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Technical Report

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DSTR-DFSECO

**Digital financial services – The digital financial
services ecosystem**

Summary

This Technical Report outlines the Digital Financial Services Ecosystem of the ITU Focus Group on Digital Financial Service (FG-DFS), as endorsed by ITU-T SG3.

This Technical Report defines the Digital Financial Services ecosystem and describes the players and their roles within the Ecosystem. These players include *users* (consumers, businesses, government agencies and non-profit groups) who have needs for digital and interoperable financial products and services; *providers* (banks, other licensed financial institutions and non-banks) who supply those products and services through digital means; the financial, technical and other *infrastructures* that make them possible; and the governmental *policies, laws and regulations* which enable them to be delivered in an accessible, affordable and safe manner.

The Technical Report recognizes a goal of reaching "digital liquidity" – a state wherein consumers and businesses are content to leave their funds in digital form, therefore reducing the burden of the "cash-in", "cash-out" process. Various high-level challenges and issues in the ecosystem are acknowledged in this Technical Report: many of these are the subject of more detailed reports produced by the Focus Group. Finally, this Technical Report looks at the many products and services that comprise the DFS ecosystem.

Keywords

Digital Financial Services, Ecosystem.

Change Log

This document contains the ITU-T Technical Report on "*Digital Financial Services – Digital Financial Services Ecosystem*", which was agreed by the ITU-T Study Group 3 meeting held in Geneva, 23 April - 2 May 2019.

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Digital financial services – The digital financial services ecosystem

1 Scope

See Summary.

2 References

None.

3 Definitions

3.1 Terms defined elsewhere

This Technical Report uses the following terms defined elsewhere:

None.

3.2 Terms defined in this Report

This Technical Report defines the following terms:

None.

4 Abbreviations and acronyms

ATM Automatic Teller Machine

CI Cash in

CICO Cash-In and Cash-Out

CO Cash Out

DFS Digital Financial Services

MNO Mobile Network Operator

P2P Person-to-Person

5 Conventions

None.

6 Introduction

The ITU DFS Focus Group was charged with describing the overall ecosystem of digital financial services, identifying the players within that ecosystem, and identifying the key elements necessary to make the ecosystem develop in such a manner that it encourages and enables financial inclusion policies.

6.1 What is the DFS ecosystem?

The Digital Financial Services ecosystem consists of users (consumers, businesses, government agencies and non-profit groups) who have needs for digital and interoperable financial products and services; the providers (banks, other licensed financial institutions and non-banks) who supply those

products and services through digital means; the financial, technical and other infrastructures that make them possible; and the governmental policies, laws and regulations which enable them to be delivered in an accessible, affordable and safe manner.

The DFS ecosystem aims to support all people and enterprises within a country, and should support national goals including financial inclusion, economic health and the stability and integrity of the financial systems.

6.2 The goal of digital financial services

The goal of financial services made available via digital means is to contribute to the reduction in poverty and deliver on the recognized benefits of financial inclusion in developing countries.

Financial inclusion means the sustainable provision of affordable financial services that bring the poor into the formal economy. An inclusive system includes a range of financial services that provide opportunities for accessing and moving funds, growing capital and reducing risk. Such services may be provided by banks and other traditional financial services organizations, or by non-bank providers.

Many people have pointed out that financial inclusion is a means rather than an end. Financial inclusion contributes to the development goals of poverty reduction, economic growth and jobs, greater food security and agricultural production, women's economic empowerment and health protection.

The financial inclusion benefits of a digital financial services ecosystem include:

- **Safety and security:** poor people are able to store and manage value without needing to protect cash as a physical asset.
- **Speed and transparency:** given the liquidity and transactional anonymity of cash, cash payments are subject to delay, "leakage" (payments that do not reach the recipient in full) and "ghost" (fake) recipients. This is particularly true in the context of government payments. By moving to digital payments, the traceability of the payment process is improved through more stringent identification procedures, direct transfers that skip current intermediate hands, digital record-keeping and more immediate funds transfer.
- **Increased flexibility:** many poor people, particularly those in rural areas, receive part of their annual income through domestic and international remittances. They may also reach out to their social networks in times of need to obtain additional funds. At times, these monies do not arrive at all or do not arrive in time. The transfer can be costly and it is not clear to the payers that their funds will be properly directed. Digital financial services can reduce costs and increase the coverage of remittances transfers, making remittances of small amounts viable. Moreover, digital financial systems can enable remitters to direct funds directly to savings, health, education fees, or other types of targeted accounts that ensure funds are being spent as intended. The increased flexibility of digital systems also allows the poor to pay for goods and services on lay-away, pay-as-you-go, or through other payment options that more closely match their ability to pay.
- **Savings incentives:** digital technology facilitates access and interfaces to saving products. Furthermore, digital payments create the opportunity to embed poor people in a system of automatic deposits, scheduled text reminders and positive default options that help people overcome psychological barriers to saving. Moreover, digital technologies can make available data analytics on users' financial lives and therefore increase the willingness to save.
- **Credit histories:** electronic payments create records, allowing transaction histories that can support borrowing by poor consumers and merchants.
- **Women's empowerment:** evidence suggests that digital financial remittances (domestic and international) empower women within their households. The digital nature of the payment enables the recipient to keep financial transactions private, even within a family.

Digital financial services, most typically, are seen within the context of one country, using accounts denominated in the respective country's currency, and institutions that are regulated by national regulators. However, these services increasingly intersect, on many levels, with those of other countries, on both a regional and a global basis. It is a goal in the development of digital financial services to make sure that services are able, as and when appropriate, to efficiently and safely connect to and integrate with services in other countries.

6.3 The digital financial ecosystem and its components

The actors and services that constitute a DFS Ecosystem depend on two fundamental support structures: an enabling environment and a solid level of infrastructure readiness.

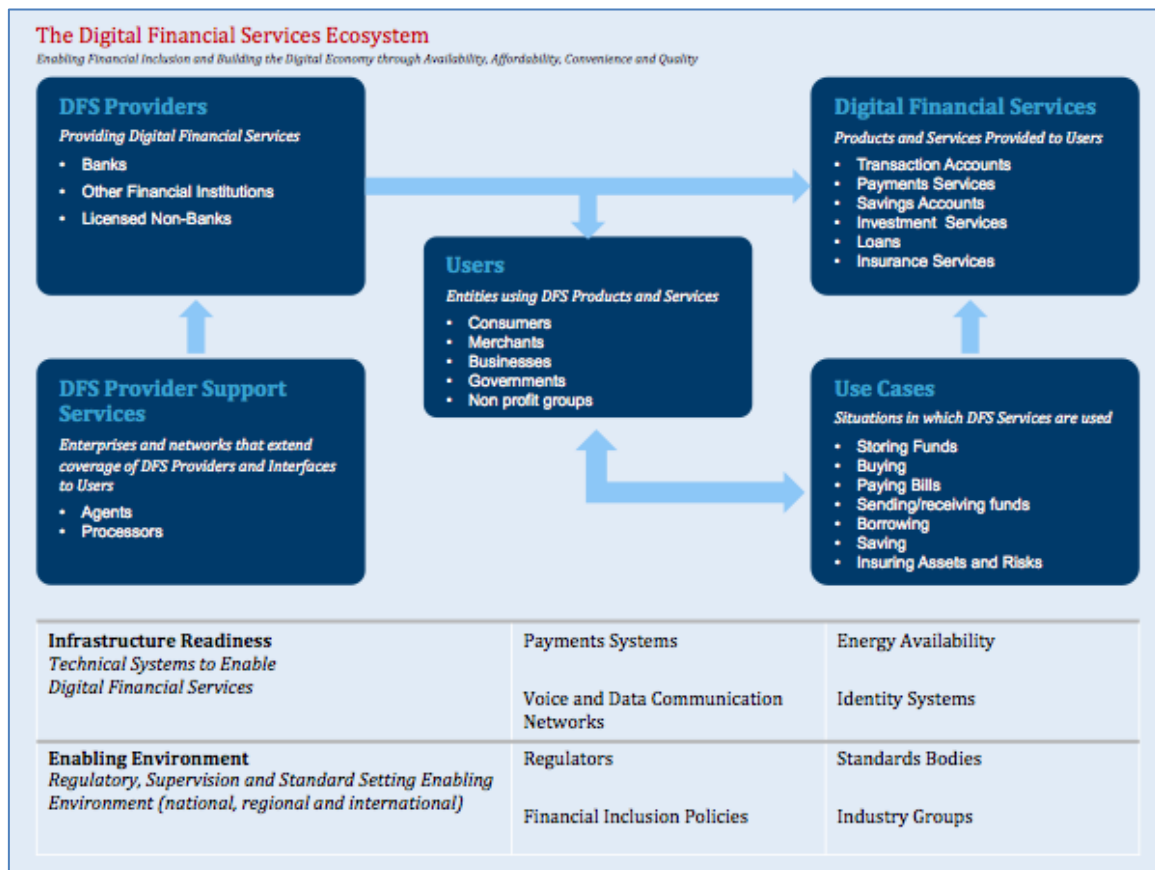


Figure 1 – The digital financial services ecosystem

- **Infrastructure readiness** consists of:
 - Payments systems available for transaction between and among end users, including consumers, merchants, businesses and governments. These payments systems may be public, semi-public, or private; they may be "closed-loop" or "open-loop". Security of payments systems is a requirement of infrastructure readiness. In addition, a certain degree of payments system interoperability among participants in payments is a necessary component of infrastructure readiness.
 - Voice and Data Communication Networks to support financial messaging among end users and providers. Certain levels of communication network quality and security are a necessary component of infrastructure readiness.
 - Energy Availability sufficient to support the users of digital financial ecosystems.
 - Identity Systems capable of identifying end users and their providers, and authentication systems capable of recognizing and validating these identities. Identity systems may be national ID's, sectorial ID's (e.g., financial industry identifiers, bank account numbers,

mobile phone numbers) or private sector ID's (e.g., WeChat or PayPal identifiers) are also important in the DFS ecosystem. Some national ID's in particular are biometrically enabled; this is expected to become a significant part of the ecosystem.

- The **Enabling environment** consists of:
 - Laws and regulations implementing those laws: these include the basic permissions given to financial institutions in the countries; the authority of financial regulators, and regulation and permissions given to non-bank financial services providers. Similar law and regulation around the role of ICT providers and the authority of telecom regulators may be relevant in a country.

Some countries may have specific legislation enabling or constraining eMoney. Law and regulation pertaining to competition and consumer protections are also significant in their impact on the development of the ecosystem.
 - National policies, particularly with respect to financial inclusion.
 - Standards setting bodies and their standards. These bodies may be specific to one industry group (e.g., EMV) or be more broadly applicable (e.g., ITU, ISO, ANSI).
 - Industry groups that act on behalf of large numbers of individual providers – these are most typically industry-specific (e.g., GSMA, Mobey Forum).
 - NGO's and Development Organizations working to implement DFS ecosystems (e.g., World Bank, CGAP, UNCAD, the Bill & Melinda Gates Foundation.)

The Ecosystem also includes, of course, the many consumers, businesses and governments that are involved in the use and provision of digital financial services. This includes:

- **Users** – this term is used to include all entities that are users of digital financial services. This includes consumers; merchants, billers and other payments acceptors; businesses; governments; and non-profit agencies. These groups can be collectively thought of as "consumers" of digital financial services.
- **DFS providers** – this term is used to include all entities that provide digital financial services to end users. It includes both so-called traditional financial services providers (banks, savings institutions, credit unions and other chartered financial institutions) and other entities, which may include eMoney operators, postal authorities and a variety of different commercial providers. These other entities are collectively referred to here as "non-bank providers". The ability of non-banks to act as DFS providers is constrained by national law and regulation.
- **DFS providers support services** – this term is used to include all entities that provide services to DFS providers. This includes processors, platform providers and a wide range of software and hardware (e.g., terminals, ATM's) providers. It also includes agents (who may work on behalf of either bank providers or non-bank providers), and is an important component of the digital financial services ecosystem.

A note on providers: any given company or organization active in the digital financial services ecosystem may play multiple roles. For example, an eMoney operator may be both a provider of data and voice services (in "infrastructure readiness") and a direct DFS provider. A card network may be both a provider of a payment system (again, in "infrastructure readiness") and a DFS support service provider.

The end users and providers of the digital financial ecosystem meet in the provision and use of the actual *digital financial services*: these services then support the *use cases* within the ecosystem.

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Digital financial services include:

- **Transaction accounts** for the safe keeping of funds: these include both bank accounts and eMoney accounts. Deposits into a bank account create a liability by the bank to the account holder: this liability is often guaranteed or insured by government agencies. Deposits into an eMoney account (by definition from a non-bank provider) create a liability by the provider to the account holder: this liability is usually covered by a regulatory requirement that the provider funds, in aggregate, in an escrow or trust account at a bank. eMoney accounts and bank accounts are both considered "Transaction Accounts" within the ecosystem.
- **Payments services:** the ability to transfer money into or out of an account: this may be done through a variety of different payments systems and providers. Remittances, transfers, merchant payments, bill payments, etc., are all examples of payments.
Payments may be domestic or cross-border. For the purpose of this Technical Report, we concentrate on digital payments: payments initiated or processed electronically, rather than by paper.
Bank ACH and RTGS systems, eMoney transfers and card payments are considered to be digital payments.
- **Savings accounts:** services designed to allow consumers to set aside some funds in storage for intended later use. Savings products typically offer some type of interest rate or return. Some savings services have shared or club-like characteristics.
- **Investment services** designed to allow consumers or businesses to invest for future financial return.
- **Loans:** this term encompasses a broad variety of services to extend credit to consumers or businesses. Micro-finance, secured and unsecured lending and mortgage financing are all included.
- **Insurance services:** this term encompasses a broad variety of services to enable consumers and businesses to protect lives and assets.

Use cases are the situations in which consumers and businesses consume or require digital financial services. A given use case may be satisfied by a variety of different digital financial services. Many use cases have two end users: for example, in a "paying bills" use case, both the consumer or business paying the bill and the biller receiving the payment are involved. Use cases include:

- **Storing funds** – the need to retain funds safely.
- **Paying for purchases** – the ability to pay for goods and services purchased: the purchase may be done either locally ("face to face") or remotely.
- **Paying bills** – the ability to pay for services delivered upon receipt of a bill.
- **Sending or receiving funds** – the ability to transfer funds to and receive funds from another end user (person or business).
- **Borrowing** – the ability to borrow funds for later repayment.
- **Saving and investing** – the ability to have a short term liquid to semi liquid investment such as an eMoney account, savings account or group savings, and the ability to invest funds for future financial return.
- **Insuring assets** – the ability to insure lives or assets.
- **Trading** – the ability to participate in international trade through the use of digital financial services.

6.4 The evolution of the DFS ecosystem

The root of the development of the digital financial services ecosystem is, of course, the rapid and widespread adoption of mobile phones. In virtually every country, this has created a base of capability among consumers, including the most poor consumers and small businesses, to transact and interact

electronically. The equally rapid spread of the phenomenon of "mobile top ups" – the ability to convert cash into airtime minutes – created a second important capability in the eventual development of what is known as eMoney.

In a well-known story, some developing countries allowed non-bank providers, often MNO's, to create transaction accounts allowing their subscribers to store funds in these accounts, and make transfers to other subscribers. These became "closed-loop" payments systems, and the general model is often referred to as a "non-bank led model". The primary weakness of these systems has been a lack of interoperability: the subscriber to one system could not pay to the subscriber of another system.

In other countries, regulators chose to support banks as the primary provider of digital financial services. In these countries, either existing or newly formed payments networks, available to banks and, in some cases, their partners, form the platforms on which these providers can deliver services to their customers. In several countries, regulators have tried to achieve financial inclusion goals by broadening the set of providers who are allowed to access these payments networks, either directly or through bank partners. These systems are generally considered to be "open-loop" systems, and the general model is often referred to as a "bank-led model". The primary weakness of the "bank-led" model has been adoption among the poor of the country.

Both models, when looked at from a financial inclusion perspective, share a common problem: that funds put into these transaction accounts are not left there, but rather withdrawn to cash almost immediately. An ecosystem dependent on networks of agents, branches or ATM's to support "cash-out" and "cash-in" has obvious problems with costs and with the management of this infrastructure.

The idea of a post-cash state of "digital liquidity" has obvious appeal. Consumers and businesses would leave their funds in electronic form, rather than "cashing out". What would it take for the ecosystem to evolve to this state? Four principle drivers are commonly recognized. Each of these is the subject of more detailed reports from this ITU Focus Group.

- The delivery of "bulk payments" – either G2P (Government to Person) or B2P (Business to Person) into digital wallets (transaction accounts managed by mobile devices) is seen as a critical enabler for consumer adoption of wallets. Bulk payments can not only deliver funds immediately into digital wallets, but they can also improve the odds that the recipient will get their full-intended payment.
- The enablement of merchant services – or, more broadly stated, payments acceptors – to receive payments out of digital wallets is seen as the most important feature in eventually reducing dependency on "cash-out". People will be more willing to leave funds in a digital wallet if they are able to use these funds as they currently use cash.
- The development of interoperability among providers of transaction accounts is seen as the key capability to enable "ubiquity" – the ability of any one payer (consumer or government or business) to make payment to any receiver, regardless of who is providing the transaction account for that receiver.
- The delivery of additional financial services, such as savings, lending and investing, through connection to the digital wallet is seen as the key to realizing many of the longer term objectives of financial inclusion. Consumers and small merchants who are able to safely save and invest money, and borrow to support short or long term needs, are more able to stabilize their financial lives and avoid many of the perils experienced in an all-cash economy.

Just as different countries have chosen different early models for digital financial services to support (many developed at a grass roots level), countries will also see different pathways to a full deployment of these services. However, we expect to see increased regional or global coordination on policy issues connected with the ecosystem, which may lead to more convergence among countries on supported models and systems.

6.5 Issues and challenges in the ecosystem

Not surprisingly, regulators, providers and the wide range of parties working to implement and enable the digital financial services ecosystem are dealing with complex issues. Many of these issues are the subject of separate reports from this ITU Focus Group.

- Who should be permitted to be a provider of digital financial services, and how should this be regulated? Although this is often thought of as a question of banks versus telecommunication companies, in fact many other types of entities are either currently or potentially supply digital financial services – including, as one example, social networks. Should regulation be done on a functional basis or by type of provider? What is the regulatory capacity within a country to support additional provider categories?
- What are the business models for digital financial services among providers? Are the business models used in pilot and early launch sufficient to support a scale implementation of the ecosystem? Are transactional costs well understood? What types of systemic controls used in legacy service models (for example, interchange in bank payments systems, or retail price regulation in telecommunication services) are appropriate for new services? Are business models dependent on elements of the ecosystem that may disappear over time – such as "cash-out" fees? What is the role of government as a provider of digital financial services? What about government as a user of the same services? Are the necessary infrastructure investments being made?
- How should national (or industry specific) identity systems be used by the digital financial services ecosystem? Will emerging biometric-based identity systems be sufficient to change the current costs of "KYC" (know your customer) processes for providers?
- How will consumers be protected from abuse by providers and/or other end users? How should this be regulated? How can consumer protection be accomplished without adding costs to the ecosystem that make services too expensive for consumers to use?
- How will the ecosystem balance the need to protect consumer (and merchant) data privacy needs against the value the data may have in helping to support the costs of the ecosystem?
- How should digital financial services providers – and their support services providers – manage the risks in the ecosystem? How should "best practices" be communicated and assimilated? How should this be regulated?
- What standards of quality of service should providers be held to? How should this be defined and regulated?
- Rapidly changing technology presents risks and opportunities within the ecosystem. This includes changes in mobile handset capability, vendor platform capabilities and changes in the underlying communication networks. How can providers, support services providers and regulators understand the impact of these changing technologies?
- How aligned to regional or global standards should digital financial services providers be?
- Should digital financial services providers be required to use regional or global standards for payments messaging? Is this necessary in order to conduct cross-border financial services in an efficient and safe manner? How should this be regulated?
- How should the digital financial ecosystem work to improve financial literacy among consumers and small businesses? To what extent is this a government function or a commercial function?

An important over-arching issue in the development of the DFS ecosystem is the need to invest in and manage two sides of the eco-system at once. Practically, this means both supporting initiatives to load electronic money into consumer transaction accounts – mainly through bulk, or G2P payments and initiatives to enable consumers to spend this money in electronic form, rather than cashing out – mainly through the enablement of merchant electronic payment acceptance. Neither initiative can be

successful without the other: consumers who accept electronic money will simply "cash-out" if they cannot spend it electronically, thus perpetuating the costly cash management problem of agents. Merchants, on the other hand, will not accept electronic payments unless presented with a significant number of consumers who are ready to make them. Solving this problem is sometimes referred to as reaching a state of "digital liquidity".

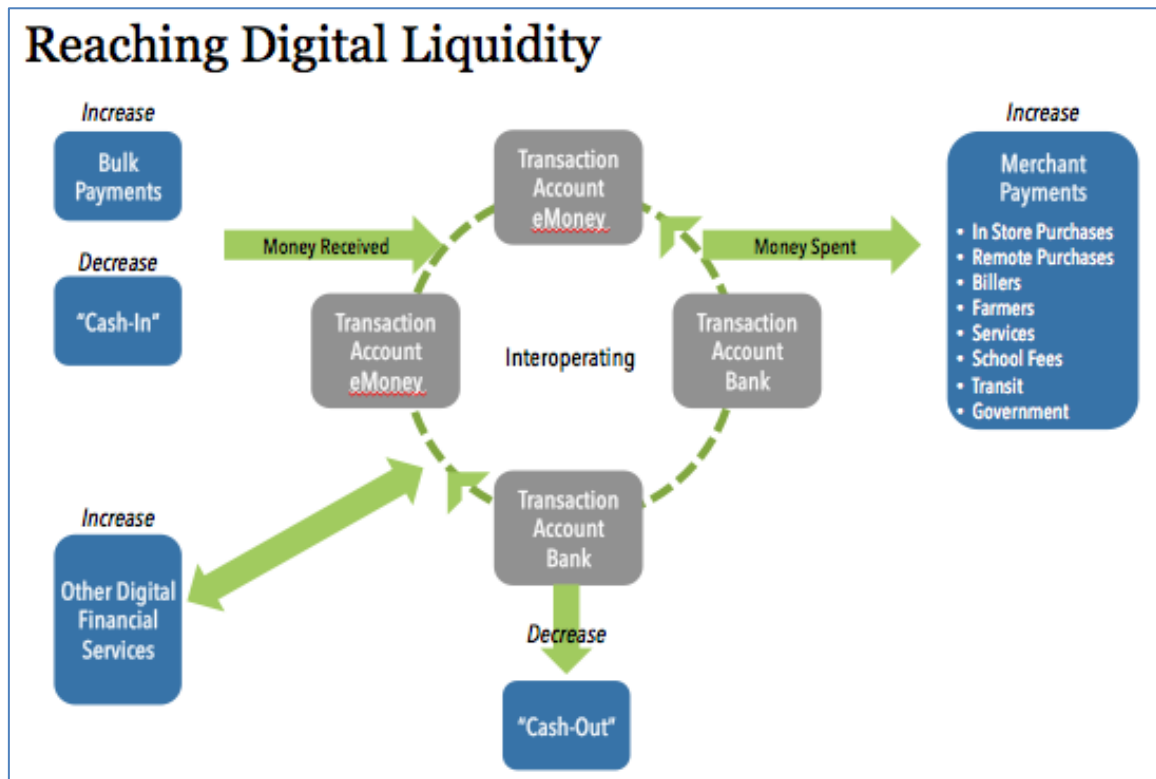


Figure 2 – Reaching digital liquidity

7 Products, services and use cases

7.1 Requirements

Products and services in the digital financial ecosystem are delivered to users to satisfy their needs in the use cases described above. All of these systems have to meet the requirements of users. Across the spectrum of consumers, businesses, governments and other entities that use the digital financial ecosystem, the following high-level user requirements are noted¹.

¹ Bill & Melinda Gates Foundation, Level One Project Guide, 2015.

7.2 Products and services

Secure: people need to trust that money held in a digital transaction account is secure, and have assurance that money will go only to the designated recipient, with a record of the transaction.

Affordable: the cost to use the system must be very low. To actually replace the use of cash, the cost to the consumer (as well as to the merchants) will need to be close to zero.

Convenient: the system needs to have accessibility and to be easy to sign up for and to use. Many poor people do not have the identity documents usually required to create financial accounts. The system has to be understood by prospective users with limited or no mediation.

Open: the system needs to be able to reach many (ideally all) counter parties for both making and receiving payments. It should not require special, costly, or time-delayed accommodations. It should make it easy for an individual to integrate into multiple financial systems of the country—including to those systems utilized by higher-income earners.

Robust: a digital payment system needs to have high performance and to satisfy user's needs. It needs to be available for use as needed, like cash. As the number of participants (and their usage volume) grows, availability should remain high and be able to handle peak volumes without an interruption in service.

Figure 3 – Products and services

7.2.1 Transaction accounts

Users, including consumers and merchants, have a requirement to store their funds safely. Today, poor consumers and merchants in developing countries do this largely through holding cash. Alternatives include eMoney wallets, from non-bank providers, or bank accounts. eMoney wallets have been successful in reaching consumers who have not been able to access transaction accounts from bank providers.

7.2.1.1 What is eMoney?

Before defining the details of the respective products and services features and functionality, it is useful to understand the broader eMoney platform in the context of where it sits in the traditional banking ecosystem. There is often a misconception as to where the value actually resides (i.e. is it similar to physical cash in a wallet or closer to electronic cash in a savings account at a financial institution).

- eMoney is a liability of an eMoney provider (sometimes called Issuer), who records a value against a transaction account ledger that they keep for the depositor. Deposits can either be made in cash (typically through an agent), or by receipt of a transfer from another consumer, business, or government entity. The eMoney provider typically uses a software platform from a support services provider to account for the ledger balances.
- Regulation requires the eMoney provider to keep the entire value of accounts on their ledger on deposit in an aggregated account at one or more commercial banks. This account is often structured as a trust account. The total in the trust account must always equal the total on the eMoney provider's ledgers of customer balances.

eMoney, in one sense, is similar to money in a bank account, in that it represents a liability of the provider to the account holder. Some form of government insurance, of course, typically protects funds held in banks, and banks are allowed to lend or otherwise invest a certain amount of balances held on account. Funds held with an eMoney provider do not typically have the same types of government insurance, but they are "100 percent reserved" through the funds held in deposit at the trust bank or banks.

7.2.1.2 Description

A transaction account is an individual account hosted by a DFS services provider (either a MNO, a bank or some other type of provider permitted to do so by regulation). The term "digital wallet" or "mobile wallet" is generally used to refer to a transaction account that is primarily accessed through a mobile device. A transaction account typically allows deposits and withdrawals in cash (discussed below in "cash-in", "cash-out". Prepaid cards may act as transaction accounts in some markets.

7.2.1.3 Attributes

Product attributes for transaction accounts accessed through digital devices include the following:

- Safety (access is through unique PIN code)
- Security (actual store of value ledger is registered on a secure platform, accessed through the handset)
- Speed (balances and transaction occur in real-time)
- Convenience (accessed through the handset)

7.2.1.4 Business model

The various providers of transaction accounts have different business models. Notably, eMoney wallets and bank accounts have different business models. Banks have a multidimensional business model based, for example, on intermediation of deposits, cross-selling of loans and several fees. For example, banks are sometimes allowed to charge a monthly service fee for banking accounts (depending on regulation, product and segment). A MNO acting as an eMoney wallet provider may have a simpler business model, which will often depend on fees generated through cash-in and/or cash-out transactions. An eMoney wallet provider's business model may also vary depending on whether the MNO is directly licensed or set up as a subsidiary.

The business model is often driven by the lead institution's broader strategy:

- MNO led models: A large percentage of airtime in the emerging markets is pre-paid and sold through third parties. MNOs thus have a challenge as attrition rates are high and cost of distribution via the third party airtime resellers is also high. An eMoney account adds an element of "stickiness" to the client relationship, solving a portion of the attrition challenge. An eMoney account also enables the MNO to sell pre-paid airtime directly to the consumer, thus eliminating the commission cost associated with distribution through third parties. Traditionally MNO led models have been seen as a loss leader for their core businesses. As the industry matures, although depending on its structure and licensing arrangements, regulation and management pressures may lead to standalone business units to be formed within the MNOs. eMoney businesses are therefore becoming standalone profit centers within the MNOs.
- Bank-led models: In some markets regulation has forced bank-led models. From a business perspective, eMoney platforms and associated accounts are often seen by banks as a low-cost hosting alternative to their traditional banking platforms introducing a low cost product "lite" solution to reach the lower end of the market. eMoney accounts are thus seen as an on-boarding product by banks.

Independent Models: Independents do not traditionally have the brand and reach which MNOs and banks enjoy and have generally approached the market by using mobile to compete with existing paper-based remittance products at a domestic level. They vary in their business model with some offering accounts and others offering over the counter money transfer services.

7.2.1.5 Best practices

The following areas have been identified as best practices for digital wallet providers²:

- Overcoming logistics and delivery challenges – a lack of infrastructure creates logistical challenges for agent and cash management. Leveraging local partnerships, flexible agent financing and smarter transactional data analysis are enabling providers to address these challenges.
- Identifying and communicating a compelling value proposition – understanding the nuances of how consumers earn, save and spend their money can help providers develop a relevant value proposition.
- Creating a user-friendly service and accessible interface – as poor customers tend to have lower financial and technical literacy levels, the service will require a user-friendly interface to enable access. While technologies such as IVR can be useful for reaching illiterate users, greater investment in customer education and increased "touch points" are also proving successful as a means of on-boarding customers.
- Finding solutions to the lack of formal identification documents – the absence of compulsory population registration and identification is a common barrier to wide-scale adoption of digital wallets. In most markets, regulation plays an important role; solutions such as tiered KYC and adjusting acceptable KYC documentation can help providers facilitate customer adoption and increase the success of financial inclusion initiatives.
- Current offerings and the Future of Money Accounts – Current offerings are primarily limited to a temporary store of value and over the counter transactions. As the industry matures deeper and richer, offerings beyond a basic store of value for the eMoney account will emerge. Money accounts may potentially become closer to traditional bank accounts but could also have nimble and bespoke product features that banks have traditionally struggled with.

7.2.1.6 The CICO problem: Cash-In and Cash-Out services

Cash-In and Cash-Out (CICO) services represent both a critical enabling element of the digital financial services ecosystem and a current and long-term problem. As an enabling element, CICO is simply necessary in order to deal with consumers who have cash on hand, and want to use a digital wallet to send the funds to someone else. CICO also helps to deal with consumers who receive electronic credit into a wallet and need to get cash to use. CICO often goes hand in hand with a Person-to-Person (P2P) transfer, where consumers would Cash In (CI) at an agent, perform a P2P transfer and the recipient performs a Cash Out (CO) at another agent.

The short term problem – often quite severe – is dealing with the liquidity and cash management needs of agents, who at any point in time may have too much or not enough cash on hand to support their business. The long term problem is an economic one: since many providers build their part of their digital wallet business model on cash-out fees, a successful transition to "digital liquidity" (when a consumer leaves funds in their wallet to be spent electronically) would present serious challenges to this model.

In some countries, "Super Agents" or "Master Agents" may be responsible for a set of underlying agents. There are a variety of models within countries for agent regulation. In some countries, agents (or their "Master Agents") are exclusive to one provider (bank or non-bank); in other countries, agents are permitted by providers (and/or required by regulation) to support multiple providers. This can be accomplished either by the agent enrolling and registering with each provider independently, or by some type of agent interoperability system, possibly provided by the "Master Agent".

² GSMA, "eMoney in Rural Areas", 2014

Note that in bank-led models, primarily bank branches and ATMs provide the CICO function. Bank-led models deployed to accomplish goals of financial inclusion normally have agent relationships (and economics), which are similar to those of non-banks.

7.2.1.7 Description

A cash-in transaction requires an eMoney account holder to deposit physical cash at a participating agent of their joint scheme. The agent accepts the cash and transfers e-money to the user's eMoney account (i.e., mPesa account at an mPesa agent). A cash-out transaction requires an eMoney account holder to transfer e-money to a participating agent of their joint scheme. The agent receives the e-value and gives the user physical cash.

Cash-In and Cash-Out transactions therefore do not change the total monetary value held on the eMoney provider's platform (and in the bank trust account), they merely change the ownership of eMoney and physical cash between users and agents of the providers.

Attributes of successful CICO models include: safety (all transactions are PIN based), speed (transactions take place in real-time) and convenience (agent distribution is widespread).

7.2.1.8 Business model

To attract funds into the system depositing users do not pay to deposit. Similarly, DFS providers incentivize agents to attract funds into the system by earning commissions for cash-in transactions. To withdraw funds/cash from the system, users pay a fee. Agents also earn commissions for cash-out transactions. Therefore, the business model leans towards users performing cash-out transactions funding the bulk of the ecosystem.

7.2.1.9 Best practices

Agent management is a critical success factor for the CICO service to perform optimally. Factors that contribute to a successful agent management include the following, which should aim to expand and consolidate efficient, effective and trusted networks:

- agent selection and recruitment;
- agent training;
- agent incentives;
- agent liquidity management;
- agent monitoring

7.2.1.10 Current offering and the future of CICO

- Current business models incentivize CO transactions – thus countering the long-term ambition to keep cash digital.
- Agents have potential working capital constraints when making trade-off decisions between allocating cash to eMoney (for cash-in transactions), keeping physical cash on hand (for cash-out transactions) or allocating the cash to purchase other goods that may turn a higher profit leading to liquidity challenges.
- Providers have aggressively competed on rolling out agent networks and pricing competition has led to reduction in agent commissions.
- Competition and pricing pressure may lead to situations where agents may not see value in CICO transactions.
- As bulk payment matures the funding side may potentially replace a large portion of the current over the counter cash-in transactions.

- As merchant payment matures and a merchant payment business model is defined the cash-out transactions may be cannibalized. There may, however, be arbitrage issues where agents could encourage cash-out transactions (and exchange the cash for goods) instead of merchant payment transactions as they earn a higher margin from cash-out than they might from merchant payments.

7.2.2 Payments services

A wide range of payments services is provided to users of the digital financial services ecosystem. These services are almost all bi-party: that is, there is both a sender and a receiver of funds, and the transaction account of each party needs to support the payments processes necessary to accommodate these transactions.

Note that two areas of payments services, of particular importance to the development of the DFS, are described in separate reports from this Focus Group and therefore are not described in detail in this Technical Report. These areas are **merchant payments** (including all forms of commercial payments acceptance such as bill payment) and **bulk payments**.

7.2.2.1 Domestic transfers (remittances)

A domestic digital funds transfer is the exchange of funds from one user to another through a DFS provider using electronic means, including a mobile handset, to either initiate and/or complete the transaction.

A digital funds transfer competes with traditional money transfers services, which are performed in various regulated and unregulated ways. The regulated environment includes licenced money transfer companies such as banks and post offices, the unregulated environment includes both unstructured and structured personal cash-transport services: in some parts of the world, these structured services are referred to as "hawala". The advent of eMoney accounts has enabled efficiencies to be gained against these traditional streams as cash can be digitised through an agent of a trusted service provider, sent instantly across vast distances, and immediately cashed out at another agent of the trusted service provider. Product attributes include security (all transfers are PIN based, initiated by the sender) and convenience (transactions happen in real time).

The business model of the domestic transfer provider is a "send" fee to the sending consumer. The business model is tightly coupled to that of the underlying digital wallet and CICO services.

Cash-to-Mobile transfers are often referred to as "Over the Counter" (OTC). In this transfer, a user sends funds from an agent (by giving the agent cash) which is then credited to a recipient mobile subscriber. Much like Mobile-to-Mobile transfers, receivers are alerted through their mobile handset of an incoming funds transfer. The transaction happens in real time with the recipient eMoney account receiving the credit.

Mobile-to-Cash Transfers: value is sent from an eMoney account to a recipient who is not on the same network. The receiver would be alerted via SMS of an incoming funds transfer. Funds have to be collected from an agent of the sender. Much like Cash-to-Mobile Transfers presented above, the Mobile-to-Cash Transfers rely on the receiving party's ability to have easier access to the relevant agents.

Interoperable Mobile-to-Mobile transfers: as the industry matures, interoperability between different service providers is becoming a reality. In this transaction the sender sends eMoney from their eMoney account to a recipient who could have an eMoney account at another service provider or potentially a bank. The business model for these transfers is typically based on the sender paying for the transaction, and the receiver paying a fee if they cash-out or perform further transactions. Fees paid to agents by providers offset this. Interoperability business models are being developed. Although the trend seems to point to sender paying models, these can range from copying an ATM carriage fee (sender pays) model, to a surcharge (sender pays) model, to an interchange model where

the receiving institution pays the sending institution and the sender or receiver do not pay any extra for off-us transactions.

Best Practices include having the transactions credited to the receiver in real time. An emerging best practice is account verification, so that the sender sees a real time message, "Do you mean to send money to [Name]?" before finalizing the transaction: this reduces errors and resulting inquiries and disputes.

7.2.2.2 International transfers (remittances)

A transfer sent from a consumer in one country to a consumer in a second country. As these transactions are normally cross-currency as well, the transaction requires someone – either the sending or receiving party, or the providers who are serving them, to affect the currency exchange.

Traditional models for sending cross-border remittances include money transfer services, many of which are specific to certain corridors (pairs of countries); banks and structured cash transfer "hawala" style services. The advent of eMoney accounts has resulted in a number of cases wherein the wallets are used to either receive or, in some cases, send cross-border remittances.

Many DFS Service Providers have built partnerships with the traditional international remittance operators such as Western Union and MoneyGram. This model requires the sender to transfer from a developed market through the provider's existing process, with the recipient receiving their funds directly into their eMoney account. The recipient would then cash-out through their local agent.

Cross-border remittances have started between regional DFS operators with agreements being announced in West and East Africa. The nature of these agreements is still bilateral and either occurs in a cross-border "on-us" environment (i.e. from a provider's company in one country to the same provider's company in a second country) or in an "off-us" environment.

The cross-border environment faces many regulatory challenges including issues such as Exchange Controls licensing, varying AML and KYC policies and central bank policies around clearing and settlement.

Product attributes include convenience, immediacy, and potentially lower costs.

7.2.3 Bulk payments

This term refers to payments made to multiple recipients. Typically, these are government payments (benefits, cash transfers, salaries), donor payments or payroll payments. Bulk payments are a critical enabling component of the DFS Ecosystem and are the subject of a separate report from this ITU Focus Group.

7.2.4 Merchant payments

This term refers to payments made to merchants or other payments acceptors (such as billers or governments) for purchases. These payments may be made in person (POS or "proximity payments") or remotely (eCommerce or "mobile" payments). Merchant payments are a critical enabling component of the DFS Ecosystem and are the subject of a separate report from this ITU Focus Group.

7.2.5 Savings accounts

7.2.5.1 Description

Digital savings products can broadly be defined into two product groups: individual savings and group savings.

7.2.5.1.1 Individual savings

Individual savings products tend to satisfy two overlapping needs on the part of consumers. One is for a return (interest) on money that is being held. The other is segregation of funds (away from the "everyday spend" of the transaction account) for short-term money management. Saved funds may

be either earmarked for specific purposes (school funds, the purchase of a bicycle) or be for more general needs (saving for emergencies).

Products in this space may create a partition in the eMoney account to keep a certain amount of funds liquid for daily use and the specific needs are stored in less liquid "partitions" to be released separately when the consumer requires it. Other providers may create separate savings accounts. Some providers create bundled products such as savings and credit combined where the savings sometimes forms part of the security for the loan product.

7.2.5.1.2 Group savings

DFS providers have designed products to facilitate group savings schemes. These schemes copy many "club savings" products popular in the developed world, where a group of people contribute to a "pool" and that pool is distributed by lottery or formula. In the digital world, the group's cash is stored on the eMoney platform, which will release the funds to an individual once a set of conditions are met (e.g., three individual PINs are entered) to release funds and individuals in the group receive SMS notification when transactions happen.

From a business case perspective DFS providers see savings products as a tool to build balances in the eMoney ecosystem and ultimately earn revenue from transactions generated from the digital wallets.

Current mobile savings products are still in the early phase of the evolution of DFS. Since inception, transactions have been nuanced towards over the counter money transfer transactions but indications are that savings products are starting to gain traction.

The advent of interest bearing products and sophisticated technology enabling deferred savings products will potentially drive the uptake of mobile savings accounts. A very important regulatory decision will be to consider whether or not eMoney issuers will be able to lend against balances kept in digital wallets.

7.2.6 Loans

7.2.6.1 Description

7.2.6.1.1 Secured loans

A form of secured loans that is common across emerging markets is Airtime Credit. Service Providers give users access to Airtime (typically a negative balance on the account) to be paid back when they top-up with Airtime again. The "loan" is thus for airtime and not redeemable for cash. The security is any future airtime purchase and risk models are based on airtime purchase behaviour.

More recently DFS providers through banking partnerships are offering cash loans. In these models there is often a joint savings and credit account and the loan is secured against a user's savings. As the models mature they evolve to unsecured lending products. M-Shwari in Kenya is potentially the most publicized example of this, which is a joint venture between Safaricom and Commercial Bank of Africa (CBA).

7.2.6.1.2 Unsecured loans

Unsecured loans have been launched more recently in a variety of markets – offering customers access to credit with no direct recourse for non-payment. Typically the loan provider will score customers using alternative data sourced from the MNO directly or through other means.

The credit decisions are based on data gathered from entities that collect mobile user data through smartphone apps to build risk models or using MNO GSM and eMoney account data to build dynamic risk models to lend to unbanked customers into their eMoney account. In this model interfaces can be for example USSD to ensure inclusion and all loans have a risk based pricing methodology through

rewarding good repayment with lower prices and higher loan sizes. Loans are advanced to key participants in the eMoney Ecosystem: agents, merchants and consumers.

7.2.6.1.3 Merchant loans

An important part of the emerging DFS ecosystem is the provision of credit to small and medium merchants – many of whom have not had previous access to formal credit. Often, these loans are based on information the provider has from seeing the flow of sales transactions handled through the provider. In some instances, the revenue from loans is sufficient to enable very low cost payments transaction fees to the merchant.

7.2.6.2 Attributes

In emerging markets the providers are often not solving a price problem but rather an access and distribution problem as the majority of the population is excluded from the traditional lending sectors. Digital Financial Services allows these segments access to convenient and simple products. Successful products have the attributes of convenience (products are accessed through the handset, no need for branch visits and paperwork) and accessibility (loans paid to eMoney account and for immediate use).

7.2.6.3 Business model

Different business models exist:

7.2.6.3.1 Direct to consumer

In this case a lender will approach customers directly, gather information and make a credit risk assessment to lend or not. Distribution is often a problem in this model and the cost of processing and verifying information is important. The provider is not incentivized to process small loan sizes. In addition, as this is stand-alone there is no integration to the eMoney account for collections translating to significantly higher risk, which typically reduces the provider from being able to take scale risk.

7.2.6.3.2 Two-way partnerships

In this model a lender partners with a DFS provider as a distribution partner to leverage the data and eMoney eco-system. The DFS provider provides the user and the lender provides the credit scoring, administration, needed regulatory approvals and most importantly the capital. The network is looking for a value added service to drive eMoney liquidity and transactions; the lender is looking for distribution at a low cost. Typically the lender will share revenue, profit or fees with the eMoney service provider to remain aligned.

7.2.6.3.3 Three-way partnerships or service providers

In this scenario a 3rd party expert will approach a MNO and provide insights into their data using it to build a credit scorecard and intelligence. With this they would then approach a bank to provide the financial services products. The financial service provider will then share profits or fees with both the eMoney service provider and the 3rd party provider. The challenge with this model is getting three parties to agree on a common objective and execution approach.

7.2.6.4 Best practices

Best practices are still being established in this space, with many variations outside of these examples being tried and tested in South East Asia, Africa and Latin America. As with all examples, the most likely to succeed and drive real value and scale will be those with collaboration between the MNO, the lender and the regulator.

7.2.6.5 Microfinance

Microfinance is a specialized form of lending with a long history (pre-dating eMoney accounts). Although an important part of the ecosystem, it remains relatively distinct from the eMoney account

and the emerging services built from it. There is an important intersection in the use of digital wallets by microfinance providers to disburse loans and/or collect payments from loans. Microfinance providers have traditionally had many challenges in disbursement and more often collection of repayments of loans. eMoney accounts potentially solve some of these pain points but to date have not garnered momentum outside of the key DFS markets. Indications are that MFIs have refined their collection models and only migrate to integrations with DFS once there is a certain level of DFS ubiquity in a market. Criticism of microfinance suggested that it was used more for consumption than investment and that it could cause a moral hazard leading to oversupply of lending to non-creditworthy clients and therefore to over-indebtedness. The provision of microfinance through the DFS ecosystem could potentially amplify this effect. Still, there are needs for financial services that are adequately addressed through microfinance services, especially since they evolved from narrower microcredit services, and this positive effect is also augmented by the DFS ecosystem. This debate underlines the importance of an adequate regulatory and institutional framework for digital financial services³.

7.2.6.6 International trade

The participation in international trade through the use of digital financial services will not be thoroughly analysed in the context of this Technical Report. Notwithstanding, it is relevant to mention how the combined use of several digital financial services facilitates engaging in international trade, thereby promoting access to trade-related development benefits.

For example, in China the e-commerce company Alibaba opted to establish its own e-payment system, which soon expanded to banking, investment and clearing house for cross-border merchandise trade. The company developed a network of affiliated financial entities that enabled business-to-consumer services. One of these entities, Alipay, had in 2013 approximately 300 million online and mobile payment services users. This underlines how digital financial services can provide the right ecosystem for the provision of financial services. It also enabled crowd-funding initiatives by facilitating contributions from a large number of people. Alibaba's platform allowed e-commerce activities by integrating consumers, manufacturers, custom clearing, transport and several financial services such as credit, foreign exchange and insurance⁴.

Digital financial services also facilitate the role of international trade in supporting rural development by reducing physical and economic barriers to financial inclusion. Small farmers in rural areas benefit greatly from enhanced connectivity to financial services, to reach clients and providers and to obtain updated price information on their products. Access to mobile savings and credit services can allow small farmers to purchase the necessary inputs for their agricultural activities. In addition, mobile credit and insurance services can enable their connection to markets and ultimately alleviate poverty in rural areas.

The introduction of a mobile wallet system in Nigeria increased agricultural productivity in the country, which was previously declining. Smallholder farmers depend on subsidized fertilizer, but often this would not reach beneficiaries. This was addressed by the introduction of mobile technology to transfer fertilizer subsidies directly to farmers, removing the Government from the role of procuring and distributing fertilizer. The transfer system relies on a database with more than 10.5 million farmers who are subsidy recipients, which allows them to have access to formal or

³ Adapted from UNCTAD, 2014, Impact of access to financial services, including by highlighting remittances on development: Economic empowerment of women and youth and from UNCTAD, forthcoming, Access to financial services and digital economy for sustainable development.

⁴ Adapted from UNCTAD, 2014, Report of the Expert Meeting on the Impact of Access to Financial Services, including by Highlighting Remittances on Development; Economic Empowerment of Women and Youth.

regulated financial services. The system is expanding for digital identification systems and biometric signatures, increasing rural financial inclusion⁵.

While growing e-commerce creates significant opportunities, lack of security and trust remain barriers to international trade transactions in the DFS ecosystem. Online fraud and data breaches require adequate legal and regulatory measures, including aligning laws for e-transactions; streamlining consumer protection policies, data protection and cybercrime laws; strengthening the capacity of policymakers and enforcement authorities; and enhancing the awareness of consumers and companies⁶. The focus area on fraud in this Technical Report will develop some of these issues.

7.2.7 Investment services

7.2.7.1 Current and future investment products

Investments (defined as investments into financial products such as stocks, unit trusts, ETFs etc.) in the DFS space have to date not gained much traction. Some DFS operators are starting to investigate medium to long-term savings plans linked to money market accounts but very few have implemented anything.

Some of the contributing factors to the immaturity of this product offering is potentially a combination of demand and supply side factors, including:

- lack of surplus funds for investments at the Bottom of the Pyramid
- lack of an investment for retirement culture
- lack of understanding of financial products
- over sophistication of the investment industry
- cost and fee structures in the investment industry
- rouge investment advisors
- lack of regulation in the emerging markets
- limited product offerings in the emerging markets for low value investments
- limited liquidity in emerging market stock exchanges

As the industry matures and a deeper offering develops then investments will potentially emerge as a tool to greater financial health. In particular, the use of various crowd-funding platforms to raise funds for smaller merchants is a topic that will be interesting to watch.

7.2.8 Insurance services

7.2.8.1 Description

Mobile insurance is insurance whose sale and/or administration and payment is facilitated by a mobile phone. Insurance products are aimed at protecting individuals or families from a variety of risks such as illness, death, crop failures and accidents. The growth in mobile handsets and associated distribution benefits accompanying them has enabled insurance firms to design applicable micro insurance products and reach customers at the Bottom of the Pyramid.

Products currently focus on health (such as hospital plans) and life (death cover). Interesting agro-insurance products that protect small-scale farmers against drought and excessive rainfalls have also been developed.

Premium collection models vary with some MNOs using eMoney to collect premiums and others deducting premiums from customers' purchased airtime. In some instances insurance is provided as

⁵ Adapted from The World Bank (2016), World Development Report.

⁶ Adapted from UNCTAD (2015), Cyberlaws and regulations for enhancing e-commerce.

a reward for purchasing a specific amount of airtime and in others insurance is being offered as part of a loyalty value proposition.

At the end of 2014, the GSMA reported that there were 100 live mobile insurance services globally, and as of June 2014, the industry had issued 17 million policies and was growing fast.

7.2.8.2 Attributes

Product attributes for mobile insurance include:

- Scale (or at least the potential for significant scale through mobile)
- Typically low value simple products (reflecting the low-touch model)
- Convenience (access through the mobile infrastructure)

7.2.8.3 Business model

The business model for mobile micro insurance products is similar to the traditional value chain and broken down as follows:

- Reinsurer, insurer (risk carrier): designs appropriate products and pricing based on market and risk assessment, takes a share of risk and premium to cover claims as well as profit margin.
- Administrator/technical service provider: earns commission or administration fee and in some cases a share of profit for claims processing.
- Aggregator e.g., MNO: mainly performs sales and client reach functions, earns commission and depending on commercial agreements a share of profit.

7.2.8.4 Best practices

The following seven points illustrate some of the keys to the success of these offerings⁷:

- A captive, large market and strong brand
 - Simplified product design and processes
 - Focus on both quality and quantity
 - Offer multiple types of insurance cover to customers
 - Build with loyalty models, then upsell with suitable payment mechanisms
 - Mix digital sales with high-touch sales
 - Enable regulatory environment
-

⁷ GSMA, "Seven Keys to Success in Mobile Insurance", 2015.