ITU Workshop on Performance, QoS and QoE for Multimedia Services
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QoS & QoE Metrics and Methodology for Digital Financial Services; Current standardization activities and future plans

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QoS of DFS

- Quality of Service
  - Describes the quality of a service from the customer's perspective
  - A service requires a service description
    - Technical
    - Standardized
- Digital Financial "Services"
  - No common standardized service description
  - High level concept obvious to everyone
  - Generic concept to be revealed
  - KPIs can be derived by experts

Use cases of DFS

- Generic use cases can be differentiated by basic types of application:
  - Use case #1:
    - targeted group of users limited to the use of feature phones, i.e. very basic functionality
  - Use case #2:
    - additional QoS aspects are assessed when the minimum requirements to the phones used for DFS are raised and typical smartphone functionality can be assumed.

Carrier services for use case #1

Carrier service	Main features	Disadvantages	Advantages
SMS	Store-and-forward alpha-numerical messages	Not real-time	Globally available Interconnection ok
IVR (interactive voice response)	Interaction with user by artificial or recorded voice, voice recognition and/or DTMF	Requires good speech quality transmission	Real-time
DTMF	Simple keypad operation	Limited character set	Real-time
USSD	Alphanumerical messages	Requires USSD Gateways	Real-time

Carrier services for use case #2

Carrier service	Main features	Disadvantages	Advantages
SMS	Store-and-forward alphanumerical messages	Not real-time	Globally available Interconnection ok
IVR	Interaction with user by artificial or recorded voice, voice recognition and/or DTMF	Requires good speech quality transmission	Real-time
DTMF	Simple keypad operation	Limited character set	Real-time
USSD	Alphanumerical messages	Requires USSD Gateways	Real-time
WAP	Simple web browser	Limited set of functions	Available on some phones even if they do not support http
HTTP	Standard web browser	Unsecure	Internet-like access
HTTPS	Safe web browser	Complex	Encrypted, not even subject to traffic shaping

Selection of a set of KPIs appropriate for DFS

- Traditionally, ITU neither specifies a specific set of KPI nor target values
- Important task for the DFS stakeholders to enter into a process of the selecting an appropriate set of KPIs

Selection of a set of KPIs appropriate for DFS (ctd.)

- Selection should reflect
  - Local market impacts
  - Customer's preferences and requirements
- Number of parameters need to be manageable both
  - For reporting and
  - For practical application
- Guidance in Supplement 9 to the ITU-T E.800-series

KPIs for non-utilization stages

- Crucial to set KPI for interactions between the user and the service provider outside the actual usage of the service
- Due to the nature of DFS related regulator for the banking sector should be involved
- The following stages need to be taken into account:
  - Preliminary information on ICT services
  - Contractual matters between ICT service providers and customers
  - Provision of services
  - Service alteration
  - Technical upgrade of ICT services
  - Documentation of services (operational instructions)

KPIs for non-utilization stages (ctd.)

- Technical support provided by service provider
- Commercial support provided by service provider
- Complaint management
- Repair services
- Charging and billing
- Network/Service management by customer
- Cessation of service

- Further details and guidance in ITU-T E.803.

Technical KPIs

- Technical KPIs require more knowledge about
  - Use cases of the DFS offer
  - Underlying carrier services of different offers

Interoperability

- Prerequisite for end-to-end QoS
- But not part of QoS
- Depends on underlying technique
  - No problem with SMS or HTTP
  - Extra effort for USSD

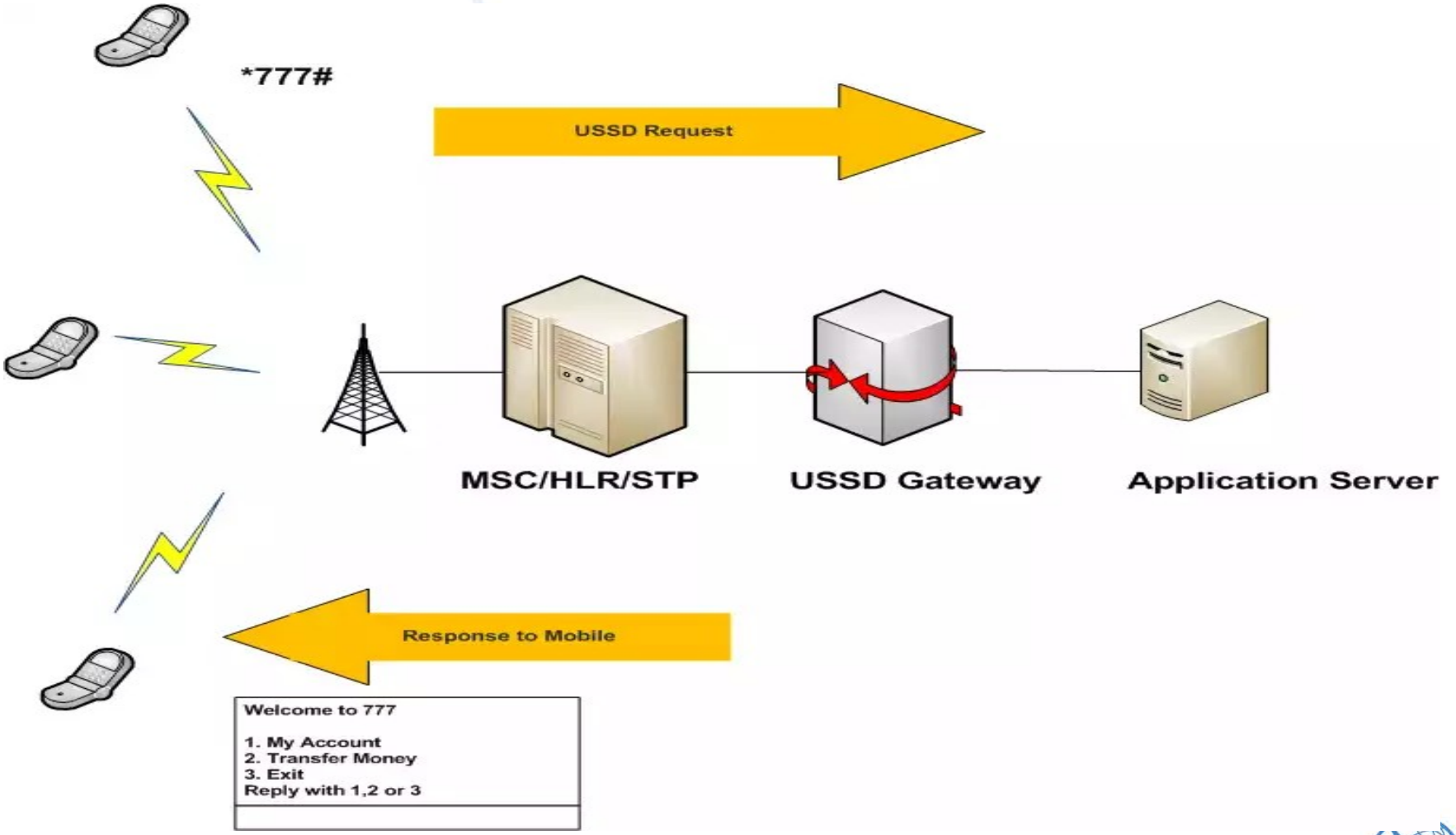
Topics from user perspective

- Time to Restore Service
  - Persistent QoS challenges with DFS:
    - people go to redeem their transfers and they are told the service is down
    - Customers have no indication of when the service is restored
- Vendor Access to overdrafts
  - Other challenges, probably non-technical
    - access of the Vendor to funds for payouts
    - there should be a linkage somewhere that:
      - monies received by a Vendor into the system be allowed for payouts
      - Vendor should be allowed to link a certain deposit account for reserves and overdrafts

Topics from user perspective -1

- Time to Restore Service
  - Persistent QoS challenges with DFS:
    - people go to redeem their transfers
      - Service is down
    - customer has no information of when the service is restored
      - Should receive notification that or when service is up again
- ???

DFS Network Overview (example)



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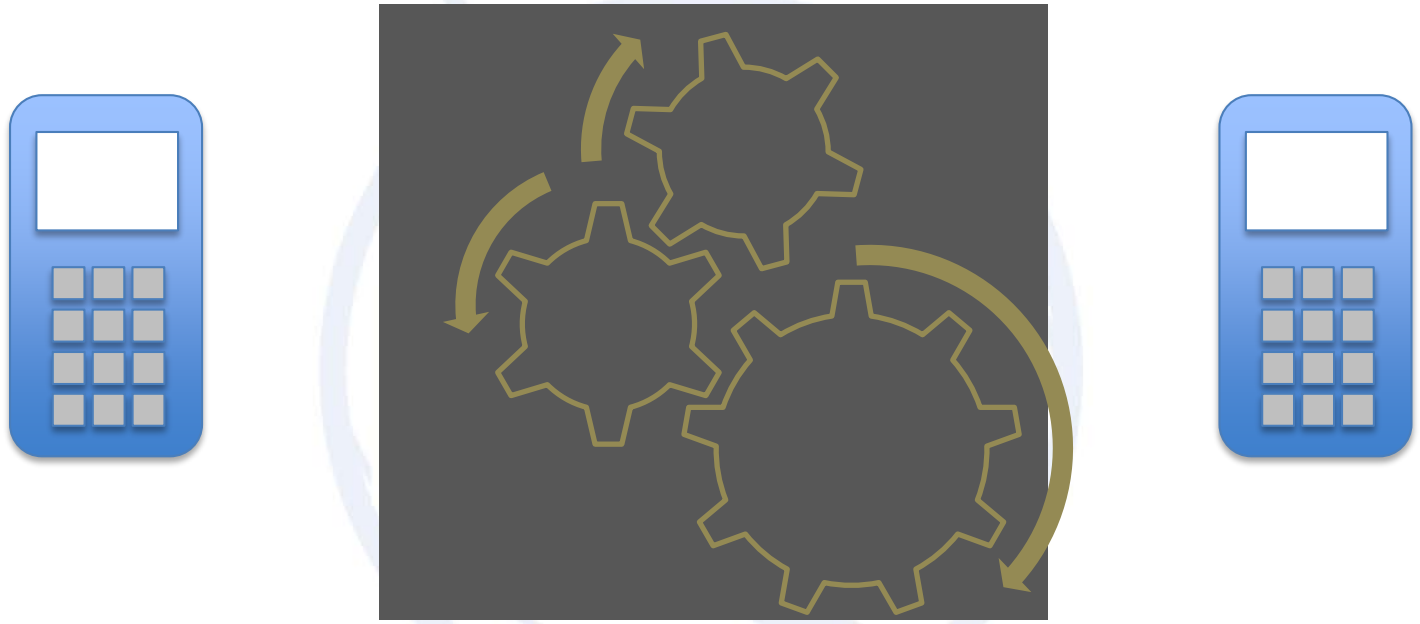
Methodology: “Grey box approach”



- Design of test case and testing environment makes minimal assumptions about actual inner workings of the service under test
  - Avoid using “shortcuts” which may work today but may create vulnerability when implementation or system architecture changes
  - Maintain the customer perspective

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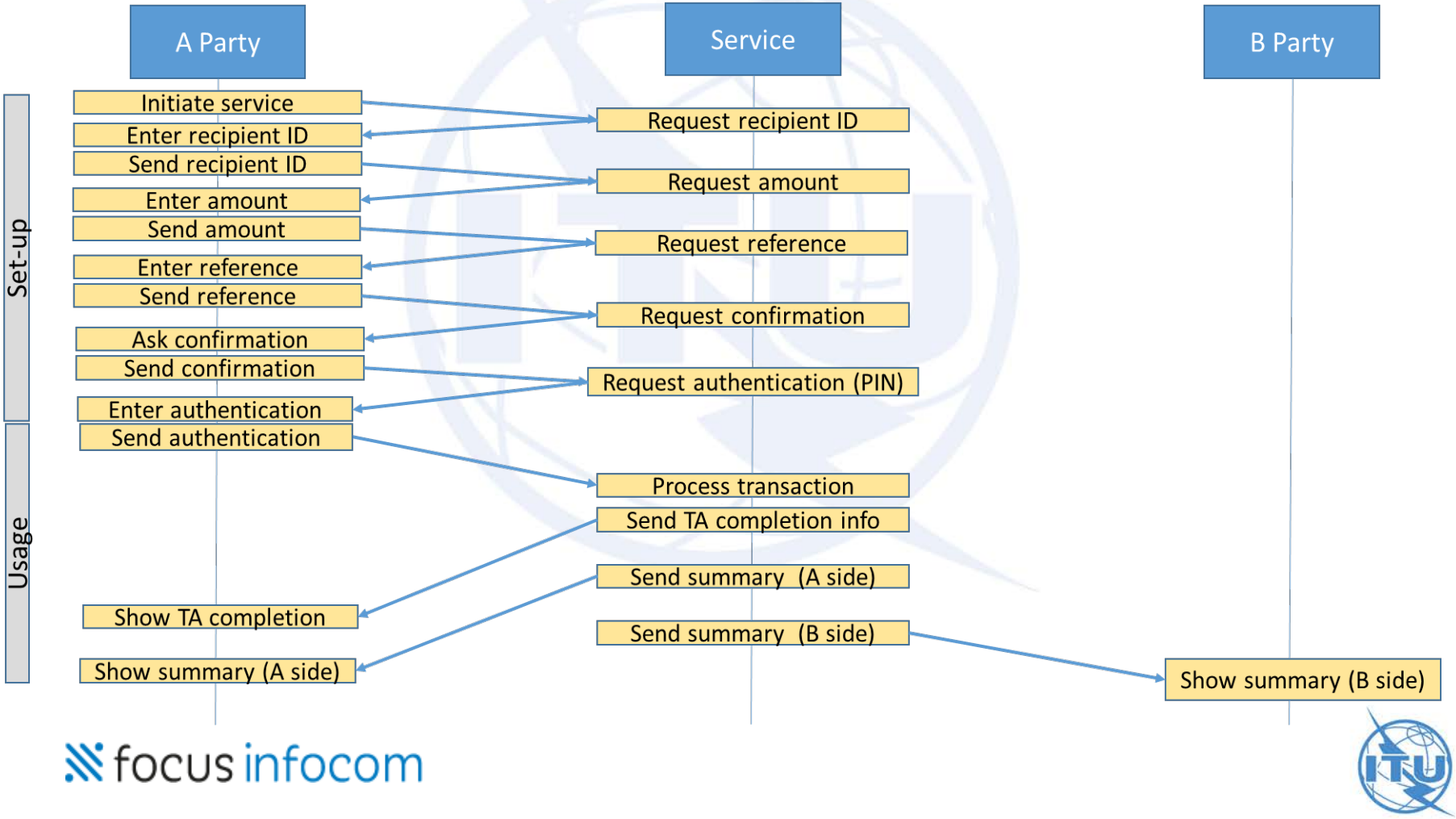
Test case modelling

Event Flow/Entities

- Version B: Collect data incrementally



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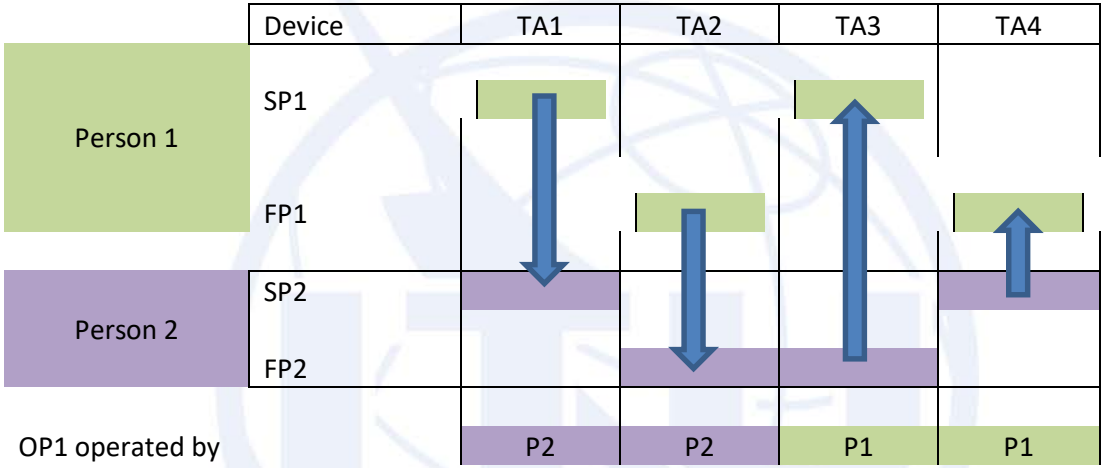
Scenario (person-to-person money transfer)



- Role and activity assignment during a 4-step DFS transfer cycle.
- After one cycle, money is back on SP1/FP1 (minus transaction fees)
- SP1,2; FP 1,2 Smartphones and feature phones used for running the DFS test case
- OP1: device running the network test application. The observing person is also responsible for recording DFS related activities of testers, and events on the devices.

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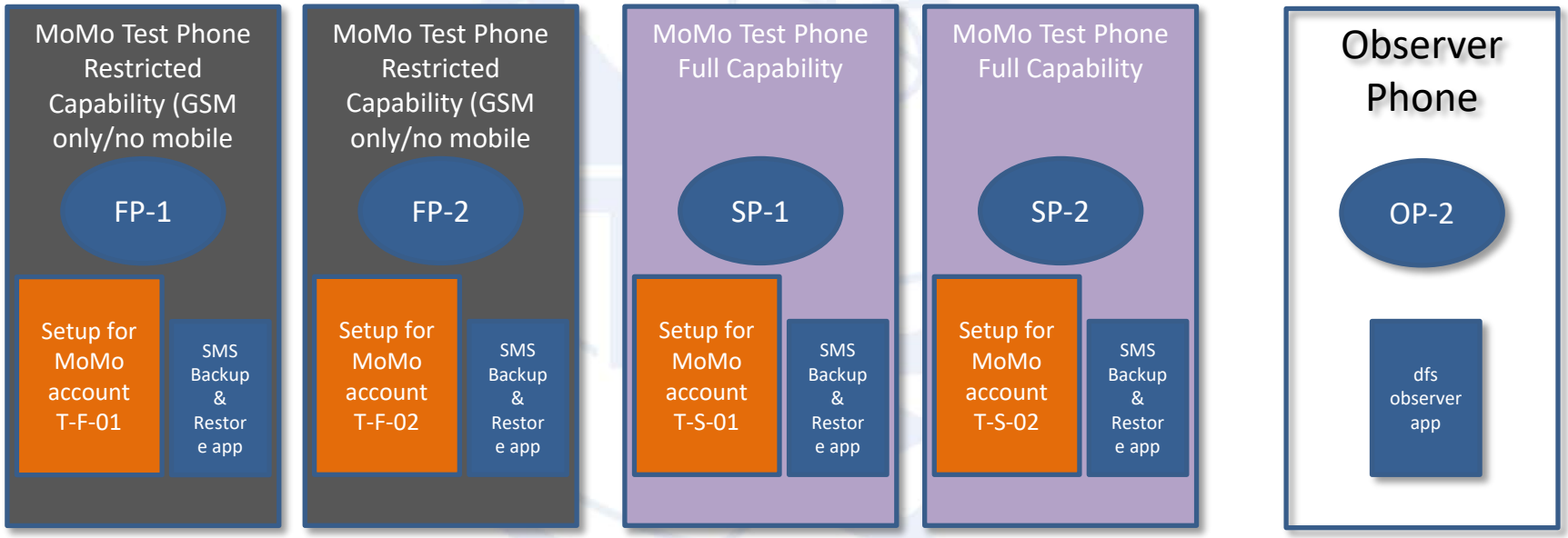
Mobile Device Set-up



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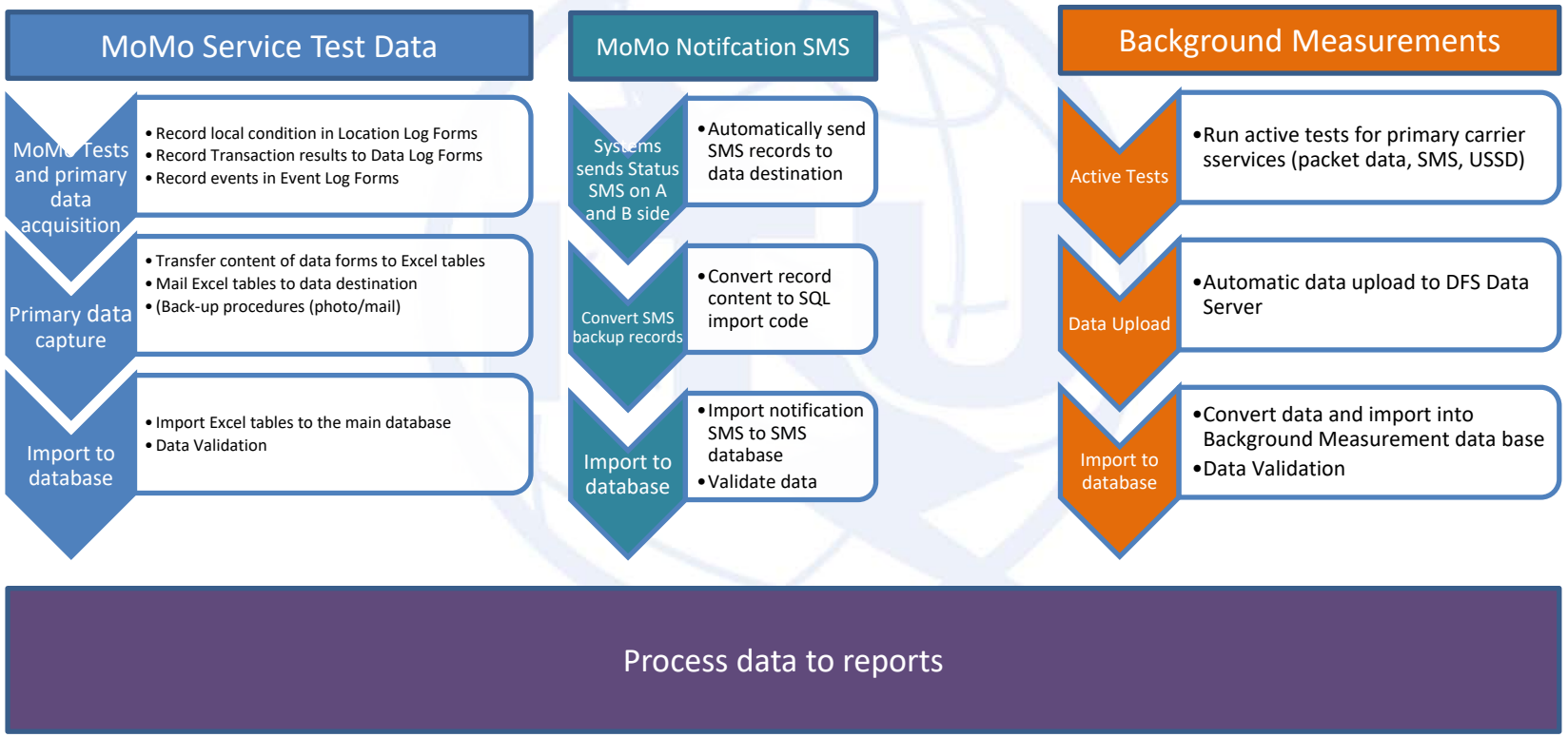
Data and Processing Flow



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End to End DFS KPI (example)

- Assign formal identifiers to events (see prev. slide)
- Express KPI computation in terms of event identifiers
- Example shows excerpt from definition document

1.1 Money Transfer completion rate MTCR

1.1.1 Functional Description

Probability that a money transfer can be completed successfully.

1.1.2 Formal definition

MTCR = ratio between the number of successful instances of the use case, and all valid attempts to perform the use case.

With AA_100 as indicator for a valid attempt (successful activation of the DFS function) and AE_300 as success indicator, the expression becomes (see Expressions)

MTCR = R(AE_300, AA_100)

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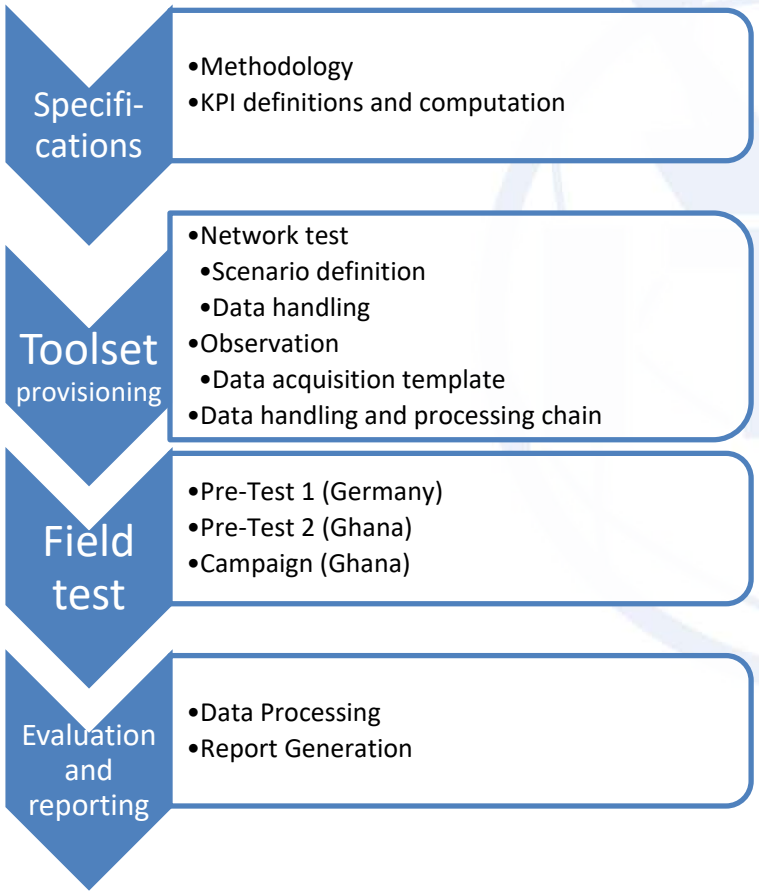
Work plan and workflow timeline



Status as of March 2018

Done (Raw document containing technical definitions)

Done: Scenario, tool customization, USSD and SMS extension (DFS specific)
Done: Data handling processes
Done: Integration tests

Done: Pre-test 1
Ongoing: Pre-test 2 (optimization of processes)
Main Tests: April to June 2018

Scheduled July to September 2018

Final deliverables to be provided thereafter (multiple review rounds)

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Future activities

- Create SG12 Recommendations
  - Application guides etc
- Work on DFS evaluation in subjective test labs
  - Objective modelling of DFS ?
- Country cases
  - Countries applying new to come ITU Recommendations
- More use cases
  - Further modeling of actual “services”

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Any questions ?

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