolen, can’t be used to fraudulently “pull” money out of a consumer’s account. For these reasons, Level One supports a “push-payments-only” design.

Are “pull” payments necessary to support merchant and biller payments?
No—the functionality of pull payments, in which the receiver of funds wants to “ask” for the payment, can be fulfilled using “request-to-pay” messaging. This request message is not a financial transaction; the payment transaction is sent to the switch by the consumer’s DFSP, so that the risk benefits of push payments are maintained.

Legacy systems developed pull payments because the technology at the time did not permit real-time push payments. Today, enabling technology is in the hands of every user. A Level One platform can handle multiple use cases. There is no reason for modern payments systems to support these higher-risk, higher-cost transaction types.

Confusion Alert: In some new systems, request-to-pay messaging is being referred to as “pull.” The important distinction is which DFSP—the paying or receiving party—is entering the transaction into the system.
B. Key Concepts

A Competitive Ecosystem

A healthy financial services ecosystem that enables financial inclusion requires multiple providers and includes both incumbents and new entrants.

Multiple Payments Service Providers

A key part of the Level One vision is that all providers have access to the platform, to make and receive payments. Providers (banks and licensed eMoney issuers) who hold customer’s “transaction accounts” are called “DFSPs” within Level One (digital financial services providers) and have direct access to a Level One platform. Others, including processors, aggregators, payments services providers and marketplace operators may access the platform (“ride the rails”) through relationships with providers on the platform.

Providers will need to collaborate on some aspects of the platform, but will compete on others. Level One considers the “rails” and the “rules” of the payments platform to be a collaborative space, and the “accounts” and “apps” to be competitive. Rails include the basic value transfer function of the Level One system, but may also include various shared services attached to that. This issue is explored further in the Shared Services section.

“Transaction accounts are broadly defined as accounts held with banks or other authorized and/or regulated service providers (including non-banks), that can be used to make and receive payments.”

Payment Aspects of Financial Inclusion Consultative Report
September 2015, The World Bank and CPMI
Business Models
All DFSPs need to find a sustainable business model to provide payments services to their customers. This is challenging, particularly when one of the objectives of providers (and regulators) is to serve “bottom-of-the-pyramid” customers. This issue is explored in more depth in (Refer to Implementing the Platform/Challenges section for more information.)

It is well understood that traditional banking models are unlikely to succeed in serving poor populations. These models have relied on a combination of revenue sources, which has been detailed in the ACTA framework published previously by the Gates Foundation.

How will business models work when there is a greatly expanded set of DFSPs? Level One expects very different models for different categories. Business models will rely on a mixture of revenue from direct charges related to payments services and from a broader definition of “adjacencies.” In fact, in ongoing research by the team at the Gates Foundation, it is becoming increasingly clear that most successful business models will rely primarily on adjacencies rather than transaction or account fees.

What Are Adjacencies?
Adjacencies are sources of revenue from customers using payments services that are apart from direct fees for those services. Adjacencies may be financial—such as lending to a customer—or non-financial. An example of a non-financial adjacency is a “commerce adjacency,” where the primary business objective of a provider of a payments service is to enable the sale of their core products or services (e.g., a ride hailing service). The provider makes money on the sale of those products or services, and views payments as a cost of doing business.

Innovation and Level One
Level One expects increasing amounts of Fintech innovation in the “apps” area. Many companies will build solutions enabled by the Level One platform. These companies may be large incumbents (e.g., Telco), financial services start-ups, or non-financial companies. Standardized APIs will provide access to the Level One platform.
The Low Cost Imperative

All DFSP providers—regardless of their business model—share a common need: a low-cost value-transfer platform. That is what Level One provides. Most (but not all) DFSPs will have for-profit businesses that use the platform.

The Level One Platform itself is a low-cost service to the DFSPs, operated on a “not-for-loss” basis. Not-for-loss means cost recovery with an additional factor to cover investment requirements by the platform. By keeping the cost of value transfer between accounts to zero or near zero, DFSPs can create products and services tailored to their market—which includes the previously excluded. The design principles of Level One establish the basis for this low-cost platform.

The most important element in achieving a low-cost platform is volume: Transactional systems need high volumes to cover fixed platform costs. This enables the platform to translate this into an ultra-low per transaction cost to the DFSP. There are two important enablers for volume: one is making sure that all DFSPs can use one platform; the other is the support of multiple use cases.

It is important to note that the platform transaction cost—which is borne by the DFSPs—is not the same as the end-user pricing. End-user pricing will be determined by DFSPs (and at times constrained by regulation). But a low-cost platform is critical to enable low (or zero) end-user pricing.

Different Business Models for Different Categories of Payments Services Providers

*Not all customers will buy adjacencies, but the revenue from the adjacencies supports the overall base of services provided to all customers.*

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<th>Other Providers Accessing the Platform</th>
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<td>Part of a bundle of retail payments services</td>
<td>Business opportunity or way to preserve base market (esp. telcos)</td>
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<tr>
<td><strong>Direct Revenue from Payments</strong></td>
<td>Fees; NII on balances</td>
<td>Fees</td>
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<tr>
<td><strong>Adjacencies</strong></td>
<td>Intermediation (lending from deposit base); financial adjacencies</td>
<td>Unclear; may include lending in some cases</td>
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Regulatory Support

Regulatory support of financial inclusion initiatives is crucial to their success. In many countries, there are a number of different government agencies and regulators that are actively involved in plans to achieve financial inclusion targets.

There are a number of issues identified by Level One as important for the payments platform itself as well as access to it. These include:

• Tiered and automated KYC
• Non-banks can issue eMoney, or a separate class of “payments banks” are chartered; all are regulated by the Central Bank.
• The Level One Scheme is a separate legal entity, governed by its participating DFSPs; the Central Bank may or may not be a partial owner of the entity.
• All licensed DFSPs have access to the Level One platform and connections, as necessary, to other national payment systems.
• Agents can cash-in and cash-out for all DFSPs, including both banks and non-banks.
• Fair telecommunications network access (e.g., USSD) and pricing
• The use of established international standards for any new payments system (including a Level One system), that includes message types, formats, and protocols for API access.
• Measures to foster an open DFS architecture and facilitate competition among both DFSPs and payments service providers using the Level One Platform

Regulators

Multiple regulators are involved. The Central Bank often has the overall authority over payments systems.
Government Support of System

Government support beyond regulatory support is necessary to ensure the successful implementation of a Level One system, and the financial inclusion that it enables.

Use of the Level One Platform
Government can provide critical early volumes for the system by making benefits and payroll payments electronically, as well as accepting electronic payments.

Supportive Formalization and Tax Policies
Reaching “digital liquidity” requires that merchants, large and small, start accepting electronic payments. Many of these today operate on an informal basis, using cash, with no tax exposure. Government programs should support a “ramp up” to formalization.

Consumer and Merchant Education Programs
Proactive education programs can help instill trust in the system.
C. Desired Outcomes

Desired Outcomes

**Financial Access**

*Provide access to transaction accounts:* The Level One Project supports a digital platform that connects all transaction accounts in a country, allowing customers to make and receive payments in real time, where transaction accounts can be offered by banks or licensed non-bank providers.

**Digital Liquidity**

*Enable use of transaction accounts:* Digital liquidity is a state in which people are willing to leave their funds in electronic form, rather than cashing-in and cashing-out for each transaction. Digital liquidity first requires financial access. Other enablers include:

- An account that is easy to open, easy to use and no more expensive than cash
- The ability to pay anyone, and be paid by anyone, as easily as cash and at no additional cost
- The ability to spend money held in the transaction account at merchants, billers, and government agencies
- Trust in the system

**Financial Enablement**

*Looking beyond transactions:* Upward mobility and a thriving financial life requires services beyond payments (e.g., access to savings, credit, insurance). The Level One Project supports a robust digital financial ecosystem that provides users with the full suite of financial services.

**A Dynamic Digital Ecosystem**

A dynamic ecosystem requires a vibrant economy with many services, products, and capabilities delivered either digitally or with a digital component and supports multiple service suppliers with differing target markets and business models. The digital payments platform supports and enables all of the transactions for the digital economy. “One economy benefits everyone.”
Section 2

Implementing the Platform

A. Design Choices
To optimize usability, safety, and low cost
01. Core Components
02. Forming the Scheme
03. Achieving Interoperability
04. Interconnected Systems
05. Payments Addressing
06. Inter-DFSP Settlement

B. Scaling the Platform
To create an inclusive digital ecosystem
01. Enabling Multiple Use Cases
02. Merchant Acceptance
03. Implementing Shared Services
04. Regional Payments Systems
05. Cross-Border Payments

C. Challenges
Balancing the needs of a diverse population of stakeholders
01. DFSP Business Model
02. Agent Liquidity Management
03. Telecommunications Network Availability and Quality
04. Transaction Irrevocability
Core Components

What are the core components of a Level One platform?

The scheme is responsible for defining the suite of scheme services that participating DFSPs use. At the heart of the system is what Level One calls and “Interoperability Service for Transfers,” or the IST. The IST handles the essential value transfer function of the system: DFSPs (or other processors or providers working on their behalf or as their agent) receive transaction orders from a sending DFSP and can route them to a receiving DFSP.
The core components of L1P include auxiliary functions to the IST

A directory service handles routing and payments addressing.

This is discussed further in the Payments Addressing section.

The calculation of multilateral net settlement positions, which includes the monitoring of transaction throughput in accordance with settlement rules, is also a core component of Level One Services. Multilateral net settlement positions are communicated to the Settlement Service of the chosen Settlement Bank.

This is discussed further in the Settlement section.

Why is it important?

It is the responsibility of each DFSP to meet and comply with all regulatory and operating rules as mandated to participants by the regulatory authorities and scheme, respectively. As a result, in legacy systems, it is common to require participants to invest, operate, and manage a suite of services to ensure they are doing so effectively. For example, each scheme DFSP would invest in a host of AML/CFT/KYC tools and/or a means to ensure accurate and appropriate payments addressing. However, an opportunity exists to pool resources and data across DFSPs in the form of shared services that exist as a utility at the hub. This may allow for improved functionality, and at a lower cost. Furthermore, appropriate shared services—such as fraud detection and management or payments addressing—are not considered areas for a competitive advantage; rather the quality of those services improves when it is done on a collaborative basis. DFSPs would still be able to compete on end-user offerings, while providing an improved, consistent experience. Finally, creating a set of shared services in the middle is likely to decrease upfront investment and thus barriers to entry, inevitably promoting new DFSPs to join the scheme.

Note: A centralized resource does not change responsibility for complying with regulatory and operating rules—that remains with the Digital Financial Services Provider (DFSP) initiating the transaction.

A Level One Perspective

The quality of certain services, shared or standalone, is directly related to the amount of data available. Take
Design Choices | 01: Core Components

fraud detection as an example. Fraudsters understandably work across DFSPs; the shared data enables detection of fraud that is not possible from the perspective of one DFSP, benefiting participants and their customers. Moreover, financial regulators will benefit from the ability to observe financial transaction data in real time, across providers. The same can be said for payments addressing. When facilitated at the scheme level, DFSPs are likely to have more robust, comprehensive information which will lend itself to fewer misappropriations and/or declines—a benefit to them and their customers. As a result, the Level One Project believes that in certain instances, pooling data to offer shared services at the hub is likely to lead to improved experiences for DFSPs, their customers, and the regulators.

The quality of certain shared services is also related to the level of investment; both the fixed, upfront investment as well as ongoing operational costs. Pooling of resources allows for the investment in and maintenance of robust services without overleveraging each DFSP. As a result, DFSPs can offer more affordable services to their end users. In addition, more DFSPs can connect to the system, enabling competition—both of which are essential to a Level One system.

Note: For centralized fraud management to be effective, the platform must either require “on-us” transactions to go through the switch, or require real-time reporting to the fraud utility of “on-us” transactions. DFSPs would be required to commit to such requirements at the onset of the shared service. ■

Best Practices

**National Payments Corporation of India (NPCI)** offers a Real-time Fraud Risk Monitoring and Management solution (FRM). This real-time monitoring tool for fraud detection and prevention is made available to participating DFSPs as a value-added service offered. As of December 2016, 59 participating DFSPs have subscribed for the services.
Forming the Scheme

Design choices in a new payments platform go well beyond the technical. There is a design of the Scheme itself that determine who owns it, what powers it has, and what economic model it uses.

In Level One, the term “Scheme” refers to an entity that writes and controls the operating rules of the payments system. This is often referred to as the “governance” structure of the system.

What are the Design Choices?

Who owns the Scheme? Is it owned by the participating DFSPs, by the government, or by a processor who supplies the switching function for the Scheme?

Level One prefers a structure in which the Scheme is a separate entity owned and managed by participating DFSPs. The DFSPs collectively decide on the Operating Rules of the Scheme. This structure—which has been well tested in legacy payments systems—creates a sense of fairness among DFSPs and increases the chances that a nation-wide system is created, enabling multiple types of products and services at the DFSP level.

What is the economic model of the Scheme? Is the Scheme owner a for-profit or a not-for-profit entity?

Level One prefers a “not-for-loss” model at the Scheme entity level. Not for loss means that the Scheme charges participating DFSPs for access to platform services at a cost recovery basis with an additional amount to fund investments in the platform. This structure creates a focus on making operations low cost (as they become a cost of doing business for participating DFSPs) and enables profits to occur at the DFSP level.

What does the Scheme do?

The Scheme has a variety of responsibilities, which are written into the operating rules of the Scheme. These include:

- Membership and membership conditions:
  - Which DFSPs can join the Scheme?
  - What are their obligations?
  - What happens if obligations are not met?

- Voting rights:
  - On what basis are votes on operating rules allocated to participating DFSPs?

What are the scope of the Operating Rules?

In some schemes, the rules are very small, and cover only the technical considerations on the exchange of transactions. In other schemes, the rule set is very broad, and covers multiple questions of product definitions, use case support, brand usage, etc.

Level One recognizes that different countries will take different approaches to this. The guiding principles should be a common commitment by participating DFSPs in creating a platform that advances financial inclusion.

Who should provide Platform services?

Should the Scheme entity itself operate the services, or should another party do so? Should that party be for-profit or not-for-profit?

Level One does not prescribe nor recommend any single structure for this. The Scheme should, however, retain the obligation of keeping services fees for participating DFSPs as low as possible.
Design Choices | 02: Forming the Scheme

When should a Scheme entity be created? As the services are being designed, or at a later date?

Level One recognizes several models in the market. Countries that are forming a Scheme as a “first step” in the development of a new system have the advantage of full participation in all decisions by DFSPs. Countries that have a single entity start the platform (often the Central Bank) arguably have the advantage of faster decision making. Some countries have started with a single-entity control and then turned this over to a DFSP-controlled entity.

Selection of providers of Scheme services: This includes, at a minimum, a switch and settlement procedures. Level One specifies that Scheme services also include payments addressing and a shared fraud utility.

What are the rights and obligations of participating DFSPs in exchanging payments transactions?

These processing parameters (e.g., message protocols) may also include end-user product requirements (e.g., posting times). Often, this includes specifications relating to the liability of one DFSP to another with respect to disputed transactions.

What are the economic obligations of participating DFSPs?

DFSPs will, of course, pay fees to the Scheme-for-Scheme services. But operating rules may also specify what is known as interchange: a payment from one DFSP to another related to a specific transaction.

Level One has created a template for Operating Rules (Refer to Resources/Business Focus section for more information.)
Interoperability is a design principle of the Level One Project. Interoperability primarily means the ability to pay anyone—and be paid by anyone—regardless of the provider, using a single account and single set of payment instruments. Interoperability also includes interoperability of agents, which is the ability to exchange account value (digital money) to cash, and vice versa, at any agent regardless of the provider.

Interoperability significantly improves the utility of digital financial services by making digital money more widely acceptable. As digital money becomes more widely acceptable, it encourages digital liquidity and reduces dependency on cash. However, it can be challenging to make DFSPs perceive the longer-term benefits of interoperability.

Interoperability is an outcome and there could be several means to that end. However, the most desirable form of creating interoperability is by deploying a market-wide, open-loop system, enabled by shared, standards-based components. This allows for scale and fosters an inclusive financial ecosystem with healthy competition among participants. CGAP’s research on interoperability, however, found that such an approach to interoperability is not commonly observed in many DFSP markets. In the absence of a market-wide, open-loop system, several short-term workarounds show up in the market, which are frequently effective in addressing a gap in the market, but not always desirable in the long run.
Design Choices | 03: Achieving Interoperability

**Barriers to Interoperability**

Achieving Interoperability is challenging because, in general, DFSPs are not comfortable letting their customers experience the services of other DFSPs due to fear of losing them to a competitor. Additionally, DFSP want a “walled garden” to ensure that money remains within their system. Furthermore, with respect to interoperability of agents, DFSPs with larger agent networks in the market note concerns that DFSPs with smaller agent networks may benefit unduly by riding on their network (and investment) while the smaller providers fear using the larger DFSP’s network because their customers may be subjected to poor treatment. In markets where the interoperable system is not open loop—which exclude some classes of DFSPs—the excluded DFSPs from a payments system start their own, and often the two systems do not interoperate, resulting in a two-tier financial system. Usually, the two separate systems belong to bank DFSPs typically catering to the rich and to non-bank DFSPs who mostly cater to the poor. Such dichotomy undermines the usefulness of digital financial services, as poor people pay rich people/big business and vice versa. In addition, building two separate systems fails to realize economies of scale and impacts viability of systems.

To connect with each other, market players sometimes respond to the lack of a market-wide, open-loop system for interoperability by entering into bilateral agreements with other providers. It may be cumbersome and expensive to maintain bilateral relations with multiple providers posing liquidity and settlement challenges. Bilateral agreements also effectively exclude new entrants. Short-term workarounds typically enable interoperability in specific use cases. While workarounds can be incredibly useful in the short term, they offer limited long-term desirability due to the costs and complexities involved in such solutions. Short-term workarounds include:

**Intermediaries** (sometimes referred to as aggregators or service providers) develop relationships with their enterprise customers and DFSPs. They enable payments “to anyone” or “from anyone” for one or more use cases where there is no interoperability supporting the particular type of use case(s). Intermediaries usually support interoperability in CICO, bill pay, merchant, and bulk payments.

In a DFSPs “Agents Sharing” model, non-exclusive agents work for multiple DFSPs, which allows consumers to cash-in or cash-out at any agent. A non-exclusive agent maintains a separate account at each provider and has to manage liquidity issues separately.

**A Level One Perspective**

Level One advocates for a single market-wide, open-loop payments system that is open for participation by all types of DFSPs (banks and non-banks). Such a system eliminates the need for multiple payments systems, enhances ubiquity and utility of digital financial services, and increases the financial viability of the system by achieving economies of scale.

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**Best Practices**

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**Open participation by all DFSPs:** SPEI in Mexico allows both bank and non-bank DFSPs to participate in the system. SPEI also allows non-bank DFSPs to maintain settlement accounts at the Central Bank to settle obligations.

**Enable multiple use cases:** Egypt’s Inter-Bank Mobile Payment Systems— which is managed by Egyptian Banks Company (EBC)—enables interoperability among participating DFSPs on multiple use cases, which includes CICO at agents, P2P transfers, bulk payments, and merchant acceptance.

**Regulatory support:** The Central Bank and National Payments Council of Jordan jointly led an effort to develop JoMoPay, a national real-time, open-loop, credit-push payments system. The role of the regulatory and a central coordinating agency helped to ensure equal voice of all participants in the construct of the system.
scale. More importantly, it obviates the risk of creating a two-tier financial system—one for the poor and one for the rich. Further, the system should adopt the following features:

**Democratic governance structure and common rules.** The system should be governed by its participants, and all participants of the system should abide to a common set of operating rules.

**Standards-based.** The interoperability system should operate on international payment standards so that it can seamlessly integrate with other payments domestically, regionally, and internationally.

**Enable multiple use cases.** The interoperability system should support multiple use cases. Enabling multiple uses cases helps to prevent the need for a short-term workaround, and at the same time, increases the overall volume handled by the payments system. This improves financial viability of the system.

**Agent access to interoperability system.** Scheme or country regulation should require any agent to support any consumer and prohibit agent exclusivity. Wherever there is an interoperability arrangement, agents should have direct access to the scheme or IST. Such arrangement should work based on well-defined incentive structures, which may include interchange arrangements to compensate one DFSP for serving the customer of another DFSP. This helps DFSPs see clear incentive and no threats in sharing agents. Finally, care should be given by regulators to avert a situation that necessitates short-term workarounds and bilateral implementations. In some instances, a formal mandate may be required to incentivize banks and other financial organizations to abandon proprietary, closed-loop systems, or systems that enable only one type of provider (such as a bank) to participate directly.
The Level One vision is for a new digital platform: A combined scheme and scheme services to effect interoperability on a low-cost basis. This system will exist within a broader payments ecosystem of a country. There are a number of ways in which a Level One platform may interconnect with these systems. Any of the environments shown in this section are compatible with the principles of Level One.

**Multiple L1P Platforms**

The operating rules of the two schemes are closely aligned. This means that system-to-system connections can be technically implemented with a simple business agreement on the treatment of transactions and on settlement. This might occur if, for example, the banks and the non-bank DFSPs want their own systems (Note a given DFSP might belong to both systems). This is similar to ATM network interconnections in many countries.

**L1P System Co-Exists with an ACH System**

The transaction handling and operating rules of the two schemes are quite different. For example, L1P is real-time, whereas ACH is deferred and batch. This means that although system-to-system connections can be technically implemented, the business agreement about the treatment of transactions is more complex.

The effect of system interconnection can be achieved by having all DFSPs—both bank and non-bank—belong to the same Level One System. Bank DFSPs, of course, may also belong to other systems, including ACH, debit card, checking, and ATM systems. But having all licensed providers of transaction accounts belong to the same system ensure that all accounts can be reached by the system—under common rules and treatment.
Level One prefers that connections be at the platform level, rather than individually between DFSPs. This is both cost-efficient and ensures equitable transaction handling and pricing. Level One cautions against having higher consumer fees for transfers from one system to another than transfers within a system. This may inadvertently create disincentives towards attaining real ubiquity and usefulness of financial services.

The overall challenge in payments system design is one of scale and economics. Payments systems depend on high volume to ensure low transaction costs—a characteristic universally desired by low- and high-income transactors. Diluting volume by spreading it across multiple systems is economically undesirable. This is compounded by additional costs for separate scheme governance structures, system connectivity, and general oversight.

L1P Platform Connects to Another Country L1P Platform
Two similar L1P schemes in different countries connect at the system level. Operating rules and transaction handling are relatively easy to agree on; settlement is more complicated and arrangements will involve the settlement banks (usually the Central Banks) of both countries.

L1P Platform with Multiple Hubs or Operators
All DFSPs are members of the same Scheme, and bound by those rules. But DFSPs choose different hub operations and link technically to these hubs. The hubs agree to the technical interchange of transactions and to settlement arrangements, following scheme rules as appropriate.
Push payments require an address: The sending DFSP must put information in its payment order that enables the transaction to reach the end party. Historically, in bank push payments, the sending institution (and therefore, in most cases, the sending end user) needs to know both the bank code and the bank account number of the recipient. Although this works, it creates a burden on the send side to collect and maintain current and accurate records of recipient data.

A common solution to this problem is aliasing, which allows the sending end user to specify an alias (commonly a mobile phone number) as a “pay to” address. Some entity in the transaction chain then needs to operate a directory that recognizes the alias and routes the transaction to the correct receiving DFSP.

### Consideration

**Who operates the directory?** In a closed-loop system, the provider maintains the aliasing directory. But in an open-loop system it can be either:

- **Provided by each DFSP.** This means that sending customers need to tell their DFSP the account details of each person they want to pay; the sending customers' DFSP then keeps the directory mapping an alias to those account details. This is inherently inefficient: An end user receiving payments from multiple senders would need their account details kept in each sending DFSPs directory. Sending DFSPs, however, often consider this as a competitive advantage, as it may keep customers from switching to another provider.

- **Provided by a central service.** In this model, customers register an alias through their DFSP, who then populates a central directory. This has advantages of efficiency and helps with ubiquitous “reach” of a payments system. Although, DFSPs may be concerned with losing control over who their customers are sending money to. Also, depending on the structure of the directory, it may enable people and businesses to change DFSPs without changing their alias. Again, some DFSPs may resist a directory on those grounds.

- **Provided by a third party.** A third party provides directory services on behalf of one or more payments systems. This has the benefits of a cross-payments system utility, but might be resisted by each individual payments system that may want control over the addressing of payments routed through their system.

**What aliases are supported?** In a payments system that begins with the P2P use case, it seems simple to have a directory that is defined around the mobile phone number as an alias. There are merits to this approach, including the fact that mobile phone roaming directories...
can be used as a part of the directory structure. But there are limitations, as customers may have more financial accounts than they have mobile numbers; there may be privacy concerns about the use of mobile numbers; and the format is generally limiting if the payments system expands to include other use cases. Directory structures that accommodate multiple different alias types are more useful over the long term, but may seem difficult to establish.

Is there a link to national ID? Many countries require—or are planning to require—the use of a national ID at the time of account opening, typically with a biometric verification component. It is possible to design a payments addressing directory so that a payment can be addressed to a national ID number. A directory service connected to the switch can then perform the necessary mapping and routing functions. This is highly efficient, particularly for government or employer payments to people, where the national ID is already held by the paying entity. Furthermore, the use of a national ID as a full (or partial) payments address also allows the payments system to leverage existing biometric authentication capabilities: A payment is addressed to a national ID, mapped via a directory to the receiving DFSP, and then possibly withdrawn at an agent, using a biometric tied to that national ID.

**Level One Position on This Issue**

Level One prefers a centralized approach to directory services; this should both create greater efficiencies (and lower cost) and support the goal of ubiquity. A centralized approach also facilitates the entry of new DFSPs, fostering competition. A non-proprietary directory also enables end users to switch DFSPs without losing their established payments capabilities.

A technical structure that allows for the eventual use of aliases other than phone numbers is preferred, as this can be an enabling factor for multiple use cases and address privacy concerns.

A structure that leverages existing directories (e.g., a national identity directory) is attractive because of its ability to lower overall costs and quickly integrated into a payments system.

Finally, where countries have an established, biometrically verified national identity system, thought should be given to leveraging the national ID as a means of addressing payments.
Design Choices | 05: Payments Addressing

**Payments Addressing: Best Practices**

**India**
Two methods of payments addressing draw on the same underlying infrastructure.

Method 1
*Can be used by anyone with a feature phone.*
Payer sends a payment order addressed to a mobile # or Aadhaar ID.

Method 2
*Requires that the payer has a smartphone and that the payer’s DFSP is using NPCI’s “UPI” (Unified Payments Interface”)*
Payer sends a payment order addressed to a UPI “Virtual Payment Handle” which is in the standard “account-id@DFSP-code” format.

Both methods require the payee to to register their account number to their Aadhaar ID, mobile number, and/or Virtual Payment Handle (the latter if supported by their bank). This is a one-time process; the registration of the mobile # and the Aadhaar ID may be done at time of account opening. The DFSPs and NPCI will check registrations against the Aadhaar database (maintained by the UIDAI), as necessary.
Inter-DFSP Settlement

In any multi-institution payment system, some form of financial settlement among participating institutions needs to exist. Level One design principles call for “same-day settlement”—but what does this mean, and how does it differ from what exists today?

Background

Legacy bank retail (low-value) payments systems generally use a net settlement process, typically calculated by the switch and communicated in the form of settlement entries to a settlement bank. Every participating bank has an account at one. Frequently, but not always, the settlement bank is the Central Bank of the country. These systems have, until recently, used one business day as a settlement period (at the end of which the net calculation is made) and settlement entries into settlement accounts are normally posted the following business day.

The bank participants, the payment scheme, and/or the settlement bank can be at risk if one bank cannot meet their settlement obligations due to either a liquidity failure of some kind or a bankruptcy event.

To manage these risks, participants, including the settlement bank, often rely on bank regulation (e.g., “safety and soundness” oversight) to ensure that settlement risks are either covered or exist at an acceptable level. The more elaborate liquidity risk management capabilities that exist for high-value settlement systems are in general, not applied to retail systems.

One additional legacy practice should be noted: that of tiered access. In a tiered access settlement system, a small bank will access the system through their relationship with a large bank. That bank takes the risk and responsibility for the smaller bank, and of course charges the small bank for that service.

The challenge is in creating a settlement system that is designed for non-bank DFSPs as well as banks, and that enables a wide range of DFSPs to participate. As a goal of Level One is low cost; it is necessary that such a system manages settlement risk to a close-to-zero level. Ideally, a non-bank DFSP would be a direct participant in a settlement system (avoiding tiered access charges), but many Central Bank settlement systems do not allow non-banks to hold accounts at the settlement bank, therefore forcing the non-bank participants into a tiered access model.

A Level One Perspective

The Level One Project aims to take advantage of modern technology to address some of the issues surrounding settlement and the management of settlement risk. An important assumption here is that if settlement risk for non-banks is held to a close-to-zero basis, the non-bank does not have to have the same kind of (expensive) prudential regulation as a full-service bank would.

Achieving close-to-zero liquidity risks requires the following elements in a settlement system:

**Dynamic calculation of multilateral net position.** The function of the switch to calculate multilateral net positions should be dynamic, updating with each transaction received and sent on to the receiving institution.

**Net Debit Cap.** Each participating DFSP has a system “Net Debit Cap,” which is the maximum negative position it may have in the dynamic multilateral net settlement calculation. The Net Debit Cap limits the extent of a participating DFSP’s settlement obligation.

**Net Debit Cap enforced by switch.** The switch stops incoming transactions that put a DFSP over its Net Debit Cap; the transactions are returned to...
the DFSP and are never delivered to the receiving DFSP.

*Fully collateralized Net Debit Cap.* Scheme operating rules require participating DFSPs to have 100% of their Net Debit Cap held in collateral at a financial institution. Note that a fully collateralized Net Debit Cap system has no potential for an uncovered loss.

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**Best Practices**

**Dynamic calculation of multilateral net position:** The Net Debit Position of participating DFSPs in Immediate Payment Service (IMPS), India is computed after every transaction.

**Net Debit Cap enforced by switch.** In IMPS, India and Faster Payments, U.K., the switch will not allow a transaction to be completed that puts a DFSP above the Net Debit Cap.

**Fully collateralized Net Debit Cap:** DFSPs participating in Faster Payments U.K. are required to hold cash in a separate Reserves Collateralization Account (RCA) equivalent to the Net Debit Cap. The scheme can instruct the Bank of England to use the cash in the RCA if any DFSP encounters difficulties meeting its settlement obligations.
Section 2

Implementing the Platform

A. Design Choices
To optimize usability, safety, and low cost
01. Core Components
02. Forming the Scheme
03. Achieving Interoperability
04. Interconnected Systems
05. Payments Addressing
06. Inter-DFSP Settlement

B. Scaling the Platform
To create an inclusive digital ecosystem
01. Enabling Multiple Use Cases
02. Merchant Acceptance
03. Implementing Shared Services
04. Regional Payments Systems
05. Cross-Border Payments

C. Challenges
Balancing the needs of a diverse population of stakeholders
01. DFSP Business Model
02. Agent Liquidity Management
03. Telecommunications Network Availability and Quality
04. Transaction Irrevocability
Enabling Multiple Use Cases

A key design choice is determining what use cases will be supported by a modern payment platform.

Many modern payments systems, particularly those focused on financial inclusion, start with the use case of Person-to-Person (P2P) domestic transfers.

The users of a P2P system, however, have other payments needs: They make purchases, pay bills, receive salaries and benefits. Small and poor merchants also buy supplies, and small farmers buy equipment, seeds, and fertilizer.

Level One suggests that all use cases are supported by the same platform for the value transfer function.

By using the same core platform for multiple use cases, the Level One system can achieve volumes necessary to keep costs low.

### Use Case Labeling

*Scheme rules should require transactions to be labeled or tagged by use case. This allows use-case specific rules, including fees, to be applied to those transactions.*

<table>
<thead>
<tr>
<th>Use Case Labeling</th>
<th>Bulk Payments (G2P, B2P)</th>
<th>Payments to Merchants and Billers</th>
<th>P2P Transfers</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Payments to Governments</td>
<td>Cash-In, Cash-Out</td>
<td>Access to Other Financial Services</td>
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</table>
Scaling the Platform | 01: Use Case Support

Enabling Programs for Use Cases
The same Level One platform supports the value transfer component for multiple use cases. Each use case, however, may have additional enabling programs.

In some cases, some or all components of these enabling programs may be provided through the Level One platform as an additional shared service among the DFSPs. In some cases, enabling platforms will be provided by processors, aggregators, facilitators, and other entities. The Level One platform will support easy access—through standardized APIs, to permit these entities to access platform services.

Examples: 3rd Party Enabling Programs
- Bulk Payment Facilitator
- Bill Payment Service Provider
- eCommerce Merchant Aggregator

Example: Additional Shared Service
In this example, DFSPs participating in the Level One Platform have elected to provide merchant services as an additional shared service. This may include standards and protocols for terminals or WR codes, for example, as well as merchant enrollment and fraud management.
Merchant Acceptance

Encouraging poor customers to actively use their DFS account is one of the major challenges facing the industry. Poor people see very little value in DFS accounts when digital money is not widely accepted as a mode of transaction. Therefore, one of the fundamental ways to incent people to use DFS accounts and scale the system is by moving merchants, where people make their “everyday purchases,” to accept digital money. However, merchants are extremely reluctant to accept digital money for a variety of reasons, such as initial fixed cost, ongoing recurring cost, lack of clear value proposition, lack of customer demand, and tax exposure.

Considerations

If merchants need to move away from cash then the alternative solution needs to be as good as cash—if not better. To make digital solutions attractive to merchants, the following issues should be taken into consideration.

Affordable. Most merchant acceptance solutions require merchants to invest in a special device (e.g., POS terminal) and incur a merchant discount fee on every transaction. SMBs whose profit margins are extremely low find these expenditures financially unviable. Merchants serving wealthy clients may be willing to incur these expenditures to benefit from consumer credit lines and an increase in sales. However, such incentives are absent for SMBs serving low-income populations. Therefore, merchant acceptance solutions targeting SMBs must be offered at affordable prices, at least initially to drive uptake.

Tailored merchant payments solution. SMBs have very different needs and business models compared to large merchants. Therefore, merchant acceptance solutions targeted at SMBs need to be adapted to suit their unique needs and business models. For instance, SMBs—who typically operate with limited working capital—cannot wait for the sale proceeds to post to their account. They need instant availability of their sale proceeds to purchase stock for the next business day. Similarly, SMBs do not have the wherewithal to bear customer chargebacks and reversals. In addition, some SMBs who operate as informal entities find it expensive and cumbersome to fulfill conventional merchant validation requirements.

Address tax visibility concerns. SMBs operating in developing countries that deal in cash typically avoid or reduce their tax liability either by not reporting or under-reporting their income. Accepting digital payments increases transparency and makes it easier for tax authorities to scrutinize. Tax authorities need to devise innovative tax structures and tax amnesty programs to address SMB’s tax visibility concerns that come with accepting digital payments.

Strengthening customer demand. SMBs operate in an ecosystem where cash is the predominant method of transaction. When customer demand for digital payments is low, merchants are not compelled to invest in digital payment accepting...
Scaling the Platform | 02: Merchant Acceptance

A Level One Perspective
Several Level One principles directly address the merchant pain points around digital payments.

**Affordable.** Level One recommends that services should be made affordable to poor merchants, both from the standpoint of upfront investment as well as recurring cost. To actually replace the use of cash for daily purchases, the cost to the merchants serving lower income consumers (as well as the customers) will need to be close to zero, as that is their perceived cost of using cash. Further, DFSPs should leverage technological innovation such as QR codes to bring down the cost of acceptance.

**Open System.** Merchants need to be able to receive payments from customers and make payments to suppliers using multiple digital payment systems within the country. All of this should be accomplished without requiring merchants to have multiple accounts or devices, which may enhance the value proposition of accepting digital payments.

**Tiered KYC.** Tiered "know your customer," (KYC) allows for participation by merchants in correlation to level of use. For example, merchants lacking documentation may be allowed to open an account and accept payments, and the risk related to these accounts may be managed by imposing strict maximum account balance and transfer limits.

**Immediate funds transfer.** Level One recommends that payments services should make funds available to the payee in near-real time, providing immediate notification of payment from the payer to the payee.

**Value-Added Services (VAS).** Bundling merchant acceptance solutions with value-added services (VAS), such as low cost, digital-payments-data-based credit, ordering and inventory management services, customers relationship management, and marketing tools will help to highlight the benefits of digital payments and offset the cost of acceptance.

**Encourage digital liquidity.** Implementing initiatives—such as tapping income sources and paying digitally, promoting savings products, and offering incentive programs to promote digital payments—is critical for enabling a merchant acceptance ecosystem.

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**Best Practices**

**Affordable:** M-Pesa in Kenya recently announced a cut in merchant fees by 50%, to a maximum of 0.5% of value. Additionally, under the new tariff M-Pesa won’t charge merchants any fees for specific transactions that are below a certain value. In India, Paytm enables low-income merchants to accept payment from customers’ Paytm wallet using a QR code, which does not require any special devices or upfront investment.

**Open System:** In India, VISA, Mastercard, Rupay (domestic debit card brand) and American Express collaborated to create an interoperable QR Code standard called "Bharat QR". Bharat QR enables merchants to receive payments from customers regardless of their card brand. In addition, to accept payments, merchants require only a single Bharat QR code and no special POS devices are needed.

**Value-Added Services:** Kopo Kopo is a company in East Africa that partners with DFSPs to offer tools and value-added services that enable SMBs to accept mobile money payments from their customers. Kopo Kopo provides merchants a payments acceptance service, in addition to working capital loans, business intelligence, marketing services, and B2B payment options.
### Merchant Payments: A Level One Perspective

*Multiple methods of creating a “push” payment at the Point of Sale*

#### No systematic association of payment with purchase data

1. Consumer reads a “Pay to” number displayed on merchant’s till.

   Consumer instructs DFSP to initiate a push payment to the merchant’s till number or code.

2. Consumer’s smartphone scans a merchant’s displayed static QR code.

   Merchant’s device scans a QR code on consumer’s smart phone or sticker and sends a “Request to Pay” message.

3. Consumer instructs their DFSP to initiate a push payment to the scanned code.

4. Merchant system can associate payment with purchase data

   Biller or merchant has consumer’s payment address on file; sends a “Request to Pay” message to consumer.

   Consumer instructs their DFSP to initiate a push payment to the account specified in the “Request to Pay” message.

5. Consumer reads a “Pay to” number displayed on merchant’s till.

   Consumer instructs DFSP to initiate a push payment to the merchant’s till number or code.

   Merchant’s device scans a QR code on consumer’s smart phone or sticker and sends a “Request to Pay” message.

   Biller or merchant has consumer’s payment address on file; sends a “Request to Pay” message to consumer.

   Consumer instructs their DFSP to initiate a push payment to the account specified in the “Request to Pay” message.

For remote commerce (e.g., eCommerce, mobile commerce) and for bill payment, variations of method #4 (including consumer entry of details) or #5 are preferred, although in some cases variations of methods #2 and #3 are possible.

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**The merchants are served either by their own DFSP, or by a Merchant Services Provider associated with their DFSP.**
Implementing Shared Services

One of the core components of Level One is a shared fraud management services. As countries scale their platforms, there may be other opportunities for DFSPs to share in the development of services.

**Considerations**

Shared services provide the opportunity to create economic efficiencies and help accelerate adoption of services. Some examples of possible shared services are:

- Use case enablement programs for merchant services, bill payment, or for bulk payments
- Agent enrollment, management, and training
- Device testing and certification
- Interface with agricultural platforms, digital marketplaces, or other segment-specific users of the digital platform

**A Level One Perspective**

- Shared services should be open to all DFSPs participating in the system, to help ensure a level playing field and a competitive marketplace.
- Although shared services may be run on either a for-profit or cost-recovery basis, platform-enabled services should be accessible to bottom-of-the-pyramid customers on an affordable basis.
Regional Payments Systems

Should countries trying to achieve financial inclusion consider leveraging existing regional platforms? Payments systems historically have operated at a country level for multiple reasons. Two of the most fundamental include:

A sovereign or national orientation towards key characteristics, including:

**Currency:** Most countries have their own national currency and use it as the only legal tender for transactions.

**Regulation and Oversight:** Central Banks have important oversight responsibilities over payments systems and in many cases, operate the platform, or participate in an association that operates the platform.

**Language:** Until very recently, most information systems were based in only one language. Moreover, different alphabets also pose certain challenges.

**Technical Systems**
Countries tend to have their own personality when it comes to information technology. Once a system, or vendor gains a prominent function, the systems in adjacent industries are typically quite similar, making larger changes more difficult to achieve.

**Considerations**
A Level One payments system aims to provide value to countries looking to increase financial inclusion and/or where low-value, high-volume transactions often occur. To do so effectively, a Level One system must exist sustainably at very low cost. As a result, volume is critical.

However, as countries vary significantly by population and the population’s usage of electronic transactions varies, it may not be realistic—or necessary—for a country with low payment volumes to build and maintain its own domestic low-cost utility payments system.

Additionally, countries of any size should evaluate whether a domestic-only Level One system is the best option given that a Level One system (and a payment system generally) is capable of, and benefits from, handling large volumes.
It is interesting to note that as of 2016, California, a single state within the United States, has an economic output that makes it the sixth largest economy in the world, yet California does not have its own payments system.

**A Level One Perspective**

The need to achieve the scale necessary to enable ultra-low costs to users is paramount. Level One encourages nations to consider developing a regional processing capability, particularly for countries that reside in a region with existing economic cooperation frameworks, where work toward harmonizing the exchange of payments and leverage volume-driven efficiencies is already underway. In much the same way that different banks use the payment processing company, countries with low electronic payment volumes can also develop a shared Level One capability that leverages collective scale and minimizes individual costs.

**Leveraging regional processing capabilities can be flexible:**

Nations still have country-specific schemes, if the schemes agreed on key provisions or “meta rules” at a regional basis.

**Leveraging regional processing capabilities has occurred successfully in the past:**

- For example, Visa and Mastercard have long run regional processing systems, supported by rules defined at the global, regional, and country level as appropriate.
- The Single Euro Payment Area (SEPA) is an example of payment standardization across multiple countries that also facilitates the exchange of cross-border transactions.

**However, Level One recognizes that challenges with this approach may exist. For example:**

- Not every protocol or rule developed for a regional or cross-border system may be appropriate for handling domestic volumes. A case in point: the domestic currency may not be a settlement currency for the regional or cross-border system, requiring the need for a multi-currency settlement capability.
- Fear or resistance by domestic regulators who are responsible for managing risk may consider this approach too unfamiliar or out of hands reach to manage effectively.
- Domestic incumbents may resist. Bank DFSPs, used to collaborating on domestic schemes, may be reluctant to expand their scope of collaboration to include competitors from other countries. Moreover, the desire of country specific processors to maintain a role in payments processing can also create a barrier. Both commercial and governance questions are likely sensitive, requiring parties to orient solutions toward the goal of low-cost digital financial services.
Cross-border payments play a vital role in macroeconomic development as well as in poverty alleviation. In addition to promoting cross-border trade and commerce, several international agencies—including Migration Policy Institute—have indicated that cross-border payments flows have a positive spillover effect: Investments in productive assets and employment-generating activities occur in mostly rural areas. Enabling cross-border payments through the system will create substantial opportunities for scale.

**Barriers to Success**

Cross-border payments are complex, often involving multiple entities, technology and operational standards, sovereignties, and currencies. It is important to harmonize these differences in order to facilitate formal transfers, improve process efficiency, and bring down the cost. Some of the complexities in cross-border payments are detailed below.

- **Lack of standards.** Payment systems in countries often do not work on open and international payment standards. As a result, correspondent institutions or aggregators are needed to link financial institutions that operate on a closed loop to proprietary standards in different countries. As the number of players in the value chain increases, cost to end users increases.

- **Sovereignty issues.** Cross-border payments extend across national boundaries and the transaction is subjected to multiple legislations and regulations. Entities involved in the transaction have to meet multiple compliance requirements in order to move money. As a result, the incremental cost of compliance and operations is often absorbed by the end user.

- **Regulatory issues.** Cross-border payments are vulnerable to risk of money laundering and financing terrorism. Therefore, cross-border payments are subjected to strict customer due diligence (CDD), anti-money laundering (AML), and countering financial of terrorism (CFT) norms. Complying to these strict norms may not always be cost effective if the value of transaction is too low, which is often the case with retail cross-border payments.

- **Operational difficulties and foreign exchange risks.** Sending money across borders typically involves multiple currencies. This involves operational heavy lifting and carries foreign exchange risks. Use of correspondent banks to handle multiple currencies, multiple currency conversion costs, and hedging costs further increases remittance cost.

**A Level One Perspective**

**Use open, international standards where appropriate.** Level One encourages payments systems to adhere to internationally accepted payments standards rather than implementing system-specific, proprietary standards, which allows for easier and more cost-effective handling of cross-border transactions across different systems.

**Adopt existing/shared infrastructure and rules.** In order to optimize resources and drive cost down, Level One advocates for leveraging existing infrastructure and creating common infrastructure and rules to be shared by multiple stakeholders and countries across a
region or continent—particularly in the cooperative space—helps to harmonize differences as well as amortize fixed costs over a greater number of participants and transactions.

**Deploy regional hubs for interoperability.** Creating regional hubs by bringing together a group of countries can be a cost-effective alternative to corresponding banking and bilateral agreement-based cross-border payments.

**Apply proportional risk-based approach.** Cross-border payments, particularly low-value, high-volume payments, should be subjected to proportional risk based approaches to make it cost-effective and affordable for the end user.

**Leverage data science and technology.** Use of predictive analysis techniques and deep learning methods to flag suspicious transactions can ease the burden of manually complying to onerous CDD, AML and CFT norms.

**Best Practices**

**Adopt existing, shared infrastructure and rules:** Southern African Development Community (SADC) Payments Project is a collective of 15 Member States in the Southern African region. SADC Payments Projects is an effort to create an interoperable system for retail payments, such as remittances and leveraging existing, shared infrastructure that could drastically reduce the transaction cost of sending cross-border remittances in the SADC region. A formal governance model oversees the project. The overall agenda for the Payments Project is defined by central banks and implemented by private sector players. The SADC Banking Association works with member countries to realize the agenda of the Payments Project.

**Use open, international standards:** Single Euro Payments Area (SEPA) is a payments integration initiative that has developed a common set of standards, protocols, operating procedures, financial instruments, and infrastructure to simplify and improve efficiency of cross-border payments denominated in Euro. SEPA allows users to make digital payments to anyone located anywhere in the region, using a single bank account and a single set of payment instruments. As of July 2015, SEPA consists of 32 member countries.
Section 2

Implementing the Platform

A. Design Choices
To optimize usability, safety, and low cost
01. Core Components
02. Forming the Scheme
03. Achieving Interoperability
04. Interconnected Systems
05. Payments Addressing
06. Inter-DFSP Settlement

B. Scaling the Platform
To create an inclusive digital ecosystem
01. Enabling Multiple Use Cases
02. Merchant Acceptance
03. Implementing Shared Services
04. Regional Payments Systems
05. Cross-Border Payments

C. Challenges
Balancing the needs of a diverse population of stakeholders
01. DFSP Business Model
02. Agent Liquidity Management
03. Telecommunications Network Availability and Quality
04. Transaction Irrevocability
Why is it Difficult?

Some of the key reasons why DFSPs struggle to breakeven are listed below. DFSPs need to focus explicitly on these issues to ensure profitability.

Account dormancy. All countries, to various degrees, have the problem of inactive accounts. That is, accounts that are either never used or seldom used. Inactive accounts not only subvert the purpose of financial inclusion, but also undermine a DFSP’s ability to generate revenue. They still incur a cost to maintain these dormant accounts.

Low account balances. Financial service providers generally make money on account balances through financial intermediation. However, the impoverished typically have low account balances, which limits bank DFSPs’ ability to make money on account-balance-driven adjacencies. In addition, a large number of transactions from these accounts are low value, and the typical percent-of-value fee schedules result in relatively low revenue.

Usefulness of the product. An important reason why customers don’t use their account or keep a low balance is because they don’t find the product very useful. Once consumers have funds in their account, what can they do with these funds? Is there ubiquitous access, meaning a person can pay anyone, or is the ability to pay limited to users of the same service, or by some other constraint? Is the money “spendable?” Can customers with funds in their account use these funds to purchases goods and services? Is the service available 24/7?

Overreliance on cash-out, fee-based revenue. DFSPs business models are often over reliant on cash-out, fee-based revenue, as typically, DFSPs make cash-ins free for customers. In addition, as competition to recruit more agents becomes intense, DFSPs are motivated to increase the cash-out fees so that they can offer attractive CICO commissions to agents. However, this is unsustainable. Not only does this make it expensive for customers, but cash-out fees also undermine the incentive for DFSPs to encourage digital liquidity.
Unwillingness to collaborate and share costs. DFSPs serving low-income customers have historically been more interested in building “walled gardens” to keep their customers within their ecosystem, by not letting them use services from competitors or make payments to customers of other providers. As a result, they are hesitant to collaborate and share costs, and their services become less useful to their customers.

Regulatory burden. In most DFS markets, regulators don’t differentiate between financial services serving the rich and the poor. They mandate a similar level of regulatory compliance for all types of accounts and transactions. However, the costs involved in doing so for DFS accounts and small-value transactions are prohibitive.

Geographic, demographic and infrastructural friction. Due to distance and lack of proper supporting infrastructures, such as road, telecommunication, banking network, and law and order, the operating cost involved in serving poor people living in rural and frontier markets can be very high.

A Level One Perspective

Make digital financial services better than cash. Level One believes that any form of payment that is trying to replace cash must be at least as good as cash, if not better. Digital financial services (DFS) must strive to replicate some of the positive attributes of cash. The need to create a compelling value proposition sufficient enough to overcome the perceived benefits of cash, including

Best Practices

Transaction interoperability: Many countries are pursuing market-wide interoperability schemes. In Peru, the scheme was called for by regulators and enacted by bank and non-bank DFSPs working together.

Agent interoperability: In India, regulation mandates that banks allow customers of other banks to use their agents for cash-in and cash-out. Rules in the value-transfer network (IMPS) require the consumer’s bank to pay interchange to the bank providing the service. The use of a biometric reader at the agent manages the issue of authentication of a consumer using another bank’s agent.

Multiple use case capability: Many mobile payments schemes start with the P2P use case and add other use cases later. In Jordan, the fledgling JoMoPay service tackled all of the major use cases (e.g., P2P, bulk payments, merchant payments, bill payments) simultaneously.

Leverage technology: Masterpass QR is a Quick Response (QR) code-based payment solution from Mastercard that allows customers to pay for goods and services from their smartphone by scanning a merchant’s unique QR code. Both the merchant and the consumer get instant notification of the payment transaction. The service allows merchants to accept electronic payment without having to install a POS terminal. As of February 2017, Masterpass QR is live in seven markets in Middle East and Africa.

Optimize fixed costs by realizing economies of scale: In India, most of the G2P payments that include social security payments and subsidies are processed digitally through one of the payment systems operated by the National Payments Corporation of India (NPCI), which operates key retail payments systems in India. In the fiscal year 2015-16, NPCI processed 715,921,601 G2P transactions worth US$ 2.82 billion.

Make money off of adjacencies: In Kenya, M-Pesa collaborated with Commercial Bank of Africa (CBA) to offer M-Shwari, a short-term loan product that allows customers to borrow against their savings. M-Shwari also looks into a customer’s financial history with M-Pesa to modify the loan terms and borrowing limits.
cost. It is important to note that the value proposition varies by use case. **Make the product useful.** There needs to be an explicit focus on making digital financial services relevant and useful for customers. There are two fundamentals ways by which DFS can be made more useful:

**A. Transaction interoperability,** as defined within Level One as an “Interoperability Service for Transfers” is a necessary ingredient for ubiquity of reach in most markets. Agent interoperability can greatly expand the consumer’s conversion capability.

**B. Multiple-use-case capabilities,** such as receipts (e.g., government payments, salaries, inbound transfers) and disbursements (e.g., in-person and remote purchasing, bill payment, outbound transfers) should be available on the same payment platform. Each use case may need separate enabling programs, provided either by DFSPs or third-party aggregators or facilitators, but the core transfer of value should be on a common platform. Merchant payments are key to making electronic money “spendable.” More importantly, enabling multiple use cases helps achieve economies of scale and amortize fixed costs over a greater number of transactions.

**[add paragraph make sure consumer value proposition is superior to current cash based usage... in terms of cost and service features. Note this is use case specific.]

**Make the product usable.** DFSPs should design products that take cross-cultural factors and local contexts into account. For instance, making the service available in vernacular languages and offering Interactive Voice Response (IVR) as an optional interface for illiterate customers are worth considering for some clientele. Furthermore, DFSPs should provide delivery channels that appeal to the needs of female customers. Countries should consider whether a common user interface across providers is helpful in spurring active use of all accounts. Similarly, a common service brand—used in conjunction with provider-specific brands—may help to clarify service solutions.

**Leverage technology.** Focusing on technological innovation to drive costs down provides another opportunity to increase business model viability. For instance, using QR codes to accept payments eliminates the need to deploy expensive POS terminals. Furthermore, leveraging eKYC and remote validation of business documents can streamline the process and bring down agent sign-up costs. Lastly, to reduce the cost of compliance, regulators should encourage DFSPs to use predictive analysis techniques and deep learning methods to flag suspicious transactions.

**Leverage partnership.** Low-income people actively using DFS could benefit from a wide range of private and public sector players, which includes governments, Fast Moving Consumer Goods (FMCG) companies, eCommerce companies, among others. Therefore, opening up the financial services value chain for participation by interested non-traditional players could lead to synergies and cost sharing.

**Make money from adjacencies.** To make financial services for the poor profitable, DFSPs will need to realize opportunities with adjacencies, both financial and non-financial. Such adjacencies include selling airtime, offering payment services as an enabler of commerce, and collaborating with mainstream financial institutions to offer credit and other financial services. Another important adjacency is transaction data, which is valuable for credit rating agencies and FMCG companies, among others. As DFSPs innovate and the ecosystem evolves, new adjacencies may be recognized and leveraged, further driving sustainability.
Agents play a critical role in enabling a digital financial services ecosystem. In addition to assisting customers to set up their DFS accounts, agents act as the “last-mile bridge” to convert cash to digital money and vice versa. Said differently, agents help customers to cash-in to and cash-out of their DFS accounts.

When agents perform unequal amounts of cash-in and cash-out transactions, they either have less digital money in their account and more cash in their drawer (more cash-ins) or vice versa (more cash-outs). Beyond a point when agents run out of digital money or physical cash, they need to rebalance one with the other in order to continue facilitating transactions on behalf of their customers. This process is called Agent Liquidity Management.

Considerations
In most DFS markets, customers are heavily reliant on cash—and cash-out services—for making their everyday transactions as digital money is not widely accepted yet. Liquidity Management is a necessary activity so that agents have ample cash/digital money to continue serving their customers. DFSPs are also dependent on customers cashing out as their business models are often based on cash-out-fee revenue. Managing liquidity is a time consuming and expensive process as it involves physically carrying cash around.

The most common types of Liquidity Management processes are described below. It is important to note that all three models incur high operating cost either to the agent (model 1) or DFSP (models 2 and 3). Each involves making frequent trips and and carrying cash around exposes them to risk of theft. Therefore, the ultimate solution to the Liquidity Management challenge lies in reducing the churn rate of customers exchanging digital money to cash.

1. Agents manage liquidity on their own: In this model, agents entirely manage the process of rebalancing on their own with only remote (call-center-based) assistance from the DFSP(s). The agent deposits cash into the DFSP’s bank account, and in turn, the DFSP will credit the agent’s digital money account, or the agent will transfer digital money to the DFSP’s digital money account, and the DFSP will credit the agent’s bank account from which the agent can withdraw cash. In this model, the agent is expected to make trips to the bank branch on their own.

2. DFSP’s sales team visits agents on a fixed schedule based on a fixed route plan: In this model, the DFSP’s sales team will visit all agents in a neighborhood to pick up or deliver cash on a fixed schedule based on a fixed route. Agents need
to manage their liquidity accordingly so that they can continue business until the sales team arrives.

3. **DFSP has a mobile sales force:** In this model, the DFSP has a mobile sales force and agents can request doorstep collection and delivery of cash at anytime during working hours.

In many cases, DFSPs make use of super agents who are responsible for managing a network of agents. The super agents help in liquidity management, in addition to providing other support services to agents. DFSP can also leverage existing retail chains and wholesale distribution networks in a country or region for managing liquidity. The retailers who also act as agents can use some or all of the excess cash or digital money for their business needs, such as replenishing stock, which reduces the frequency of rebalancing.

**A Level One Perspective**

Level One aims for a digital money ecosystem where customers eventually do not have to exchange the digital value for cash. In other words, if customers operate in a highly digitized ecosystem, they can keep money in digital form instead of having to cash-out frequently. While agents today provide cash-in and cash-out services, this role will change—or disappear—as progress is made towards digital liquidity. This will alleviate liquidity management issues; hopefully, agents will find other value-added services to provide their customers. A longer-term approach to solving Liquidity Management issues focuses on increasing digital liquidity. These efforts could include tapping inflow of funds, such as digital payment of salaries, wages, and agricultural and allied produce procurement. In addition, a critical mass of merchants in the ecosystem should be willing to accept digital money so customers don’t have to withdraw cash from their accounts to pay for their purchases. However, it is important to note that DFSPs reliance on cash-out fee revenue undermines their incentive to encourage digital liquidity. Therefore, it is an unattractive top-line item.

Until digital liquidity is achieved, liquidity management will remain a problem. Level One believes that this can be managed, to some extent, by making agents interoperable (by allowing agents to access the scheme). If agents are interoperable, the burden of liquidity management is distributed across the market. For instance, if agents who belong to DFSP1 runs out of eMoney, they can ask their neighbor who is an agent of DFSP 2 for eMoney who may be willing to accommodate the request. Note there are other benefits to agent interoperability, particularly in giving consumers access to a wider range of service points.

**What is Happening on the Ground?**

**Agents manage liquidity with some support:** In Kenya, M-Pesa agents are responsible for managing liquidity on their own, although some super agents and agent network managers offer support by having special queues for M-Pesa agents at bank branches.

**DFSP has a mobile sales force:** FINO in India has a mobile sales force that visits agents whenever they need cash delivered or picked up. However, it is important to note that DFSPs’ reliance on cash-out fee revenue undermines their incentive to encourage digital liquidity. Therefore, making it an unattractive top-line item.
Availability and quality of the telecommunications network are fundamental to digital financial services. Sometimes the reason for unavailability and sub-standard telecommunications networks is simply a lack of adequate infrastructure in developing countries, particularly moving further away from urban areas. Also, it is not uncommon to find non-MNO DFSPs suffering from access issues and network quality issues caused by competition.

In either scenario, it is unviable to deliver or scale digital financial services with real-time capabilities without a reliable telecommunications network. Delivering DFS over a poor network can result in “timeout” issues, and cause transactions to fail, which will negatively affect usability, reliability, and consumer and agent confidence.

Why is it difficult?
A reliable telecommunications network is a basic prerequisite to expand digital financial services. Ironically, it is often the rural and frontier markets—where digital financial services are most needed—that suffer the most from poor telecommunications network availability and quality where digital financial services are most needed. MNOs do not install sufficient cell towers in areas where there is no critical mass of customers, which leads to patchy and unreliable network connectivity.

The other reason for lack of availability and quality of the DFSPs’ telecommunications network is related to competition. More often than not, digital financial services are provided either by an MNO or its subsidiary. Therefore, MNOs that have its own DFS offering have a vested interested in undercutting the competition by not providing easy access or quality services to non-MNO DFSPs who are reliant on the MNOs’ network to deliver digital financial services. As suggested in an International Telecommunications Union (ITU) publication, an MNO can restrict access to it network or reduce quality by:

- Not granting access to USD gateway or SIM tool kit (STK) gateways
- Not offering USSD short codes or SMS short codes
**Challenges | 03: Telecommunications Network Availability and Quality**

- Restricting length of USSD session and number of stages in USSD menu trees
- Charging prohibitive pricing for using USSD, SMS, or STK services
- Deliberately deteriorating the quality of service

Conducting offline transactions to overcome network quality issues is a possibility. However, offline transactions can expose digital financial services to various types of risks, such as invalid account, or lack of funds in the account resulting in expired or declined transactions and chargebacks. Therefore, until smartphone and internet access become widely available, DFSPs’ reliance on telecommunications services will continue and telecommunications network availability and quality will play a critical role in enabling or limiting digital financial services.

**A Level One Perspective**

A “base” level of telecommunications infrastructure is necessary for the growth of digital financial services. In segments of the market where private sector players—such as MNOs—find it unviable to develop the telecommunications infrastructure, public-private partnerships can be a useful format to explore.

Financial, telecommunications and competition regulatory authorities should set a level playing field for all by ensuring open and equal access to telecommunications network for all DFSPs. This would include prohibiting unfair means of undercutting competition (e.g., restricting access, reducing service quality, charging prohibitive prices). With growing access to smartphones and internet connectivity among low-income communities, DFSPs should experiment with other bearer channels, such as Near Sound Data Transfer (NSDT), Java applets, Wireless Application Protocol (WAP) based access, or Over The Top (OTT) smartphone apps to gradually reduce their reliance on telecommunications assets for delivery of DFS.

At a system level, the operating rules should prescribe minimum standards for the system and its interdependent parts, including the coverage of mobile network and the availability of the payments system. As the number of participants—and their usage volume—grows, platform availability should remain high and be able to handle peak volumes without an interruption in service. This is critical to achieve system usability, reliability, and consumer confidence.

**Best Practices**

Different countries follow different approaches to ensure equal and fair access to telecommunications network and quality.

According to an ITU publication by Leon J. Perlman:

- **India** not only mandates USSD access to all DFSPs but has also capped the tariff on USSD sessions.
- In **Peru**, the telecommunications and financial regulators have jointly issued regulations that ensures fair and equal access to USSD services and restricts MNOs from charging DFSPs discriminatory prices for USSD services.
- **Colombia** also mandated fair and equal access to USSD services and the Colombian telecommunications regulator stated that it will review issues related to quality and pricing on a case-to-case basis.

On the other hand, GSMA points out that in countries, such as **Cambodia**, **South Africa** and **Tanzania**, MNOs have opened their USSD services to non-MNO DFSPs in a non-discriminatory fashion without any regulatory intervention.

**Equity Bank in Kenya** presents an interesting case of telecommunications network availability and quality, and its implications for DFS. Ignacio Mas and John Staley in their CGAP blog say that after prolonged dissatisfaction with telecommunications services, Equity Bank (reluctantly) became a Mobile Virtual Network Operator just so that it does not have to be dependent on other MNOs, who have their own DFS, to deliver its own DFS.
Transaction Irrevocability

One of the design principles of Level One is transaction irrevocability. This means that once money has been sent from one party to the other, the sending party can’t change their mind and take the money back – without the consent of the receiving party. This leads us to the question of consumer protection; particularly when low-income consumers are susceptible to making errors in addressing payments and entering amounts. How can transaction irrevocability be achieved without undermining consumer protection principles?

One challenging issue is the management of claimed consumer errors. Should a consumer who claims to have made an error in sending money (e.g., incorrect recipient, wrong amount) be allowed to reverse that transaction? If so, does that mean that money received in an account can be withdrawn without the account holder’s permission?

Why This is Difficult
Evidence from many early mobile money programs shows that consumers make errors—lots of them—in addressing payments and entering amounts. It seems logical to allow a customer who has made a mistake to reverse a transaction. However, experience with payments systems in the developed world indicate that false claims of error—a type of fraud—are expected as a system grows. How should these two forces be balanced?

One objective of the Level One System is to eventually achieve “digital liquidity:” a state wherein customers no longer cash-out when they receive funds electronically. If funds can be withdrawn without their consent, will they trust the system and leave funds in their mobile wallet?

A Level One Perspective
A design principle of Level One is that payments are irrevocable. In other words, no one can take money out of your account without your permission. Allowing a consumer to reverse a transaction violates this principle and reduces trust in the system. A recipient of funds would have a powerful motivation to “cash out” if she believed that the money could be taken away without her consent.

Several programs are implementing a validation message protocol: The consumer enters the payment address and amount; the message goes to the receiving DFSP who returns a validation message: “do you really mean to send [this amount] to [this person (or alias)]?”

If the customer says “yes” the payment is then irrevocable.

Note: A weaker form of this would provide the validation message from the consumer’s own (sending) institution.
Challenges | 04: Transaction Irrevocability

**Why This is Important**

The long term goal of Level One is to reduce dependency on the use of cash. If the recipient cannot rely on funds received, they will be incented to “cash out” as soon as possible. Transaction irrevocability makes the transfer more like cash, and will lead, over time, to greater trust in the system.

**Example: A Message Flow for a Validated, Irrevocable Payment Transaction**

1. Consumer sends an order to pay to their DFSP, using a mobile number as an address.
2. Their DFSP sends it to the L1P System.
3. The system routes it to the DFSP associated with that mobile number.
4. The receiving DFSP confirms back to the system that the transaction account is ready to receive money, and returns the name associated with that account.
5. The system passes the message to the sending DFSP.
6. The sending DFSP returns a message to the consumer, asking “do you want to send [amount] to [name]?”
7. If the consumer responds with a “yes,” the transaction is executed and considered irrevocable.

**Best Practices**

**Paym, U.K.:** Paym lets users send and receive money using mobile numbers as the payments address. Users need to register their mobile number through their banks’ mobile banking app. To send money, senders enter the mobile number of the recipient. Before the money is sent, a message goes to the receiving bank; the receiving bank returns the name of the receiver; this name, along with the amount, is shown to the sender for final validation before the transaction is executed. This process helps to avoid senders from sending money to wrong recipients.
Section 3

Progress Around the World

Contents

Introduction
Countries and Schemes
• Peru’s BIM
• Egypt’s Inter-Bank Mobile Payment System
• India’s Suite of Payment Schemes Operated by National Payments Corporation of India (NPCI)
• Jordan’s JoMoPay
• U.K.’s Faster Payments
• Mexico’s SPEI
• Tanzania’s eMoney Interoperability
Progress Around the World

Payment schemes operate in every country around the world. Both developed and developing economies have legacy and/or new schemes that respond to a different set of challenges, support different use cases (e.g., personal, business, government transactions) and align with the Level One Project principles to varying degrees. All provide a rich set of lessons essential for the development of an inclusive digital financial services system.

In this section, we outline seven schemes, describe what is notable about the scheme, discuss in what ways it is aligned with the Level One Project principles and explain key challenges the scheme is currently facing.
Peru’s BIM

Description of Scheme

BIM ("Billetera Móvil") is a national initiative in Peru that encourages the use of mobile payments to accelerate financial inclusion. The genesis of BIM was a law passed in 2013 which enabled the issuance of eMoney by both banks and licensed non-banks, and called for an interoperable payment system for the exchange of transactions. The goal was to quickly increase the percentage of Peruvians with formal financial accounts.

The major banks in Peru formed an association and later a company, now called “Pagos Digitales Peruanos” (PDP) which worked to define and launch the newly branded BIM payment scheme.

Banks and non-banks can issue eMoney and participate in PDP. Banks are required to open separate “wallet” accounts, although these may be linked to bank accounts.

Representatives from banks and participating non-banks worked within PDP to establish operating rules, set system policies, select and implement the technical platform, and develop the common BIM brand.

The service went live in February 2016, with strong government support. The leading use case is airtime top-up, but PDP and the banks have done extensive planning of other use cases, including P2P transfers, government benefit payments, school payments, and merchant payments.

What’s Notable

The Platform: Because all of the DFSPs participating in BIM needed to acquire new wallet-hosting capabilities, the scheme decided to pick one technical provider to host not only the interoperable switch, but also the wallets themselves. Ericsson was selected as the vendor. Though technically, a DFSP using a different wallet provider could still connect to the interoperability switch, but none at this time are doing so. From this perspective, the platform operates like a closed loop system, transferring value from one wallet holder to another. There are several notable effects of this platform decision. The platform sees all transactions, not just “off us” transactions. And the platform supports a common wallet user interface.

Common USSD User Interface: BIM presents the same user interface to a consumer using a feature phone. The hope is that this common interface will aid in consumer adoption and eventually help drive use of the system. The common interface also is used for an exceptionally easy-to-use account opening process. Consumers can self-enroll in BIM, on their feature phone, using only their national ID numbers and a few other pieces of data that the national ID system can verify online.

Approach to agents: Peru had a well-developed ecosystem of bank agents prior to the introduction of BIM. The scheme used these existing agents and brought new agents on board. Moreover, the scheme participants decided to require, through Operating Rules of the scheme, that a consumer could access any DFSP provider’s agent on the system. The scheme specified interchange among the DFSPs to compensate a DFSP’s agent who is servicing another DFSP’s agent. Finally, BIM also created a category of users called ‘BIMers’, to serve as promoters and supporters of the system.

Fees: Because BIM operates on a cost recovery basis, BIM users are only charged a minimal fee upon cashing out. All other transactions are free to the end users.

Challenges

The business case issue is classic, and shared with many other digital financial services systems—the DFSPs are reluctant to promote a service with essentially no material … for performing this service. This business case issue is classic, and shared with many other financial services systems. PDP has a number of initiatives underway to further help alleviate this issue, including implementing an interoperable agent fee captured by the bank that supports the BIM agent.

Another challenge is the availability of agents. Currently there are only
10,000 BIM access points. BIM agents, previously required to open a separate BIM wallet, had difficulty in both learning and supporting the requirements of a new system. However, PDP recognized this hurdle and the requirement has since been lifted. To further increase access points, PDP is working to make the ATM network available for cash-out transactions later this month. Finally, as with most digital financial services programs, BIM suffers from the “usability” problem. This is likely the result of focusing primarily on airtime top-up as a first use case, followed by a host of others. However, until these use cases become available, if consumers cannot spend their eMoney, they are forced to cash-out, limiting ongoing use and the possibility of reaching “digital liquidity.”

### By the Numbers

<table>
<thead>
<tr>
<th>By the Numbers</th>
<th>24</th>
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<td>Number of Consumer Accounts Reached</td>
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<td>Business Cases Supported</td>
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<tr>
<td>Airtime Top-Up P2P</td>
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</table>

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SECTION 3: PROGRESS AROUND THE WORLD

A NEW MEANS OF PAYMENT, TO DO THE SAME, DIFFERENTLY.
Egypt’s Inter-Bank Mobile Payment System

Description of Scheme

With intent to bring financial services across the Egyptian population, the Egyptian Banks Company (EBC), a bank-owned consortium, collaborated with the Central Bank of Egypt to implement a real-time, credit-push, open-loop digital financial services system. The EBC hired Mastercard to operate the inter-bank mobile payments system. The system allows both banks and non-banks to present as e-money issuers and in both instances, users are required to open a wallet account to access the inter-bank system. Currently there are eight wallet providers.

The system enables multiple use cases including P2P, merchant payments, bill payments, airtime top-up, and bulk payments. Most recently, the system is working to allow for inbound remittances. In parallel, the Central Bank of Egypt (CBE) continues its focus on increasing the number of transaction accounts and increasing financial inclusion. As part of this effort, in 2016, the CBE released a “second round” of mobile money regulations.

What’s Notable

Role of Egyptian Government:
The CBE continues to play a proactive role, working to enable use cases—such as international money transfers—through the release of new digital financial regulations that aim to account for market circumstances and players. Moreover, the Egyptian government recently signed a partnership with Mastercard to link National IDs to virtual accounts in order to enable government disbursements through the scheme.

Relatively Low Fees: As of 2016, DFSPs were offering most services for zero or low cost, including account registration, P2P transfer, cash-in, cash-out, airtime top-off, bill pay, and P2B.

Role of Mastercard: Mastercard is the scheme operator, but also supplies APIs that the DFSPs use to connect consumers to the switch.

Challenges

Uptake and usage continue to serve as a challenge for the scheme. With a population of over 91 million, of whom, approximately 15% are considered financially included, there are still only six million DFS accounts. The opportunity for scale exists, but usage and uptake of the scheme must grow.

A significant contributor to account usage is account access, in particular, merchant account access and enablement. To help mitigate this, Mastercard is looking to start a QR code initiative, which has proven successful in other countries such as India and China.

The number of agents also remains an issue. The current number does not meet popular demand. As a result, actions requiring the support of an agent—primarily CICO transactions—have limited availability, likely impacting user perception and scheme usage.

By the Numbers

<table>
<thead>
<tr>
<th></th>
<th>8+</th>
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<tr>
<td>Participating</td>
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<tr>
<td>DFSPs</td>
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<tr>
<td>Number of</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Consumer Accounts Reached</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Business Cases Supported</td>
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</tr>
<tr>
<td>No. of Agents or Other Access Points Connected</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
SECTION 3: PROGRESS AROUND THE WORLD

With FLOUS Service from Etisalat

Transfer money from your mobile to any other Etisalat mobile and withdraw cash instantly

This service is brought to you in association with

[Image of logos]
## India’s Suite of Payment Schemes Operated by National Payments Corporation of India (NPCI)

<table>
<thead>
<tr>
<th>Level One Alignment</th>
<th>Real-Time, Push Payments</th>
<th>Open-Loop System</th>
<th>Scheme Governance by Participants</th>
<th>Scheme Operations on a Cost-Recovery Basis</th>
<th>Shared Investment in Fraud Capabilities</th>
<th>A Common Brand</th>
</tr>
</thead>
</table>

### Description of Scheme

The National Payments Corporation of India (NPCI) is a non-profit, bank-owned consortium for all India retail payments systems. It aims to provide all citizens access to e-payment services and serves as the lead for India’s national suite of payments infrastructure programs.

NPCI was driven by—and still experiences strong support from—the Reserve Bank of India (RBI), where financial inclusion continues to be one of the primary focus areas. RBI plays a critical role in regulating and promoting the schemes and infrastructures of NPCI. The government of India plays a supportive role as well, for example, through its Jan Dhan program, “a National Mission on Financial Inclusion encompassing an integrated approach to bring about comprehensive financial inclusion of all the households in the country.”

NPCI operates a suite of payment schemes whose infrastructure programs interconnect and, most notably, include (1) Immediate Payments Service (IMPS), a real-time, credit-push, open-loop P2P payments system that connects all banks and wallet providers; and (2) Unified Payments Interface (UPI), which is built on IMPS, leveraging standard APIs, and provides enhanced features like virtual payments addressing, and request to pay messages.

### What’s Notable

**Technology:** The India stack facilitates digitizing transactions through a set of centralized services including (1) Aadhaar Authentication layer, which allows verification of identity through biometric authentication; (2) a paperless layer storage layer, including eKYC and Digilocker, that allows for remote sharing of documents; (3) a suite of digital payment services that enable interoperability which also includes payments addressing. These services promote a thriving ecosystem, supporting straightforward customer onboarding and KYC, enabling multiple use cases and promoting access.

**Interoperability of Agents:** Agents are fully interoperable. This feature is supported by a number of factors, including microATM devices that support biometric authentication across DFSPs (once registered) and interchange agreements across DFSPs that make it financially viable for the agent of one DFSP to serve the customer of another.

**Interoperability of DFSPs:** The scheme is interoperable across DFSPs, a key Level One principle. As services and use cases are enabled centrally through NPCI, it promotes ease of access and onboarding for new entrants. Moreover, NPCIs recent service—the Bharat QR code—promotes interoperable merchant acceptance through the collaboration of key competing brands, including Visa, Mastercard, American Express, and RuPay. Additionally, agents are interoperable across the network.

**Role of India Government:** The India government has a strong financial inclusion strategy and continues to vigorously promote digitization through regulation. For example, its recent push to demonetize led to an increase in the use of digital financial services, as intended. Though, surprisingly, instead of NPCI suit of services, Paytm, a private DFS company, captured most of the volume from this opportunity. Moreover, it recently mandated mandated that employees earning at least minimum wage receive their wages from their employers via a bank account. Finally, it is a user of the system, making all G2P payments digitally.

**Role of Payments Banks:** Legacy payments systems usually allow only banks to directly participate in the system. However, non-banks are also
allowed access with bank sponsorship. RBI introduced a new class of providers offering deposit accounts — payments banks — and currently there are 11 licenses. This promotes competition and innovation, increases access, and likely drives down the cost of services to consumers and businesses, a core enabler of financial inclusion.

**Single Financial System for All: The “in-principle” license for payments banks allows for new players to provide transaction accounts, which the Reserve Bank of India regulates. This promotes a single system for all, as opposed to a two-tiered financial system in which non-banks conduct transactions and a separate, traditional banking system.**

**Challenges**

**Merchant Adoption:** It remains unclear if DFSPs are committed to getting schemes and services out to merchants. Moreover, the role of taxes and merchants continues to limit merchant adoption. However, Goods & Services Tax (GST) — a new indirect tax system being proposed— could make it more attractive for merchants to formalize and accept digital payments. Finally, like many systems, merchants still experience relatively high up-front costs to accept digital payments which can be a barrier to entry. However, the government is working to combat this. For example, the introduction of the Bharat QR code brings down the upfront cost of signing up and having to invest in a device.

**Agent Networks:** There continues to be a shortage of cash-in, cash-out points, particularly in rural areas. The few agents who operate in rural areas face both liquidity management and business viability issues. Until digital liquidity is fully realized, this will continue to be problematic, particularly for low-income populations.

**Business Case for Payments Banks:** Unfortunately, the business model for the payments banks in India is still forthcoming. As a result, few of the 11 licensed payments banks are currently operational. However, there is likely a strong opportunity for these licensed providers in adjacencies to payments rather than the transactions themselves.
Description of Scheme

In 2011, the Central Bank and National Payments Council of Jordan led an effort to develop JoMoPay, a national real-time, open-loop, credit-push payments system based on three key strategic pillars: (1) developing comprehensive national retail payments strategy and financial inclusion; (2) modernizing comprehensive legal framework, raising the bar, and driving efficiencies and; (3) fair and open access to payments systems according to disclosed criteria for participation.

In 2014, JoMoPay conducted a pilot which was followed by a full-scale launch with four institutions in 2016 and the fifth in the middle of 2017. The JoMoPay switch was built by ProgressSoft, and while originally controlled by the Central Bank of Jordan, is now managed by a participant-owned consortium, JoPACC (Jordan Payments & Clearing Company).

The system supports multiple use cases and connects to other systems and processes for further enablement (e.g., ATM network, electronic bill presentment, payments switch).

What’s Notable

Role of Government: JoMoPay was developed and implemented by the Central Bank. This coordinating role helped ensure equal voice in the construct of the scheme.

Fees: The government subsidized switching fees as the scheme was taking off to promote DFSP onboarding and usage in the early years. Since then, DFSPs continue to offer low fees to end users.

Role of Non-Banks: To promote DFSPs as well as the development of the scheme, both banks and non-banks can facilitate account opening. Moreover, Jordan experienced an influx of refugees given recent crises, which accelerated the regulators’ recognition of the valuable role non-banks played in the scheme.

Use Cases: There has been an aggressive pursuit of multiple use cases, including many types of merchant and biller use cases. This includes leveraging either QR code or NFC sticker technology to enable P2P payments.

Approach to Fraud Management:
Risk management and fraud detection is managed at the hub. This reduces the need for duplicated investment at edge (by DFSPs), allows for greater competition, and promotes new entrants to join the scheme.

Challenges

Traction: Like many other schemes, JoMoPay continues to face challenges related to usage and uptake, particularly by merchants who are hesitant to bear the fees that come with receiving funds digitally. Trust and familiarity with electronic payments also appears to be playing a role.

Agent Accessibility: Cashing out remains commonplace in Jordan; however, there are few places where customers are currently able to do so.

Account Opening and Onboarding: Although the Central Bank allows a tiered approach to KYC, users are still required to enroll and onboard in person at a JoMoPay agent. The Central Bank is working to implement eKYC in the coming months.

Cross-Border Transactions: Users are eager to use JoMoPay to facilitate cross-border transfers, though to do so, they are required to do a P2P transfer with an agent, who then facilitates the cross-border transaction. The Central Bank would like to digitize all aspects of the cross-border transfer eventually, as an additional use case.
### By the Numbers

**As of Summer 2017**

<table>
<thead>
<tr>
<th>Number of Participating DFSPs</th>
<th>Number of Consumer Accounts Reached</th>
<th>Recent Month Transaction Volume</th>
<th>Business Cases Supported</th>
<th>No. of Agents or Other Access Points Connected</th>
</tr>
</thead>
</table>
U.K.’s Faster Payments Service

Description of Scheme
The genesis of Faster Payments traces back to a recommendation made by a review commissioned by the U.K. treasury department to increase competition in the banking industry. Association for Payment Clearing Services (APACS) was originally made responsible for developing the Faster Payments Service, which later transferred the day-to-day operations and management of the service to CHAPS Clearing Company.
Faster Payments is a real-time credit push payment systems that enables interoperable sterling payments among participating financial institutions in the United Kingdom. Launched in 2008, Faster Payments Service (FPS) is operated by Faster Payments Scheme Limited (FPSL). Currently, 15 banks and building societies are direct members of the scheme, and over 400 other financial institutions are able to offer the service as an indirect member. Vocalink, which is a third-party service provider, supplies the Faster Payments Central Infrastructure (CI) for processing payment instructions.

What’s Notable
Ubiquitous: Faster Payments is emerging as a ubiquitous payment service that connects every financial institution in the United Kingdom. Every bank and building society in the U.K. is now able to send and receive Faster Payments, with more than 400 connecting indirectly to the service through a sponsoring institution.

Overlay Directory Service: Paym is an overlay directory services that allows a customer to send money P2P using the beneficiary’s mobile number. Paym uses Faster Payments for value transfer, although it is optional for members of Faster Payments to be a part of Paym.

Follows Best Practice in Settlement: Faster Payments follows best practices in settling payment obligations among participating DFSPs.

Multilateral net settlement with dynamic net position calculation: Faster Payments Service is a multilateral net settlement system. Dynamic position of all participants gets computed after every transaction.

Same-day settlement using central bank as the settlement bank: Settlement obligations are fulfilled intra-day. There are three inter-DFSP clearing cycles each working day, settling at 07:15, 13:00, and 15:45. Settlement happens in the accounts of direct members maintained in the Bank of England’s RTGS system.

Adequate risk management measures: Participating DFSPs are required to hold cash in a separate Reserves Collateralization Account (RCA) with the Bank of England that determines the Net Debit Cap (NDC). Transactions are not allowed that put a participant above its NDC. In addition, all participant banks are party to a liquidity and loss-sharing agreement (LLSA).

Sort Code Checker: Faster Payments offers a unique service through its website called Sort Code Checker. By entering a sort code—a six-digit code that identifies both the bank and the branch where the account is held—customers can verify whether an account held in a particular bank branch can send or receive Faster Payments. This feature helps customers avoid sending money to an account that can’t receive Faster Payments.

 SECTION 3: PROGRESS AROUND THE WORLD
Challenges

**Market Perception**: Like any payments system, the DFSPs that connect may experience downtimes or delays due to internal systems. However, sometimes customers attribute these delays to the system rather than to the DFSP, resulting in brand deterioration and market confusion about the system reliability.

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**By the Numbers**

<table>
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<th>Direct Members</th>
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<td>Indirect Members</td>
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<table>
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<th>Number of Participating DFSP’s</th>
<th>P2P, P2B, B2P, Bill Pay and Bulk Payments</th>
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<td>Business Cases Supported</td>
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As of Summer 2017
**Mexico’s SPEI**

**Description of Scheme**
Sistema de Pagos Electrónicos Interbancarios (SPEI) is a real-time, credit-push, open-loop system operated by the Central Bank, used for both commercial and retail transactions.

This system was developed to facilitate payments between financial institutions. Non-bank financial institutions are allowed to open accounts, but usage by non-bank institutions remains minimal. The system is designed to manage high volumes and facilitate real-time settlement and funds availability.

**What’s Notable**

**Tiered KYC:** SPEI pioneered the implementation of tiered KYC. DFSPs offer four levels of services, starting from low-balance pre-paid cards with no identification required, up to traditional bank accounts requiring full documentation and no limit on the account balance limit.

**Same System for Wholesale and Retail:** SPEI uniquely facilitates both wholesale and retail transactions, though current system growth is largely driven by retail transactions. When facilitated appropriately, this dual role avoids unnecessary duplication of infrastructures and investments.

**Approach to Settlement:** SPEIs approach to settlement is quite noteworthy. The Switch holds the transactions in a queue until the end of the (very short) Settlement Period.

Transactions are offset (i.e., netted) between participating DFSPs, and the resulting net positions are posted to the Settlement Account. If a DFSP does not have sufficient funds in the Settlement Account, the transaction is returned to the queue during the next Settlement Period. Pending transactions (i.e., unsettled) at the end of the operating hours (or end of day) are returned to the Payer DFSP. The Payee DFSP may get a payment “intention” message, but a payment confirmation message is sent for settled transactions only. Also, SPEI is one of the few schemes globally that allows non-bank DFSPs to participate in the settlement process directly without a sponsoring DFSP.

**Government Use of SPEI:** The Federal government processes its payroll through SPEI and will process all social security pension payments via SPEI.

**Low Fees:** SPEI charges DFSPs a maximum of 0.5 pesos (0.03 USD) per transaction in day shift and 0.1 pesos (0.01 USD) per transaction in the night shift. This encourages DFSPs to offer low fees to end users.

Additionally, the Central Bank requires that beneficiary customers are not charged and mandates that DFSPs cannot differentiate fees based on the transaction amount.

**Challenges**

**Usage by Non-Banks:** There is limited use of SPEI by non-banks. This may be driven by a number of factors, many of which we can only speculate. However, the Central Bank is working to attract non-bank users, including a current effort focused on remittance providers and payments service providers.

Notably, SPEI pre-dates Mexico’s formal financial inclusion strategy. The Central Bank has consistently pushed to make the real-time service attractive by helping keep fees affordable and extending access to the broader population through tiered KYC and an increase in SPEI service to 24 hours a day, seven days a week.
SECTION 3: PROGRESS AROUND THE WORLD

By the Numbers
As of Summer 2017

~100
Number of Participating DFSP’s

335M
Recent Month Transaction Volume

All electronic transactions between financial institutions

40.6k
Access Points Not Necessarily interoperable

No. of Agents or Other Access Points Connected
Tanzania’s eMoney Interoperability

Description of Scheme
Tanzanian regulators, recognizing the opportunity presented by digital financial services, adopted policies to allow “emoney issuance” and encouraged mobile network operators to establish DFS solutions. As a result, today, there are four primary digital financial services players in Tanzania (i.e., M-Pesa, Tigo Pesa, Airtel Money, Ezy Pesa). Three have reasonable market share, though M-Pesa dominates with just over 50% of active wallets.

Recently, with the help of the IFC and other multilateral organizations, the four primary providers established a private agreement to interoperate—made up of a series of bilateral commercial agreements to negotiate interchange to compensate parties for perceived imbalance in CICO revenues and expenses as well as an agreed operating model. Transaction volume rapidly increased following the agreement, as consumers became aware of the ability to pay consumers using other services.

The market remains largely limited to P2P, though attempts to expand are taking place.

What’s Notable
Role of Multilaterals: The IFC played a critical role in orchestrating the effort to interoperate. It brought together competing players who may have otherwise been unable to cooperate. Similarly, it served as the primary liaison to the Central Bank, ensuring regulatory agreement to the approach.

Regulatory Approach: The Bank of Tanzania (BoT) and the Tanzania Communications Regulatory Authority (TCRA) engaged with one another early to ensure proper regulation of the DFSPs, with both regulatory authorities signing a memorandum of understanding (MoU) in 2011.

Interoperability of Non-Bank DFSPs: Through bilateral commercial agreements and an agreed-upon operating model, the four major DFSPs now interoperate. As a result of this interoperability, Tanzania has experienced an increase in transaction volume.

Challenges
KYC: Currently, account opening in Tanzania is cumbersome. While tiered KYC exists, tier 1 still requires a level of documentation many do not have. Additionally, Tanzania recently aimed to issue a national ID program; however, the program is on hold pending corruption inquiries.

Bilateral Agreements: Leveraging bilateral commercial agreements allows for customization of party negotiations, but it does not allow new entrants to easily access the system (because there is no system) nor does it promote competition, both of which are long-term risks.

Bilateral Settlement: Bilateral settlement among participating DFSPs has several disadvantages. It is operationally cumbersome and liquidity inefficient, as each participant is required to replicate processes and liquidity requirements with each partner DFSP. Moreover, the settlement approach lacks transparency, which may cause end user and marketplace confusion.

Fee Structure: the current cost structure continues a reliance on CICO revenue, which hinders scale and digital liquidity.

Government Use: currently, the government does not leverage the agreements to distribute G2P payments.
### By the Numbers

**As of Summer 2017**

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<tr>
<td>No. of Agents or Other Access Points Connected</td>
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</table>

**SECTION 3: PROGRESS AROUND THE WORLD**
The Bill & Melinda Gates Foundation makes available a number of resources to help country implementations of Level One aligned systems. These resources are generally accessible on the leveloneproject.org website.

Contents
• Implementation Checklist
• References
• Business Focus
• Technical Focus
# Implementation Checklist

Regulators, system operators, and DFSPs will all be required to make choices that impact the design and implementation of a Level One System. As you do, we encourage you to keep the following checklist and considerations top of mind.

<table>
<thead>
<tr>
<th>Regulators</th>
<th>System Operators</th>
<th>DFSPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider mandating access to telecommunications network availability</td>
<td>Understand technical design implications</td>
<td>Understand business model options and implications</td>
</tr>
<tr>
<td>Support an open-loop, interoperable system</td>
<td>Create a technical build that allows for the creation and use of shared services at the hub (e.g., centralized directory, fraud management)</td>
<td>Consider agent interoperability to help manage agent liquidity issues</td>
</tr>
<tr>
<td>Support tiered KYC requirements</td>
<td>Build for scale</td>
<td>Consider supporting scheme shared services</td>
</tr>
<tr>
<td>Support the use of shared infrastructure and rules, when in place</td>
<td>Manage settlement according to best practices (e.g., dynamic calculation of multilateral net position, enforce a fully collateralized, net debit cap)</td>
<td>Understand implications of approaches to implementing interoperability</td>
</tr>
<tr>
<td>Consider developing a regional processing capability</td>
<td>Use open, international standards</td>
<td>Build value-added services to promote digital liquidity and merchant acceptance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use open, international standards</td>
</tr>
</tbody>
</table>

SECTION 4: Resources
## References

The Level One Project recognizes the outstanding work of many partners and would like to highlight a few bodies of work in particular.

| Center for Global Development | Financial Regulations for Improving Financial Access  
|-------------------------------|--------------------------------------------------------------------------------------------------|
| CGAP                          | Digital Finance Interoperability and Financial Inclusion  
| CPMI and The World Bank Group | Payment Aspects of Financial Inclusion  
| FSD Africa + Consult Hyperion | Blockchains, Distributed Ledgers and Funds Transfer: An Overview  
| GSMA                         | State of the Industry Report  
| ITU                          | A series of reports on Digital Financial Services and Financial Inclusion  
| McKinsey Global Institute    | How Digital Finance could Boost Growth in Emerging Economies  
| The Bill & Melinda Gates Foundation | Fighting Poverty Profitably  
| The Fletcher School           | Financial Inclusion in Refugee Economies  
http://fletcher.tufts.edu/CEME/~./media/CC882A166CB2476CA6C5DB62739FF5CC.ashx |
## Business Focus

### Documents

*All documents are available for download at leveloneproject.org*

<table>
<thead>
<tr>
<th>Document Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>L1P Reference Rules</td>
<td>A pro-forma set of rules for a newly created, participant-governed, Level One Scheme. These can be used as a starting point for rules creation.</td>
</tr>
<tr>
<td>L1P Fee Scenarios and Descriptions</td>
<td>A set of documents that describe of what types of fees may exist within a Level One platform, and how these may be implemented.</td>
</tr>
<tr>
<td>L1P Settlement Research</td>
<td>A research report on best practices in inter-DFSP settlement for a Level One System.</td>
</tr>
<tr>
<td>L1P QR Code Research</td>
<td>A research report on the use of QR codes for merchant payments in a Level One System.</td>
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<td>L1P Risk/Fraud Research</td>
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</table>

### Training

*Contact info@leveloneproject.org for more information*

<table>
<thead>
<tr>
<th>Training Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1P Boot Camp</td>
<td>A two-day program for country-wide groups—including various constituencies—considering implementation of a modern Level One system.</td>
</tr>
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The Financial Services for the Poor team at the Bill & Melinda Gates Foundation has created a detailed reference implementation of the Level One Project, called Mojaloop.

Elements of this code, and of the design documents and specifications related to it, may be of use to enterprises implementing such systems around the world.

**What is Mojaloop? Who is Mojaloop for?**

Mojaloop is open-source software for creating digital payments platforms that connect all customers, merchants, banks, and other financial providers in a country’s economy. The intention is for financial institutions and commercial providers to use the open-source software to help build digital, interoperable payments platforms that drive financial inclusion on a national scale. Specifically, the platforms will enable seamless, low-cost transactions between individual users, merchants, banks, providers, and even government offices—helping connect poor customers with everyone else in the digital economy.

**How does it work?**

Most digital financial providers run on their own networks, which prevents customers who use different services from transacting with each other. Mojaloop functions like a universal switchboard, routing payments securely between all customers, regardless of which network they’re on. It consists of three primary layers, each with a specific function: an interoperability layer, which connects bank accounts, mobile money wallets, and merchants in an open loop; a directory service layer, which navigates the different methods that providers use to identify accounts on each side of a transaction; a transactions settlement layer, which makes payments instant and irrevocable; and components which protect against fraud.

The Gates Foundation developed Mojaloop in collaboration with Ripple, Dwolla, ModusBox, Software Group, and Crosslake Technologies.

More information is available at [www.mojaloop.io](http://www.mojaloop.io)
The table below provides a more detailed view of the Level One System as used by the Mojaloop Reference Implementation.
## Technical Focus

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<th><strong>Documents</strong></th>
<th><strong>L1P API Documents</strong></th>
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<td><em>All documents are available for download at leveloneproject.org</em></td>
<td>A suite of documents describing standards and other parameters for APIs to access the Level One System. These are implemented with the Reference Application of the Level One System.</td>
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<tr>
<th><strong>L1P: Business Requirements</strong></th>
<th><strong>Mojalooop</strong></th>
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<tr>
<td>A series of documents with technical business requirements for components of the Level One System, including the IST, the Mobile Wallet, and Agent Management solutions.</td>
<td>Mojalooop is open-source software for financial services companies, government regulators, and others taking on the challenges of interoperability and financial inclusion.</td>
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### Additional Resources

**Software**

*More information on Mojalooop can be found at mojalooop.io. The code can be found on Git Hub*
Section 5

Glossary
Glossary (1 of 5)

**Adjacencies**: Ways in which businesses, banks, or other financial services providers realize revenue from services that are not directly associated with payments—for example, loans made to payments account holders.

**Account ID**: A unique identifier assigned by the DFSP that created the account.

**Addressing**: The use of necessary information (account number, phone number, etc.) for a paying user to direct payment to a receiving user.

**Agent**: An authorized person or entity that handles financial account opening and/or transactions on behalf of another entity. The other entity may be a bank, or in some countries, a non-bank provider of digital financial services. Cash-in, cash-out (CICO) is a common service provided by agents.

**Aggregator**: A specialized form of a merchant services or bill payment provider, who typically handles payments transactions for a large number of small merchants. Agent aggregators also exist. Aggregators may connect directly to a Level One Platform, through a relationship with a DFSP. Scheme rules will specify how aggregators may interact with the platform.

**Anti-Money Laundering (AML)**: Initiatives to detect and stop the practice of obtaining illegal funds through financial systems.

**Application Program Interface (API)**: A set of clearly defined methods of communication to allow interaction and sharing of data between different software programs.

**Authentication**: The mechanism whereby systems may securely identify their users. Authentication systems provide answers to the questions: “Who is the user?” “Are the user really who they represent themselves to be?” In payments systems, signatures and PINs are common methods of authentication.

**Authorization**: The permission given by the paying person or entity to make the payment. In a push payment, the paying person authorizes their bank or financial service provider to make a payment. In a pull payment (e.g., card payment), the paying person’s bank or financial service provider answers the payee’s question: “Is the payer authorized to make this payment?” Note that authorization means a good funds guaranty in some systems (e.g., card systems), but not in others (e.g., direct debits).

**Automated Clearing House (ACH)**: Electronic bank transfer systems that handle either or both credit push or debit pull (also called direct debit) payments. ACHs operate by requiring most banks in the country belong to the ACH, either directly or through intermediary banks. The ACH switch moves transactions from one bank to another, and either provides for, or interfaces with, a net settlement system.

**Bank Transfer System**: Open-loop payment systems used by banks in a country. Checking, ACH, wire transfer, and some card systems are all bank transfer systems. In some countries, these systems are being opened up

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**Level One Terminology**

**The Level One Project**: An initiative of the Bill & Melinda Gates Foundation, within the Financial Services for the Poor program.

**A Level One System**: A payment system that reflects the design principles of the Level One Project.

**A Level One Scheme**: An entity formed to control aspects of the use, governance, and participation in a given Level One system. The scheme provides operating rules which cover issues of governance, platform services, participation in the system, and the responsibilities of participants and users of the system.

**Level One Services**: The suite of services, defined by the scheme, which provide the core functions of the system (such as value transfer) as well as certain shared services decided upon by participants in the system.

**A Level One Platform**: A term used to describe a scheme and its services together.
Batch Processing: An approach through which transactions are held together in a batch and then processed at the same time. In financial services, transactions may be batched together and processed at different intervals (e.g., every few hours, end of the day). Batch processing contrasts to real-time processing.

Biometric Authentication: The use of a physical characteristic of a person (e.g., fingerprint, IRIS) to authenticate that person.

Blockchain: A protocol used with math-based currencies such as Bitcoin, a publicly available transaction ledger.

Bulk Payment: Making and receiving payments from a government to a consumer (e.g., benefits, cash transfers, salaries, pensions).

Cash-In, Cash-Out (CICO): Receiving eMoney credit in exchange for physical cash (CI) or receiving physical cash in exchange for a debit to an eMoney account (CO), typically done at an agent.

Clearing: The payments systems process in which the paying bank or financial services provider posts individual transactions to their customer accounts. Clearing may be done in batch or real time. This is often referred to in conjunction with settlement.

Clearing House: An organization formed to handle payments in an open-loop bank transfer system. A clearing house may handle transaction switching, or facilitate clearing and interbank settlement. The term is most typically used for check or ACH systems.

Closed Loop: A payment system with limited participation by banks or financial services providers. Most closed-loop systems have only one provider, who has a direct relationship with both the payer and the payee. Closed loop contrasts with open loop.

Combatting Terrorist Financing: Initiatives to detect and stop the use of financial systems to transfer funds to terrorist organizations or people.

Cost Utility Model: A business model often used in payments systems where the participants agree that the entity or entities providing central switching and settlement services operate on a cost recovery, rather than a for-profit, basis. Many checking, ACH, and some debit card networks operate on this basis.

Digital: Electronic communications between two parties that can occur on various devices (e.g., mobile, tablet, computer).

Direct Digital Financial Services Providers (DFSPs): A term used in this paper to describe a financial services provider that is a participant in the digital financial services system. DFS providers have relationships with consumers, merchants, and other enterprises, and provide digital financial services to these end parties. DFS providers operate their own digital financial services platforms.

Digital Liquidity: A practice of keeping value in digital form, rather than exchanging the digital value for cash.

Dispute Resolution: A process specified by a provider or by the rules of a payment scheme to resolve issues between end users and providers, or between an end user and its counter party.

Financial Action Task Force (FATF): The Financial Action Task Force is an intergovernmental organization to combat money laundering and to act on terrorism financing.

Fees: The payments assessed by a provider to their end user. This may either be a fixed fee, a percent-of-value fee, or a mixture. A Merchant Discount Fee is a fee charged by a Merchant Services Provider to a merchant for payments acceptance. Payments systems or schemes, as well as processors, also charge fees to their customer (typically the provider).

Fiat Currencies: Currencies issued by the central bank of a country.

Financial Inclusion: The sustainable provision of affordable digital financial services that bring the poor into the formal economy.

Financial Services Provider: An entity providing a financial account and transaction services to end parties.

Escrow: A means of holding funds for the benefit of another party. eMoney issuers are usually required by law to hold the value of end users’ eMoney accounts at a bank, typically in a trust account. This accomplishes the goals of funds isolation and safeguarding.

eMoney: A record of funds or value available to a consumer stored on a payment device such as chip, prepaid cards, mobile phones, or on computer systems as a non-traditional account with a banking or non-banking entity.
Glossary (3 of 5)

Encryption: The process of encoding a message so that it can be read only by the sender and the intended recipient.

End User: The customer of a digital financial services provider. The customer may be a consumer, a merchant, a government, or another form of enterprise.

Gross Settlement: The process used by high-value bank transfer systems to settle obligations among participants. Each transaction is debited or credited to an account, typically at the central bank of the country. Referred to as real-time gross settlement (RTGS). Gross settlement contrasts to net settlement.

Guarantee: A promise from a bank or non-bank that the liabilities of a debtor will be met.

Immediate Funds Transfer (IFT): A payment system in which the processing and clearing of transactions occurs in real time. IFT transactions are usually push transactions. Participant or interbank settlement may occur at the same time (as in an RTGS system) or later, on a net basis.

Indirect Providers: Users of a digital financial services system who are not direct participants in the system. Indirect providers access the system through relationships with direct participants. For example, an indirect provider will not connect directly to the IST, except as a partner of a participating DFS provider. Similarly, an indirect participant will not directly participate in system settlement and instead will rely on their DFS providers to handle a private financial settlement with them.

Interchange: The compensation practice in some open-loop payment systems. System rules require one bank in a transaction to compensate the other bank for handling the transaction.

Interoperability: The ability of an end user dealing with one bank or financial services provider to exchange a transaction with an end-user who is dealing with a different bank or financial services provider. Interoperability may be achieved either through participants all using the same system, or through inter-system networking agreements.

Irrevocable: A transaction that cannot be "called back" by the payer; an irrevocable payment, once received by a payee, cannot be taken back by the payer.

Know Your Customer (KYC): Regulatory requirements for banks or financial services providers to establish the identity of a customer or entity before opening a financial account.

Merchant: Generally used in the payments industry to describe receivers of funds, where payments are made for goods and services. Such recipients are a broad group, and include stores, service providers (often referred to as billers), not-for-profit enterprises, and governments.

Microfinance Institution (MFI): A microfinance institution is an organization that offers financial services to low income populations, including loans. Almost all give loans to their members, and many offer insurance, deposit and other services. MFIs are considered DFSRs in a Level One system if they provide transaction accounts to their customers. MFIs who are not DFSPs may connect directly to a Level One Platform, through a relationship with a DFSP. Scheme rules will specify how such MFIs may interact with the platform.

Mobile Money Services Provider: A category of financial services providers using mobile phones as the access method for end parties.

National Identity: A credential that identifies an end user. National identities are issued by national governments.

Near Field Communication: A communication technology used within payments to transmit payment data from an NFC-equipped mobile phone to a capable terminal.
Glossary (4 of 5)

**Net Settlement**: The process in an open-loop bank transfer system in which the obligations of one bank to another are fulfilled. A settlement process requires an entity (i.e., the settlement agent) to compute on an ongoing basis the net position of the participants in the system. At the end of the settlement period, the agent calculates the net position and advises participants of their need to fund, or ability to draw from, a settlement account held at a common institution.

**Non-Bank**: An entity that is not a chartered bank, but is providing financial services to end users. The requirements of non-banks to do this, and the limitations of what they can do, are specified by national law.

**Nostro Account**: From the payer’s perspective, payer DFSP funds/accounts are held or hosted at a payee DFSP.

**Not-for-Loss**: Not-for-loss refers to a cost-recovery model with an additional factor to cover investment requirement by the platform.

**Application Program Interface (API)**: An API that provides a developer with programmatic access to a software application or system. Open APIs are published (often on the internet) and typically shared freely.

**On-Us Payments**: Payments made in a multiple-participant system or scheme, where the payer’s provider is the same entity as the payee’s provider.

**Off-Us Payments**: Payments made in a multiple-participant system or scheme, where the payer’s provider is a different entity as the payee’s provider.

**Open Loop**: A payments network that is open to all participants in given categories—most typically, all banks in a country. Some country open-loop systems allow non-bank participants to belong directly to the system. Open loop contrasts with closed loop.

**Over-The-Counter Services (OTC)**: Services provided by agents when one end party does not have an eMoney account. The (remote) payer may pay the eMoney to the agent’s account, who then pays cash to the non-account holding payee.

**Participants**: Entities that join a payments scheme. Participants in a Level One scheme are referred to as DFSPs (digital financial services providers). DFSPs provide transaction accounts and other financial services to end-users. Participants are bound to follow scheme rules.

**Payments Service Provider (PSP)**: A term used in two ways: generally, as any company involved in the provision of payments services (including DFSPs); or for a provider that offers branded products or services to end users or merchants but does not offer transaction accounts. PSPs may connect directly to a Level One Platform, through a relationship with a DFSP. Scheme rules will specify how PSPs may interact with the platform.

**Processor**: An enterprise that manages, on an out-sourced basis, various functions for a digital financial services provider. These functions may include transaction management, customer database management, and risk management. Processors may also do functions on behalf of payments systems, schemes, or switches. Processors may connect directly to a Level One Platform, acting on behalf of a DFSP. Scheme rules will specify how processors may interact with the platform.

**Pull**: A type of payment transaction originated by the payee’s bank or financial service provider who requests payment from the payee through the system. ACH direct debits, checks, and card payments are all pull payments. Pull payments can bounce for insufficient funds unless a separate authorization transaction is done (e.g., cards).

**Push**: A type of payment transaction initiated by the paying person or entity’s bank or financial service provider who sends a message to the payee’s bank or financial service provider. This is sometimes called credit transactions.

**Real Time**: Processing of transactions as they are initiated, rather than processing in a batch.

**Reconciliation of Funds**: All digital funds received, regardless of the payer, should be deposited into the same transaction account.

**Recourse**: The rules in certain open-loop systems that allow one participant to have recourse to another in certain situations. For example, a “charge-back” in a card transaction.
**Remittances**: Payment from one consumer to another, either domestically or cross-border.

**Risk-based Approach**: A regulatory and/or business management approach that creates different levels of obligation based on the risk of the underlying transaction or customer.

**Secure Element**: A secure chip on a phone that can be used to store payment data.

**Settlement Service**: A function provided by the Settlement Bank, to post Settlement Entries calculated by the Switch during Multilateral Net Settlement Calculations.

**Scheme**: A set of rules, practices, and standards necessary for the functioning of payment services.

**Shared Service**: A common set of services that participating DFSPs collaborate to develop and/or use.

**Special Charter Banks**: Banks in a country which are permitted to do a limited set of banking functions. Special Charter Banks that can only accept deposits and handle payment transactions are considered DFSPs in a Level One system.

**Switch**: A processing entity in a payments system that routes a transaction from one participant to another. A system may operate its own switch, or this function may be done by one or more third parties.

**Transaction Accounts**: Broadly defined as an account held with a bank or other authorized and/or regulated service provider (including a non-bank) which can be used to make and receive payments. Transaction accounts can be further differentiated into deposit transaction accounts and eMoney accounts. Deposit transaction accounts are deposit accounts held with banks and other authorized deposit-taking financial institutions that can be used for making and receiving payments. Such accounts are known in some countries as current accounts, chequing accounts, or other similar terms.

**USSD**: A communication technology that is used to send texts between a mobile phone and an application program in the network.

**Value-Added Network Model**: A business model used in some payments systems, in which the central hub operates on a for-profit basis. Credit card and some debit card networks operate on this basis.

**Vostro Account**: From the Payee’s perspective, a payer DFSP funds/accounts held or hosted at a payee DFSP.