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TECHNICAL DOCUMENTATION FOR THE HB-MCN MIDDLEWARE

As-Built by Quetzal Consults

DOCUMENT SUMMARY

Technical Overview of the Heritage Bank and MultiChoice Integration for DSTV and Go-TV Payment Middleware

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1.0   Version History

Version No:	Date Revised	Revised by	Comments
1.0:	March, 2018	Bola Adekoya (Solution Architect)	Initial Document

2.0   Product Brief:

This document is created to serve as a Technical Reference for the Middleware created by Quetzal Consults for the Heritage Bank – Multichoice Integration. It contains the relevant Technical Information for the As-Built (Version 1.0) of Middleware along with the necessary technical dependencies required for the integration.

3.0   Platform Overview

3.0.1 Architecture Overview
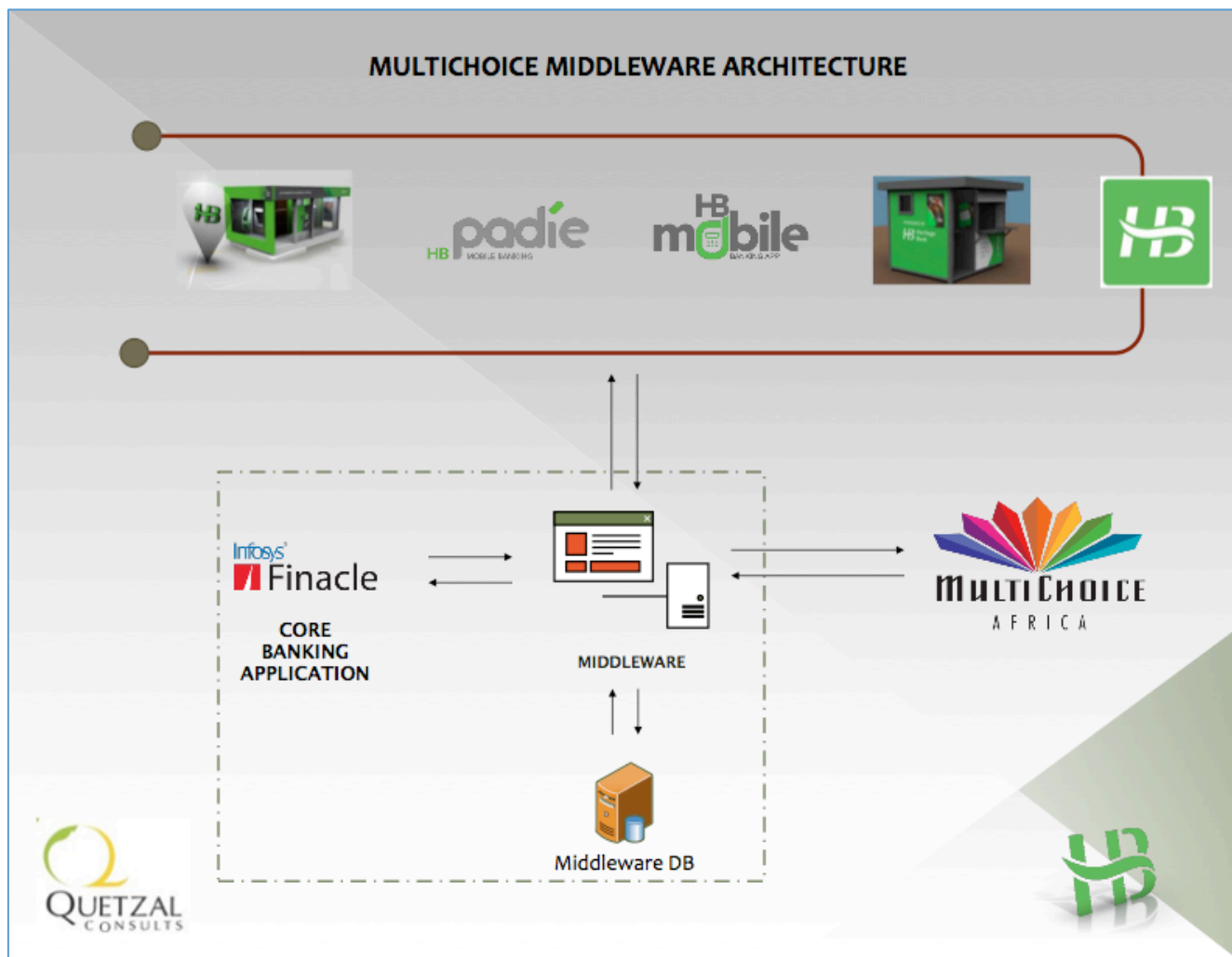
3.0.2 System Details and Configuration

SYSTEM:	TECHNOLOGY	PLATFORM
Programming Technology:	.NET CORE 2.0	C#
Architecture Type	Multi-Tiered Architecture	
Server OS:	Windows Server 2012 R2	Microsoft
Database Engine:	SQL Server 2008 R2	
Web Services	REST	JSON

3.0.3 Application Business Technology Dependencies

BUSINESS SYSTEM:	DESCRIPTION
Connect 24	This is a Finacle Middleware responsible for converting ISO messages for Finacle to perform Transactions.
Finacle 10:	This is the Core Banking Application of the Bank. It holds information pertaining to the Customer's Account i.e. Customer Name, Balance, Account Validity etc. This system is queried using the API Services (Finacle)

3.0.4 Services, Libraries and Running Tasks

NAME:	Description	Comments
Retry Service:	This service retries transactions that were debited but could not get a response from MCN. It also reverses transactions that have exceeded the number of retries	A console service deployed on the server using Windows Task Scheduler. This service runs every 3 minutes
Finacle Service	This service is used to get Customer's details based on the Account Number supplied by the User on the Platform.	http://apps.hbng.com/applicationservices/finacleservice.asmx
MCNService	The middleware API handling the request	Yet to be determined

4.0   Engine / Core

This adopts a 2-Tiered Architecture structure i.e. Web Service Layer and Database Layer. It depends on some internal Business Systems (captured in 4.0.3) using WebServices or Libraries.

The API is responsible for Three (3) Major Processes in the integration with the MultiChoice API and is generic to all endpoints. These processes are

- **Authorization of End Points:** this manages the security of the API
- **Operations Management:** This manages the Operations and Interactions of the API between MultiChoice, Finacle, the database and the 3rd Party Application
- **Transactions Management :** This manages transaction queries on the Middleware.

The Middleware uses REST technologies and ContentType will be in JSON; the API will log Transaction details performed by each 3rd Party System (channel) integrated into a local database.

4.1 How the Engine Works

PAYMENT PROCESS

1. Calling API initiates Payment Process
2. Validate the package selected to make sure it's DSTV or GoTV
3. Confirms if the API consumer is authenticated and authorized
4. Confirms the API client has not been recently deactivated
5. Based on the API client's setup, calculates the income sharing
6. Check to make sure the customer has sufficient balance to cover both the fees and the main transaction amount
7. Log the payment request (Transaction Table)
8. Generate transaction reference
9. Debit the customer
10. Update the transaction table with the debit response
11. If debit was successful, proceed to call MCN payment service **(skip to 13**),
12. Else return failed response to calling API
13. Update the transaction table with MCN response
14. If MCN Response is failed, trigger **Failed Transactions (RETRY) Process** else Return MCN response to calling API
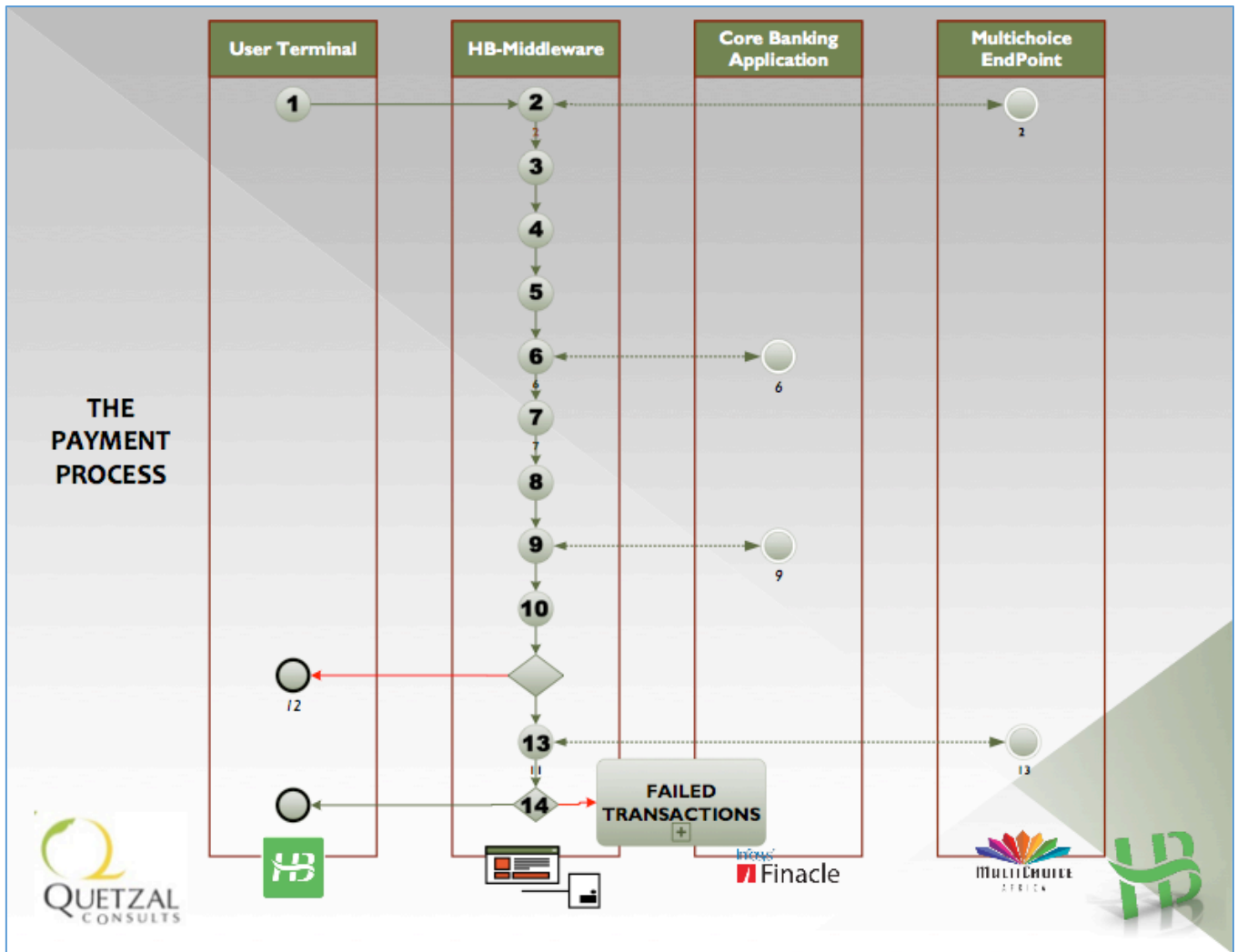
FAILED TRANSACTIONS (RETRY)

1. System checks for transactions that were debited but did not get success response from MCN
2. System checks their status on MCN,
3. if successful, system updates the transaction tables **(Step 13 – Payment Process)**
4. if failed, system attempts to repost to MCN
5. System updates transaction table with MCN response (**Step 13 – Payment Process)**

FAILED TRANSACTIONS (REVERSAL)

1. System runs a check for transactions that were debited and have attempted repost to MCN up to the maximum retry period
2. System sends reversal request to Finacle via C24
3. System updates transaction table with Finacle response
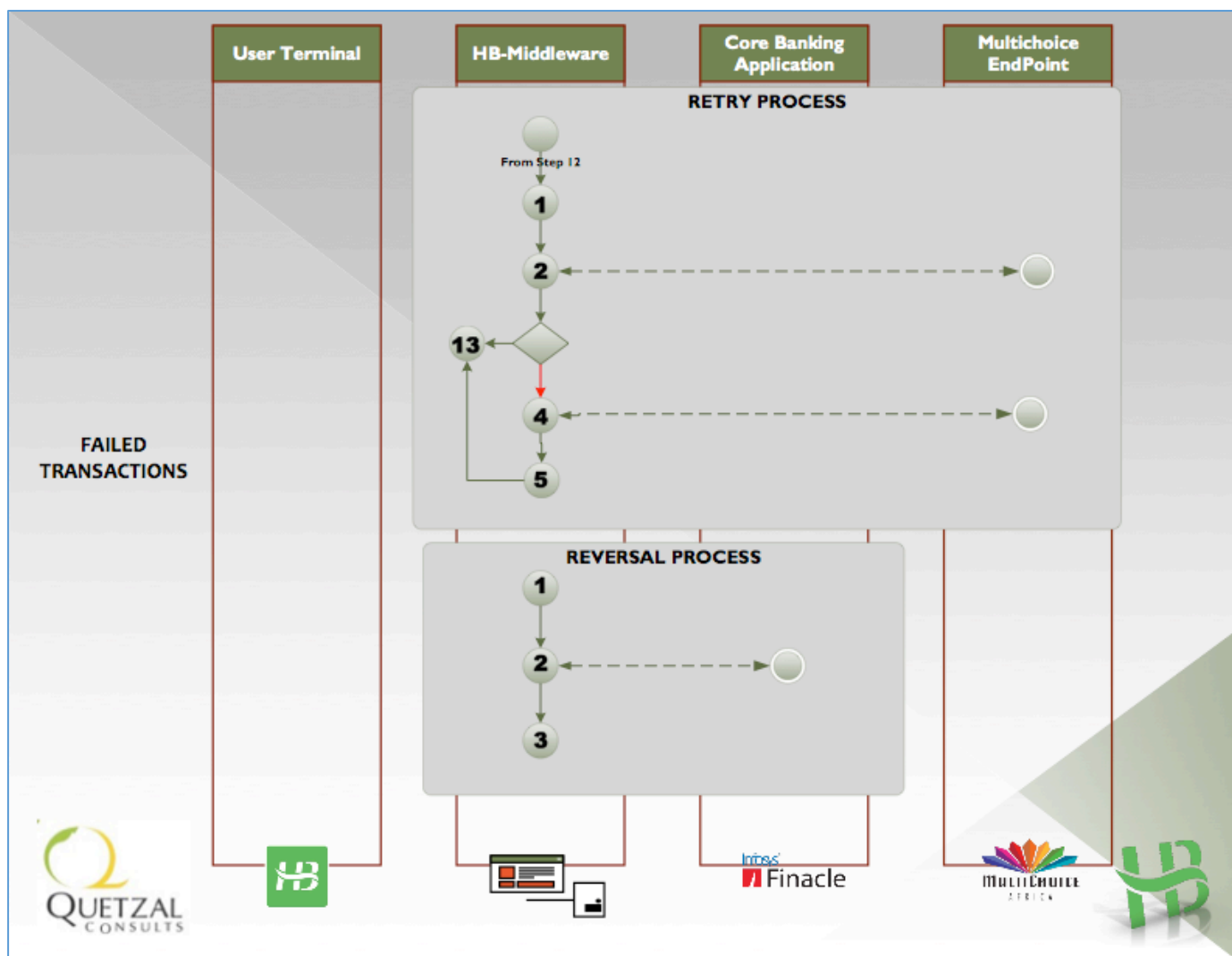
5.0   Database Information

This system maintains a database (SQL Server 2012 R2) which it uses to perform its operations; the Database is housed on the Database Layer and communicates with other parts of the system using the Application Layer.

5.1 Tables, Descriptions and Structure

TBL_01: APIClients

Description: This table stores the configuration of APIClients accessing the middleware.

PrimaryKey: Id

Column Name	Data Type	Length	Nulls	Identity	Description
Id	int	4	N	Y	Auto generated Id for the table
Active	bit	1	N	N	Status indicating if the 3rd is active/inactive. This status also indicates if the 3rd party can use the API
BankIncomeAccount	varchar	15	N	N	The bank (HBC) income account

ClientId	varchar	20	N	N	The Unique Name of the 3rd party application
ClientIncomeAccount	varchar	15	N	N	The 3rd party income account
DateCreated	datetime2	8	N	N	System Date captured by the database when the 3rd party application was added
EmailAddress	varchar	100	N	N	Email Address used by the 3rd party application. This is important as generated password would be sent to it upon reset
HashSalt	nvarchar	512	N	N	System generated salt for hashing the password
IncomePercent	decimal	9	N	N	% share of the income that the 3rd party application would take from the fees
Name	varchar	100	N	N	Full name of the 3rd party application
Password	varchar	250	N	N	Hashed password, this is generated by the system

TBL_02: Transactions

Description: This table stores the details of transactions performed through the middleware.

PrimaryKey: Id

Column Name	Data Type	Length	Nulls	Identity	Description
Id	int	4	N	Y	Auto generated Id for the table
AccountNumber	varchar	10	N	N	Customer account number
Amount	decimal	9	N	N	Amount been paid
ApiClientId	varchar	20	N	N	3rd party application, processing the payment
AuditReferenceNo	uniqueidentifier	16	N	N	Audit Reference number generated by MCN
BankIncome	Decimal		Y	N	The fees earned by the bank
BankIncomeAccount	varchar	15	Y	N	The bank(HBC) account where the fees is remitted to
BusinessType	varchar	10	N	N	DSTV or GoTV
ClientIncome	decimal	9	Y	N	The fee amount earned by the 3rd party application for the particular transaction
ClientIncomeAccount	varchar	15	Y	N	The 3rd party income account where the fees is remitted to
CustomerNumber	varchar	10	Y	N	MCN customer number
DeviceNumber	varchar	10	Y	N	Customer device number (in case of GoTV) or smart card number (in case of DSTV)
EmailAddress	varchar	100	N	N	The supplied email address when payment is being made
FinacleStatus	Varchar	1	N	N	Status indicating if the transaction was posted to Finacle successfully. P - Posted

					R – Reversed N – Not Posted NULL or empty – never posted
FinacleTraceId	varchar	100	Y	N	Finacle transaction Trace Id
FinacleTranId	varchar	100	Y	N	Finacle transaction Tran Id or error
IPAddress	varchar	100	N	N	IP address where the transaction originated from
LastRetryDate	Datetime2	9	N	N	The last date (& time) the system attempted to post the payment to MCN
MCNErrorMessage	varchar	500	Y	N	MCN error message
MCNStatus	bit	1	N	N	MCN status, to indicate if payment was effected on MCN
MobileNumber	varchar	15	Y	N	The supplied mobile when payment is being made
Narration	nvarchar	-1	Y	N	The payment narration as supplied
PackageCode	varchar	20	Y	N	The MCN package code selected by the customer
ReceiptNumber	int	4	Y	N	Receipt number issued by MCN
RetryCount	Int	4	N	N	The number of attempts the system has made to post the payments to MCN service.
ReverseTranId	varchar	100	Y	N	Finacle Tran Id, if the transaction was reversed. Usually due to payment failure from MCN
TransactionDate	datetime2	8	N	N	Transaction date
C24OfficeAccount	Varchar	12	N	N	The office account (for MCN) the payment was made to
BasketId	Int	4	Y	N	The customer basketId as supplied by MCN GetCustomerDetails
InvoicePeriod	Int	4	N	N	The invoice period selected for the payment
LastReversalAttempt	Datetime2	9	Y	N	The last time the service attempts to reverse failed transactions that have exceeded the number of retry counts
PaymentMode	Varchar	12	N	Y	The mode of payment
TransactionReference	Varchar	12	N	Y	The reference number generated by the system for the transaction