# ITU & Digital Financial Services

*Chaesub Lee, Director of the ITU Telecommunication Standardization Bureau*
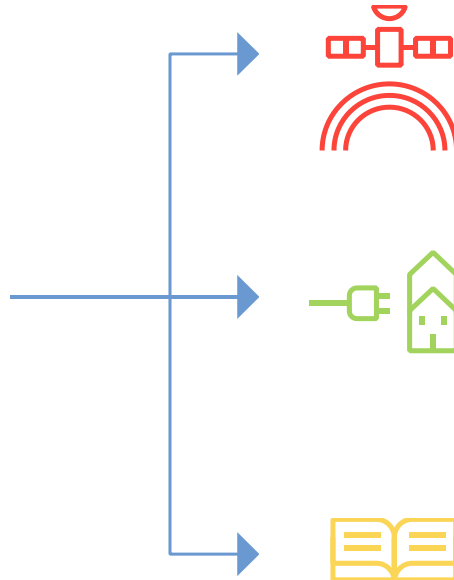
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1) **Introduction to ITU**

2) **Key concepts underlying DFS**

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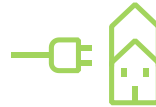4) **ITU activities on DFS**

# What we do

**UN specialized agency for ICTs**

'Committed to Connecting the World'

**Allocation** of radiofrequency spectrum and satellite orbits

**Bridging** the digital divide

**Establishing** international standards

# ITU membership

* Academia admitted to 3 Sectors of ITU for a single fee

**193** MEMBER STATES

**700+** PRIVATE-SECTOR ENTITIES

**150*** ACADEMIA

# Focus on ITU-T

📖 **ITU's Standardization Sector (ITU-T) has three main objectives:**

i. To develop interoperable, non-discriminatory **international standards**

ii. To extend and facilitate **cooperation** among international and regional standards bodies

iii. To assist in **bridging the standardization gap** between developed and developing countries

# ITU-T platform

Membership-driven **Study Groups** develop international standards (ITU-T Recommendations)

Open-to-all **Focus Groups** define new directions in ITU standardization

Open-to-all **Workshops and Symposia** analyze emerging trends and encourage peer-learning

# Key concepts

**2 billion unbanked ...**

**=> ... 1.6 billion have mobile phone**

# Key concepts

- **Digital financial services (DFS)**
  - Methods to electronically store and transfer funds; to make and receive payments; to borrow, save, insure and invest; and to manage a person or enterprise's finances

- **e-Money or Mobile Money**
  - A record of funds or value available to a consumer stored on a payment device such as chip, prepaid cards, mobile phones or computer systems as a non-traditional account with a banking or non-banking entity

For additional definitions see [ITU-T Focus Group Digital Financial Services Glossary](#)

# Key concepts

- **DFS Ecosystem**
    - **Users** (consumers, businesses, government agencies and non-profit groups) with need for digital and interoperable financial products and services
    - **Providers** (banks, other licensed financial institutions, and non-banks) supplying those products and services through digital means
    - Financial, technical, and other **infrastructures** that make them possible
    - **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 system.**

For additional definitions see [ITU-T Focus Group Digital Financial Services Glossary](#)

# Key concepts

- **Transaction Account**
  - 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

For additional definitions see ITU-T Focus Group Digital Financial Services Glossary

# Key concepts
## Reaching Digital Liquidity

*Increase*

**Bulk Payments**

Money Received →

**Transaction Account eMoney**

Money Spent →

*Increase*

**Merchant Payments**

- In store purchases
- Remote purchases
- Billers
- Farmers
- School Fees
- Services
- Government

*Decrease*

**"Cash-In"**

**Transaction Account eMoney**

**Interoperating**

**Transaction Account Bank**

*Increase*

**Other Digital Financial Services**

**Transaction Account Bank**

*Decrease*

**"Cash-Out"**

# DFS value chain

## DFS Value Chain Analysis Framework

| Account | Data | Comms. Channel | Physical Channel |
|---|---|---|---|
| Who is responsible for the user accounts?<br><br>Who owns the user relationship? | Who owns the user data?<br><br>Is the data used to offer Value Added Services? | Who controls the comms channel (i.e. USSD, SIM data)? | Who controls the physical access points (i.e. agents and ATMs)? |
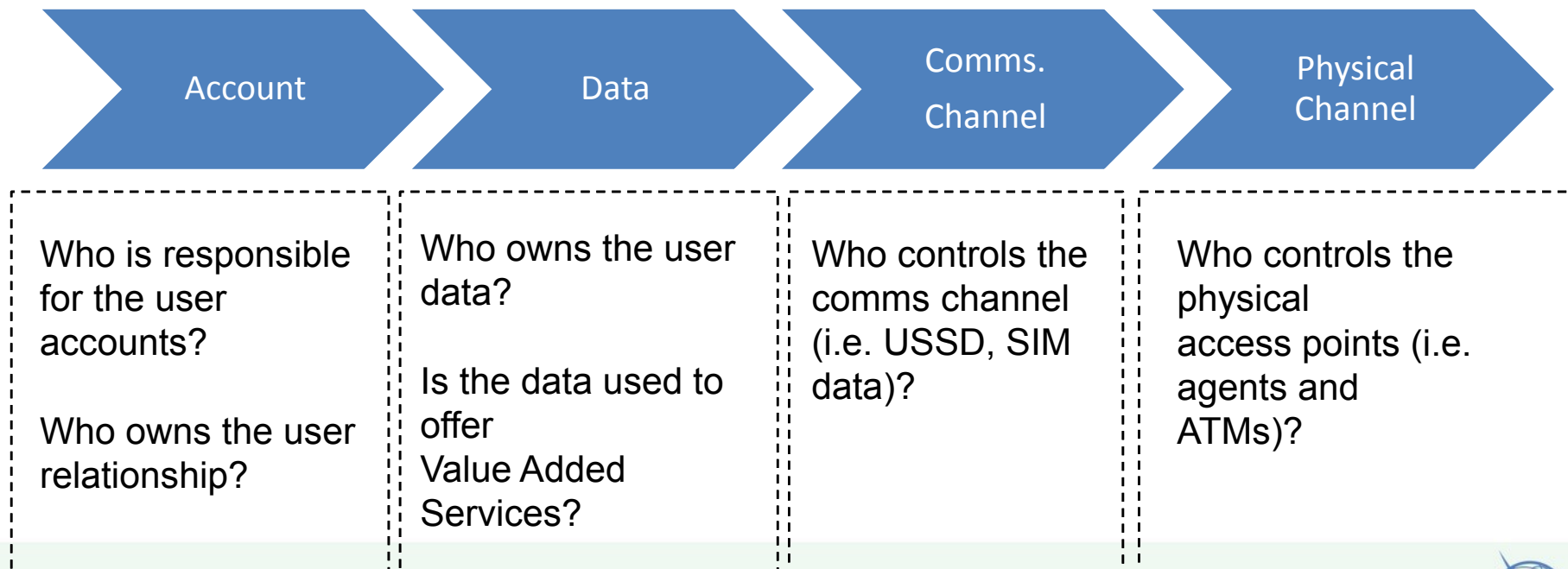
# Business models

- **3 main models**
  - Bank led model (e.g. Equity Bank)
  - MNO led model (e.g. Airtel Money, MPESA)
  - Independent model (e.g. bKash)
- Other variants are emerging as business models evolve with the growth of the ecosystem

# Business models

## Bank Led Model: Equity Bank

- Licensed as a Mobile Virtual Network Operator (MVNO)

- Rents the communications channel from Airtel

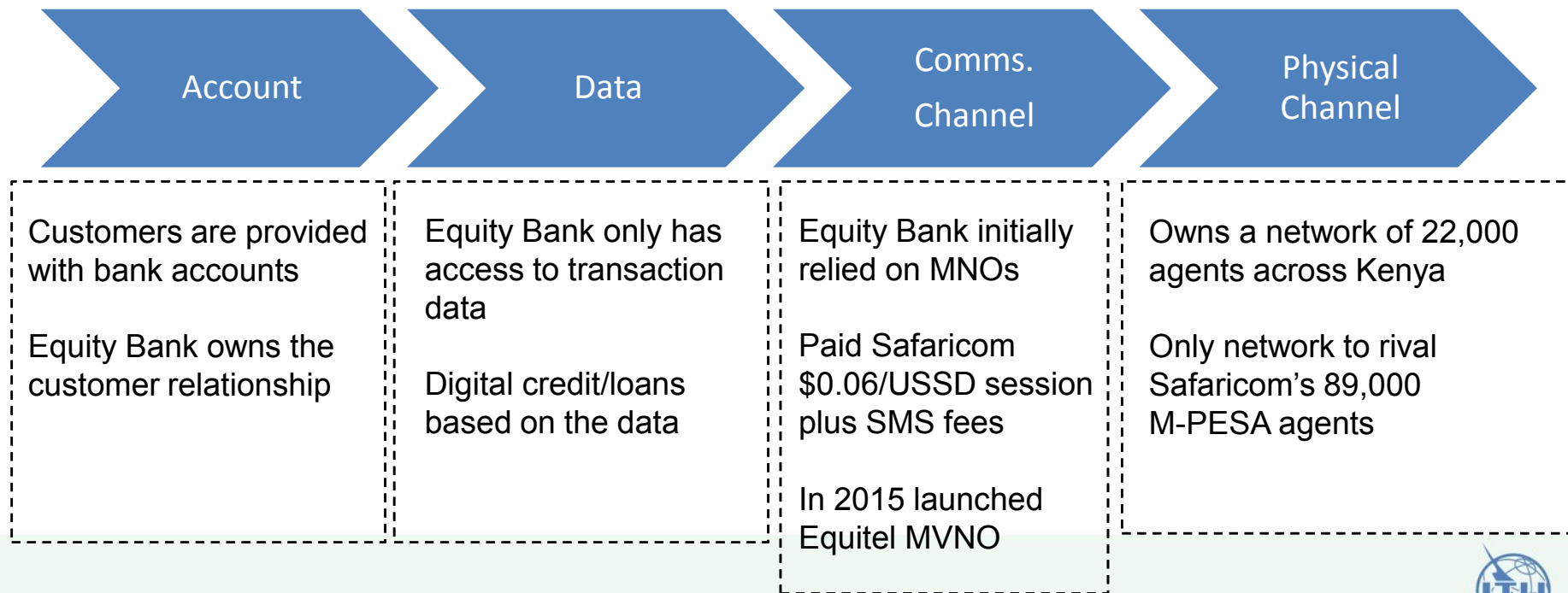- Issues SIM cards and SIM overlay

- Offers regular voice, SMS and data services alongside an integrated financial services product

- Free P2P between Equity customers and Orange Money wallets

- Offers mobile loans (digital credit)

- Free educational content

# Business models

## Bank Led Model: Equity Bank

| Account | Data | Comms. Channel | Physical Channel |
|---|---|---|---|
| Customers are provided with bank accounts<br><br>Equity Bank owns the customer relationship | Equity Bank only has access to transaction data<br><br>Digital credit/loans based on the data | Equity Bank initially relied on MNOs<br><br>Paid Safaricom $0.06/USSD session plus SMS fees<br><br>In 2015 launched Equitel MVNO | Owns a network of 22,000 agents across Kenya<br><br>Only network to rival Safaricom's 89,000 M-PESA agents |

# Business models

**Key Learning Points**

- Digital channels lowers CAPEX and cost to reach customers (an agent transaction costs USD 0.88 less than a branch transaction)

- Majority of transactions are through the agent networks rather than branches or ATMs

- DFS helps to drive down the costs of physical infrastructure

- Uses digital channels to drive bank deposits and increase revenues through transaction fees

- These enable banks to offer cheaper transactions

- Lack of control over the communications channel can be a major challenge (and cost)

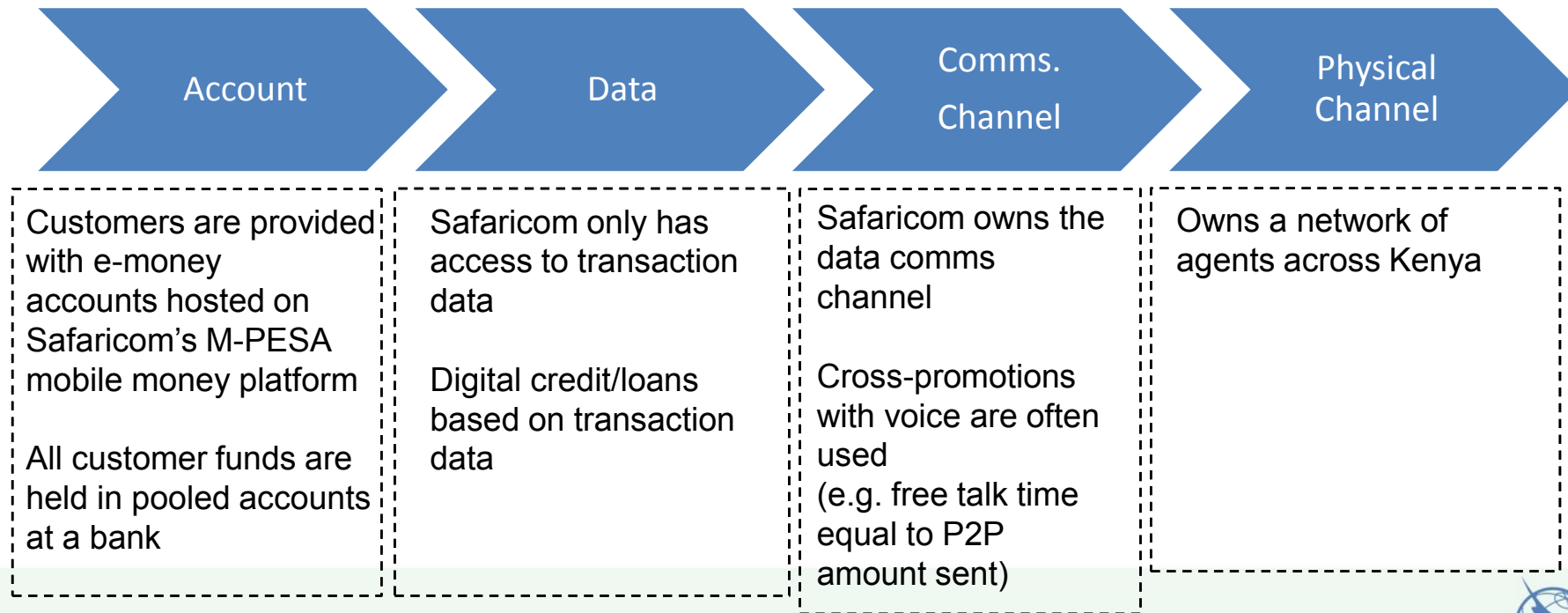- Achieved cost savings through the MVNO on the USSD channel

# Business models

## MNO Led Model: M-PESA

- Launched by Safaricom in 2007 in Kenya
- In 2012, there were 19.5 million mobile money users in Kenya (83% of Kenya's adult population), transferring ~US $8 billion per year (~24% of Kenyan GDP)
- DFS was devised primarily to retain the existing mobile phone user base
- Allows users to convert real cash to e-money and transfer e-money to others via SMS
- Broke even 14 months after launch
- Revenue: Transaction charge is applied for sending and receiving funds
- Lower KYC (know-your-customer) requirements than bank accounts

# Business models

## MNO Led Model: M-PESA

| Account | Data | Comms. Channel | Physical Channel |
|---|---|---|---|
| Customers are provided with e-money accounts hosted on Safaricom's M-PESA mobile money platform<br><br>All customer funds are held in pooled accounts at a bank | Safaricom only has access to transaction data<br><br>Digital credit/loans based on transaction data | Safaricom owns the data comms channel<br><br>Cross-promotions with voice are often used (e.g. free talk time equal to P2P amount sent) | Owns a network of agents across Kenya |

# Business models

**Key Learning Points**

- Relatively little CAPEX needed to launch, but significant OPEX required (agent network)
- Upon launch, MNOs invest 6-8x revenue generated, for:
  - Agent commissions
  - Outreach and marketing
  - Personnel and training
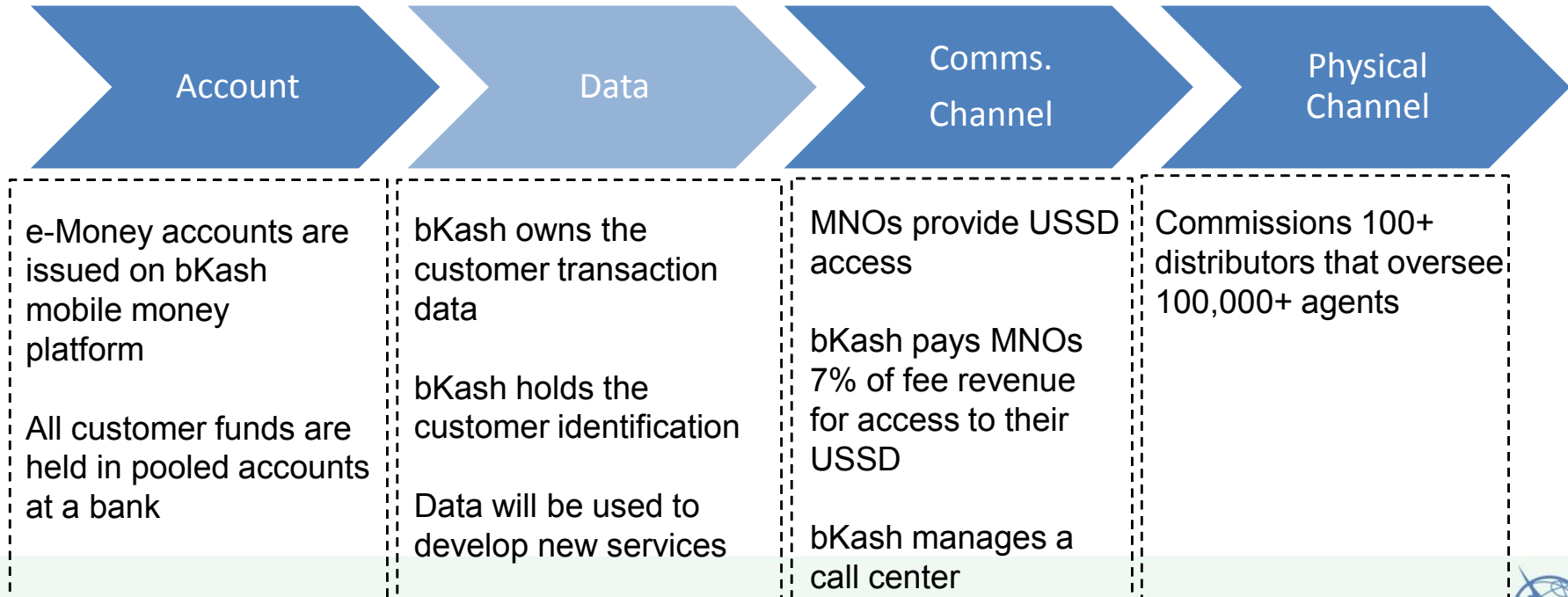- Incur losses in early years to build agent network and acquire customers

# Business models

## Independent Model: bKash

- Launched in 2011 as subsidiary of BRAC, a local bank
- bKash is neither an MNO nor a bank
- It is run separately from BRAC and it has its own CEO, staff, agent network and investors
- bKash cannot lend: value of bKash mobile accounts deposited in full with commercial banks

# Business models

## Independent Model: bKash

| Account | Data | Comms. Channel | Physical Channel |
|---|---|---|---|
| e-Money accounts are issued on bKash mobile money platform

All customer funds are held in pooled accounts at a bank | bKash owns the customer transaction data

bKash holds the customer identification

Data will be used to develop new services | MNOs provide USSD access

bKash pays MNOs 7% of fee revenue for access to their USSD

bKash manages a call center | Commissions 100+ distributors that oversee 100,000+ agents |

# Business models

**Key Learning Points**

- Being a start-up, it can scale quickly and is flexible
- Challenging profit model:
    - No existing business lines to cut cost
    - No adjacencies or cross-sell
    - Profitability relies on transaction fees
- Early scale and profitability come from focus on basic payments
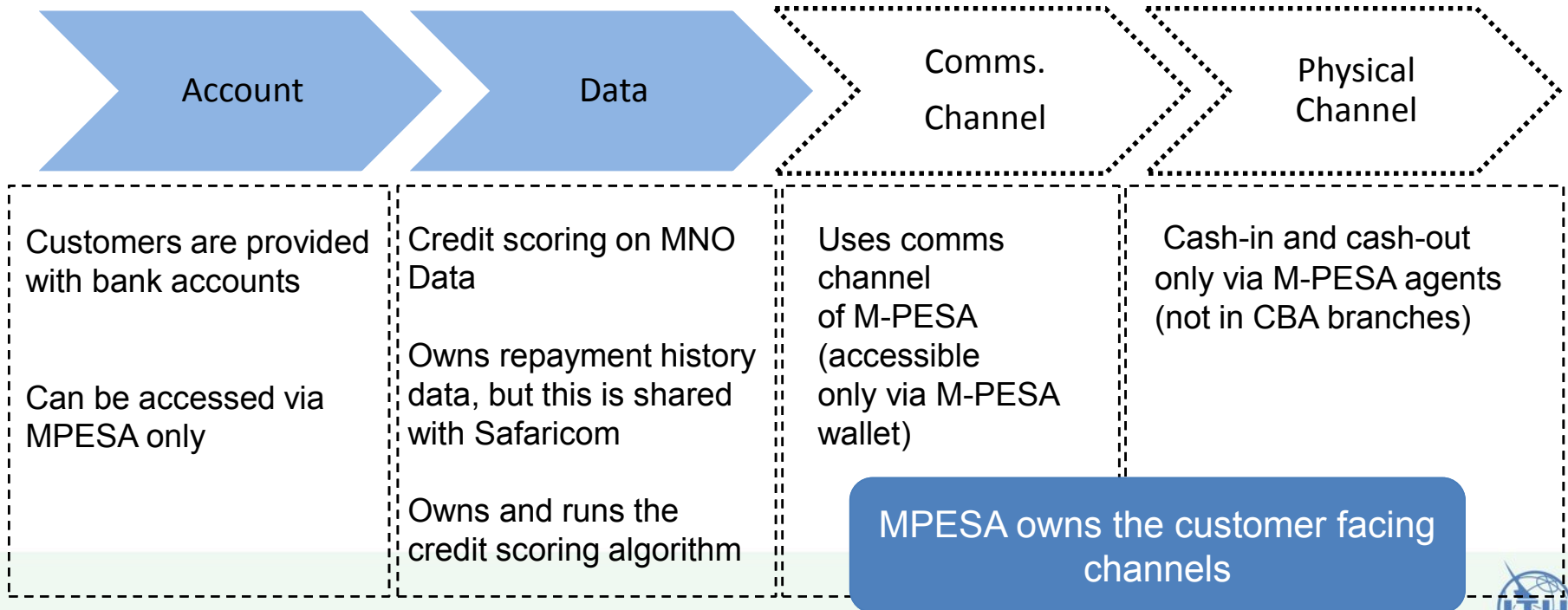
# Business models

## Variant Models: M-Shwari

- M-Shwari is a partnership between an MNO mobile money provider (Safaricom) and a bank (Commercial Bank of Africa (CBA))

- Offers digital credit facilities

- Profit sharing agreement between Safaricom and CBA

- Partnership with M-PESA allows CBA to reach the mass market

- M-PESA owns the customer-facing channels

# Business models

## Variant Models: M-Shwari

| Account | Data | Comms. Channel | Physical Channel |
|---|---|---|---|
| Customers are provided with bank accounts | Credit scoring on MNO Data | Uses comms channel of M-PESA (accessible only via M-PESA wallet) | Cash-in and cash-out only via M-PESA agents (not in CBA branches) |
| Can be accessed via MPESA only | Owns repayment history data, but this is shared with Safaricom | | |
| | Owns and runs the credit scoring algorithm | | |

MPESA owns the customer facing channels

# ITU activities on DFS

## ITU-T Focus Group Digital Financial Services (FG DFS)

- **Established** - June 2014; **Concluded** - 5 December 2016
- FG DFS facilitated effective consultation and collaboration on key DFS issues. For the first time, the Focus Group brought together financial and telecoms regulators at the global level to address DFS regulation and supervision, to:
  - **Increase and formalize** the collaboration between financial and telecoms regulators with respect to DFS
  - **Identify** key issues limiting the development of safe, enabling DFS ecosystems
  - **Analyze** how these issues have been addressed in practice and exchange information on best practices
  - **Develop** policy recommendations for regulators and other stakeholders

# ITU activities on DFS

## FG DFS Deliverables

- **28 Technical Reports and 85 policy recommendations**
- **FG DFS recommendations**
- **DFS Ecosystem Technical Reports:**
  - The Digital Financial Services Ecosystem
  - Regulation in the Digital Financial Services Ecosystem
  - Review of National Identity Programs
  - Enabling Merchant Payments Acceptance in the Digital Financial Ecosystems
  - Merchant Data and Lending
  - Impact of Agricultural Value Chains on Digital Liquidity
  - Impact of social networks on digital liquidity
  - The Role of Postal Networks in Digital Financial Services
  - B2B and the DFS Ecosystem
  - Bulk Payments and the DFS Ecosystem
  - Over the counter transactions: A threat to or a facilitator for digital finance ecosystems?
  - DFS Glossary
- **Consumer Experience and Protection Technical Reports:**
  - Commonly identified Consumer Protection themes for Digital Financial Services
  - QoS and QoE Aspects of Digital Financial Services
  - Review of DFS User Agreements in Africa: A Consumer Protection Perspective

# ITU activities on DFS

## FG DFS Deliverables

- **Technology, Innovation and Competition** Technical Reports:
  - Mobile Handset Use in DFS
  - Security Aspects of Digital Financial Services (DFS)
  - Identity and Authentication
  - DFS Vendor Platform Features
  - Distributed Ledger Technologies and Financial Inclusion
  - Technology evolution and innovation in DFS
  - Mobile Handset Use in DFS
- **Interoperability** Technical Reports:
  - Cooperation frameworks between Authorities, Users and Providers for the development of the National Payments System
  - Payment System Oversight and Interoperability
  - Payment System Interoperability and Oversight: The International Dimension
  - Access to payment infrastructures
  - The Regulator's Perspective on the Right Timing for Inducing Interoperability

# ITU activities on DFS

## Financial Inclusion Global Initiative

Global Goal – UFA 2020

FIGI 3X3X3

Implementation Principles, Recommendations, Guidelines

PAFI Guiding Principles + ITU DFS Focus Group Recommendations + Level One Design Principles

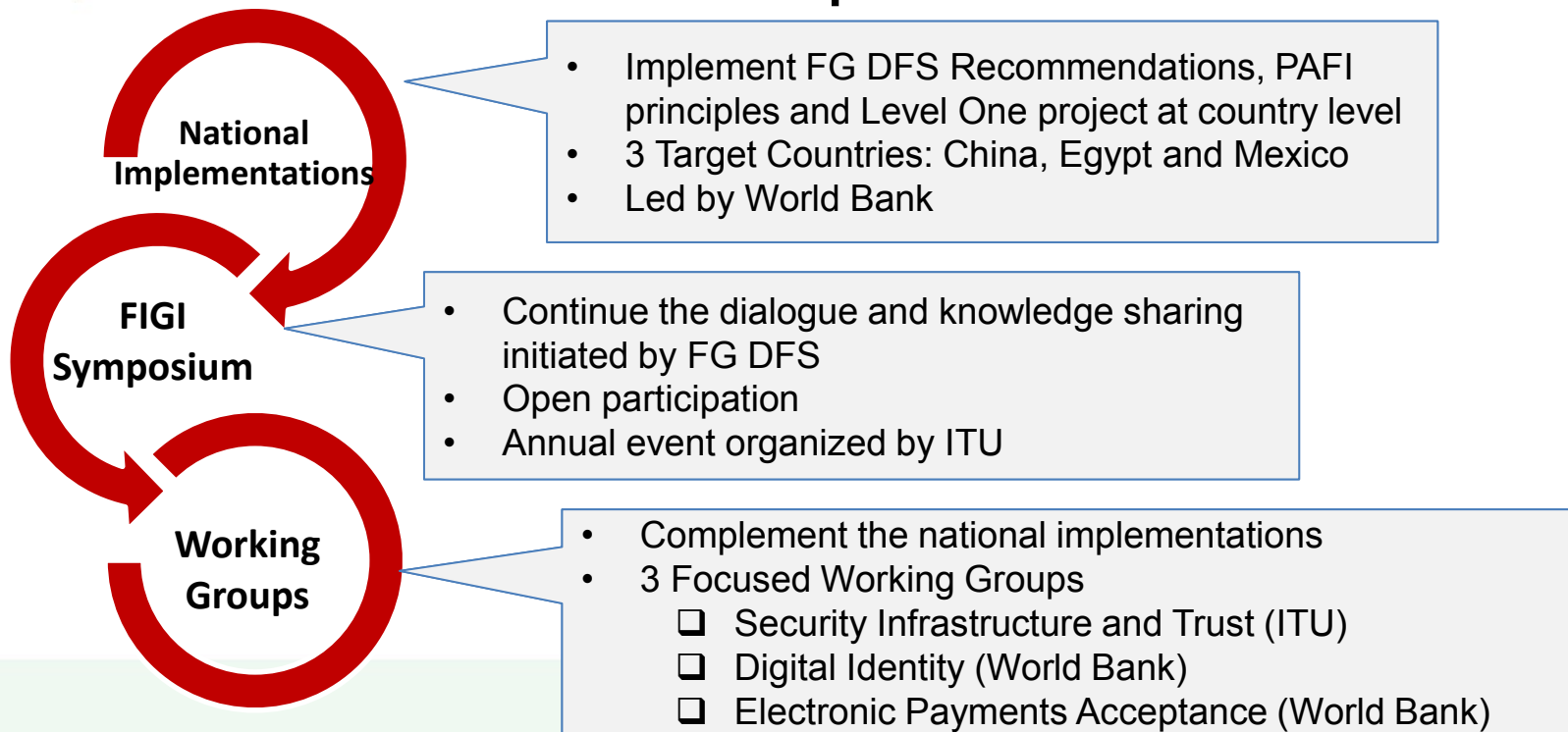BANK FOR INTERNATIONAL SETTLEMENTS

WORLD BANK GROUP

ITU

BILL & MELINDA GATES foundation

International Standards

# ITU activities on DFS

## FIGI components

**National Implementations**

- Implement FG DFS Recommendations, PAFI principles and Level One project at country level
- 3 Target Countries: China, Egypt and Mexico
- Led by World Bank

**FIGI Symposium**

- Continue the dialogue and knowledge sharing initiated by FG DFS
- Open participation
- Annual event organized by ITU

**Working Groups**

- Complement the national implementations
- 3 Focused Working Groups
  - ❑ Security Infrastructure and Trust (ITU)
  - ❑ Digital Identity (World Bank)
  - ❑ Electronic Payments Acceptance (World Bank)

# ITU activities on DFS

## FIGI Symposium

- Annual event over the next three years
- **First symposium in Bangalore, India, 29 Nov – 1 Dec 2017**
- Main events:
  - 29 Nov: Working Group meetings and capacity building event for regulators
  - 30 Nov: FIGI Symposium begins; presentation from FIGI Working Groups
  - 1 Dec: Thematic Workshop on hot topics in DFS
- More information:
  - Visit FIGI Symposium website
  - e-Mail: figi-symposium@itu.int

# ITU activities on DFS

**ITU-led Working Group on Security, Infrastructure and Trust (SIT)**

❑ Objectives

- o Build confidence and trust in the use of DFS
- o Technical guidelines and best practices for security
- o Digital Mass Fraud Prevention
- o Impact of new technologies on security and consumer protection

# ITU activities on DFS

**Terms of Reference**

❑ Conduct systematic research to investigate security of USSD, STK toolkit and biometrics use in DFS to develop best practices for developers and security measures and controls for mitigating risks

❑ Establish lab/sandbox in ITU for security testing of DFS applications

❑ Develop security measures to mitigate the risk of SS7 vulnerabilities and other cybersecurity-related threats which could impact the DFS provider network and payment system infrastructure

# ITU activities on DFS

## Terms of Reference

❑ Develop tools to assess DFS provider security compliance, for user confidence, with respect to safeguarding the privacy of customer data, preventing fraud in DFS and resilience of the DFS system to cyberattacks (similar to PCI DSS).

❑ Develop regulatory and policy guidelines to address digital fraud and protect privacy of consumer data in DFS to create trust in consumer use of DFS (i.e. address cases of social engineering, Ponzi schemes, data security and privacy issues)

❑ Investigate interoperable authentication technologies for securing DFS

# ITU activities on DFS

## Terms of Reference

❑ Investigate distributed ledger technology security in DFS

❑ Undertake research to investigate KPIs for QoS monitoring based on FG DFS report on QoS

❑ Develop technical and regulatory toolkit on QoS measurement for telecom regulators

❑ Organize workshops on topics of interest to the Working Group to disseminate the outputs for adoption by DFS stakeholders

# ITU activities on DFS

**Working Group Structure**
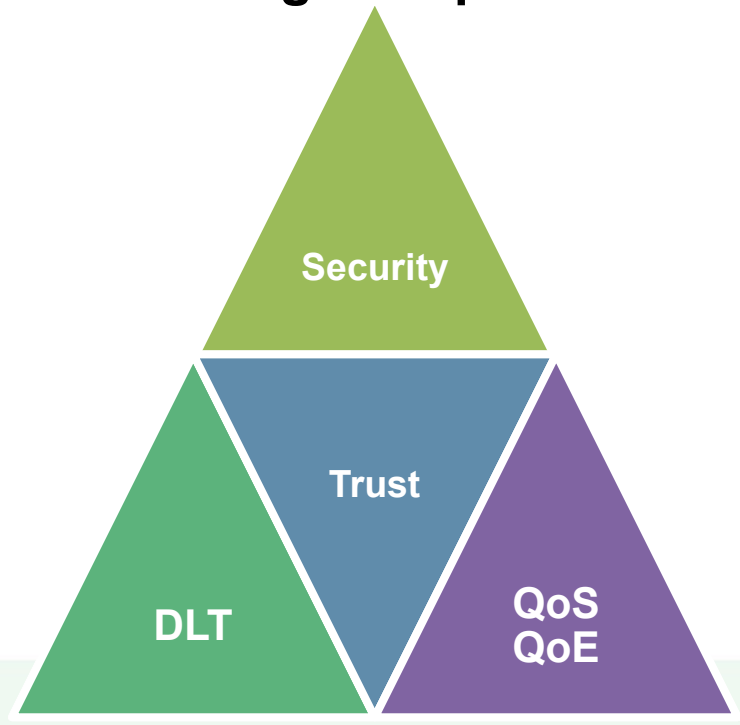
# ITU activities on DFS

**Join the working group**

- Working Group Website
- Join group's Mailing List to be informed of future e-meetings

# ITU activities on DFS

**ITU Focus Group on Digital Currency including Digital Fiat Currency**

- Established May 2017

- First Meeting in Beijing, China, 12-13 October 2017

- Chairman: David Wen, eCurrency

- Investigate digital currency including digital fiat currency platforms, focusing on the platform features and characteristics, security challenges to prevent counterfeiting of currencies in digital form, and overcome challenges of interoperability with other payment systems

- Terms of reference can be accessed here

- More information on FG DFC website

# ITU activities on DFS

## Main Objectives

- Study the economic benefit and impact of introducing digital fiat curreny (DFC) over mobile money
- Investigate the ecosystem of DFC implementation for financial inclusion
- Map the functional network reference architecture and process components required to implement DFC and integrate with existing payment systems for interoperability
- Identify use cases, requirements and applications of DFC
- Develop a better understanding of the security, regulatory implications, consumer protection, fraud prevention and counterfeiting issues of DFS and how can DFC can address these concerns
- Identify critical sovereign security, transparency and verifiability of DFC technology and provide guidelines towards the escrow of critical software and hardware components to ensure trust and verifiability
- Identify new areas for standardization in ITU-T Study Groups

# ITU activities on DFS

## FG DFC Deliverables

- Collect documentation that provides a reference foundation to the governance aspects of DFC from the Central Bank and regulator perspective
- Report on best practices and guidelines on policy and processes to ensure the sovereign security, transparency and verifiability of critical technology components
- Report on the possible economic benefit and impact of DFC on mobile payment ecosystem
- Develop definitions of terminologies and taxonomy for DFC and its ecosystem
- Report on DFC ecosystem, describing the roles and responsibilities of various stakeholders and uses cases for financial inclusion

# ITU activities on DFS

## FG DFC Deliverables

- Report on interoperability scenarios for DFC implementation
- Develop a security architecture and reference model for implementation of DFC
- Report on use cases for DFC and integration framework with existing payment systems for interoperability and consumer protection
- Report on use cases for big data analytics in DFC implementation
- Report on ICT security and governance reference model for DFC and assurance framework for compliance
- Report on new areas for standardization in ITU-T Study Groups
- Organize thematic workshops and events in order to collect inputs from various stakeholders

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