Macroeconomic and Financial Management Institute of Eastern and Southern Africa

PRIVATE CAPITAL MONITORING SYSTEM

REQUIREMENTS DOCUMENT

VERSION 1.0

MARCH 2019

Document Revision History

Version	Date	Description
1.0	19/03/2019	Document Created

Preface

Purpose of this Document

This is a System Requirements document for use by potential bidders for redesigning and development of the MEFMI Private Capital Monitoring System. It provides guidance and detailed information about the requirements of the improved Private Capital Monitoring System. The document is also intended to assist the potential consultants/firms to provide *specific* Technical and Financial Proposals for consideration by MEFMI in developing the proposed system. It is also useful background reading for anyone involved in developing, reviewing or monitoring the system.

Potential bidders should thus read this document concurrently with the Request for Proposals, RFP No. 001/19/MMP

Table of Contents

Definition of Key Terms Used

Private Capital Monitoring System: The Private Capital Monitoring System (PCMS) refers to the system which will be redesigned and developed, and is the ultimate delivery for this project.

Solution: Refers to the Private Capital Monitoring System and accompanying documentation

Must: Refers to a Mandatory requirement.

Shall and Will: Refers to a requirement that is relevant/important to have and also preferred.

1. INTRODUCTION

1.1 MEFMI in Brief

The Macroeconomic and Financial Management Institute of Eastern and Southern Africa (MEFMI) is a regionally owned Institute, currently with 14 member countries: Angola, Botswana, Burundi, Eswatini, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, Tanzania, Uganda, Zambia and Zimbabwe.

1.2 Background and Problem Definition

Since the late 1990s, private capital flows have continued to be a significant source of investment in the MEFMI region, especially in the context of declining official flows. Consequently, there have been efforts by governments to collect and analyse information on Foreign Private Capital (FPC) flows and stocks in order to design policies that ensure maximum benefits and manage challenges associated with their volatility. However, it was observed that most of the countries in the MEFMI region faced major problems in monitoring and managing private capital flows data due to lack of reliable information systems (software). To this end, MEFMI developed a web-based Private Capital Monitoring System (PCMS) in 2007 to assist member countries to capture and report this data. The PCMS has been regularly reviewed to take into account users' evolving reporting needs.

As part of ongoing efforts to contribute to the strengthening of intra-regional trade and investment, MEFMI envisages rolling out a more robust system to its member countries and beyond. MEFMI now plans to redesign and develop the PCMS taking into account desired enhancements from current users, as well as the envisaged increased user capacity arising from potential users of the system beyond the MEFMI region. As input to this process, MEFMI conducted a user needs brainstorming workshop in November 2018. The workshop which was attended by representatives from MEFMI member countries provided a platform for evaluation of the current system's compliance with country reporting requirements and consolidation of user needs. In addition, MEFMI received recommendations on the system development, from the Common Market for Eastern and Southern Africa (COMESA) Secretariat to cater for the envisioned wider regional needs.

1.3 Purpose of Document

This System Requirements Document describes the functional requirements for Version 4.0 of the MEFMI Private Capital Monitoring System. Members of the project team that will implement and verify correct functioning of the system will use this document as a guide to decide whether or not the system meets all the user requirements. Unless otherwise stated, all requirements specified in this document are mandatory and committed for Version 4.0 of the system.

1.4 Project Scope

The project focuses on the redesign, development and implementation of a Private Capital Monitoring System for MEFMI. This application is required by MEFMI to provide a regional IT solution that will efficiently and effectively support the management of private capital flows statistics among MEFMI member countries and beyond.

The scope of the project includes reviewing the system specifications, redesigning and developing the system, user testing and review of system functionality, uploading data into the system and ensuring accessibility over the internet, training of users and MEFMI IT regional experts, development of a user manual and a technical manual.

2. OVERALL DESCRIPTION

2.1 System Perspective

The system should provide all required functionalities allowing users to create, edit, query, import, and export data using the system features. **The main goal of this system is to maintain countries' private capital data with integrity, reliability, consistence, availability and accuracy of high level.**

2.2 Overall look and feel

The system must use the MEFMI colours, images and logo for its interface, and for the reports that will be extracted from the system. The colours and logos should be as per the MEFMI Brand Manual, editable as well as documented in the technical user manual. The system must also have the flags of MEFMI's member countries as a gateway or login interface to the countries' databases.

2.3 System Features

The main tasks that the system will perform are to facilitate:

- Data capture, which must involve validation and verification processes for quality assurance. The system must support both physical data capture as well as electronic data capture.
- Data processing, which will involve handling of all calculations, aggregation, sorting, filtering, comparing, and converting various information into desirable forms or formats.
- Querying and reporting of outputs of the processes, which will be presented in tabular and/or graphical form, depending on the specific reporting requirements and which can be interfaced with other software and databases to facilitate statistical analysis such as the Statistical Package for the Social Sciences (SPSS).
- Generation of data time series reports.
- Migration of data from previous/current databases into the new PCMS.

2.4 User Classes and Characteristics

USER CLASS	Number of users	Location	USER ROLE/CHARACTERISTICS	Device
MEFMI Macroeconomic Management Programme	2	MEFMI Secretariat – Harare, and in Client Institutions	Data management, report generation and dissemination, analysis, planning, reading of dashboard, help desk management. Coordination of the system and harmonisation of information	Desktop computer, laptop, tablets and mobile phones

MEFMI IT Personnel	2	MEFMI Secretariat - Harare	System Review and Administration, running Backups, help desk management	Desktop computer, laptop, tablets and mobile phones
MEFMI IT Regional Experts	3	Regional	System Review and administration, help desk management, downloading and implementation of system on local area networks in client institutions	Desktop computer, laptop, tablets and mobile phones
Client Institutions	750	Regional	Survey management, Data collection, processing (entry, cleaning, editing, validation, calculations), Data management, report generation and dissemination, analysis, evaluations, planning, reading of dashboard	Desktop computer, laptop, tablets and mobile phones
Enterprises being surveyed	5,000+	Regional	Electronic capturing, reporting and sharing of survey data	Desktop computer, laptop, tablets and mobile phones
Public		All over the world	View pre-formatted and shared reports, searching library/warehouse, downloading reports	Desktop computer, laptop, tablets and mobile phones

2.5 Operating Environment

- The system must be installed and hosted on MEFMI managed servers.
- The system must be web-based.
- The system must have a functionality to enable configuration to be operated on the Local Area Network (LAN), as a local copy on client institutions' servers as might be desired by some users.
- The internet hosted system must be connected with the LAN version/copy and allow data updates and or synchronisation of data from the LAN, and to the LAN
- The system must use standardised technologies that can enable integration with other relational database management systems (RDBMS) such as SQL, Oracle etc.
- The system must support electronic requests, collection, and submission, sharing and reporting of survey data.
- The application system shall preferably use XAMP tools (Apache web server, MySQL database and PHP language).
- The system development process must apply and meet systems development/coding security standards, preferably the OWASP web development security standards. The security standards must also be well defined and apparent on implementation.
- The application system must be compatible with applications internet standards as defined in the IETF RFCs.

2.6 User Documentation and Technical Support

- The user documentation (Help and Tutorials) must be available as an electronic copy and shall be opened from within the system, and also as a separate electronic document. The user documentation shall be detailed and comprehensive, and will use screen captures of system interfaces to illustrate methods, procedures and processes.
- There must be a detailed technical documentation of the system. Source code, together with its documentation must also be made available to MEFMI for future upgrades and/or reconfiguration.

2.7 Source Code

- The source code for the System shall be the property of MEFMI upon handover. The developer will thus relinquish ALL rights to the source code to MEFMI.

2.8 System Interfaces

- The system must be able to integrate with other relational database management systems used for complementary data analysis as required by users, for example the debt management and other macroeconomic databases which may use SQL or Oracle RDBMSs.

3. DATA REQUIREMENTS

The system requirements are categorized as follows:

A. General Information
B. Survey Management
C. Data Capture
D. Outputs
E. User Interface
F. Security Features
G. Audit
H. Backup and restore
I. Other Requirements

3.1 General Information

No.	Field Name	Field Description	Field Variables
A.1	Enterprise Register	The system must capture and maintain details on an entity. The system must identify each entity uniquely with a code and name and must identify and reject duplications.	• Unique Entity Code • Unique Entity Name • Physical Address/ Location • District/ Region • Postal Address • Telephone • Email Address • Website • Type of Investment • Date of registration • Date of commencement of business • Enterprise Status (M&A, Closed, Changed Name, Not located, Did not qualify)
A.1.1	Contact person details	The system must capture and maintain details on the primary contact person and alternative contact person for an entity	• Name • Position • Telephone • Email
A.1.2	ISIC	The system must capture and maintain the information on the classification of the entity's business according to the current International Standard Industrial Classification (ISIC) Rev 4, with flexibility to adapt to subsequent revisions	• All levels of classification • Open description of the entity's activities
A.2	Institutions	The system must capture and maintain information on the institutions involved in	• Unique Institution Code • Institution Name • Physical Address/ Location • Postal Address

		coordinating the FPC Surveys (FPC National Task Force)	• Telephone • Email Address • Website
A.3	Country Divisions	The system must capture and maintain information on the country divisions e.g. into regions or provinces	• Division • Sub division
A.4	Enumerators	The system must capture and maintain information on the enumerators who will be responsible for data collection	• Enumerator name • Institution of the Enumerator • Enumerator Telephone • Enumerator email address

3.2 Survey Management

No.	Field Name	Field Description	Field Variable
B.1	Survey Set up	The system must capture and maintain information on a particular survey	• Unique Survey Name • Survey activities start and end date • Survey data coverage start and end date • Survey data base currency • Survey period type (e.g quarterly, annually)
B.2	Exchange Rates	The system must allow definition of exchange rates between various currencies for the base currency and reporting currency. Definition of exchange rates between various currencies must be done simultaneously. The system must automatically allocate exchange rate of 1:1 if the base currency is the same as the reporting currency.	• End-period exchange rates • Period average exchange rates
B.3	Enterprise Selection	The system must allow the selection and export of entities from the enterprise register into a particular survey. Entities that have been closed or acquired (through a merger&acquisition) must not be available for selection into a survey	• Survey sample list by entity name and sector

B.4	Questionnaire Management	The system must capture and maintain the following information about a particular questionnaire in a selected survey.	• Entity to which the questionnaire was issued • Name of the Person completing the form • Position of the Person completing the form • Telephone and Email address of the Person completing the form • Delivery date/Date questionnaire received • Return date/date questionnaire was submitted • Delivery method (physical delivery, electronic) • Is questionnaire returned and accepted • Follow up to be done if not accepted

3.3 Data Capture

Data capture and Processing will include the following modules:

a) Foreign Assets and Liabilities
b) Private Sector External Debt – Extended Reporting
c) Foreign Affiliates Statistics (FATS)
d) Trade in Services
e) Investor Perceptions

Foreign Assets and Liabilities (FAL)

No.	Field Name	Field Description	Field Variable
C.1	Shareholding Structure	The system must capture and maintain information on an entity's shareholding structure for each period defined in the survey data coverage. Shareholding must be equal to 100. Shareholder information must be uniquely identified by the system to avoid duplications	• Name of the shareholder • Country of residence of the shareholder • Ownership in percentage terms • Investment relationship ○ Equity (>=10%) by Non-Residents (**Direct Investment** -DI) ○ Equity (<10%) by Non-Residents (**Portfolio Investment** – PI if tradable; **Other Investment** –OI if non-tradable; **Fellows** –FE if share a common parent; and **Direct Investment Enterprise-** DIE if reverse investment) ○ All Equity by Residents - **Domestic**
C.2	Income on Equity Liabilities	The system must capture and maintain information on income on equity liabilities components for the period	• Net profit/loss (after tax) • Total dividends declared • Total dividends paid / profits remitted • Total retained earnings
C.3	Equity Liabilities	The system must capture and maintain information on the book value of the equity	• Paid up share capital • Share premium • Retained earnings • Reserves • Other Equity

		liabilities components (beginning period positions, transactions, other changes, and closing period positions)	
C.4	Non-Equity Liabilities	The system must capture and maintain information on the borrowing by resident entities	• Creditor Country / Name of International Organisation • Credit Type • Original maturity (short term or long term) • Creditor type • Investor relationship • Opening position • Disbursement amount • Principal repayment • Other changes • Closing position • Interest paid
C.5	Income on Equity Assets	The system must capture and maintain information on income on equity assets components for the period	• Net profit/loss (after tax) • Total dividends declared • Total dividends paid / profits remitted • Total retained earnings •
C.6	Equity Assets	The system must capture and maintain information on the book value of the equity assets components (beginning period positions, transactions, other changes*, and closing period positions) **includes exchange rate changes, price changes, and other changes in volume*	• Paid up share capital • Share premium • Retained earnings • Reserves • Other Equity
C.7	Non-Equity Assets	The system must capture and maintain information on the lending from resident entities to non-residents	• Debtor Country / International Organisation • Credit Type • Original maturity (short term or long term) • Debtor type • Investor relationship • Opening position • Disbursement amount • Principal repayment • Other changes • Closing position • Interest paid

Private Sector External Debt- Extended Reporting

No.	Field Name	Field Description	Field Variable
C.8	Private Sector External Debt	The system must provide for capture, maintaining information, and generating projections for private sector external debt on instrument by instrument basis	• Original currency of contraction • Total Credit Amount • Date of Agreement • Purpose of borrowing • Disbursement method • Date of First disbursement • Date of Last disbursement • Principal payment methods • Payment instalments • First Principal Payment Date • Last Principal Payment Date • Interest terms • Interest rate

Foreign Affiliates Statistics (FATS)

No.	Field Name	Field Description	Field Variable

C.9	Foreign Affiliates Statistics	The system must capture and maintain information on FATS for each entity and must allow flexibility for users to define their variables
		
		The system must also record the number of entities meeting the criteria for coverage under FATS
			• Sales (Turnover)
			• Output
			• Employment by year
			  ○ Nature of employment (Full time/Part time domestic worker; Short term foreign/Long term foreign worker
			  ○ Category of employment (management, technical/skilled, administrative, unskilled/casual)
			  ○ Gender
			  ○ Employment numbers
			• Compensation of employees
			  ○ Type of compensation (salaries & wages, fringe benefits, pension, directors fees)
			  ○ Value of compensation
			• Value added
			• Exports of goods and services
			• Imports of goods and services
			
			Additional FATS variables
			• Assets
			• Net worth
			• Net operating surplus,
			• Gross fixed capital formation,
			• Taxes on income
			• Research and Development expenditures.

Trade in Services

No.	Field Name	Field Description	Field Variable
C.10	Trade in Services	The system must capture and maintain information on trade in services and must allow flexibility for users to define their variables under the selected service category	• Manufacturing services on physical inputs owned by others • Maintenance and repair services not included elsewhere (n.i.e.) • Transport • Construction • Insurance and pension services • Financial services • Charges for the use of intellectual property not included elsewhere (n.i.e.) • Telecommunications, computer and information services • Other business services • Personal, cultural and recreational services

Investor Perceptions

<table>
<tr><th>No.</th><th>Field Name</th><th>Field Description</th><th>Field Variable</th></tr>
<tr><td>C.11</td><td>Investor Perceptions</td><td>The system must provide functionality for users to capture and maintain investor perception questions and sub-questions, and select the responses as ratings.

The system must allow flexibility for users to define their questions</td><td>Example 1
Question:
To what extent has the following <u>economic and financial factors</u> affected your entity in conducting business?
Sub-question:
▪ Domestic market size
▪ Competition with imports
▪ Access to international markets
▪ Interest rates
▪ Exchange rates

Answer
<table>
<tr><th>Answer</th><th>Meaning</th></tr>
<tr><td>1</td><td>Strong positive effect</td></tr>
<tr><td>2</td><td>Limited positive effect</td></tr>
<tr><td>3</td><td>No effect</td></tr>
<tr><td>4</td><td>Limited negative effect</td></tr>
<tr><td>5</td><td>Strong negative effect</td></tr>
</table>
Example 2
Question:
Where do you see the direction of the size of your business operations over the next 3 years?
Answer
<table>
<tr><th>Answer</th><th>Meaning</th></tr>
<tr><td>1</td><td>Expand</td></tr>
<tr><td>2</td><td>Maintain</td></tr>
<tr><td>3</td><td>Contract</td></tr>
<tr><td>4</td><td>Not relevant</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>Example 3
Question:

How useful are the following Agencies in providing information for your business needs?

Sub-question:
Investment Promotion Agency
Central Bank
National Statistics Office
<table><tr><th>Answer</th><th>Meaning</th></tr><tr><td>1</td><td>Very useful</td></tr><tr><td>2</td><td>Quite useful</td></tr><tr><td>3</td><td>Not useful</td></tr></table></td></tr>
</table>

3.3.1 Data Review

The system must include a functionality for the user to do a review of the data captured before it is processed. This functionality must enable the following:

a) Allow the user to edit data on the review screen without having to go back to the data entry menu.
b) Alternatively, if the user has to go back to the data entry screen, enable the user to be automatically redirected to the exact data entry cell upon double clicking the error on the review screen.
c) The review screen should include a column for errors that are calculated as residuals.

3.4 Outputs

The system shall provide the functionality to display the following general information reports using various filters.

No.	**Field Name**	**Field Description**	**Field Variable**
D.1	Survey Management	The system must display the reports under the general information and survey management (A-B)	• Sample list by entity • Questionnaire Management - Questionnaires administered, Delivered, Returned and Response rate by enumerator
D.2.1	Survey Output - FAL	The system must display the reports on FAL indicating the positions, transactions, and other changes; and apportioned according to the shareholding structure	Reports • Income on equity • BOP and IIP report format • CDIS report format Filters • Residence type • Economic Activity /ISIC • Country • Enterprise • Functional category

		The reports must be displayed using different filters The system must also display a survey detailed report which shows the raw data of all entries posted by a user before processing	• Assets vs liabilities • Instrument type • Country division • Combination e.g by country and sector PSED report filters • credit type / related vs. non-related borrowing • maturity borrowing terms (short/long) • currency • purpose of borrowing
D.2.2	Survey Output – FATS	The system must display the reports on FATS indicating the values as captured, using different filters	Filters • Enterprise • Economic Activity /ISIC • Country • Inward and Outward
D.2.3	Survey Output – Trade in Services	The system must display the reports on trade in services	Filters • Enterprise • Economic Activity /ISIC • Country • Inward and Outward
D.2.4	Survey Output – Investor Perceptions	The system must display the reports on investor perceptions including the number of responses under each rating.	Filters • Enterprises • status of enterprise (local vs. foreign) • Economic Activity /ISIC

3.4.1 Processing

In addition to producing the above defined reports, the system must provide the following facilities for outputting information;

D.3 Uprating

The system shall provide functionality to apply an up-rating factor to the survey output reports as specified by users

D.4 Time Series

The system shall provide functionality to generate time series for selected data.

D.5 Queries

d) The system shall provide a user-friend facility to enable users select, filter, organize and display data from the database.
e) The system shall provide a user-friendly facility to enable users to link data from different tables/queries on a selected field or fields.
f) The system shall provide a facility to enable users to save their queries for future use.

D.6 Cross-tabulations

a) The system shall provide a user-friendly facility to select, filter, organise data for cross-tabulation.
b) The system shall provide a user-friendly facility to enable users to specify the row headings, column headings and data functions for a cross-tabulation.
c) The system shall provide a facility to display the selected data in a cross-tabulation.

D.7 Charts

a) The system shall provide a facility to enable users to select and link different items of data according to user-defined criteria.
b) The system shall provide a facility to draw a chart of the selected/filtered data.

D.8 Data Export

The system shall provide a facility to enable users select and export data from the system to an external file in different formats including portable document format(PDF), MS Excel, MS Word, Plain Text – Fixed Length and Plain Text – Delimited (by comma, tab or space)

3.5 User Interface

E.1 Graphical User Interface

The system shall maintain a common style to the Graphical User Interface by using familiar icons and functional keys to all user interfaces to ensure that the system is user friendly and easy to navigate with the mouse and key board. The system must incorporate drop down menus and search button functionalities.

E.2 Dashboard

The system must provide a dashboard facility that shows at-a-glance information on the survey output for a particular survey as well as comparisons between surveys. The dashboard must provide for flexibility for users to have the option to view items in their interest. The dashboard must be well organised and provide the right visuals including bar charts, pie charts, line graphs, maps etc.

3.6 Security Features

The system must provide functionality to control user access through User ID/name and Password, and User groups. This facility will feature the following**:**

F.1 Passwords:

a) Password length minimum of 8 characters (Alphanumeric)
b) Expiration and hence forced regular password changes
c) Suspension of access to the system after a user specified number of attempts to input the incorrect password
d) Recording entry attempts
e) Preventing re-use of a password
f) Users should be able to reset their passwords

F.2 User Groups/ Roles:

a) Creation of User Groups with defined Access Rights (Profiles)
b) Assigning User IDs to User Group
c) User ID inheriting access rights of the User Group
d) To assign specific additional or reduced rights to individual user IDs
e) Password for functions
f) Hidden (or greyed) inaccessible functions
g) Access control rights shall include Execute, Read, Insert, Update and Delete.
h) Logging off inactive users after a pre-defined period.

3.7 Audit

G.1 Audit Trail

a) The system must feature an audit trail to track all modifications that will at a minimum comprise the following detail:
    - User ID
    - Log date and time
    - Record name/field
    - Change type (e.g. create, maintenance, export, delete a field or record)
    - Value of data record/field before and after amendment

b) The system must allow authorised users to view and print the audit trail. The audit trail must not allow editing, that is, no overwriting, changing, importing or deletion of any and all data in the audit trail. Audit trail data should only be for export or viewing

3.8 Back-up and Restore

H.1 The system must allow for **back-up** of the database, transfer of the system and data to another systems, and **restoration** of the system and data from the back-ups.

3.9 Other Requirements

I.1 The system must have features that reinforce data validation and verification, general database integrity, security and reliability with interface for integration with other systems. Some of the checks and controls that must be in the system include:

- System must detect and reject all duplicate entries.
- The system must facilitate identification and retrieval of historical data for every entity to enable consistency checks on data across overlapping periods.
- Data capture of numbers should be delimited (by comma or space) after every three digits to minimise errors.
- Validation checks to ensure consistency between positions, transactions and other changes.

I.2 In order to provide adequate support capabilities for the system, the system implementation and deployment must cater for the transfer of knowledge through user training, technical training, user and technical documentation for MEFMI Programme and IT staff, MEFMI regional IT Experts, and on-call user support. The source code, data dictionary, user guide and other technical documentation shall also be refined during system development, and made available to MEFMI. The final user guide must be available on the system homepage.

I.3 In addition to the field variables listed for each modules in the tables in sections 3.1 to 3.3 above, the system shall maintain a functionality that gives the users the flexibility to capture additional data that might be specific for their country reporting requirements.

I.4 The system must provide a language translation facility to French and Portuguese.

I.5 The system shall provide other system administration features & utilities which shall include:

a) Error, exception, notice and warning logs and notifications
b) Print settings

I.6 The system must exhibit stable performance supporting at least 20 concurrent users.

I.7 The system must provide an on-line help desk facility and must include the system user guide on the homepage.

I.8 The system must be available to operate for 24 hours a day, seven (7) days a week.