Business Requirements Document

for

Digital Financial Services Data Reporting and Analytics Platform

Version 1.0

11 December 2018

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Document Purpose

The purpose of the Business Requirements Document (BRD) is to describe the different requirements for the Bank of Zambia's (BoZ) envisioned ***Data Reporting and Analytics platform.*** This document describes what the system would look like from a business perspective and lists critical requirements accurately in a technology-independent manner.

Specifically, this document intends to describe;

- Business Requirements – high level business needs and goal of BoZ
- User Requirements – needs of primary users who will be using the platform regularly
- Non-Functional Requirements – usability and behaviour characteristic required from the platform (in relation to things like the user interface, access security, availability, robustness, system failure, integration
- Transition Requirements – capabilities the platform must have to meet future requirements

The information has been captured and written through technical support from UNCDF MM4P and signed-off by the relevant stakeholders at BoZ, validating the requirements meet their core business needs. This document does not include technical and functional design specifications for the BoZ platform, nor provide an analysis of requirements related to systems outside BoZ.

Sign-offs

Having validated the structure and contents of the document, the below stakeholders are signing-off on their specific business requirements.

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Waza Ng'uni Munkombwe	Analyst, Payment Systems Oversight	28 February 2018
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Introduction

Bank of Zambia

Created through the passage of the Bank of Zambia Act in 1965, The Bank of Zambia (BoZ) is the central bank of Zambia. The principal responsibilities of BoZ include being banker to government, issuer of currency, manager of foreign exchange reserves, controller of commercial banks' liquidity and with responsibilities for the formulation and implementation of monetary policy.

The Bank is active in promoting financial inclusion policy and is a leading member of the Alliance for Financial Inclusion. It is also one of the original 17 regulatory institutions to make specific national commitments to financial inclusion under the Maya Declaration, during the Global Policy Forum, held in Riviera Maya, Mexico in 2011. BoZ has deployed various policies to ensure that financial services are able to make in-roads in remote and rural areas. Still, financial services are concentrated in mostly urban and semi-urban areas, with capital region of Lusaka having the highest concentration.

Zambia was the earliest adopter of digital financial services (DFS) in Africa in 2002, and the country has made significant improvements over the years in terms of financial services delivery outlets/channels offered through both formal and informal financial institutions. Despite that, the level of adults Zambians above 18 years who are excluded from financial services remains significant. Data from the Finscope Zambia survey conducted in 2015 showed that only 59.3 % of the population are financially included.

The Bank of Zambia realizes the important catalytic role that Digital Financial Services (DFS) can play towards the increased usage of electronic payment mechanisms by the general public. The Bank of Zambia is therefore working with government and other private and public stakeholders to increase financial inclusion, by increasing access to formal financial services. To this effect the Bank has amongst its strategic objective include plans to increase formal financial inclusion.

A number of initiatives have since been put into motion in order to meet this objective. Among others, these include;

- Working financial institutions and other interested parties in carrying out sensitization campaigns that highlight the importance of using formal financial services
- Review of regulatory space in order to promote innovation and increase usage of modern payment mechanisms and financial services, and provide safety and security amidst innovation in the payment systems in the country
- Working with the commercial banks, electronic money issuers (e.g. mobile money) and other financial service providers to implement a National Financial Switch
- Establishment of standards and regulation that facilitate for interoperability of retail and large value payment streams both domestically and across the border.

To ensure integrity of the Digital Financial Services (DFS) sector and enhancing of financial access and usage, Bank of Zambia recognizes it is important that data and measurement tools are deployed for aiding effective supervision and policy making.

UNCDF

UNCDF is the UN's capital investment agency for the world's 48 least developed countries (LDCs). With its capital mandate and instruments, UNCDF offers "last mile" finance models that unlock public and private resources, especially at the domestic level, to reduce poverty and support local economic development. This last mile is where available resources for development are scarcest; where market failures are most pronounced; and where benefits from national growth tend to leave people excluded.

Mobile Money for the Poor (MM4P)

Mobile Money for the Poor (MM4P) is a global thematic initiative to address the opportunities and challenges of implementing branchless banking and mobile money in challenging markets in Africa and Asia. MM4P's long-term mission is to help low income and rural households in LDCs increase their financial security through appropriate, affordable and secure means to receive, manage and save money through these "digital financial services" (DFS). DFS refers to a range of formal financial services accessible via digital channels, such as mobile money and agency banking, as opposed to traditional financial services accessed through physically visited at a bank branch. UNCDF is currently implementing this in eight countries (Benin, Laos, Nepal, Malawi, Myanmar, Senegal, Uganda and Zambia).

In Zambia, MM4P launched its program in March 2015, funded by both MasterCard Foundation, is aimed at increasing active usage of DFS from the current 3% to 36% by 2019 amongst the adult population. Using the MM4P theory of change, the program seeks to work with all DFS providers, the regulators and the government to achieve this mandate.

Data Reporting and Analytics Platform

1. Business Requirements

The Bank of Zambia is mandated by the Bank of Zambia Act (1996) and the National Payment Systems Act (2007) to ensure that Zambian payment systems are safe, secure, reliable and efficient. In order to discharge these functions, the Bank needs a robust Data Reporting and Analytics platform (hereinafter "the Platform") that will support its monitoring and policy making activities.

Consequently, the 'Banking Currency and Payment Systems Department' at BoZ, with support from UNCDF Zambia, seeks to deploy a ***Data Reporting and Analytics platform*** that would automate the reporting processes and provide analytics useful for policy making.

Through the platform BoZ aims to;

- Automate the collection, aggregation and analysis of data
- Provide data and analytics for policy formulation towards enhancing financial inclusion in Zambia
- Provide aggregated market data for the Zambian DFS Ecosystem on a regular basis
- Identify underserved geographies and population segments
- Enhance monitoring and evaluation of sector through data analytics
- Enable providers to monitor their performance and craft effective strategies

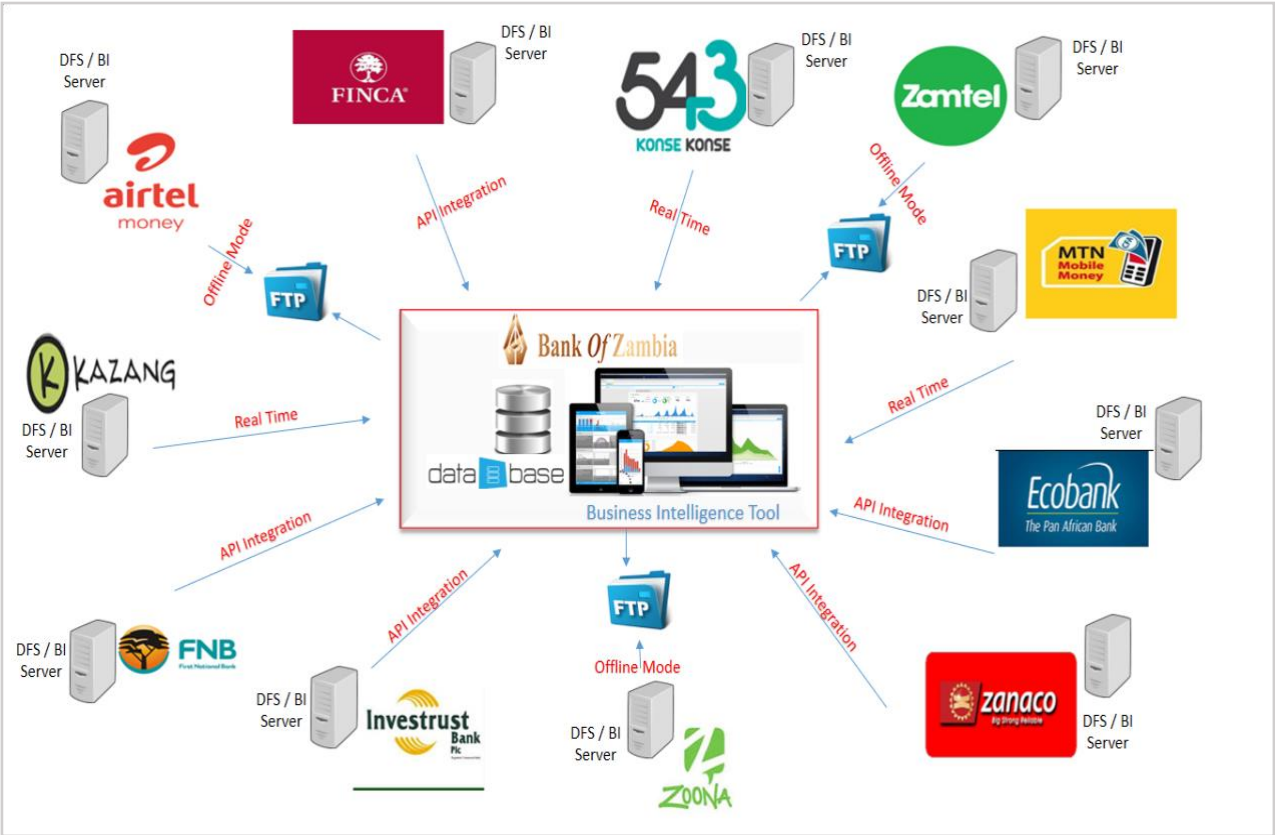


Table 1: High-level view of envisaged platform

I. Existing Process (As-Is)

BoZ collects a significant magnitude of data from financial service providers to carry out its regulatory obligations and policy making function. The transactional data is collected from a range of institutions include banks, non-banks and DFS providers (for list of reporting institutions please see Annexure 1).

The present reporting process involves providers manually filling the required regulatory reporting data in a pre-defined excel spreadsheets and emailing it to the BoZ (Banking Currency and Payment Systems Department) within the first week of every month. Staff at Payment System then collects more than 50 excel files from 34 reporting institutions to manually aggregate the data from these sheets to prepare monthly, quarterly and yearly performance reports. The monthly reporting process takes a dedicated resource nearly a week to complete and an additional week is required when quarter and year-end reports are prepared.

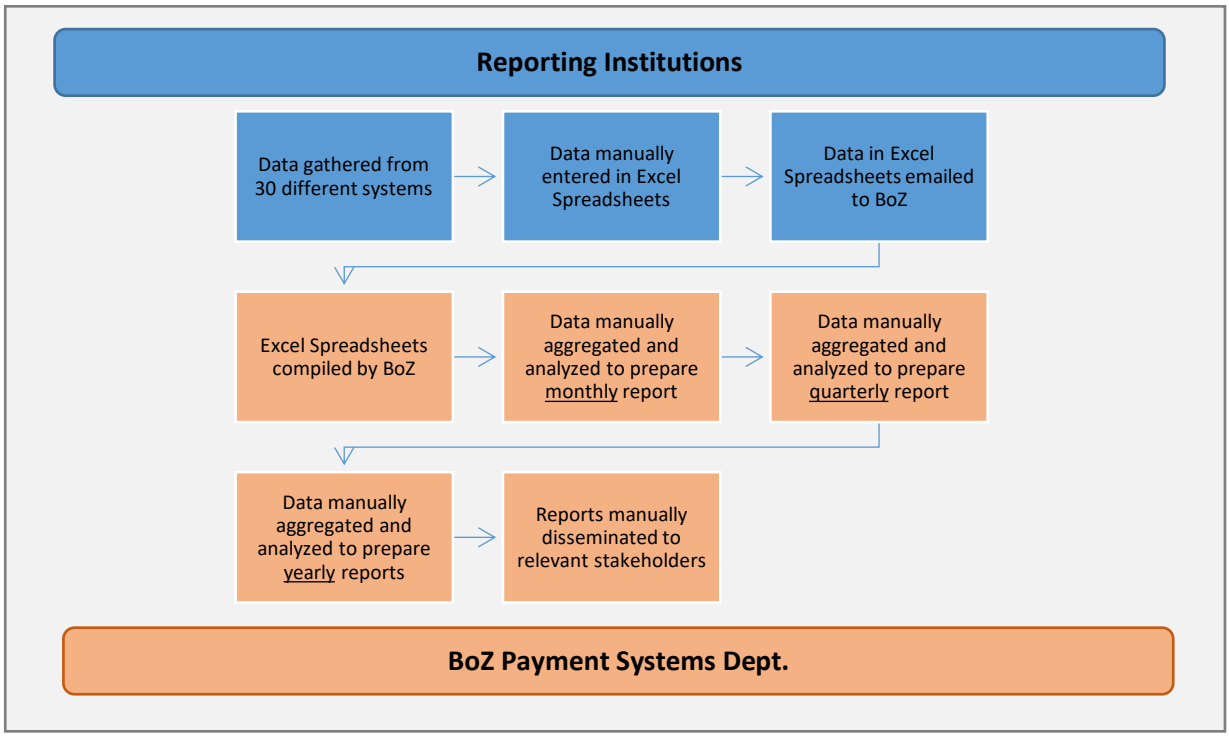


Figure 1 Current reporting process

Needless to say, the current process of manually entering, extracting, compiling, aggregating, analysing and reporting data creates numerous challenges for both; BoZ and reporting institutions.

The challenges include:

- Process is laborious and time-consuming, requiring investment of substantial time every month
- Process is prone to human errors and data is not always consistent
- Overly dependent on individuals who are trained to submit, compile and analyse data
- Limitations on kind of data analysis that can be conducted manually to support policy making
- Challenges in timely generation and distribution of reports to stakeholders
- Potential security issues as data is shared through emails over internet

II. Business Objectives (To-Be)

BoZ seeks to implementing a secure, flexible, scalable solution that automates the data collection, analysis and reporting process. Once the data has been collected and cleansed, it will be stored in a secure database and the analytical functionality would create intelligence in the form of dashboards, visualizations and reports (adhoc & routine).

At a minimum, the platform would have the following featured capabilities:

- The platform is envisaged to have an internal utility at BOZ and should also provide an external interface;
- Capability to run analytics, driven mainly by i) Data collected from BOZ reporting from all forms of financial institutions providing Digital Financial Services, ii) Data collected from other different sources around mobile networks, poverty levels, population;
- Platform should provide an interface to the financial and non-financial institutions licensed by BOZ to submit data-set online related to mandatory reporting and related to financial channel;
- A link needs to be established through the Bank of Zambia website to provide data access and login access;
- Capability to validate data entries and flag data outliers that might indicate data entry errors;
- Mapping of existing digital financial services infrastructure across Zambia by district and province if possible.;
- The data set should as far as possible be clustered at the lowest administrative level which is the lowest structure in administrative hierarchy;
- The tool be set-up as a platform with public interface supported with key control measures to ensure data confidentiality;
- The tool should be open for future changes and integrations based on need

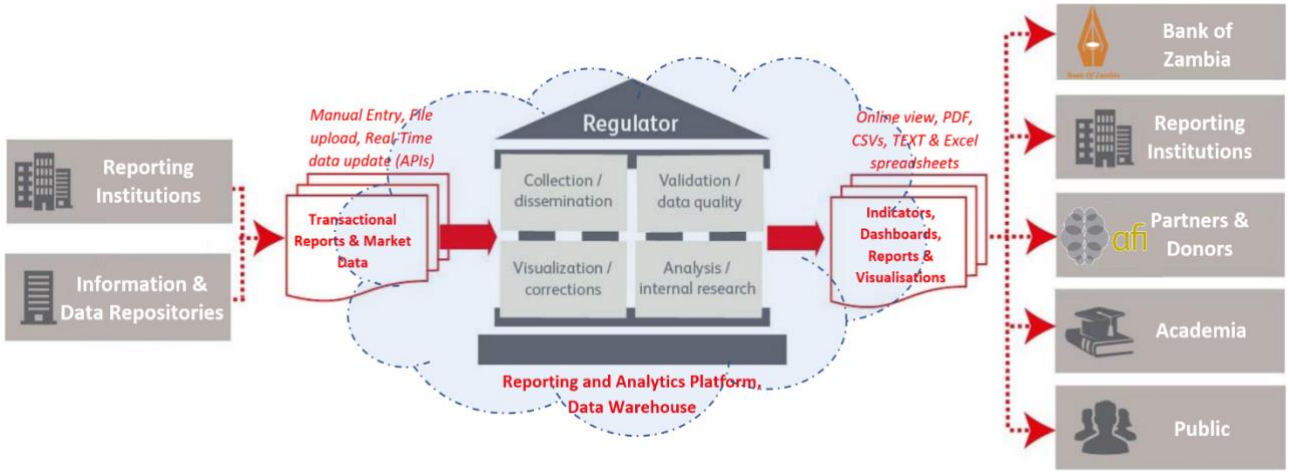


Figure 2: General Data Flow[1]

Where the following sections of the BRD are based on more traditional approach, UNCDF is open to explore solutions that leverage innovative technologies for regulatory reporting, such as blockchain, provided these meet requirements set by BoZ and offers additional advantages in term of functionality and costs.

III. Operating Environment

Presently, BoZ does not have an in-house data centre and there is an abundance of disparate ICT systems which need to be integrated to facilitate information sharing. A key objective under BoZ's Strategic Plan 2016-2019, is the development and strengthening of the Bank's Information and Communication Technologies to achieve operational efficiency and effectiveness.

This includes two critical initiatives;

[1] Adapted from: *Data as a critical factor for central banks, 8th IFC Conference on "Statistical implications of the new financial landscape"*

Adoption and implementation of an Enterprise Architecture (EA) Framework: The Bank in a bid to enhance operational efficiency and effectiveness will implement an Enterprise Architecture (EA) Framework[2]. The EA Framework will assist the Bank to respond better to its stakeholders by having a method and an organising principle that aligns functional business objectives and strategy with an IT strategy and execution plan.

The Bank will also seek to implement greater integration among its information systems by implementing an Enterprise Resource Planning (ERP) platform. Some of the benefits of the ERP include reduction in complexity of the Bank's Information Architecture through the establishment of a single platform for the Bank's business systems.

Development and implement an ICT governance framework: The Bank has plans to an implement ICT Governance Framework, based on the new COBIT 5, to manage how ICTs are managed in the organization. COBIT 5 encompasses all stakeholders within BoZ and calls for the establishment of an ICT Steering Committee at Board that should make ICT-related decisions, such as which ICT investments to make and what ICT projects to run.

Currently BoZ's main computing platforms and operating system environment consist of:

- Client desktops based on Microsoft Windows 64-bit Operating systems
- Several Intel quad core processors servers running Windows 20xx 64-bit.
- Several Intel processor servers running Linux Operating Systems
- Cisco routers and Extreme switches
- NetApp NAS/SAN based storage system for production and disaster recovery sites
    - The BOZ uses Symantec Backup EXEC as a backup utility
    - NetApp SnapShot technology for disk-to-disk backups
- Three Internet Service Providers with an aggregate bandwidth of 22 Mbps
- Consolidated UPS and Power Generating Set solutions
- There is an optical fiber in metro Lusaka and provides easy connectivity with stakeholder institutions

2. Solution Requirements

The envisaged Data Reporting and Analytics platform will be developed under the supervision and leadership of Bank of Zambia. Data will be stored in-house on Bank of Zambia servers, the platform would be the CAPEX model in nature with minimal ongoing maintenance and service costs.

The platform will be optimised to collect data from various sources, transforming and cleanse the data into a standardized format, and warehousing the data for analysis and dissemination to users in various formats. In the ideal scenario the data warehouse could utilize Online Analytical Processing (OLAP) methodologies for analytical analysis and allowing users to construct queries ad-hoc, or "on-the-fly".

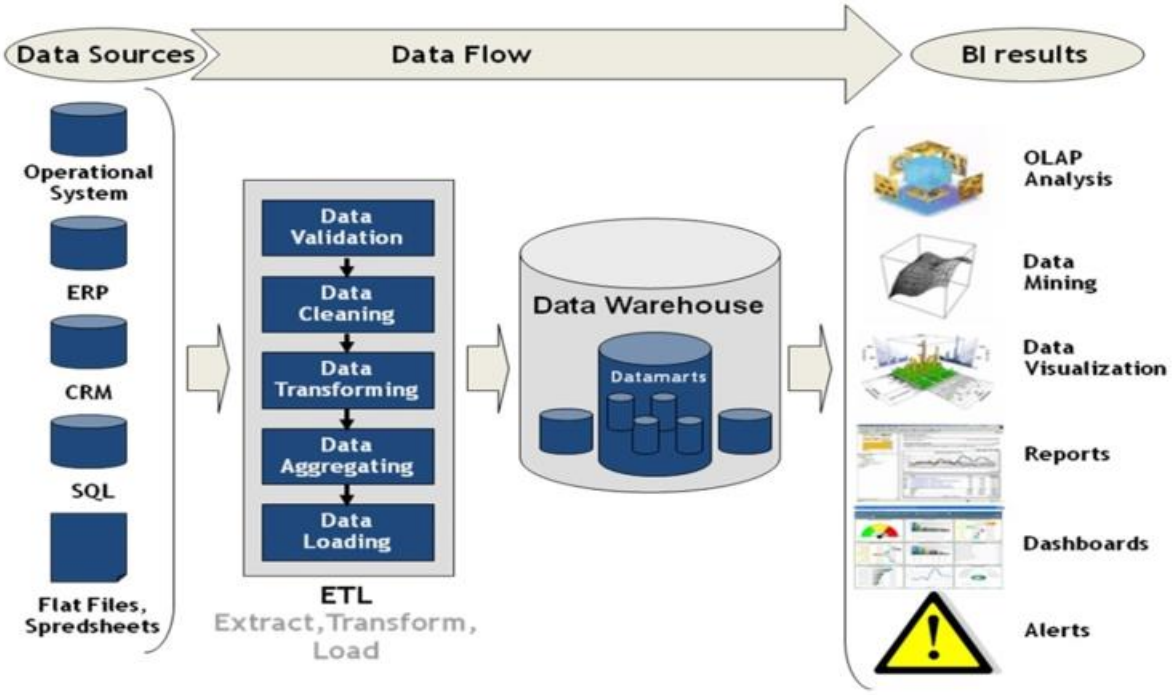
The expected architecture of a solution should be sufficient to meet all essential business requirements and offer a coherent set of functionalities. Furthermore, the platform should allow it incorporate more features as business needs and technology evolves.

To that end, the platform should be;

- A Capex model solution that can interface with multiple external platforms and data sources;

[2] An enterprise architecture framework (EA framework) defines how to create and use an enterprise architecture. An architecture framework provides principles and practices for creating and using the architecture description of a system - Wikipedia

- The platform will be based on industry open standard protocols such that it is scalable and compliant with the new hardware and software to come into the market
- The system should require minimum (preferably no) intervention by ICT technical staff for normal operations including start-up, daily operations and shut-down
- Optimised for low bandwidth connections without compromising on functionality considering the operating and client environments
- Be compatible with common desktop applications, analysis software and protocols for easy access and usage of generated outputs by stakeholders
- Supports popular web-browsers such Mozilla Firefox, Opera, Chrome, Internet Explorer, Safari etc.
- Users with relatively limited IT skills should be able to access and use the platform with minimal training



I. System Interface

The long-term vision of the platform includes straight-through processing of data from reporting institutions with minimal intervention to ensure data accuracy, integrity and timeliness. This will require Online and Offline interface with relevant databases and systems using the following major modes;

Requirement	Priority
Offline Batch Mode	High
FTP File Placement	Medium
Application Programming Interface (API Base Connectivity)	Low
Online/ Real Time data update	Low

To ensure data can be shared effectively with other systems belonging to the reporting financial institutions of market data repositories, the platform interface should;

Requirement	Priority
Interface with BoZ's internal systems to share generated outputs seamlessly to other platforms and applications	Medium

Be based on industry open standard protocols and comply with industry standard conventions for linking with other systems	High
Have internal controls for API to ensure the integrity of received and transmitted data	Low
Process API submitted transactions using the same business rules as are used while online data submission by user using the user interface	Medium

II. Transition Requirements

In a bid to enhance operational efficiency and effectiveness, BoZ has plans to implement an Enterprise Architecture (EA) Framework. The platform would need to comply with these frameworks and might require integration with infrastructure components as they are deployed. The platform therefore should consider all interdependencies and linkages that will be required as components of the new framework are introduced.

As such, the platform will be required to;

Requirement	Priority
The hardware architecture should be oriented to be integrated into existing BOZ infrastructure and should have ability to seamless integration with future modules/components/applications	High
Migrate historical data to the platform to generate comparative analysis and reports	Medium
Utilise the NetApp technology data storage available at the BOZ	Medium

III. Hosting Requirements-

Bank of Zambia intends to procure in 2019 an in-house server for this system. It's specifications will be at a minimum: 8 Core CPU; 16GB Ram; 1 TB Hard Drive (with mirroring or Raid); 5 Mbps Bandwidth; 5 TB External drive for backup. The data will need to reside in the Bank of Zambia in-house server as per Bank of Zambia policies and requirements.

3. Functional Requirements

BoZ seeks to enhance the efficiency of the data collection and analytics to ensure quality and timeliness of data. To that end, the key operations and activities the Data Reporting and Analytics platform must be able to perform functions as summarised in sections below:

I. Access Controls

The platform will provide functionality for managing and restricting system access according to each user group's access privileges as authorised by BoZ.

As such, the platform should;

Requirement	Priority
Limit access to the platform only to authorised and uniquely identified users by enforce authentication that can be based on combination of user/password or user certificate	High
Manage and monitor privileges of users, allowing them access to features, sensitive data and outputs as per their privileges. Platform outputs include reports, data display screens and GUIs, query results, etc	High

II. User Groups

In addition to BOZ, the envisaged platform will be used by a diverse group of stakeholders that include reporting institutions, and other industry actors who might be interested for reasons of transparency, investment or regional or international reporting reasons.

The primary user groups include:

User Group	Function and Relationship	User Privilege
BoZ Users (Internal)	Relevant BoZ users from different departments with responsibility to ensure compliance with regulations, frame policy, and report sector performance	• Ability to view reports relevant to their departmental functions. Users from different may have access to some, or all, reports depending on their role
Reporting Institutions (Financial Service Providers)	Persons authorised by reporting institution to upload, transmit data specified by BoZ	• Can upload reporting data as mandated by BoZ • Can view all reports/analytics derived from their institutions reporting • Can view industry-level aggregated data, as approved by BoZ
Relevant industry Stakeholders (academics, partners, donors)	Industry stakeholders who are supporting financial inclusion in Zambia	• Can view all reports/analytics tailored to their institutional need, as approved by BoZ • Can view industry-level aggregated data, as approved by BoZ
System Administrators	Functional Owner of the platform with the responsibility for controlling and managing the platform	• Full access privileges, rights to create, authorise, amend, remove, suspend and reinstate users on the platform • Establish and maint business rules and related procedures • Administer the operation of the daily business cycle • Manage the creation of reports and charts
Infrastructure Operation and Support - ICT Dept., BoZ	Technical Operator of the platform with the responsibility managing the platform Infrastructure	• Responsible for platform infrastructure and its security, and including managing data backups

To accommodate the different user groups, the platform will enforce user hierarchies and access controls to prevent unauthorised access to sensitive data and features.

At a minimum, the platform should provide the below mentioned features:

Requirement	Priority
Enforce authorization mechanism for user privilege and profile management, allowing users to only use features and menus for which they have access privileges	High
Configurable to which roles and tasks need '2-eye' or '4-eye' principles (maker-checker)	High
Maintain all user permissions and activity in a host of logs (including user and event logs), which can be used platform audits, user activity assessment, review permissions, privilege assignment etc	High

III. Data Collection

BoZ collects a large amount of data for statistical, prudential and monitoring purposes. Once the deployed, users from multiple reporting institutions will interact with the platform, through a secure web-based, to enter the required regulatory reporting data.

Before the data is submitted to BoZ, the platform will check input values to ensure conformity to the defined business rules. If the submitted data/report is in conflict with the business rules, then the platform will display the appropriate error message that will allow user to identify and adjust the erroneous entries.

As such, the platform should be able to:

Requirement	Priority
Allow manual input of data, through manual data entry and uploading of predefined data reporting forms/templates to populate relevant fields (CSV, excel, etc)	High
• Provide capability to automatically populate required regulatory data through API integration with external systems and data repositories	Low
• Apply defined business rules to input data, and display pre-defined error messages with reason displayed to user why entered/uploaded is rejected or declined by the platform	High
• Enforce tiered maker/checker processes, where data will be entered (or file uploaded) by multiple 'makers' and validated by nominated 'checkers' in different departments at the reporting institution. The final data set will be transmitted to BoZ after the final 'checker' (compliance officer) at the reporting institution has validated all of the reporting data	High

Key critical data elements to be provided to BoZ by reporting institutions can be found in the embedded excel file in the annexures. These data elements include quantitative reporting on the following financial services and parameters:

- Access and Usage of Financial Services Report
- Trust Account Balances of Mobile Money Providers Report
- Mobile Banking Returns
- Agency Banking Returns
- Internet Banking Returns
- Automatic Teller Machine (ATM) Returns
- Point of Sale (POS) Returns
- International and Domestic Remittances Report
- Incidents/ Frauds Reports
- Unpaid Cheques Report
- Unpaid Direct Debit and Credit Clearing (DDACC) Report

Please see Annexure 2 for relevant Financial Inclusion Data Sources

Business rules

To ensure a harmonized model for input data as well as rules for analysis of collected data, the platform should operate as per the criteria and conditions defined by BoZ in the form of Business Rules. As reporting requirements can evolve with new regulatory priorities, the platform should provide the capability to define and modify business rules through the administrator login.

At a minimum, the business rules should be:

Requirement	Priority
Pre-defined in the platform based on business and accounting logic rules	High
Applicable to various features across the platform and different input methods	High
Based on expandable and configurable private sets of rules that can be based on;	
o Scenario logic validations, Red flags;	Medium;
o Mandatory/optional validations;	High;
o Alphanumeric value validations;	High;
o Specific and threshold value validations;	Medium;
o Value range and length validation	High

IV. Data Analytics

Apart from increasing efficiency of supervision, a key objective of the platform is the measurement of progress towards Zambia's financial inclusion goals. To that end, the platform should be capable of handling complex multi-dimensional data and have robust data analysis and modelling capability would gain a better understanding of the relationships between disparate pieces of data. This will allow BoZ to proactively manage the DFS sector and gain a better understanding of the relationships between disparate pieces of data, particularly on matters related to gender and youth.

To that end, the platform would be required to;

- Execute reliable trend analyses on KPIs based on collected data;
- Create projections of important metrics based on historical data
- Detect patterns based on predefined criteria;

At a minimum, the platform should be able to conduct the below types of analysis:

Analytics Requirement	Description	Priority
Aggregation	Ability to create totals of different fields by provider and provider types, for specified time periods	High
Complex Calculations	Ability to perform complex calculations, e.g. percent of total, rolling sums and averages, period comparisons etc.	High
Statistical Functions	Ability to perform advanced statistical functions, e.g. standard deviation, variance, skew etc.	High
Time Series Analysis	Ability to perform a time-based analysis for specified periods	High
Regression Analysis	Ability to analyse relationship between different variables and conduct predictive analysis	Medium
Segmentation	Ability to define data into sub-groups based on a specified criteria and characteristics to conduct further analysis	High

Ad hoc Queries

The platform will provide additional ad-hoc data access functionality to users so they may run custom queries, according to their access privileges. Methodologies for inclusion of variables in a custom query should include;

Requirement	Priority
Searching by keywords and filtering different data elements (provider, indicator, location etc.)	Medium
Selecting and linking objects for inclusion in a custom query by 'drag & drop' and 'point and click'	Low
Providing summaries and detailed breaks-up of defined data elements/ parameter through comprehensive and drill-down capabilities	Medium
Support dynamic report reformatting upon regrouping and drill-down to detail records	High

V. Outputs – Reporting & Dashboards

The platform would have the ability to generate a variety of decision making tools in different formats that would help BoZ and other stakeholders assess the performance of the DFS sector and make strategic decisions. In addition to generating a set of predetermined reports based on historical trends and future projections, the platform would also create customized reports and share automatically with relevant stakeholder. Sample output being created by BoZ are summarised in annexures 5 for reference.

At a minimum, the platform output capabilities should;

Requirement	Priority
Provide analytics created by the platform in a variety of report and dashboard formats to users, according to their needs and user privileges o Reports, based on collected data and generated analytics, should be produced automatically on periodical basis to provide stakeholders reliable, consistent, timely and useful information o Dashboards should be user-friendly, providing stakeholders important data and information through graphics that are easy to understand at a glance	High; High
Provide an integrated data query facility that supports ad-hoc queries	Medium
Use visualizations to represent data, indicators and other matrices, such as Graphs, Charts, Heat Maps, Tables, Metric Legends, Scatter Plots	High
Support graphical output display on screen and previews before printing of hardcopies on standard paper sizes	High
Generate extractable data files in multiple predefined electronic formats like PDF, CSVs, TEXT and Excel spreadsheets	High
Notify stakeholders of an output's availability through e-mail to multiple pre-identified users or groups	Low
It will be highly preferably if the platform supports a report designer tool feature that allows designing of reports and dashboards to suit specific stakeholder requirements	High

Basic report categories and access are summarised in the table below:

Report Category	Description	Access
General Reporting	State of DFS industry Monthly, Quarterly and Yearly Reports	General Access
Internal Reporting	Users within BoZ can access all reports relevant to their unit and function	Authorised Personnel in BoZ
External Reporting	-Users can access all reports derived from their own institutions data -Users and stakeholders are supporting financial inclusion in Zambia can access relevant reports/indicators	Authorised Personnel from reporting institutions Other external stakeholders (donors, partners, academics etc)
Admin Logs	Security and user activity logs	Platform Administrator

Automatic Notifications and Emails

The platform should be capable of sending status alerts, reminders and notifications to users automatically under predefined scenarios

Requirement	Priority
Send notifications to designated persons at each stakeholder by email when a report is available	Low
Send reminders when data or actions are due	Low
Display an appropriate error message if entered data violates the business rules	Low
Prompt reporting institution to enter comments when entered data raises a flag (for outliers)	Low
Send error message to the reporting institution if uploaded data is rejected by BoZ	Low
Send notification of acceptance, and PDF copy of data entered via email, once submitted data has been accepted by BoZ;	Low

4. Non-Functional Requirements

BOZ warrants that the platform be designed and implemented to a high standard of security and reliability, with the objective of maintaining the integrity, availability and confidentiality of data. Furthermore, the

platform will be modular in design, utilize open-systems architecture, and be upgradeable to accommodate changes in laws, regulations, best practices and new technology

a) User interface

Accessible through web-browsers, the user interface should be windows-compatible and provide access to all platform features and modules. The design should have a high level of usability with a common "look and feel" achieved through consistent Graphical User Interfaces (GUI) for all internal and external users. Interface consistency includes the use of common command entry syntax, dialog window styles, data entry structures, and information presentation.

The user interface should:

- Provide secure access to sensitive data and different platform features related to the user, including user management, entering & uploading data, review & approve data, accessing outputs and downloading & printing these outputs
- Incorporate common Graphical User Interface characteristics to make it easy-to-use and accessible to users with varying levels of technical knowledge of systems. These could include;
    - Mouse activated icons, Buttons, Scroll bars;
    - Drop-down lists, Check boxes, Text boxes;
    - Menu bars, Resizable windows;
    - o Cut, copy, and paste functions
- Incorporate data entry features designed to reduce the amount of direct keying required to enter data. These could include;
    - Copy/paste, drop-down lists, and tab function
    - Use of default values, look-up tables
    - Automatic data recall where applicable
- Provide the ability to preview reports, analytics and query result before printing

b) Modularity and Scalability

The platform solution must be scalable upwards and designed using modular architecture to accommodate increasing number of users, sessions, transactions, and analytical reports as need. Modularity of the system would be characterized by;

i. Platform will be organized in several independent modules that can be enabled/disabled according to BOZ's needs;
ii. Each module can be upgraded independently to extend the platform's functionality
iii. Each module should provide possibility to be tested/troubleshot individually;

c) Security

The developed cloud-based solution needs to ensure adequate security and maintain strict confidentiality of all information provided by stakeholders.

To ensure integrity of the platform, all its components should have all required security certifications and conform to all industry security standards. All sensitive information such as user/passwords in the database should be stored securely, in encrypted form. Furthermore, the platform should provide full audit trails for all activities within the system, including system accesses and activities.

d) Usability

The platform must be easy to use in order to minimize a chance of human error leading to a malfunctioning of the system. Using the system should not require high technical skills from users

e) Availability

At the minimum, the platform has to be available to users with official working hours in Zambia.

f) Concurrency Requirements

The platform should be able to handle at least 60 users concurrently.

g) Response/ Performance

In terms of throughput capacity and response times, the platform should make due allowance for peaks in usage and general growth.

In the ideal scenario, the platform should be capable of creating required reports within 10 seconds and allow replacing the back-end queries to be able to override slow performing queries with optimized queries.

h) Reliability

The platform should provide high reliability and ensure flawless switching of all functionalities to the Disaster Recovery (DR) site to avoid catastrophic loss of critical information. The switching to DR site should be automatic without loss of data or service to users

i) Redundancy

The platform should be designed with high redundancy level to ensure no or little impact by failure of one or more components. All cloud-based components proposed for the platform should be systematically duplicated to ensure that no single point of failure exists

Annexure

I. List of Reporting Institutions

No.	Banks
1	AB Bank
2	Access Bank
3	BancABC
4	Bank of China
5	Barclays
6	Cavmont Capital
7	Citibank
8	Ecobank
9	Finance Bank
10	First Alliance
11	First Capital Bank
12	First National Bank
13	Indo Zambia
14	Intermarket Banking Corporation
15	Investrust
16	Stanbic
17	Standard Chartered
18	United Bank of Africa Zambia
19	ZANACO

No.	Non-Banks
1	National Savings and Credit Bank
2	Zambia National Building Society
3	Pan African Building Society

No.	DFS Providers
1	Airtel
2	Cgrate
3	KAZANG
4	MTN
5	Zamtel

Total Reporting Institutions	
Banks	19
Non-Banks	3
DFS Providers	5
Total	**27**

II. Financial Inclusion Data Sources

Data Source	Demand- or supply- side	Unit of measurement	Year (most recent)	Frequency	Topics covered	Responsible Institution
Existing Sources of Financial Inclusion Data						
Bank of Zambia	Supply	Financial service providers	2015	Annual	Access points, product uptake / volumes	BoZ
FinScope	Demand	Individual	2015	Periodic	Accounts, payments, savings, credit	FSD Zambia
ICT Survey	Demand	Individual	Forthcoming	Every 2-3 years	Uptake / usage of digital financial services	ZICTA / CSO
Financial Capability Survey	Demand	Individual	2016	TBD	Financial capability	World Bank
Global Findex	Demand	Individual	2014	Trienniel	Accounts, payments, savings, credit	World Bank
Enterprise Surveys	Demand	Firm	2013	Periodic	Access to finance	World Bank
Potential Sources of Financial Inclusion Data						

Living Conditions Survey	Demand	Household / Individual	2010, 2015	Bienniel*	Consumption, education, housing, etc.	CSO
Informal Sector Survey	Demand	Household	2013	Bienniel*	Production, employment	CSO
Crop Forecasting / Post- Harvest Surveys	Demand	Agricultural production unit	2015	Annual*	Agricultural production, inputs	CSO

III. Reporting Templates

BoZ PS Monthly Returns.xlsx

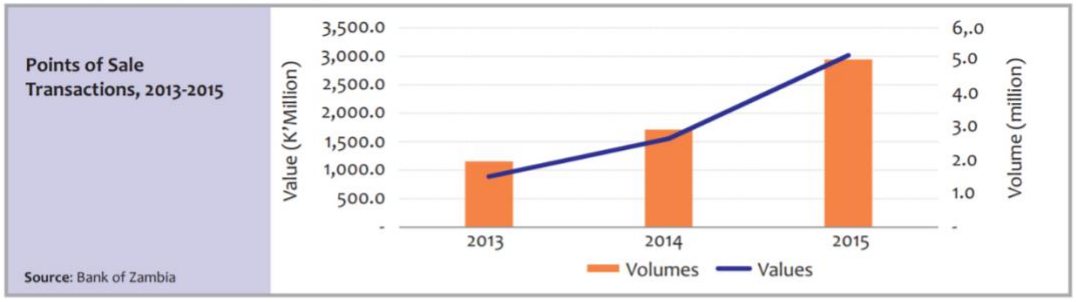
Templates (MMO).xlsx

IV. Key Critical Data Elements

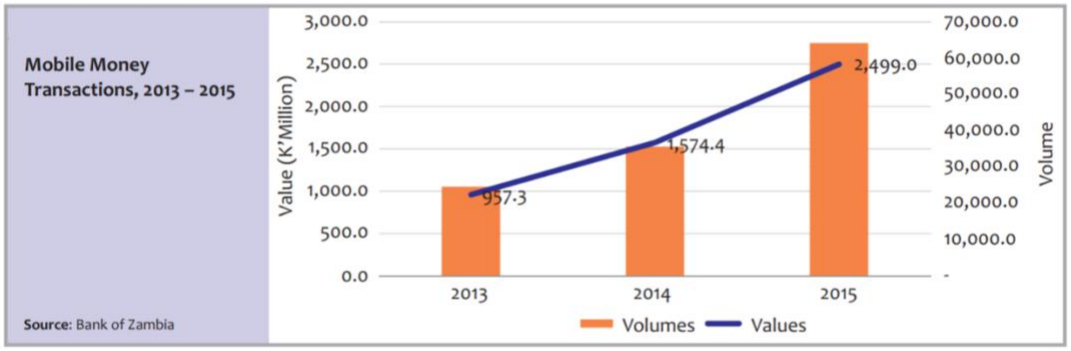
Driver	Financial Inclusion Indicator	Source	Reporting Frequency	Disaggregation
Products	% adults financially included (formal & informal)	FinScope	Trienniel	By district
	% women financially included (formal & informal)	FinScope	Trienniel	By district
	% youth financially included (formal & informal)	FinScope	Trienniel	By district
	% rural financially included (formal & informal)	FinScope	Trienniel	By district
Delivery Channels	Financial Access Index (components listed in 2A-2C)	BoZ	Biannual	By type of access point (branch, agent, ATM)
	# of access points per 10,000 adults	BoZ	Biannual	By type of access point (branch, agent, ATM)
	% of districts with at least one access point	BoZ	Biannual	By type of access point (branch, agent, ATM)
	% of total population living in districts with at least one access point	BoZ	Biannual	By type of access point (branch, agent, ATM)
Products	% adults with a store-of-value transaction account	FinScope / Findex	Trienniel	By gender, age, income, rural, district
Products	% adults using an electronic payment instrument	FinScope / Findex	Trienniel	By gender, age, income, rural, district
Products	Cashless retail transactions per capita	BoZ	Quarterly	By type of instrument
Products	% of adults saving at a regulated financial institution	FinScope / Findex	Trienniel	By gender, age, income, rural, district
Products	% of adults saving with informal saving groups	FinScope / Findex	Trienniel	By gender, age, income, rural, district
Products	% of adults with at least one non-mandatory insurance product	Capability Survey 2016	Trienniel	By gender, age, income, rural, district
Products	% of adults with at least one pension product	FinScope	Trienniel	By gender, age, income, rural, district
Products	% of adults using an investment product	FinScope	Trienniel	By gender, age, income, rural, district

V. Output samples

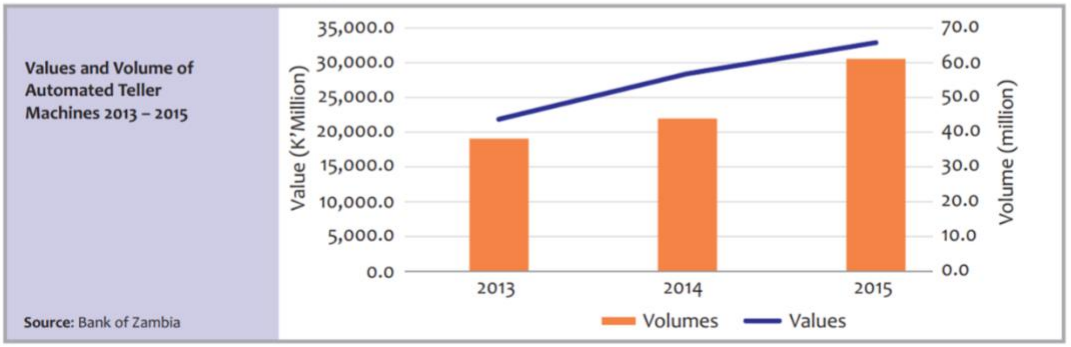
Transactions Processed through Point of Sale Machines

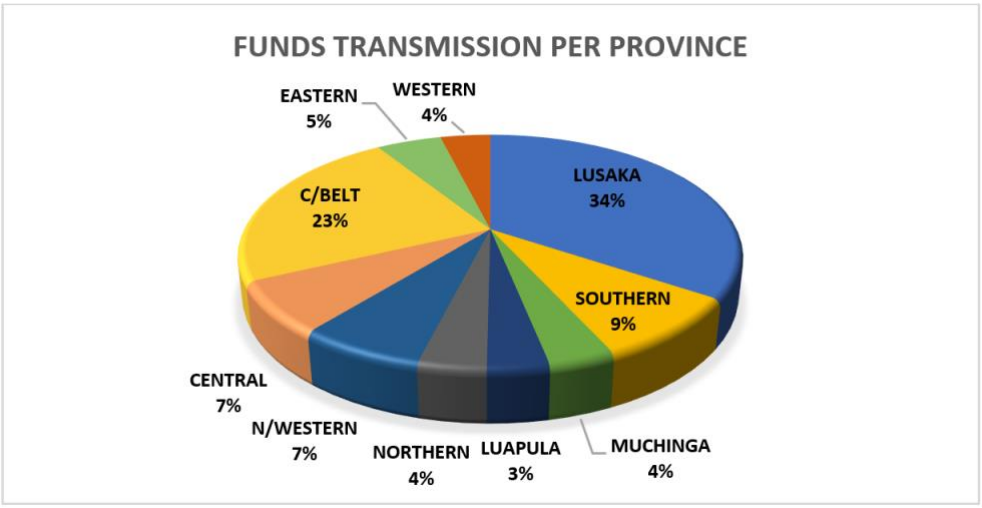


Mobile Money or Electronic Money (e-money) Transactions



Transactions Processed through the Automated Teller Machines




FUNDS TRANSMISSION PER PROVINCE
EASTERN 5%
WESTERN 4%
LUSAKA 34%
C/BELT 23%
SOUTHERN 9%
CENTRAL 7%
N/WESTERN 7%
NORTHERN 4%
LUAPULA 3%
MUCHINGA 4%