QOS TRIAL TESTING OF MOBILE FINANCIAL SERVICES (MFS) - CASE OF GHANA

BY:

Samuel K. Agyekum, MPhil, BSP

(Head, Network Monitoring, NCA)

NATIONAL COMMUNICATIONS AUTHORITY

Presentation Outline

- Introduction
- Test Methodology
- Measurement Profile & Scenario
- QoS Parameters, Definitions & Formula
- Test Results and Analysis
- Conclusion & Planned Way Forward

Introduction

- The National Communications Authority (NCA) conducted **a QoS trial testing exercise on mobile financial services (MFS)** from 12th June 2019 at 10:21 am to 3rd July, 2019 at 12:02 pm in the case of two (2) Mobile Network Operators in Ghana.

- The tests were performed with the objective of **assessing the capability levels of mobile money platforms** to comply with QoS indicators and targets on mobile financial services (MFS).

- It also sought to ascertain **NCA's testing and consumer protection readiness** on mobile money transaction services and more so in line with Ghana's **Payment Systems and Services Act, 2019** (Act 987)

Test Methodology

National Communications Authority (NCA) is currently using the SIGOS Integrated Test Environment (SITE) system as its the billing verification solution (BVS) on billing accuracy, mobile money (MOMO) and revenue assurance tests.

In this QoS trial testing exercise on MFS;

- *A total of four (4) mobile money registered simcards for two (2) operators were fully configured to work in a complete, automated and independent way based on the Unstructured Supplementary Service Data (USSD) application.*
- *Test CDRs of MOMO transactions were generated together with their configured settings.*
- *Live CDRs were imported from Operators via an ftp link ftps://ftp@nca.org.gh.*
- *Comparison and reconciliation of test results was performed with Operators X and Y using live and test CDRs (from SITE system)*

Measurement Profile & Scenario

Step 1:The test is initiated with the "*Start Recording activity*" after which the Measurement Sequence Activities follows.

Step 2: MFS Portal short code (USSD) of the Operator is dialed by the sending number, herein "A-party", as configured in the system.

Step 3: Money is transferred by the sending number to a receiving number, herein "B-party".

Step 4: After the end of each transaction, the system becomes idle for 60 seconds (wait period) and reactivated to perform the next transaction.

Note 1: The "*wait time*" allows for the proper completion of the transaction and release of channels used for the transactions.

Measurement Profile & Scenario

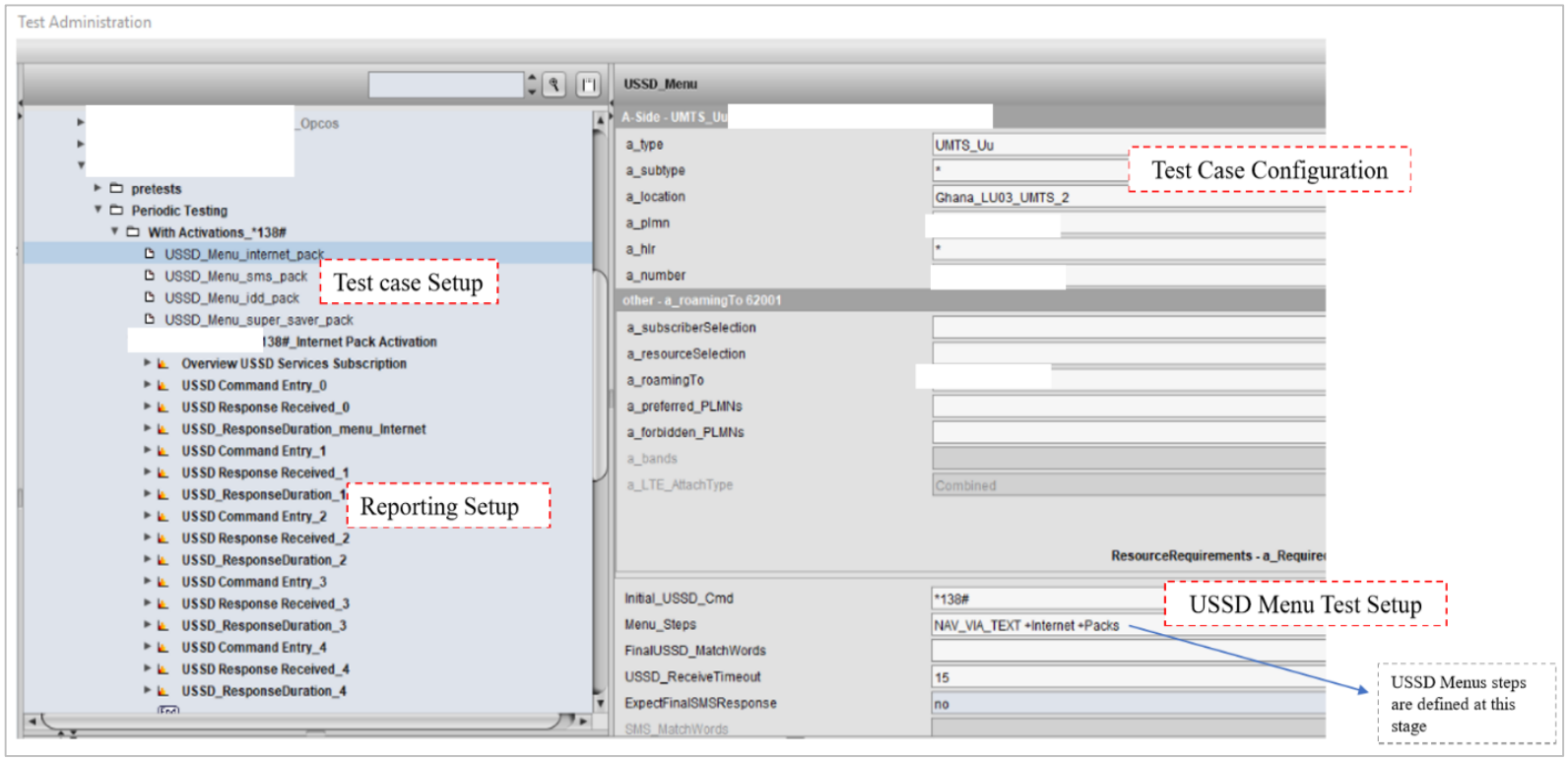


Fig 1: Configuration of USSD services using the BVS for Momo Testing

QoS Parameters, Definitions & Formula

Parameter	Definition	Formula	Measurement Mechanism	Measurement Tool	Target
MFS Accessibility Rate	Percentage of successfully accessed MFS portal request	(Number of MFS Portal request response received/Total Number of MFS Portal Request Attempts)*100	Test Traffic	Billing Verification System	=100%
MFS Response Time	The duration from when a MFS request is made to when response is received	Average Response Duration for each USSD Command String	Test Traffic	Billing Verification System	All service requests should be less than 5 seconds
MFS Success Rate	Percentage of successfully completed MFS request	(Number of completed service request/ Total number of service request) *100	Test Traffic	Billing Verification System	=100%

Test Results and Analysis

- The parameters assessed were benchmarked against compliance requirements in Ghana's Draft QoS regulations at the time of testing.

- The summary of the results of the QoS parameters under consideration for Operators X and Y are below:

Operator	MFS Accessibility Rate = 100%	MFS Success Rate = 100%	MFS Response Time < 5 Sec
Operator_X	100%	100%	1.81
Operator_Y	100%	100%	1.61

Test Results and Analysis

Test Case	Test_Case_Id	Timestamp	USSD Command Response Duration_0	USSD Command Response Duration_1	USSD Command Response Duration_2	USSD Command Response Duration_3	USSD Command Response Duration_4	USSD Command Response Duration_5
1	3201533	12/06/2019 10:21	1.88	0.59	0.54	0.50	0.51	0.49
2	3201542	12/06/2019 10:26	1.64	0.74	0.58	0.53	0.53	0.56
3	3201644	12/06/2019 13:25	1.91	0.58	0.55	0.55	0.44	0.36
4	3202304	13/06/2019 09:48	1.82	0.67	0.59	0.45	0.57	0.37
5	3202440	13/06/2019 13:23	1.92	0.72	0.61	0.56	0.50	0.50
6	3203098	14/06/2019 09:46	2.92	1.84	0.50	0.62	0.57	0.49
7	3203226	14/06/2019 13:23	1.84	0.53	0.55	0.56	0.49	0.59
8	3203884	15/06/2019 09:47	2.11	0.58	0.55	0.62	0.67	0.56
9	3204012	15/06/2019 13:24	2.20	0.61	0.60	0.54	0.45	0.47
10	3204670	16/06/2019 09:46	2.30	0.56	0.46	0.48	0.47	0.51
11	3204798	16/06/2019 13:24	1.76	0.55	0.74	0.53	0.57	0.56
12	3205456	17/06/2019 09:46	1.92	0.50	0.70	0.53	0.60	0.43
13	3205528	17/06/2019 11:46	1.93	0.53	0.48	0.56	0.38	0.65
14	3205538	17/06/2019 11:54	1.76	0.57	0.61	0.57	0.57	0.54

REMARKS:

- The above Table provides a snapshot yet detailed information about the service response times for several MOMO test cases

Test Results and Analysis

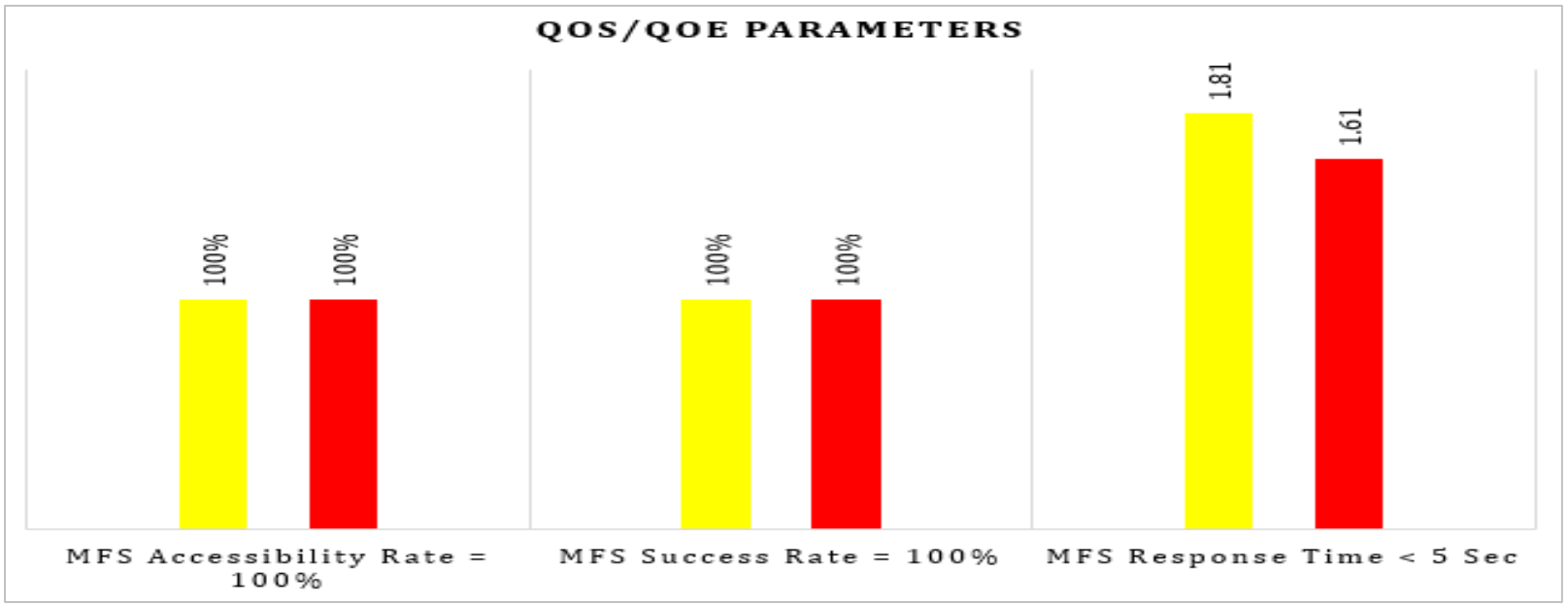


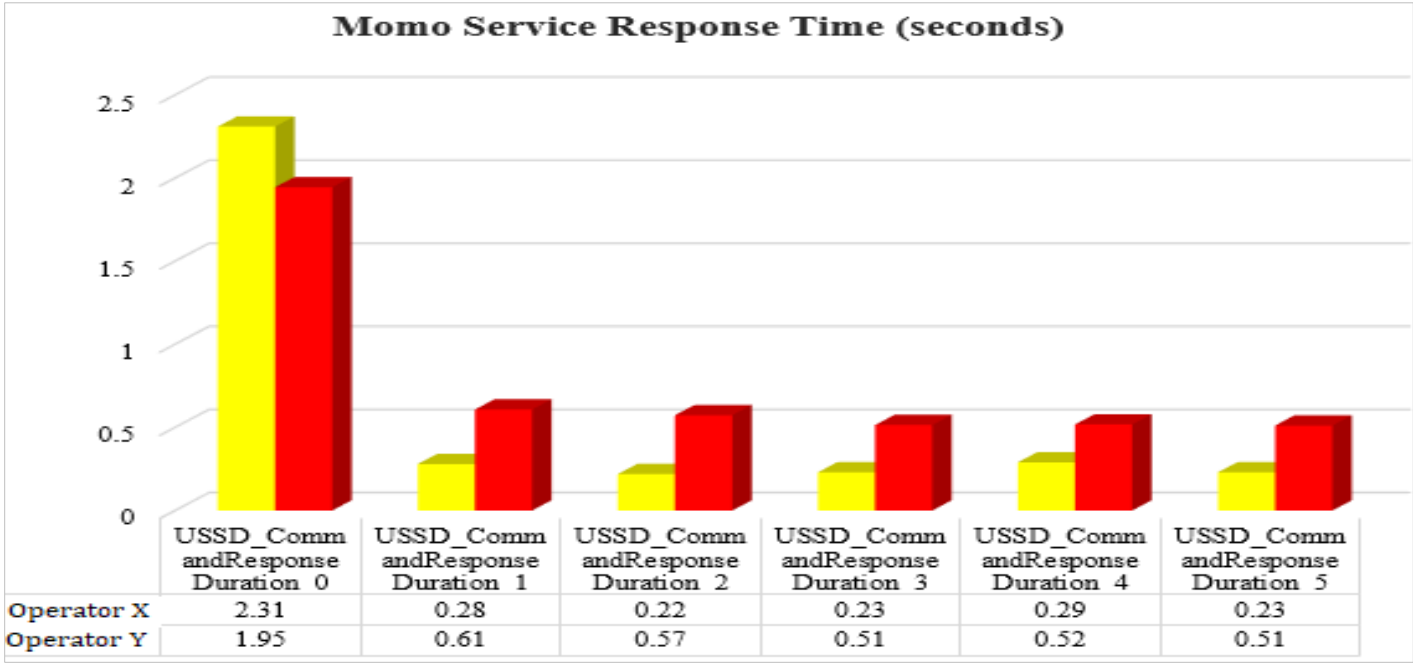
Fig 2a: Benchmarking the QoS performances of Operators X and Y

REMARKS:

- Operators X and Y met the expected targets for all parameters tested (Accessibility Rate, Success Rate and Response Time).

- Operators X and Y attained 100% in Accessibility Rate and Success Rate and recorded average service response times of 1.81 secs and 1.61 secs respectively

Test Results and Analysis



	USSD_CommandResponse Duration 0	USSD_CommandResponse Duration 1	USSD_CommandResponse Duration 2	USSD_CommandResponse Duration 3	USSD_CommandResponse Duration 4	USSD_CommandResponse Duration 5
Operator X	2.31	0.28	0.22	0.23	0.29	0.23
Operator Y	1.95	0.61	0.57	0.51	0.52	0.51

Fig 2b: Benchmarking of Avg. MOMO Service Response times of Operators X and Y

REMARKS:

- Operators X and Y recorded relatively less Avg. Response Times (i.e. below 1 second) for all Mobile Money USSD requests as compared to the Main Menu request command.

Conclusion & Way Forward

- The findings of this exercise indicated that out of the 26 test cases, Operators X and Y recorded a MFS Accessibility Rate of 100%, and MFS Success Rate of 100% and Average Service Response times of 1.81 & 1.61 seconds respectively .

- The NCA would take steps to review the New Rec. P.1502 (former P.DFSm) “Methodology for QoE Testing of DFS” to fine-tune Ghana’s testing regime on Digital Financial Services.

- It is our expectation that future test reports would be shared as Ghana’s contribution to the ongoing DFS standardization work under Q20/12.

Thank You for your time & attention