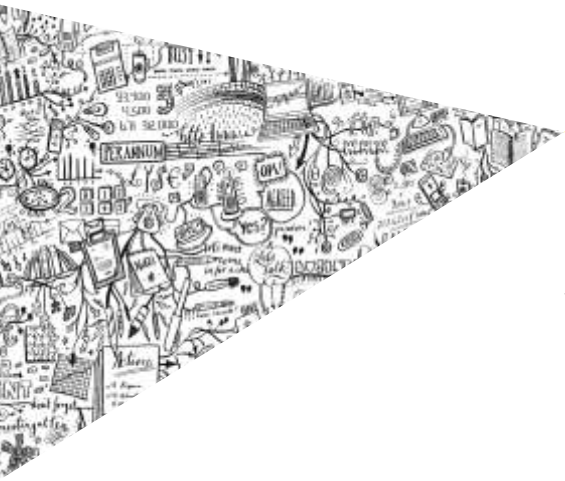
Financial Sector Modernization and Information Management System Project (FSMIMS)



SBV&CIC Components – Group 1 Deliverables

First Bi-Annual Report

For the first six-month period of 2014

Building a better working world

No. 664/EY-FSMIMS

PMU 13 October 2014
Financial Sector Modernization and Information Management system
("FSMIMS")
State Bank of Vietnam (SBV)

Submission of the first bi-annual report for the first six-month period of 2014 - SBV&CIC Components – Group 1 Deliverables

Dear PMU,

First, we would like to express our sincere gratitude to PMU for your cooperation in FSMIMS project.

We have completed the first bi-annual report for the first six-month period of 2014 - SBV&CIC Components – Group 1 Deliverables ("first bi-annual report"). The task was performed in accordance with our contract dated 14 January 2011 and our Addendum No. 3 dated 14 August 2012, in which our procedures were limited to those described.

Results of our work

Our first bi-annual report resulting from our work is provided in the Attachment A

Activities conducted within scope of this task

As outlined in our contract Addendum No.03, the main activities of this task is:

SBV - Functional strengthening:

- Half-yearly reports on TA activities including reviews of selected functional strengthening outputs

SBV-ICT platform development:

- Half-yearly reports on system implementation;

CIC - IT development:

- Half-yearly reports on system implementation

Our first bi-annual report to you is based on inquiries of, and discussions with management. We have not sought to confirm the accuracy of the data or the information and explanations provided by management.

Restrictions on the use of our work product

Our first bi-annual report is intended solely for the information and use of the management of SBV and is not intended to be and should not be used by anyone other than this specified party.

We appreciate the cooperation and assistance provided to us during the course of our work.

Yours sincerely,

Henri Hoang
Partner

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Executive Summary

1.1 Introduction

1.1.1 Project Background

The FSMIMS project, financed by the World Bank, is to assist the SBV to address the main identified weaknesses in information management and related capacity building through: a) development and adoption of a suitable policy, an operational and institutional framework as well as an international standard technology platform for information management for timely and comprehensive analysis of the money and banking market development, and internal resources planning and risk control; and b) learning-by-doing processes, classroom-based training programs and workshops/study tours to improve professional knowledge and upgrade practical skills. The project implementation period is planned to close by December 31, 2014.

FSMIMS is entirely in line with the development orientation of Vietnam's banking industry approved by the Government in the decision No. 112/2006/QĐ-TTG. It is one of the fourteen key projects and programs that the Prime Minister assigned to the SBV for implementation up to 2010 and towards the 2020 vision. FSMIMS covers part of the eleven main subject areas to implement the Master plan of banking industry development, and is directly related to the following six groups:

- Strengthen the development and implementation capacity of the monetary policy and foreign exchange management policy;
- Strengthen the banking inspection and surveillance capacity of SBV;
- Modernize banking technology, accounting and payment systems;
- Enhance the performance of organization management and human resource development;
- Develop the money market;
- Speed up the international integration process in the banking sector.

The scope of FSMIMS also includes the Credit Information Center (CIC) and the Deposit Insurance of Viet Nam (DIV), although the DIV shall separately carry out its own project activities. The FSMIMS project consists of three parts as following:

Part A - Modernizing the SBV

i. **SBV Component 1 - Functional Strengthening and Business Re-engineering:** Assist the SBV to develop a policy and institutional framework as well as the capabilities for information management and decision making.

ii. **SBV Component 2- ICT Platform Development and Implementation:** Assist the SBV to design and build a centralized ICT platform based on international IT standards to support SBV's evolving role as a central bank, taking account of relevant international practices and all critical Vietnamese realities.

iii. **SBV Component 3 – Project Management:** Assist the SBV to manage the implementation of a complex project as described above, to ensure Bank guidelines for procurement and financial management are complied with, contract implementations are on schedule and there are good communications between the management and the project task teams regarding project implementation.

Part B - Strengthening the CIC

iv. **CIC Component 1 - Functional Strengthening**: Assist the CIC to re-engineer business processes; improve the quality of the products and services provided to customers; and develop and train staff on new credit reporting knowledge and equip them with the skills required to use the new knowledge and procedures.

v. **CIC Component 2- ICT Platform Development and Implementation:** Assist the CIC to acquire and install centralized data management systems for the collection, storage, processing, analysis and sharing of information on credit. The direct beneficiary and main implementing unit will be CIC's IT department.

Part C – Enhancing DIV

vi. **DIV Component 1 - Functional Strengthening:** Assist the DIV to re-engineer business processes and provide systematic training to its management and staff.

vii. **DIV Component 2 - ICT Platform Development and Implementation:** Assist DIV to build the technology capacity to support its enhanced role. The direct beneficiary and main implementing unit is DIV's IT department.

viii. **DIV Component 3 – Project Management:** Assist the DIV to manage the implementation of the DIV part of the Project, to ensure Bank guidelines for procurement and financial management are complied with, contract implementations are on schedule and there are good communications between the management and the project task teams regarding project implementation.

1.1.2 Objectives of bi-annual report

Under the regulation, FSMIMS PMU reports to World Bank bi-annually on its project implementation activities. The reports, which are issued for the periods ending June 30 and December 31 of each year, describe major issues and concerns identified during reviews, working sessions with implementation team and vendors, and evaluations, along with recommendations for corrective action.

The objectives of this bi-annual report are to review the projects status; identify any changes compared to the initial project design/project plan; identify of any issues and risks incurred during the project implementation; and propose recommendation to mitigate/solve the risks/issues. Additionally, as this bi-annual report marked the movement from Business Component Completion (SBV Component 1) to ICT & Implementation (SBV Component 2), a comprehensive assessment of business components as well as the recommendations for implementation is also included. Therefore this bi-annual report focuses on the following components of Part A and Part B of FSMIMS project:

- Part A - Modernizing the SBV:
  - SBV Component 1 - Functional Strengthening and Business Re-engineering
  - SBV Component 2 - ICT Platform Development and Implementation
- Part B - Strengthening the CIC:
  - CIC Component 1 - Functional Strengthening.
  - CIC Component 2- ICT Platform Development and Implementation.

1.1.3 Scope of this report and activities

Scope of the report:

- Assess the achievements and summarize outputs of business components; recommend activities that should be considered by SBV to achieve the performance indicators at the end of the project (Component 1).
- Review the implementation of CG1 & SG1.1 packages and related business processes recommended by EY in Process improvement, functional operation strengthen component (Component 2).

Activities performed:

EY perform the main activities as below:

- Assess the business components;
- Review the actual system design and compare to the initial design;
- Review the project implementation progress and compare to implementation plan;
- Identify issues and risks during implementation process;
- Recommendation on risk mitigation solutions.

For the business components, EY will summarize the achievements of all business outputs delivered by EY against the performance indicators of the project.

For ICT components, both packages CG1 and SG1.1, EY will perform the revision for the project implementation status. For CG1, EY also review the business processes in-scope, compare the design of detailed processes during the system implementation of contractors to the processes recommended by EY in CIC part, and identify the differences of objectives, design principle and potential risks (if any).

1.2 Report development approach

To develop this bi-annual report, the information was obtained through reviews of the project documents/deliverables and working sessions with SBV implementation team (CIC PIU CG1) and vendor (FIS-DP). For SG1.1 package, because the project has just started since March 2014, there are only reviews of the documents and deliverables provided by PMU and vendor (NEC-MITEC). For CG1 package, the project implementation information was also through interview and working sessions with the related parties.

The reviewing documents and deliverables consist of:

- Previous terms' reports of FSMIMS project;
- Bidding documents;
- Implementation contracts;
- Periodic project progress reports (weekly, monthly);
- System architecture overview documents;
- System design documents.

Two working sessions are performed separately, one with CIC implementation team and one with FIS-DP project team, to get the information of CG1 package implementation, in order to:

- Update on project progress;
- Update on project scope;
- Update on project issues, challenges and resolving solutions;
- Update on project plan and the change/adjustment compare to initial plan (if any);

- Improvement proposal for resolving of project issues/risks and effective strengthen for project success and timely progress;
- And other related issues.

1.3 Functional Strengthening & Business Re-engineering - Recommendations to achieve the performance indicators by the end of the project

With a review to achieving the performance indicators by the end of the project, it's very important that SBV could accomplish the following activities:

1.3.1 Reporting Regime

- Issues new Regulations for the Reporting Requirement of credit institutions;
- Prepares and pro-actively communicates with credit institutions all the changes in the new reporting regime for their better preparation, especially given the current wave of core system replacement;
- Prepares a comprehensive Implementation Plan for the data warehouse, outlining all the implementation tasks in proper sequences, ownership of the tasks, the coordination and the governance organization, etc.
- Designs the training plan to all relevant end-users of the new reporting system.

1.3.2 Strengthening Monetary Policy Capability

- Implement the OMO process with the deployment of the new Core Banking system;
- Closely collaborate with FSD to provide any changes to data requirements during implementation of the Data Warehouse;
- Implement the 2 research topics, namely inflation forecasting and interbank contagion analysis.

1.3.3 Banking Supervision

- Closely coordinate with task team to implement SBV Centralized Data Warehouse so as to achieve the highest efficiency in deploying its own management information system.

1.3.4 Accounting

- Institutionalize the COA and accounting processes along the line of implementation of the core system.

1.3.5 Budgeting

- Institutionalize the proposed budgeting processes;
- Closely link the implementation of the budgeting re-engineered processes and systems with the deployment of the new ERP system.

1.3.6 Human Resource Management

- Institutionalize the HR re-engineered processes during the implementation of the new HR system. The design of the operation manual should be toward process automation. Only when the enabling HR system is properly used, can SBV monitor the use of all enterprise resources on a daily basis for the branches and on a real-time basis for the headquarters functions.
- Plan for data migration and data cleansing so that a complete and accurate HR database is available. This would create a very good starting point and improve the value of new system which then encourages SBV staff to use it properly.

- Prepare and conduct a communication plan to promote change.
- Promote training activities during the deployment of the new system.
- Design a simple, user-friendly interface and design a user-friendly guide book.

1.3.7 Internal Audit

- *Develop and implement a risk based audit approach:* The guidance policy and the supplementary documents should be used as a basis for preparation of the regulation for introducing risk based internal auditing by the IAD.
- *Revisit the organization structure of IAD:* The introduction of a risk management unit within the IAD would obviously entail a structural change and the IAD might want to take advantage of this opportunity to re-evaluate the assignment of duties within the divisions. In particular, separating head office and branch audits or putting the responsibility for both into one division, except for some special audit activities such as Vault or IT related. If the steps recommended are implemented, the flexibility of allocating auditors to assignments should be increased.
- *Fully utilize Teammate:* As the existing IT audit support infrastructure is sufficient, but not (fully) utilized, SBV should ensure a better utilization of all resources and modules already at hand of Internal Audit Department.

1.3.8 Document Management

- Specify the pre-defined processes within the scope of implementing the Document Management System and issue relevant document as basis for the system go-live.

1.3.9 Training

- It is recommended that HR Department consider integrating medium term training plan in the annual training curriculum of SBV in the years to come.

1.4 ICT Platform Development and Implementation - Progress Review and Recommendations

1.4.1 Overview of ICT package implementation progress - From Business Design to ICT Implementation

The process of FSMIMS project execution is divided into four phases: business requirements, vendor selection, implementation and deployment:

No	Package	Phase 1 - Business requirements	Phase 2 - Vendor Selection	Phase 3 - Implementation	Phase 4 - Deployment
	Part A - Modernizing the SBV				
1	SG1.1 - Servers, Middleware and Database			In progress (10/03/2014 - 25/04/2017)	
2	SG1.2 - ITDB's new Data Center			Not start	
3	SG3.1 - Core-banking, Accounting, Budgeting applications and System Integration			In progress (12/06/2014 - 12/07/2016)	
4	SG3.2 - Document			Not start	

No	Package	Phase 1 - Business requirements	Phase 2 - Vendor Selection	Phase 3 - Implementation	Phase 4 - Deployment
	Management and Human Resource Management			(Bid evaluation)	
5	SG3.3 - IT standards			Not start	
6	SG4 - Data Management, Data Warehouse and related applications			Not start	
	Part B - Strengthening the CIC				
7	CG1 - CIC data management system			In progress	
	Part C – Enhancing DIV				
8	DG1 - Suply, Installation and Integration of Information and Communication System for DIV's Advanced Business Process			Not start	
	FSMIMS – Others				
9	ST3 - IT Contract Management Support			Not start	

- The first phase is the blueprint development and business justification and identification of business requirements.

  SBV has completed this phase with support by EY consultants for packages SG1.1, SG3.1, SG3.2, SG4 and CG1. Representatives from all functional divisions (technical teams) were involved in all stages of the blueprint development, the user requirement definition preparation and ultimately the solution selection process. Hence, SBV has (so far) applied best practices to its core packages. Owing to the pervasive nature of these systems within the organization, viewing the project as just another IT project would have been a recipe for failure.

- The second phase is the selection of the final solution(s) and the vendor(s).

  SBV has also completed this phase with support by EY consultants for packages SG1.1, SG3.1, SG3.2, SG4 and CG1, where SG3.1 got two-stage bidding process. This two-stage bidding process has been in line with the World Bank procurement guidelines. SBV has evaluated all available options and selected the solution(s) that provide the right DNA (the architecture) to meet its business and strategic requirements, in line with its blueprint.

Each of the bids received and opened, during the official bid opening ceremony, has been assessed on both qualitative and quantitative terms across a matrix of selection criteria. A critical requirement for the new systems is flexibility and scalability to cater to the inevitable future growth and the baseline, blueprint requirements.

Thus, the right selection will be a solution with a forward-looking flexible architecture that has the ability to support SBV's current business requirements and needs, and allows for future modifications with ease.

- The third phase of the project is implementation.

  The key objective is to operationalize and pilot the transformed future state, including technology, process and organizational change. This involves developing detailed designs, including system designs for configuration and customization and designs for interfaces and data conversion.

  The other critical elements of this phase are building and testing the system, implementing pilots and conducting business acceptance tests at each stage.

  There has been a sign-off at each stage to ensure that deliverables and expectations match, or else the project can easily digress from its initial plan and increase in scope through incremental changes which will lead to schedule and cost overruns.

- The last and final phase of the project is deployment.

  This is probably the most critical and challenging stage, where SBV undertakes the actual deployment of the new system in live operation. The process involves numerous logistical issues such as data conversion, interfacing and coexistence.

  The deployment has been done in small "clusters", though the bank has to tackle the tricky issue of coexistence. This gradual step-by-step approach is appropriate as it entails lower risks, facilitates change management and allows changes to be incorporated in the technical framework as it is being installed (to provide a better fit with the SBV actual real live business needs).

Up to now SBV has executed the FSMIMS project with two of three parts, Part A – Modernizing the SBV and Part B – Strengthening the CIC. Summary of the application of the functional strengthening outputs (Component 1) as inputs for the ICT implementation (Component 2) as below:

#	Outputs of Component 1 - Functional Strengthening	Inputs for Component 2 - ICT
	Part A - Modernizing the SBV	
1	► Inputs to User Needs Specifications and Functional Requirements of Strengthening Monetary Policy Capability; and ► Inputs to User Needs Specifications and Functional Requirements of Reporting Regime.	SG4 - Procurement of Data Management, Data Warehouse and Related Applications for SBV
2	► Inputs to User Needs Specifications and Functional Requirements of Accounting Component ► Inputs to User Needs Specifications and Functional Requirements of Budgeting Component ► Inputs to User Needs Specifications and Functional Requirements of Central Banking Operation	SG3.1 - Procurement of Core Banking, Accounting, Budgeting applications and System Integration for SBV

	Part B - Strengthening the CIC	
	► User needs and functional requirements of CIC	CG1- CIC Data Management Applications (Servers, core data warehouse, communication & related applications)

1.4.2 Implementation Progress Review

During this bi-annual report period, package SG1.1 (Part A) issued three deliverables in accordance to the project plan and package CG1 (Part B) issued four deliverables with one in plan and three behind the initial plan.

SG1.1 package

#	Task name	Completion period	Deliverables/Work completed	Status
1	Survey, Plan and System Design	10-Mar-2014 – 23-Jun-2014	► Report of Survey result and plan of infrastructure installation. ► Project planning ► System design	Complete. In plan
2	Import, Check, Delivery Goods	13-Mar-2014 – 02-July-2014	► Good delivery at DC and DR. ► CO, CQ. ► Transportation papers, Insurance certificate. ► Warranty certificate, License certificate.	Complete. In plan
5	Local training	21-Apr-2014 – 20-Jun-2014	► Database: Oracle 12c – RAC Administrator ► Server and accompanied software ► Network and Virtualization software	Complete. In Plan

CG1 package

#	Project Milestones	Completion Date	Deliverables/Work complete	Status
1.	Agreed and Finalized Project Plan	21-Nov-2013	► Project Management Plan	Completed. Behind the plan
2.	Sign-off hardware and software acceptance at the End of Software and Hardware Installation	18-Feb-2014	► Hardware and standard software delivery report ► Infrastructure system specification document ► Standard software system specification document	Completed. In plan
3.	Agreed and Finalized Software Requirements Specification at the end of Gap Analysis	28-Feb-2014	► Software Requirement Specification Document	Completed. Behind the plan
4.	Customize/Develop Data Management System at the end of Design & Development period	16-Jul-2014	► Application software customization specification Document	Completed. Behind the plan

1.4.3 Key findings and recommendations

SG1.1 package

During this bi-annual report period, SG1.1 package implementation progress is in planned with all the milestones up to now. There are no major issue and concern identified during review and evaluation.

*For more details, please refer to Section **2. Detailed Review of SG1.1 - Servers, Middlewares, Database for SBV**.*

CG1 package

There are several issues and concerns identified during review and evaluation of GC1 implementation process:

	Findings	Recommendations
	Project management	
1	*Hardly to follow initial project implementation milestones:* Due to the high complexity in the nature of CIC's business processes as well as the GAPs between CIC's business requirements and FIS-DP's proposed solution, the actual work and time required was extended for GAP analysis and customization design activities. Therefore, as the project progressing, project team are adjusting the actual time needed for each tasks, but to make sure the main milestones and the overall progress are committed as in the initial plan.	CIC, FIS-DP and PMU should agree on an appropriate adjustment of not only the activities timelines but also the remaining key project milestones (SIT, Training, UAT and OAT) to ensure the whole project deadline (December 2014) be in time. EY also noticed that FIS-DP has added more engineer to cope with the project's activities to make sure the deadline is committed. However, in practice, FIS-DP cannot meet the initial deadlines of key milestones, including: SIT on 15/08/2014, UAT on 3/10/2014, and even OAT on 14/11/2014; and will face to penalties for delays in project milestones. CIC, FIS-DP and PMU should agree on change of UAT milestone, perform UAT earlier than Project milestone (3/10/2014). UAT should be performed since September 2014, rolling with SIT, instead of on October as planned. Therefore, FIS-DP should try to prepare and deliver the test scenario as soon as possible. Any module finished with SIT, should be continued with UAT shortly thereafter.
2	*Difficult project organization and governance due to large personnel resources from various specific technical groups:* The Project consists of various categories spanning over areas of technology, including infrastructure, hardware and software. There are different technical groups in the project, such as: Technology Infrastructure (networking, securities, virtual servers, storage); and Application Software (database, data warehouse, ETL, web application, modern and updated Oracle portal). Therefore, the project requires recruiting personnel and experts from various technical groups, leading to difficulties for project organization and	As the project running towards the deadline, both team has mobilize more people into the project team. This could help in sharing the work load. However, PMU and project team must pay attention to the management of the team which is much bigger now. New joiner need to be provided with necessary training and sharing to be able to perform as expected.

	Findings	Recommendations
	governance.	
3	*Implementation quality:* The Project has enormous volume of work, in great detail level, and high quality standards to be met. This challenge requires human-intensive, working efficiency and intense concentration from team members for the project.	Project quality assurance always one of the key thing project management team has to pay attention to. Quality may be compromised, and activities cut short over tight deadlines. CIC project team must ensure that FIS-DP's deliverables for the remaining activities of the project all meet the required quality as stated in the contract.
4	*Project communication and coordination:* The Project requires close coordination between parties and foreign experts. Proactive works were sometime affected by coordination plan of the parties.	Improve in developing and monitoring of a communication plan to perform better coordination.
	GAP analysis & Customization Design	
5	*Delay in completion of Gap Analysis and Customization design* Due to the complexity of modules M1.B (CIC Internal Report), M4.A (Industry Analysis) and M4.B (Probability of Default) and the all the differences between FIS-DP's proposed solution and CIC's User Requirements, there were delays in agreement and completion of Gap Analysis; as well as the review of adjusted design regardless FIS-DP's increase in personnel and working hours.	EY noticed that there were measures of project progress improvement agreed by CIC, FIS-DP and PMU through working sessions on date 14/05/2014 and 10/06/2014, including: ► Resource Reinforcement; ► Working Hours Increase; ► Parallelization of Tasks; ► Enhancing Communication and Coordination with Implementation Team; ► Querying CIC for testing data; ► Optimizing Gantt's critical path for improvement of workflows and deadlines; ► Prioritizing major business modules and reports. With about measures, the progress of the project will be ensured. In addition, CIC-PIU and FIS-DP should closely monitor the implementation of these measures by detailed weekly planning.
6	*Short time for reviewing Design documents:* There was large number of Design documents delivered by FIS-DP, while time for reviewing of design documents by CIC are too short to ensure quality and	CIC should allocate more manpower to support design deliverables review process.

	Findings	Recommendations
	responsiveness of the customization design.	
	System Integration Test (SIT)	
7	*Hardly to follow SIT milestones:* Due to the unforeseen complexity and large scope of testing, the initial SIT completion date of 15/08/2014 was hardly to be committed. This may also affect timeline of activities after SIT, such as UAT testing activites.	Giving the fact that the overall progression of the project may not met the initial plan, project team need to consider on: ► Review and agree on reasonably rearranging the timeline of the detail activities but still to keep the overall progress and milestones. For example, project team may need to extend the SIT testing time compare to the initial plan, but to start the UAT testing earlier. UAT testing will be carried out part by part by modules/function right after the SIT for those modules/functions was completed. Trying to run the SIT and UAT partially parallel may help put the overall progress of the project in track. ► Allocate more manpower from both sides CIC and FIS-DP to support SIT and UAT processes. ► The training for UAT testing must be conducted earlier for a better preparation for CIC's project team and end users.

*For more details, please refer to Section **3. Detailed Review of CG1 – CIC Data Management Applications (Servers, core data warehouse, communication & related applications).***

Part A: Assessment & Output Summary of SBV Component

1 - Functional Strengthening and Business Process Reengineering

1. Reporting Regime

1.1 Objectives

- Improve SBV's statistical reporting regime governing credit institutions (CI) and narrow the scope of information gathered at the CI branch level to essential needs. Focus on information gathering at the CI central level that is useful for the implementation of national monetary policy, state management functions, inspection and monitoring for SBV's governance needs.

The final outcome of this component is a new reporting regime in line with international best practices: statistics accuracy and consistency improved; monthly monetary survey submitted to IMF.

1.2 Assessment & Output Summary

Component overview

The consultant has designed for SBV a modern centralized reporting regime, fully in line with the FSMIMS project objectives to move SBV towards international standards, such as IAS/IFRS and also to enable SBV to meet the baseline standards, as outlined under the core principle for effective banking supervision under the Basel Accord.

The consultant has also developed an interims reporting regime for SBV, which can help the Vietnam Financial Services sector smoothly transit towards a "Best Practice" reporting regime. The transition roadmap which addresses all the key changes and the pre-conditions to establish and successfully maintain the new reporting regime was delivered.

A survey to selected financial institutions (25) to receive feedback and discuss implementation target dates, has been completed by the consultant.

Key observations for the reporting regime are:

- An "interims" and "Future Stage" model for the reporting regime were developed and delivered. This makes SBV "Future Proof" and avoids major re-work in the future; and
- The new "Future Stage" reporting regime is in line with the FSMIMS objectives & final project assessment benchmarks, e.g. to comply with the Basel core principle for effective banking supervision and IAS/IFRS standards.

Component outcome against project objectives:

The analysis of existing decentralized reporting regime model revealed quite a few challenges, such as:

- Too much focus on input reports (including amended input requirements for Circular 21) while being negligent of the designing of output reports
- Dispersed data analysis capacity in most of the functional departments

- No consideration for the reporting cost which leads to excessive requirements of data (i.e: “something nice to have” or “just in case the Board might ask for it”, etc.)
- Inefficient data validation procedures which represent a huge waste of resources and low accuracy of data
- The lack of guidance on data management and regulatory reporting requirements
- The lack of on-site examination of regulatory reporting

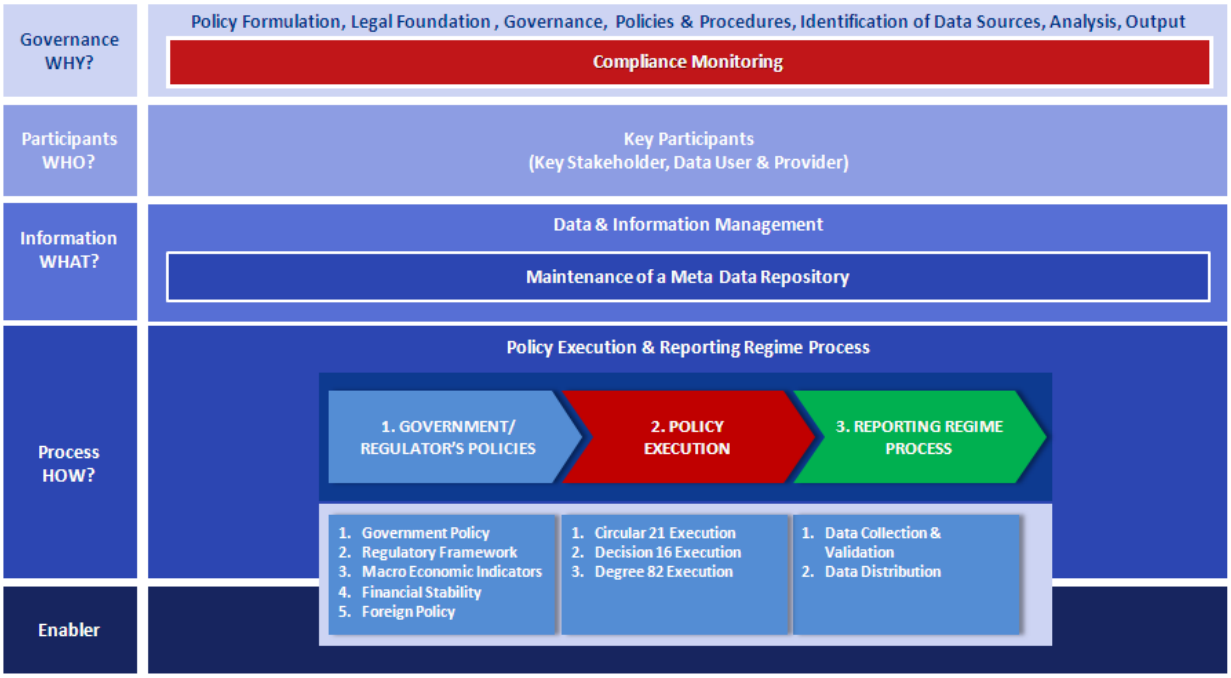
The transformation from this decentralized model to a centralized one represents a long and very challenging journey for SBV. Along the way, SBV will need a sound conceptual framework, a new central information management function, the new data acquisition process, new regulations for reporting regime, new data reporting method, data model as the framework for the establishment and maintenance of centralized data warehouse the implementation of national monetary policy, state management functions, inspection and monitoring for SBV’s governance needs.

Highlights of key features of new reporting regime design include:

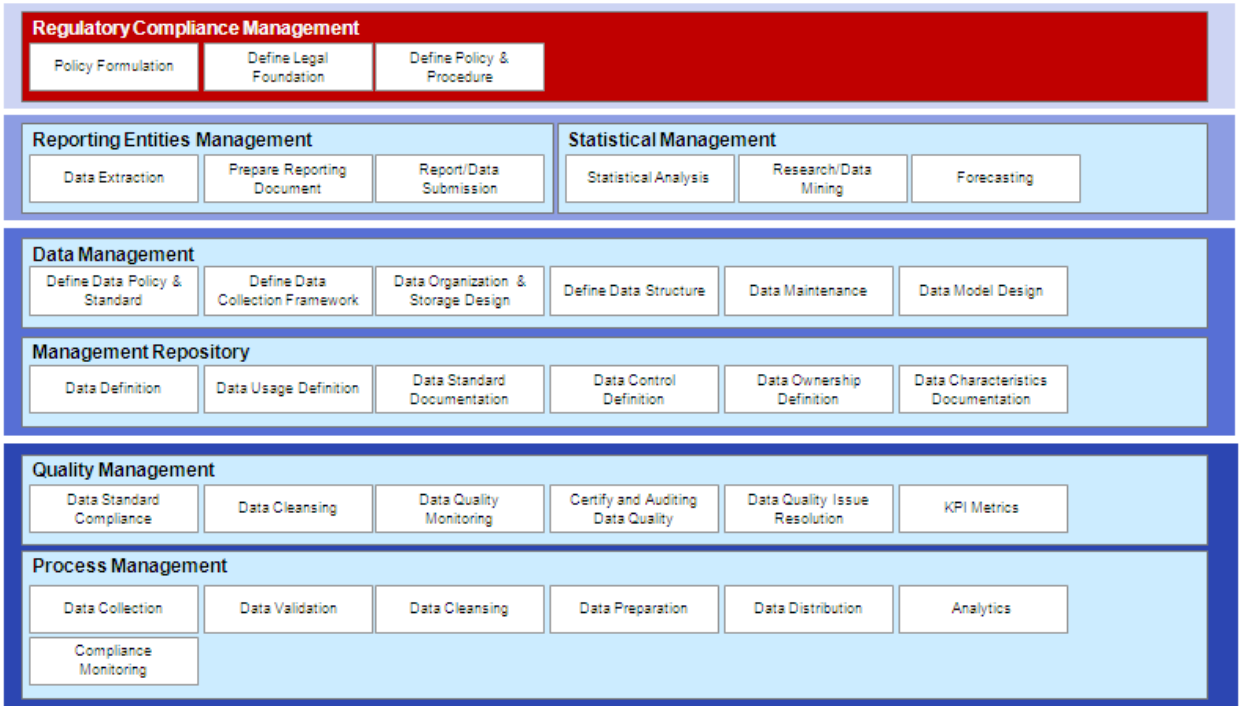
a. Conceptual framework:

A comprehensive conceptual blueprint of the Reporting Regime has been introduced by the Consultant. This Conceptual Blueprint is the starting point and the guidance for the detailed design of the most challenging component.

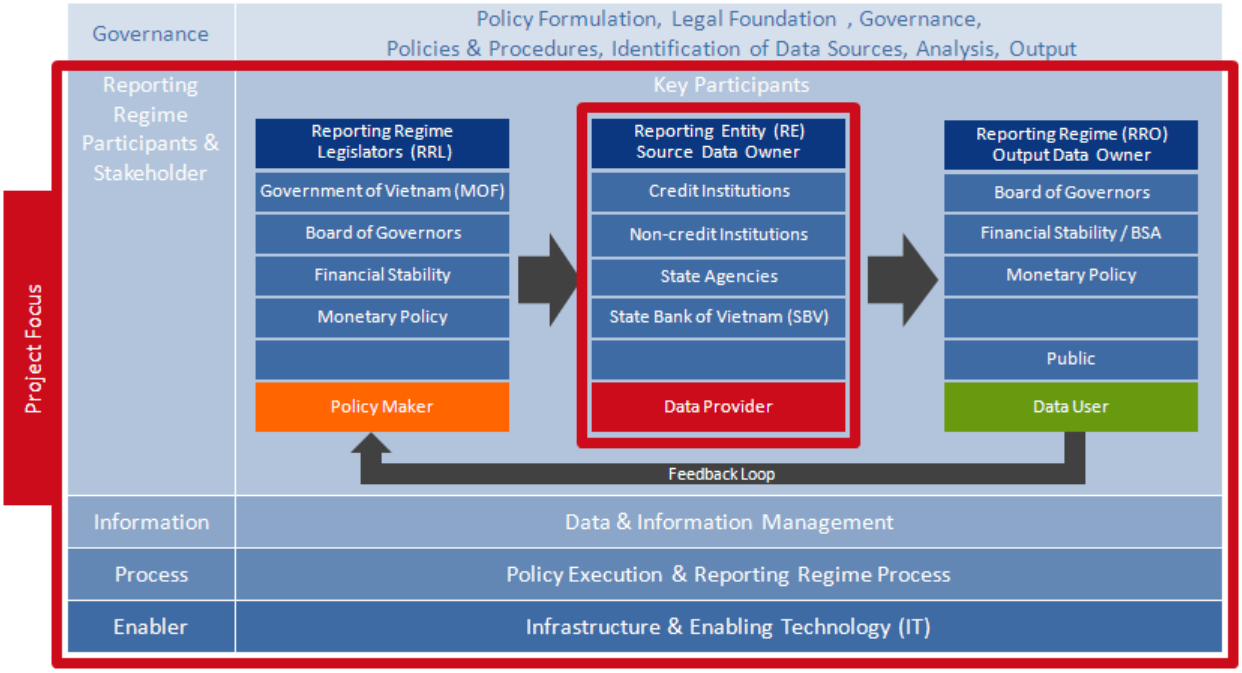
SBV’s reporting regime operates on multiple dimensions …



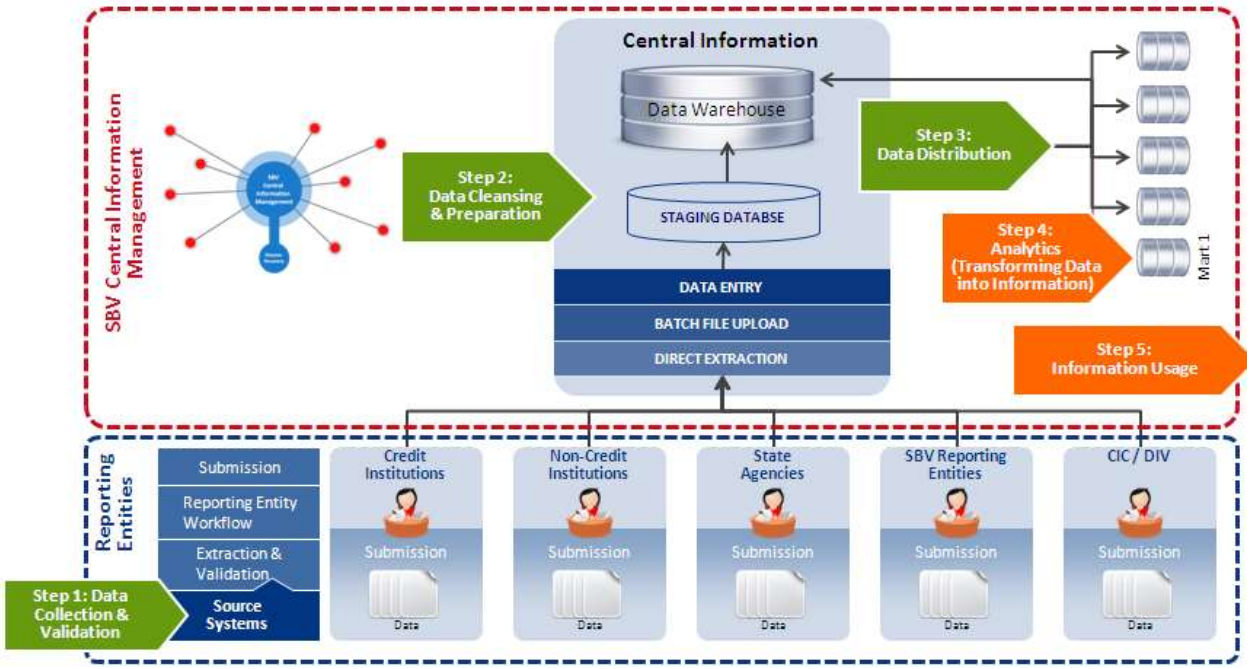
…. and requires multidisciplinary capabilities



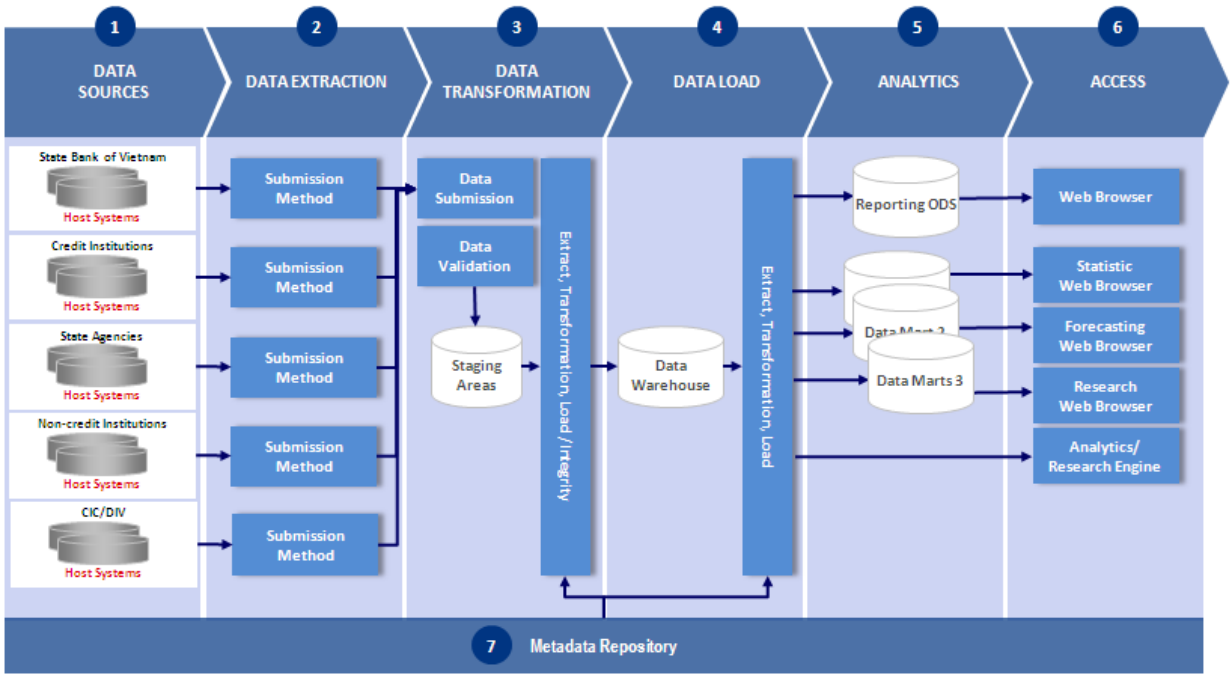
…. and includes various stakeholders



As data is very critical to all stakeholders, the process of data acquisition, data analysis and usage are required to be standardized.

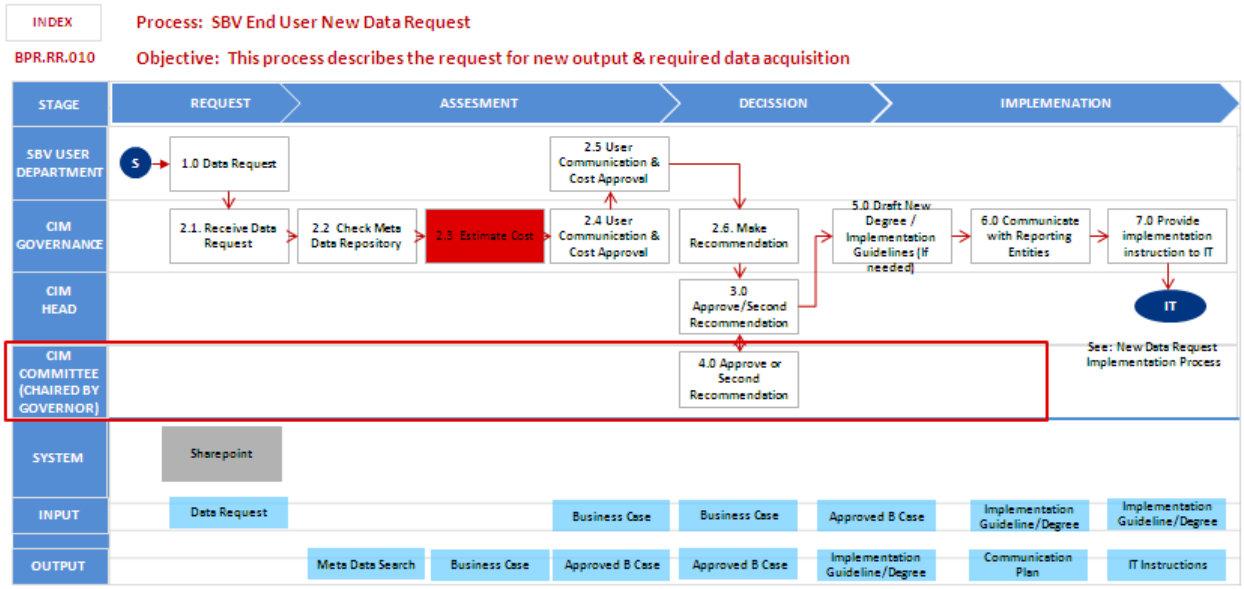


And the data architecture which is designed to support SBV's statutory duties needs to be sustainable.



b. New data acquisition process:

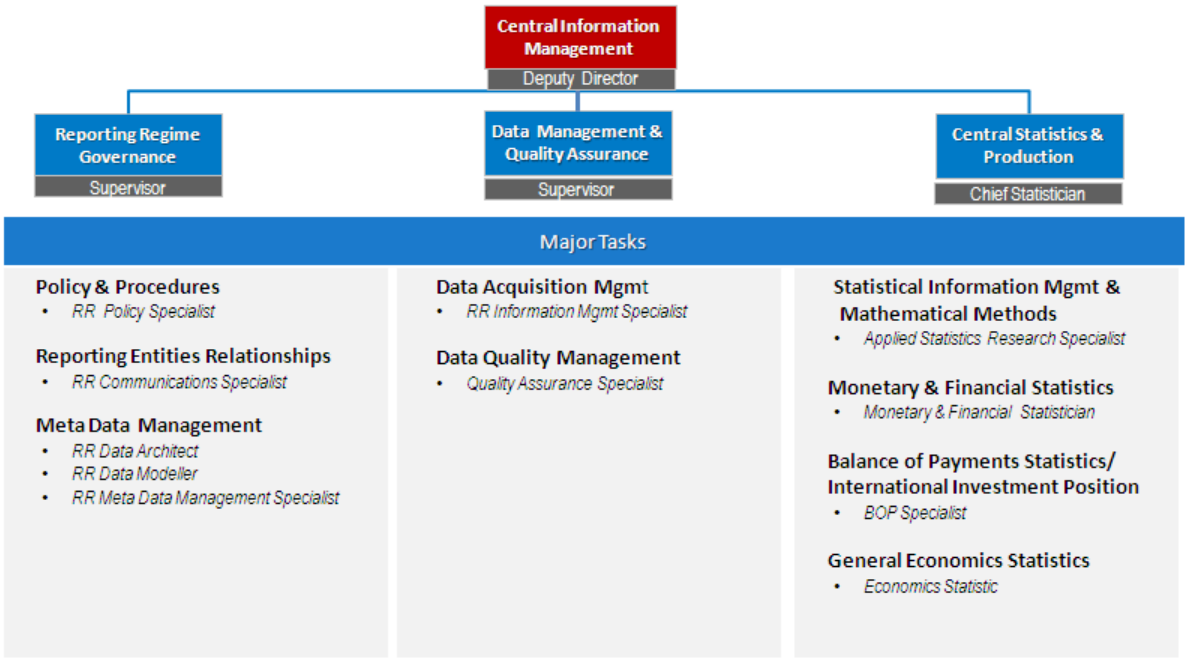
Reporting Regime is an ecosystem involving many external parties. To minimize burden to data providers, the cost estimation is embedded in the new data acquisition process.



c. Central Information Management:

This function will own the centralized data warehouse and new system to execute the new business processes of the centralized information and statistics management of the Reporting Regime. The function's structure and major responsibilities are:

The new Central Information Management function requires a number of new positions with the new skills.



d. New Regulation for Reporting Regime:

A new regulation for Reporting Regime which deems to replace the existing Circular 21 has been developed. It extensively covers every single aspect, from the new data requirement to Guidance to Data Preparation, Guidelines on Data Management and Regulatory Reporting Requirements, all kinds of code and Penalties for Violations.

The new data requirement has been discussed in many rounds with 8 related departments, including: including: BSA, FSD, MPD, CD, FXMD, CBD, Settlement Dept and Vault & Issuance Dept. The Consultant did re-perform the new data acquisition process to provide SBV with sound baseline in its implementation of the new data warehouse. The process consists of:

- Step 1: Obtain and Challenge Output Reports
- Step 2: Define the Data Elements
- Step 3: Classify Data
- Step 4: Develop Input Report Requirements

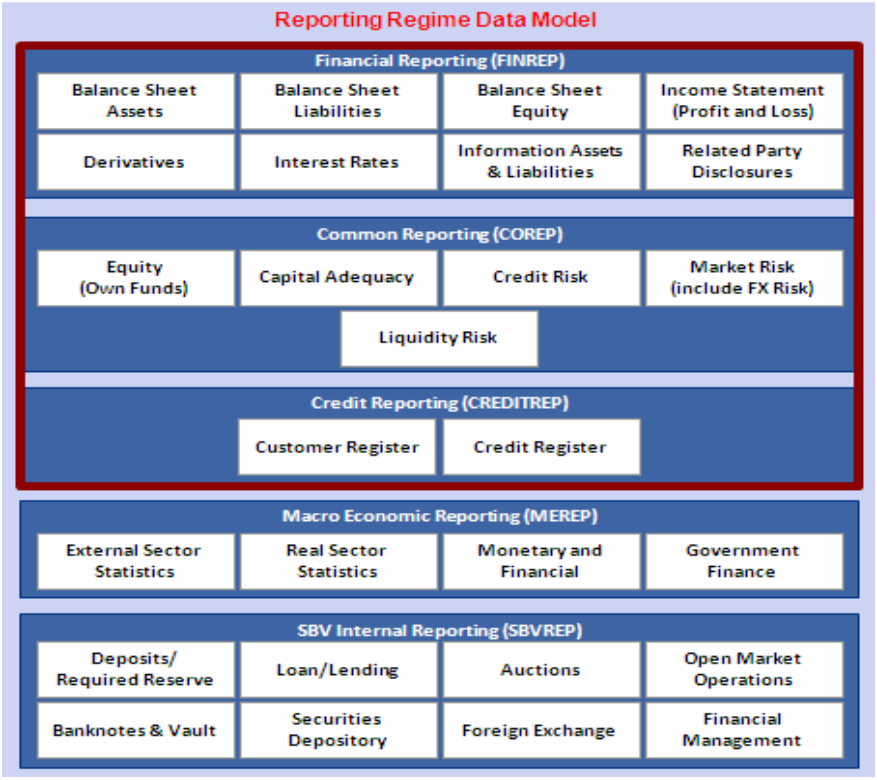
The end result is a set of data requirement which is:

- Serving of both management information for CI and regulatory reporting to SBV
- In-line with other central bank practice both in the region and world-wide
- Big picture for both information provider and receiver which help to improve data accuracy

A detailed guideline has been developed for each of a thousand data elements as well as the guidance to CIs how to prepare those data.

e. Reporting Regime Data Model:

On the basis of the data requirement of end-user departments, the data model has been designed which is “future proof” and save SBV any major re-work in its transition to comply with Basel Core Principal and IFRS.



f. Reporting Method:

Given the diversified IT infrastructure of the CIs, the Consultant has proposed various reporting methods, which is presented in the form of an article of the new circular as follows:

- All MFIs shall prepare their consolidated or sub-consolidated reporting returns according to the regular supervisory reporting requirements covering FINREP, COREP and CREDITREP.
- Reports shall be prepared in form of electronic data files and shall be submitted through data submission portal of State bank of Vietnam. The electronic data file must be formatted in one of the applicable formats -- form of structured data in text format, in form of Excel and in form of XML according to technical specification specify in the reporting guidelines.
- Reports shall be submitted to SBV via one of the reporting methods below:

  Option 1 - Real-time Submission. This option allows reporting entities to create a file using a common data extraction provided by SBV and then automatically transmitting to data staging in data submission portal. With technology support, this option is recommended, as target model of data submission by MFIs, to ensure high level of harmonisation and strong convergence in supervisory reporting requirements.

  Option 2A - Batch Electronic File Upload (Structured and Excel). This option allows reporting entities to create a file using one of the acceptable formats listed in the implementation guidelines. The acceptable formats include structured data file or in Excel format.

  Option 2B - Batch XML Document Upload. Similar to Batch Electronic File Upload except the reporting entities create a upload file in XML document format using one of the acceptable formats listed in the implementation guidelines.

  ***Option 3A - Data Entry*.** An online version of filling-out a paper form. Enter each data and the system validates the input data based on program rules. The system generates the same file format as Batch Electronic File Upload (Structure and Excel) option.

  Option 3B - Data Entry in XML Document. An online version of filling-out a paper form. Enter each data and the system validates the input data based on program rules. The system generates the same file format as Batch XML Document Upload option.

- MFIs in Vietnam are classified into 4 tiers, which are categorized into 3 reporting groups – basic, intermediate and advance. See table 2 in next page.
- Basic reporting group covering tier-3 and tier-4 MFIs; and they are compulsory to fulfil the basic minimum reporting method that is option 3 for FINREP and COREP and option 3 for CREDITREP.
- Intermediate reporting group covering tier-2 MFIs; they are compulsory to fulfil the intermediate minimum reporting group that is all reporting domains under option 2.
- Advance reporting group covering tier-1 MFIs; they are compulsory to fulfil the advance minimum reporting group that is all reporting domains under option 2 and readiness for transition to option 1 within 7 years.
- MFIs under lower tiers are allowed to use higher reporting methods, e.g. basic reporting group allows to use option 2 for FINREP.

No	Domains	Advance (Tier 1)			Intermediate (Tier 2)			Basic (Tier 3 & 4)		
		Option 1	Option 2	Option 3	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3
1	Financial Reporting	√	√	NA	Optional	√	NA	Optional	Optional	√
2	Common Reporting	√	√	NA	Optional	√	NA	Optional	Optional	√
3	Credit Reporting	√	√	NA	Optional	√	NA	Optional	√	NA

In short, a new reporting regime in line with international best practices, the principles for effective banking supervision of the Basel accord and compliance with the international IAS/IFRS standards was proposed. SBV nevertheless will need certain pre-conditions in place so as to realize this regime, for example the Accounting Law Amendment toward IFRS and the enactment of regulations on CIs operation which are in line with Basel accord. In the transition period, the reporting regime under FSMIMS has been aligned toward those requirements; no major work would be required once the above-mentioned pre-conditions are introduced.

2. Monetary Policy Capacity Strengthening

2.1 Objectives

Major outcomes from the capacity enhancement and business functionality strengthening of SBV with regards to monetary policy are specified as:

- Streamline the coordination process between monetary policy planning and implementation, to create a highly integrated structure, assure synchronization and effectiveness of SBV‘s policies; and
- Strengthen the research capacity on economy and monetary issues, with high priority given to monetary and forex policies, and banking system development.

The final performance indicators for this component would be presentation, coverage, timeliness and disclosure of monetary and financial statistics largely consistent with IMF guidelines.

2.2 Assessment & Output Summary:

Component overview

The initial diagnostic and development of the target operating model for this “mission critical” component, was initially difficult due to the extremely complex nature of this Component. The most material and also root cause to the delay of Inception Report for nearly 6 months was the unclear scope of work. As policy planning and implementation involves 4 departments, namely Monetary Policy Department, Credit Department, Foreign Exchange Management Department and Forecast and Statistics Department, with a lot of highly complicated and specialized business processes, the unclear scope of work in ST1 RFP did take its toll. Too many rounds of discussion without result even led to the point, at one time, that the work for this component was seriously contemplated to be terminated.

Nevertheless, after the detailed scope was finally clarified by all parties, the consultant and related SBV departments worked very hard to close the time gap and were able to complete all the deliverables without any impacts on the critical path of the project (i.e: bidding process of related package, namely SG4 & SG3.1).

Component outcome against project objectives:

1. *Streamline the coordination process between monetary policy planning and implementation by selected process re-engineering*

Three processes which provide the inputs for monetary policy planning (namely Inflation Forecasting and Targeting, Capital Inflow/Outflow Process and Interbank Market Operation) and one process which cover the key instrument used by SBV in its monetary policy implementation (namely Open Market Operation) were selected for re-engineering. Specifically, the focus of process improvement is:

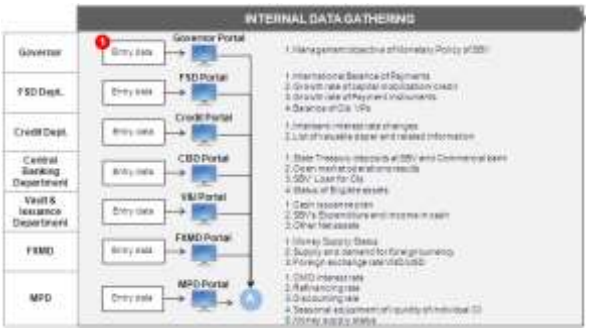
- analysis framework for OMO planning and recommendations about workflow management for OMO auction processes;
- the approach and implementation of inflation targeting strategy and the suggestion of appropriate inflation forecasting process and model in Vietnam context;
- recommendation on capital inflows and outflows forecasting and overview of workflow management to support capital flows process; and
- analysis framework for interbank market operation and overview of workflow management to support interbank process.

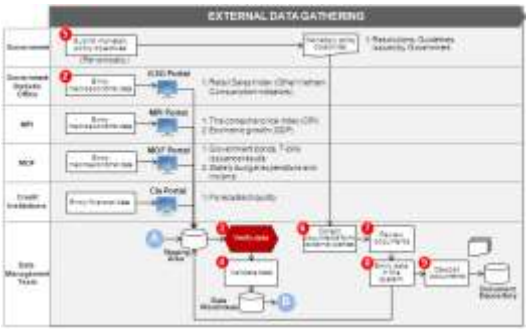
Summary of key recommendations is presented below

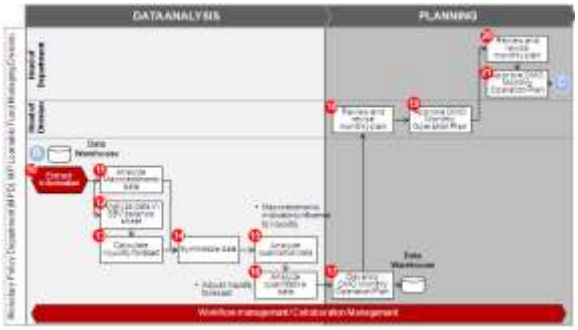
- **OMO process**

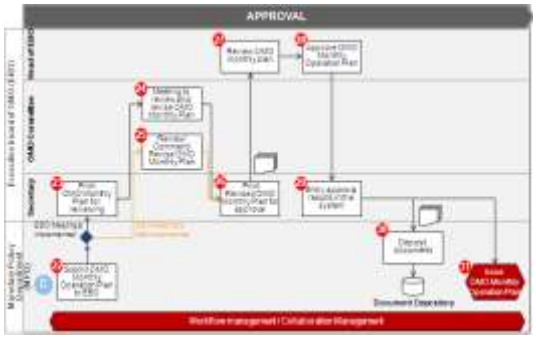
  i. OMO

  - SBV must develop interbank market and standing facilities to redistribute efficiently the liquidity throughout the banking system
  - SBV can apply averaging provision of the reserve requirements to smooth the effects of temporary liquidity fluctuations and minimize the use of standard tender
  - SBV can implement standard auctions, quick auctions, fixed and variable interest rates auctions and bilateral operation
  - Proposed list of useful input indicators such as inflation forecast and short-term (quarterly) macroeconomic outlook, business cycle indicators (BCI), SBV's balance sheet, change in official reserves, so on.
  - Recommendation on methodology, information, process and legal framework required for estimation of Vietnam Interbank Offering Rate (VIBOR)
  - Recommendation on monthly OMO Operation plan including 5 stages: 1) internal data gathering; 2) external data gathering; 3) data analysis, 4) planning & 5) approval

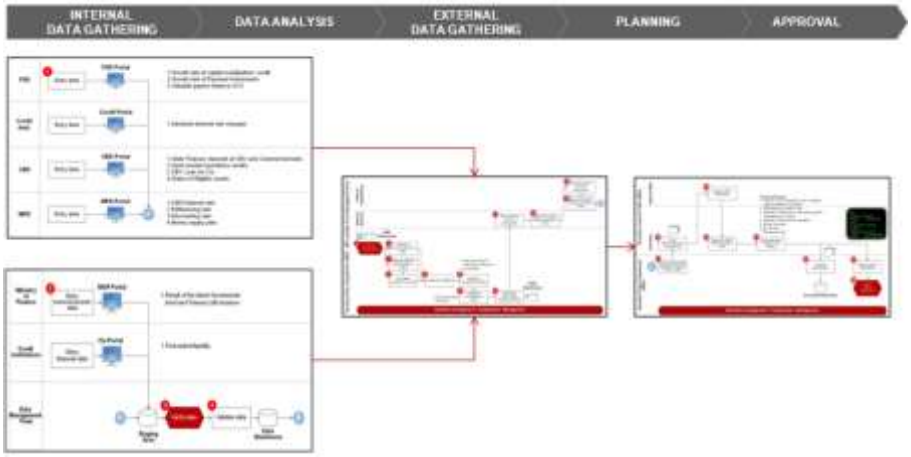




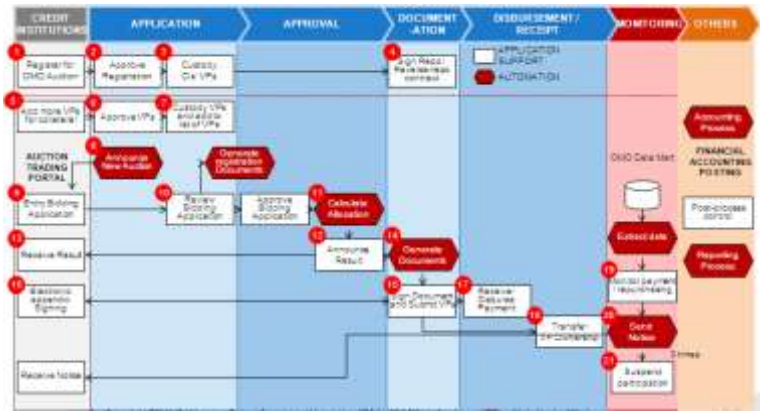




- Recommendations on daily OMO Operation plan including 5 stages: 1) internal data gathering; 2) data analysis; 3) external gata gathering; 4) planning; 5) approval



- Recommendations on OMO auction execution including 5 sub-processes 1) Application; 2) Approval; 3) Documentation; 4) Disbursement / Receipt and 5) Monitoring



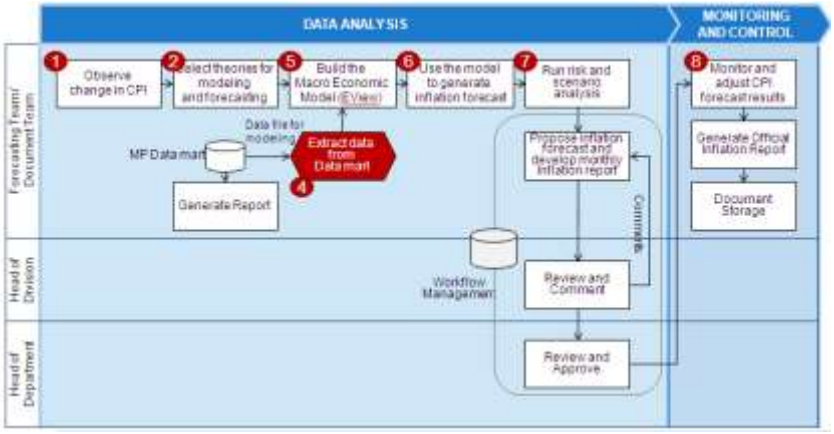
- Recommend specific Roles and responsibilities of related departments

ii. Liquidity forecasting

- Due to lack of required indicators and historical data, SBV can use forecasting model involving only currently-collected important indicator and start collecting new indicators, instead
- SBV should increase collaboration with government such as Ministry of Finance, Ministry of Planning and Investment to obtain figures on government lending directly and try to detect regularities in the government payments and receipts
- SBV need to develop an approach to forecast liquidity demand in the system

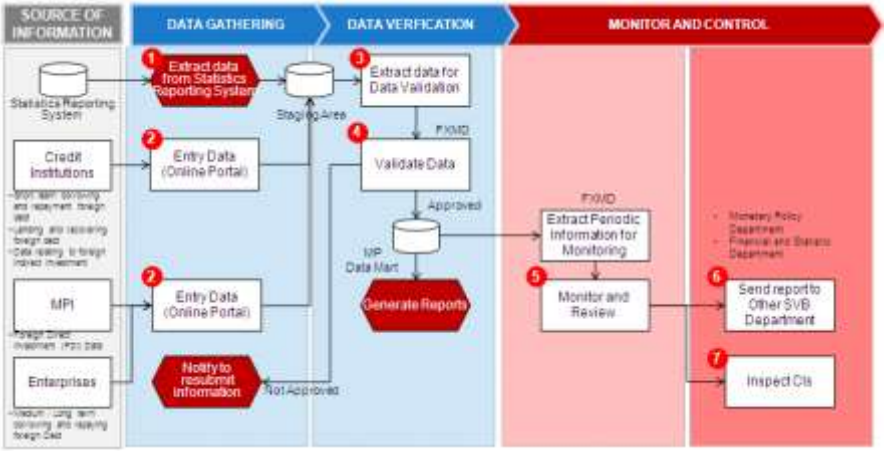
Inflation targeting and forecasting

- Introduction of approaches for inflation forecasting modeling: monetary approach and real sector approach
- Recommend inflation targeting strategy
- Recommend inflation forecasting model
  - VAR or VECM model for short-term (monthly) inflation forecasting model
  - VECM model or ARDL model for longer term (quarterly) inflation forecasting model
- Recommend inflation forecasting process including 4 sub-processes 1) Data Gathering, 2) Data Verification, 3) Data Analysis, and 4) Monitoring and Control which are separated into 8 key steps

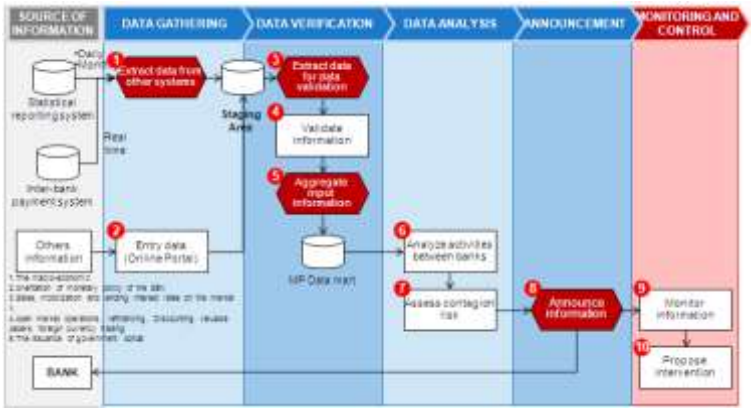


- Recommend framework of inflation report

- **Capital inflows and outflows**
  - Recommend BOP reports in compliance with IMF BOF and IIP requirement
  - Recommend capital inflows/outflows monitoring and collecting process
    - Recommend Monetary Policy Department to be central responsible unit to provide type of framework and design coherence to disseminate data requirements to other related departments.
    - FXMD takes responsibility of providing information and analysis on both short-term and long-term capital flow
    - CBD is the responsible unit to provide the return in the market and provide information to Budgeting or Account department
  - Recommend SBV to optimize data flows and management to improve capture and validation
  - Recommend Capital Inflows / Outflows process including 3 sub-processes 1) Data Gathering, 2) Data Verification and 3) Monitor And Control



  - Recommend Capital flows forecasting pertaining to: analysis capital flow information of FXMD
  - Recommend Capital inflows and outflows reports
  - Recommend roles and responsibilities of related departments in each stages of capital inflows and outflows process
- **Interbank market monitoring**
  - Recommend on interbank market process improvement
    - SBV should improve quality of electronic reporting system
    - SBV should develop mechanism of exchanging information, communication between units
    - SBV should have effective analysis and project models to forecast changes of the interbank market
  - Recommend Interbank market monitoring process including 5 sub-processes) Data Gathering, 2) Data Verification, 3) Data Analysis, 4) Announcement and 5) Monitoring and Control



- Recommend input reports and output reports of interbank market
- Recommend roles and responsibilities of related departments in each stages of interbank market monitoring process

2. *Strengthen the research capacity on economy and monetary issues by a prioritized research program covering two topics*

Two research topics (inflation forecasting and interbank contagion analysis) were selected and executed together with FSD and Credit Department. A series of on-the-job training were conducted with all 4 departments who are in charge of receiving and analyzing monetary and financial information, proposing monetary policy planning and assessing monetary policy implementation and effectiveness.

Research paper on inflation forecasts

In most central banks inflation forecasts are an important input in the monetary policy decisions and the same is true in the state bank of Vietnam. Inflation forecasts can be model-based or off-model based forecasts or a combination of both. But in any case, the forecasts take into account, knowledge concerning the transmission mechanisms of monetary policy decisions towards CPI movements and other macroeconomic variables.

This paper therefore focusses on two main themes. Firstly, the exchange rate pass-through into inflation in Vietnam will be analyzed. Secondly, the information gained in the pass-through analysis will be used to explore some alternative inflation models that can be used for inflation forecasts in the case of Vietnam. More specifically, the paper explores inflation forecasting using Vector Error Correction Models (VECM) for monthly and quarterly inflation forecasting and Autoregressive Distributed Lag (ARDL) models for quarterly inflation forecasting. These models are then used to generate baseline inflation forecasts. In addition, the paper also covers the analysis of alternative scenarios based on different exogenous assumptions and the methods to illustrate the degree of uncertainty surrounding the baseline forecasts.

The results of the analysis in this research paper allowed to draw a number of conclusions and to lead to a number of recommendations concerning the transmission mechanisms of monetary policy in the case of Vietnam, inflation modelling and inflation forecasts, requirements in terms of future analysis and research and the importance of statistics and indicators.

Contagion Analysis in the Inter-Bank Market in Vietnam

The paper uses counterfactual simulations to assess contagion risk from interbank lending in Vietnam. More specifically, the paper focuses on the direct contagion due to interbank lending. The focus on interbank lending in many countries stems from the fact that interbank exposures tend to make up a large proportion of bank's balance sheets and may often exceed bank capital.

The Vietnam Interbank Lending Matrix (IBLM) is used to conduct simulations-based calculations of interbank solvency contagion risk. The paper discusses the nature of the

Vietnam IBLM, the development of the spreadsheet on which the calculations are based, the main assumptions that are used in the simulations and the main results of the exercise. The illustration by this paper demonstrates how the analysis result could provide useful insights regarding:

- The risk of failure of each bank active in the interbank market, following the failure of each of the other banks by comparing the exposure of each bank to each of the other banks with its own capital;
- The change in the level of the Capital Adequacy Ratio of each bank after the failure of each of the other banks. This provides an indication of the necessary amount of recapitalization of banks following their exposures in the interbank market;
- Which banks are critical for financial stability (systemically important banks), given their liabilities to each of the other banks;
- How a changing interbank structure may affect the danger of contagion;
- What kind of changes in regulation design may be appropriate concerning for example netting arrangements, limits to large exposures etc.;
- What kind of design of crises management may be appropriate for example in terms of implicit government guarantees and bail-outs. It also allows toestimate the cost to the government budget if such guarantees would have to be provided and large banks would have to be bailed out.

Additionally, the paper also recommends potentially useful extensions of the contagion analysis.

3. Banking Supervision ("BSA")

3.1 Objectives:

The major goal for the Banking Supervision component of the FSMIMS project is partially compliant with Core Principles number 16-20 of Basel Core Principles for Effective Banking Supervision. That means the implementation of SBV's inspection and surveillance functions with higher level of integration between the processes of authorization, off-site surveillance and on-site examination, in order to provide early warning on potential risks and crises, and to determine appropriate actions to deal with those risks or crises.

3.2 Assessment & Output Summary:

With the target to partially comply with Core Principles number 16-20 of Basel Core Principles for Effective Banking Supervision, a comprehensive gap analysis was conducted which covered the followings:

Review of current business processes:

- Summary outline of the duties, responsibilities, tasks/activities and outputs of each unit.
- Prepare a summary outline of BSA staffs' daily, weekly, monthly, quarterly, annual tasks/activities and outputs, and evaluate the purpose/use of these.
- Obtaining Policy and Procedures Manuals (PPMs) for each unit (if any) and comparing the content of these to (i) prescribed/stated duties, responsibilities, outputs; (ii) the survey summary descriptions by staff; (iii) best practice.
- Identify discrepancies.
- Compile recommendations to upgrade the PPMs or for the content of new PPMs where none currently exist.

Review of the existing data base and IT systems:

- Identifying sources of data – from what/where
- Identifying inputs - formats and prescriptive document, manner of inputting, storage,
- Identifying outputs – format, how processed/generated, software used, purposes/use of outputs.

Review of the training & skill development:

- Obtaining authorized vs. actual staffing for each unit, by position/level;
- Obtaining job descriptions for "benchmark" positions;
- Obtaining summary bio-data sheets of employees at each level
- Making a comparison of BSA's current status to position description requirements and actual duties performed and best practices to identify gaps (if any)

On the basis of this review, the following proposals have been made which will be useful input for BSA in their issuance of related policies and procedures in the upcoming years.

a. Off-site supervision manual

Off-site Supervision Manual is a technical document which provides guidance to supervisors in discharging their responsibilities, including:

- Check the accuracy and transparency of profit of CIs
- Analyze the financial ratios base on periodic profit of CIs
- Analyze and evaluate periodic financial data of each CI, observe the unexpected trend and give comments, warning timely
- Supervise the compliance level of each CI to the applicable laws, decrees, circulars
- Analyze external audit reports, evaluate internal control procedure of each CI and assess the quality of audit report
- Analyze annual report of CI and refer to other audited reports to identify differences and root causes
- Collect and analyze observations and indexes that forecasts their impact and propose regulations/strategies on supervision
- Monitor, check the accuracy of information periodically
- Discover, fine CI if the data reporting does not comply with current provisions

The Manual therefore covers from the overview of banking supervision activities to collection of information and documentation to various types of supervision as compliance based and risk based supervision. Additionally, the manual also provides guidance on off-site supervision policies and procedures as well as various techniques to analyze the financial ratio and annual external audit results. One may also find the relevant checklists and questionnaires to supplement those content.

b. Input to User Requirements:

The input of user requirements was delivered which consists of 5 components as below:

- ***Macro Analysis System:***
  - Develop an information system supporting the Macro Safety Supervision operations in order to match with the current international standards and prepare for future standards.

- Provide the multi-direction analysis reports which can use in forecasting and analyzing operation status of banking sector basing on macro factors.
- Make use of Micro Safety Supervision information to achieve the effectiveness of Macro Safety Supervision operations.

- ***Micro Analysis System:***
  - Develop an information system supporting the Micro Safety Supervision operations in order to match with the current international standards and prepare for future standards;
  - Provide the multi-direction analysis report which can describe the nature of each operational activities/fields of the credit institutions;
  - Coordinate the off-site supervision and the on-site supervision to achieve the effectiveness of Micro Safety Supervision operations.
- ***CAMELS:***
  - Develop a System that will assist in determining CAMELS ratings. This is envisioned to basically be a CAEL (Capital, Assets, Earnings, Liquidity) model based on available off-site information.
  - A manual worksheet or "justification" form will also be developed to further assist BSA management in arriving at a final CAMELS rating for banks.
- ***Early Warning System:***
  - Develop an Early Warning System with key ratios.
- ***Management Information System:***
  - Develop portions of a Management System that enhances communication and cooperation between the on-site and off-site functions within the Bank Supervision Agency (BSA), if any is applicable.

C. Training Program

Based on the result of gap analysis on training and skill development, recommendations in terms of number, duties and responsibilities, minimum training/education and qualifications for staff at each level have been presented in Training Program Report. The Report provides guidance from assessment of training needs and establishment of a training framework to the development of curriculum and course as well as the design of training program. Besides, a core curriculum for various level of supervisors are provided as reference materials to BSA.

4. Accounting

4.1 Objectives

The objective of this Component is to transform the finance and accounting system of SBV in line with international standards and best practices as well as in conformity with local regulations, and additionally, to assist SBV in developing the management accounting system. This requires a centralized accounting regime and a new Chart of Accounts for central banking and related internal regulations, as well as intensive training on the underpinning concepts and principles and preparation of timely financial statements that are consolidated and presented in a format in accordance with the IAS/IFRS and conformable with Vietnam's accounting and legal framework.

The outcome of this Component, for Accounting, is measured by 3 key indicators, namely *Presentation, Consolidation* and *Timeliness* of SBV's financial statements supported by notes to financial statements in line with IAS/IFRS.

4.2 Assessment & Output Summary

The FAD of SBV has encountered numerous difficulties in consolidating central banking operations and branch operations. The reasons included:

- SBV's current accounting processes are highly fragmented with many stakeholders being involved. There is no single point accountability for the transparency and accuracy of the financial and accounting information across SBV.
- Each "department embedded" accounting unit is under the directly supervision of the Head of the respective SBV unit, which impacts the finance control function;
- Financial statement reporting is conducted at 2 level: unit level and consolidated SBV level.
- The accounting processes are also highly paper-intensive. There are also stand-alone GL systems in every SBV branch, thus manual "integration" with the head office consolidation system requires rekeying and might impact the integrity of the accounting system.

Evaluating these gaps from a future-state approach, the following proposals have been made which will be the corner-stone for the future operation of SBV accounting and bring the new system to its full effect:

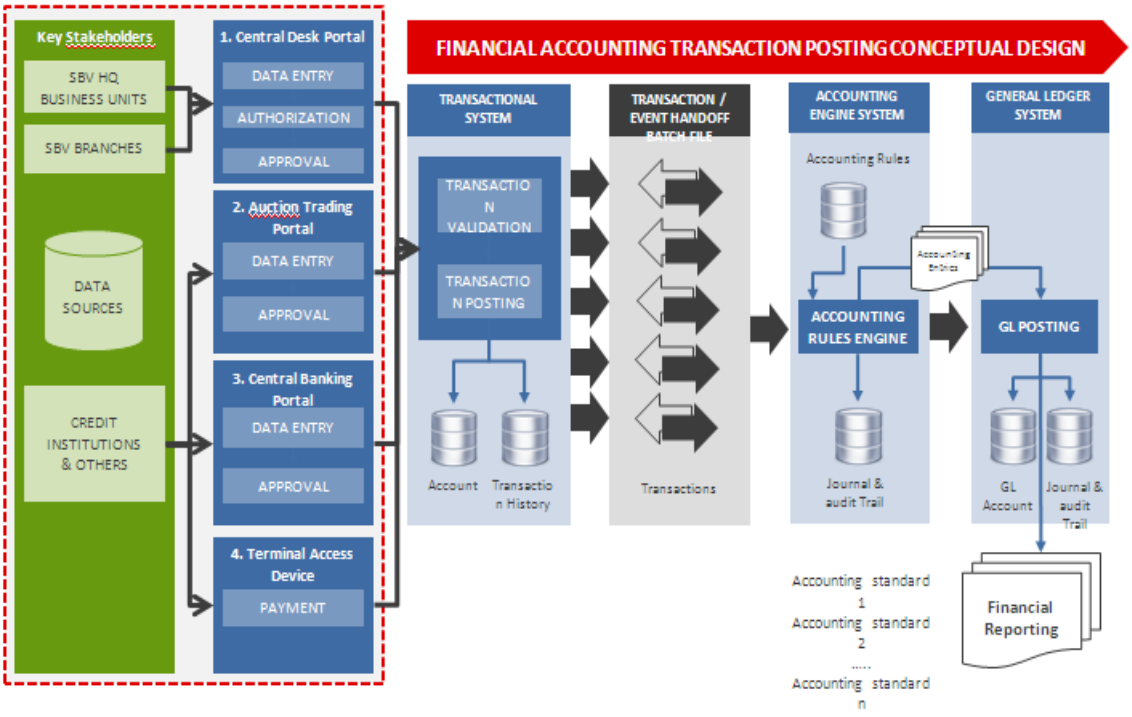
c. Target operating model

The ultimate target operating model is that the accounting and finance function will be centralized at the head quarter of SBV, and operate based on an Accounting and Finance Shared Services Center ("AFSSC").

Nevertheless, a transition model has been proposed for SBV in the implementation of its new GL System. Accordingly, each branch has its own Branch General Ledger, consolidated in the Enterprise General Ledger. Transaction Approval and Data Entry is conducted at the source of the transaction.

Accounting data integrity will be improved thanks to the automated systems, embedded controls, and transaction validation utilizing the "four-eye principle„ while finance control is significantly enhanced with an Accounting Rules Engine which controls all transactions without exception.

Illustration of the accounting process for all financial transactions in SBV is presented



below:

d. New business processes

The future accounting processes and outputs of SBV will be standardized, consistent, automated and performed/ produced at the right frequency to meet legal and SBV policy requirements and support management, as well as monetary policy and Banking Supervision decision-making process.

Key enablers for this transformation in the new process design include:

- Straight-through processing, as overriding design principle which aims at elimination of manual interventions or automation of all manual processes;
- Provision of all data attributes required by Finance defined by downstream processing and reporting needs;

- Re-organization and standardization of all accounting & finance processes within SBV and preparation for the migration into Accounting and Finance Shared Service Center.

In line with the project objective, the target process model will enable SBV to meet its timing requirements, in terms of period-end close and consolidation, as well as delivery of information for internal decision-making and external reporting.

e. Chart of Accounts

The proposed CoA for SBV is designed to:

- capture all economic and financial transactions in SBV
- facilitate its external reporting requirements as well as internal management reporting. As such:
  - Structure of CoA is designed in line with the structure of balance sheet and profit/loss statement to facilitate the preparation of meaningful and comprehensive financial statements and meet requirements for financial management.
  - Different account classes are designated for monetary policy implementation, foreign reserve management, note/coin circulation and reserved requirements, … which serve various internal users.
  - CoA structure facilitates FAD monitoring and analysis of financial records
- facilitate SBV's upcoming implementation of the new core systems:
  - Scalability account structure to accommodate future needs as well as flexibility of defining sub-ledger account
  - Reusability of the same account segments for different organization entity , e.g. entity A and entity B
  - Support multiple Chart of Accounts with multiple organizational
  - Multicurrency capability with base currency embedded outside the account segment structure
  - Capabilities in the automated daily roll-up closing process
  - Reliability in financial statement generation and multi-dimension reporting

With this well-structured, forward-looking CoA, any new requirements of SBV in the future could be accommodated without major revise of the banks coding system.

5. Budgeting

5.1 Objectives

The objective of this Component is develop a budgeting function with high level of transparency and accountability in line with international best practices for central banks, which is supported by re-engineered business processes.

5.2 Assessment & Output Summary

The current budgeting function which is totally manual and fairly fragmented was re-engineered. Accordingly, the budgeting blueprint introduced:

- The future state budget planning and control cycle and an overall view of the master budget.
- Detailed design of budgeting processes to deploy a new "Paperless" Financial Management Infrastructure and shorten the budget process data collection and data aggregation and approval processes. This design is in-line with SBV's culture and complies with budgeting requirements for a government agency.
- Forecast function and algorithm to facilitate budget preparation and improve the budget accuracy.

6. Human Resource Management

6.1 Objectives

General objective for internal resource management, including: Human Resource Management, Internal Audit, Document Management and Budgeting is to rearrange SBV's internal resource management system, and monitor the use of all enterprise resources on a daily basis for the branches and on a real-time basis for the headquarters functions.

6.2 Assessment & Output Summary

An in-depth analysis of the current HR systems and processes has been prepared. The diagnostics revealed that:

- Not all of the HR staff fully understand the HR Management Information System (HRMIS) functions and see the advantages of using technology in their daily work. Moreover, some may think that using the HRMIS is an additional job to do. This was partly due to the fact that software interface is not user-friendly and low infrastructure results to low processing performance.
- All the processes are still done manually outside of the system. Only after the process completion, do HR staff key in the data. As this is double work, there is no mechanism to check for the accuracy and completeness of data input to the system.

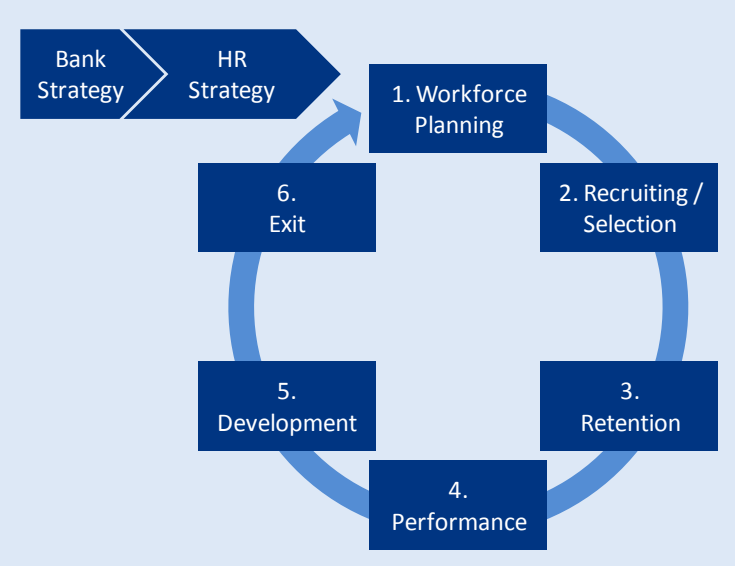
Consequently, HRMIS system has been rarely used because the input information is not updated regularly, thus the reliability of the output information is not high which lead to the low usage level of such information.

Based on this analysis, a target operating model, grounded in international best practices for human resource management, was conceived. To ensure that SBV can monitor the use of all enterprise resources on a daily basis for the branches and on a real-time basis for the headquarters functions, all new processes have embedded application controls. As such, no activities could be done manually outside of the system and the data remains updated and accurate for any management decision. Guidelines for automation of selected HR processes include:

- *Reduce manual operations and still align processes:* Through online automation based on an automatic routing and tracking of process steps as well as a triggering of subsequent processes

- *Reduce paper-based documents:* By implementing electronic forms for all important requests
- *Reduce data duplication:* Through a centralized HR system following the principle of capturing the data only once at the source
- *Reduce process throughput times and increase work efficiency:* by implementing a common database between SBV headquarter, units and branches, system supported enterprise wide processes and an automated tracking of request status
- *Improve data consistency and quality:* through clearly defined roles in the system, input assistance, real time validation and proposed values

The processes to be re-engineered were also considered to cover the life cycle of an employee of SBV as follows:



Besides, employee administration function was introduced which linked to all processes and provided the updated profile of any SBV employee.

These processes are utilized as critical baseline input for the definition of URD which would be translated to technical requirements in the bidding document for the HR system procurement.

7. Internal Audit

7.1 Objectives

Clearly define and install an auditing framework that is consistent with international standards and conformable with Vietnam‘s legal framework.

7.2 Assessment & Output Summary

Risk-based internal audit is the framework adopted by many central banks. However, our analysis revealed that there are several critical challenges the SBV and the IAD need to address as they adopt new methodologies and a new working environment at the SBV. These challenges include:

- Lack of overall risk strategy and framework at the SBV
- Lack of risk based methodology in the IAD
- Lack of fully developed trained staff

- Lack of complete understanding of current software (Teammate) to fully utilize the system in daily work
- Lack of a board level audit committee

The greatest challenge to the SBV and the IAD is the lack of a comprehensive risk strategy and framework at the SBV. Without the benefit of a bank wide risk strategy, the introduction and implementation of an audit risk based methodology and approach will be difficult.

A road map for SBV having the auditing framework that is consistent with international standards and conformable with Vietnam's legal framework is defined as follows:

1. *Develop risk strategy and framework bank-wide*

   To develop such a strategy, the SBV management should undertake the following:

   - Define the core operations of SBV and identify and assess the principal risks inherent in the SBV operations.
   - Develop a catalogue (commonly called risk register) of core risks.
   - Map each of these risks to current organizational structure and operating area of SBV to identify the key departments/divisions and personnel responsible for proper monitoring of the risks and developing the appropriate mitigating procedures.

   After development and implementation of such a register, the IAD will be responsible for reviewing and evaluating risks identified by departments and the SBV, the internal systems used to mitigate the risks and the overall SBV corporate governance process. This is the first step in implementing a risk based approach to audit.

2. *Revise the policies and procedures for internal audit on the basis of the risk-based methodology*

   As the SBV moves towards a risk based methodology, SBV should incorporate international audit standards where possible and create an independent audit committee at the board level to ensure the SBV meets international and central bank standards.

3. *Train staff to have the proper staff mix*

   Combined with introducing a bank wide risk framework and strategy, the SBV and IAD should review their hiring profiles and trained staff to have the proper staff mix. Along with training, revising policies and procedures, the IAD must be able to properly monitor risk at the SBV. Module TeamRisk of TeamMate software must be used fully to achieve this goal.

On the basis of this roadmap, the Consultant worked with Internal Audit Department to:

- develop risk-based internal audit methodology with clear examples.
- select six audit procedures as demonstration case how existing policies and procedures of SBV should be revised.
- propose training curriculum to strengthen the capacity of IAD in doing risk-based audit.

A training course was provided, which included case study for IAD staff to better understand risk-based internal audit methodology and link it with their daily activities as well as how software could be used to support the activities of the IAD. An on-site training course on risk-based audit methodology, with the Central Bank of Malaysia was arranged by the Consultant.

With regards to IT enabling for IAD to perform risk-based internal audit, it was concluded that the existing IT audit support infrastructure is sufficient, but not (fully) utilized. Hence, it was concluded to maintain the current IT solution, but ensure a better utilization of all resources and modules already at hand of Internal Audit Department.

In short, the roadmap and various aspects of a framework to transform IAD to modern audit organization (including risk based methodology, new policies and procedures, training, software to support their activities) has been properly addressed.

8. Document Management

8.1 Objectives

General objective for internal resource management, including: Human Resource Management, Internal Audit, Document Management and Budgeting is to rearrange SBV's internal resource management system, and monitor the use of all enterprise resources on a daily basis for the branches and on a real-time basis for the headquarters functions.

8.2 Assessment & Output Summary

The Blueprint of a Document Management System (DM) has been designed to manage administrative documents, including the workflow of the preparation, review, clearance and filing of such documents. Furthermore, document management processes of the SBV and its functional units and branches will be improved through the automation of document processing, and enhancement of efficiency of searching document for the SBV. After realizing the Document Management Blueprint, the achievement will include:

- Improvement of document management processes and operating efficiency through automatized processes and elimination of redundant data items;
- Recording and management of the SBV's document in a comprehensive way that utilizes the SBV's resources and time;
- General administration and document archives;
- Better management of work program, conference and other administrative activities.

9. Training

9.1 Objectives

Training component provides trainings on international practices, the new regulations and operational procedures. Also, the component should provide inputs to the skills gap assessment and development of a medium - term staff training program for the maintaining, upgrading and uses of the regulatory framework for credit institution reporting and market information.

The outcome indicator for this component includes:

- A skills gap assessment completed
- A medium- term training program adopted
- First batches of training completed

9.2 Assessment & Output Summary

Component overview

Training component is broken down into 3 main sections including:

- Skill gap assessment report, which provides evaluation on current skill gap of SBV's staffs between current state and international practices;
- Medium term training report which is a comprehensive training plan for HRD. The training plan aims at filling the skill gaps of SBV's staffs so that they can improve competencies up to international standards in the future; and
- Transition training activities which include a series of training courses, workshops and on-the-job trainings to equip SBV's staffs with essential up-to-date knowledge and skills on their main core functionalities. These training activities provide SBV's staffs with very basic foundation to acquire new knowledge and skills as well as quickly adapt with new IT system and trainings knowledge in medium term training program.

Apart from these core outputs, training component has two integrated outputs named training toolbox, which covers methodologies for training effectiveness evaluation, and project communication plan. These two reports play important roles in improving training and project management activities in the SBV. Training toolbox provides essential tools for HRD to ameliorate training activities including training planning and training execution while project communication aims at supporting PMU in conducting the communication activities to actively manage the massive change that are introduced by FSMIMS.

Regarding training component, the following achievements have been accomplished:

- A comprehensive skill gaps assessment for core functional departments in SBV, including Monetary Policy, Statistics & Forecasting, Banking Supervision and Accounting & Finance.
- A detailed medium - term training program for SBV.
- Training toolbox.
- Many training courses in transition training have been conducted. The training activities in transition training were completed in November 2013.
- Project communication plan was completed and presented to SBV.

Component outcome against project objectives:

Highlights of deliverables can be presented as follows:

- *Skill Gap Assessment:* the report is aimed to provide comprehensive and in-depth analysis on skill gap of functional departments including Banking Supervision Agency (BSA), Finance and Accounting Department (FAD) and Monetary Policy Block (MP) as well as valuable recommendations and highlights to these departments.

  To analyze current state of skills of SBV's staffs, EY consultants collected input information from functional experts as well as verification questionnaire. The questionnaire was designed to evaluate skills of SBV's staffs on general & specific technical/functional skill, behavioral skill and managerial skill. Also, the questionnaire is targeted to three hierarchy levels of employees ranged from junior, senior to management. Then, on the basis of questionnaire response, information on relevance of

skills and knowledge, level of knowledge and improvement need is collected and processed.

Skill gap assessment report clearly points out vision of SBV for personal competencies based on experiences and best practices from other central banks on the world. After the indicated steps, findings and validations on skill gap of functional departments (BSA, FAD and MP) in SBV were identified and revealed. Subsequently, detailed recommendations were proposed in order to improve and supplement current skills of SBV's staffs up to international standards.

- *Medium term training program:* The report presents detailed medium training curriculum for different functional blocks and level of employees. Specifically, medium training curriculum is divided into 5 sections as follows:
  - Policy Functional Strengthening & Reporting Regime
  - Banking Supervision
  - Accounting & Budgeting, Internal Audit, Central Banking Operation
  - Management skills: essential skills for all officials at management level
  - Behavioral (Soft) skills: essential skills for all employees in SBV

  For each section, training courses are appropriately customized into foundation, intermediate or advance for different official levels to enhance training effectiveness.

- *Transition training activities:* Basically, transition training implementation plan was approved by HRD. Each training course has specific information on 5 key information:
  - Objectives: list of objectives for organizing the training course and expected achievements from participants.
  - Content overview: Overall content of the training course is listed down
  - Methodology: Means of transferring knowledge including lectures and presentations, group discussions, exercises or case studies
  - Target participant: the targeted group of participants who should attend the training course
  - Duration: The total duration of the course.

  In total, there were 25 courses with 20 to 30 participants each course from various functional departments of SBV.

- *Training toolbox* was completed and signed off by HRD. The report is structured into 7 main parts:
  - Introduction: the section provides concepts, definitions and instructional system design for training activities
  - Training needs assessment: the section provides step by step guideline for training needs assessment from obtaining need assessment data, analyzing data, defining performance problems, researching integrated performance solutions, determining best training & development to assessing cost/benefit of training and development approach.
  - Training design and planning: the section provides step by step guideline for training design and planning from writing learning objectives, designing evaluation tools, determining trainer's competencies, choosing effective methods, conducting sequence activities, organizing session to calculating costs.

- Training implementation: the section provides step by step guideline for training implementation from development of teaching and training materials, equipment and setting to conducting the training.
- Training evaluation: the section provides step by step guideline for training evaluation including measurement means and recommendations.
- Roles and organizational tasks of the training unit: the section clearly defines and identifies the roles and functions of training division/unit in training system.
- Appendixes: the section provides detailed analysis on current situation as well as practical recommendations for SBV.

- *Project communication plan:* At reporting date, project communication plan was delivered and communicated with PMU. It's very important that PMU conducts the communication activities to actively manage the massive change that are introduced by FSMIMS.

Part B: ICT Platform Development and Implementation - Progress Review and Recommendations

1. Detailed Review of SG1.1 – Servers, Middlewares, Database for SBV

1.1 General Information

1.1.1 Objectives of the package

The objectives of this procurement are:

- To select the hardware, standard software and database which meet the requirements set in the bidding documents;
- To implement and integrate new procurement with the current infrastructure of the SBV in order to revamp core banking system and other business application systems; and
- To select the best-fit vendor to successfully implement the systems in a timely, cost-effective and low-risk manner.

The bid package consists of:

- Server(s)
- Core switch
- Load balancer
- Air conditioner
- Top of rack access switch
- Extend interface FC of current Cisco 9509 SAN switch
- Extend capacity of current Hitachi VSP storage
- DBMS

1.1.2 Selected vendor and proposed solution

The NEC-MITEC is a joint-venture between 2 parties:

- Leader of joint venture: NEC Asian Pacific Pte Ltd (NEC-Singapore)
- Partner of joint venture: MITEC JSC (Vietnam)

NEC Asian Pacific (NEC-Singapore) was established in 1977 in Singapore. The company is operating in information technology services, specialized in 3 main areas:

- Enterprise solution
- Security and Banking solution
- System integration

NEC Asian Pacific has considerable experience in infrastructure management, customer management, integrated document management solution, e-commerce applications (including registration of population), networking, server connectivity, infrastructure, resource management and banking solution. Particularly, NEC Asian Pacific has delivered many successful project with financial and banking sector including a) the provision of servers and hardware designed for Disaster Recovery Plan (DRP) for Vietnam Bank for Agriculture and Rural Development (VBARD) and b) the provision of connection solution for Central Bank of Singapore.

MITEC was established in 2005 in Vietnam. With the experiences and capabilities accumulated in 8 years, MITEC has become a reliable and prestigious partner with major IT projects of ministries and industries such as Post Telecommunications, Banking (including State Bank of Vietnam and commercial banks), Finance, Public Security, Health Care, Education, Judiciary and other international organizations. Particularly, in the early of 2013, MITEC has become the contractor of “ICT Infrastructure Upgrade and System for Statistical Information Collection” for GSO (General Statistic Office of Vietnam).

NEC-MITEC proposed a project team consisted of experts from local and oversea with high competency, qualified through professional certificates and experienced backgrounds.

NEC – MITEC proposed the solution for Data Center and Disaster Recovery Site as follows:

#	Bidding Requirement	Proposed Solution
Data center		
1.	Server type 1	IBM System x3850 X5 and accompanied Software
2.	Server type 2	IBM P780:9179 Model MHD and accompanied Software
3.	Core switch	Cisco Nexus 7009
4.	Load balancer	F5 BIG-IP Switch: Local Traffic Manager 4200V
5.	Air Conditioner	APC InfraStruXure InRow RP DX Air Cooled
6.	Top of rack access switch	Cisco Nexus 2248 TP-E-1GE
7.	Extend interface FC of current Cisco 9509 SAN switch	48-Port 8-Gbps Advanced FC Module 48 8G SW SFP+ 8 Gbps Fiber Channel SW SFP+ LC
8.	Extend capacity of current VSP Storage	► Hitachi VSP Hardware Upgrade ► License for using total extended storage

#	Bidding Requirement	Proposed Solution
		▶ Capacity in RAID 10
9.	DMBS	▶ Oracle Database Enterprise Edition version ▶ 11g or higher ▶ Oracle Real Application Clusters
Disaster Recovery Site		
1.	Server type 1	IBM System x3850 X5 and accompanied Software
2.	Server type 2	02 x IBM System P780 and accompanied Software
3.	Core switch	Cisco Nexus 7009
4.	Load balancer	F5 BIG-IP Switch: Local Traffic Manager 4200V
5.	Air Conditioner	APC InfraStruXure InRow RP DX Air Cooled
6.	Top of rack access switch	Cisco N2K-C2248TP-E-1GE
7.	Extend interface FC of current Cisco 9509 SAN switch	48-Port 8-Gbps Advanced FC Module 48 8G SW SFP+ 8 Gbps Fiber Channel SW SFP+ LC
8.	Extend capacity of current VSP Storage	▶ Hitachi VSP Hardware Upgrade ▶ License for using total extended storage ▶ Capacity in RAID 5
9.	DMBS	▶ Oracle Database Enterprise Edition version 11g or higher ▶ Oracle Real Application Clusters

1.1.3 Implementation schedule

The main tasks and implementation schedule of SG1.1 package as below:

	Task name	Completion period	Deliverables/Work completed
1	Survey, Plan and System Design	10/03/2014 – 23/06/2014	► Report of Survey result and plan of infrastructure installation. ► Project planning ► System design
2	Import, Check, Delivery Goods	13/03/2014 – 02/07/2014	► Good delivery at DC and DR. ► CO, CQ. ► Transportation papers, Insurance certificate. ► Warranty certificate, License certificate.
3	Implementation - Install and configure the proposed system	03/07/2014 – 04 /10/2014	► System installation and configuration process. ► System integration process. ► System operation process. ► DR solution implementation process. ► System check, management and maintenance process.
4	OAT Testing and Delivery	Oct – Nov 2014	► UAT assessment results
5	Local training	21/04/2014 – 20/06/2014	► Database: Oracle 12c – RAC Administrator ► Server and accompanied software ► Network and Virtualization software
6	Abroad training	Nov 2014	► Technical onsite survey ► DC/DR Center architecture and design

1.2 Review of Package Implementation

1.2.1 Implementation Progress

The milestone of implementation schedule as in the following table:

	Task name	Planning date	Actual Status	Note
Survey, Plan and System Design		**10/03/2014 – 23/06/2014**		
	Site survey	10/03/2014 – 22/4/2014	Completed 22/4/2014	Refer to Report of Survey result and plan of infrastructure installation
	High-level Design	11/03/2014 – 23/06/2104	Completed 22/04/2016	Refer to High-level Design, delivery date 25/03/2014
	Low-level Design	11/03/2014 – 23/06/2104	Completed 27/06/2016	
Import, Check, Delivery Goods		**13/03/2014 – 02/07/2014**		
	Import goods	13/03/2014 – 29/06/2014	Completed	
	Check, Delivery Goods	20/05/2014 – 02/07/2014	Completed	
Implementation – Install and configure the proposed system		**03/07/2014 – 03/10/2014**		
	Air-Conditioner system – Inrow APC for DC and DR	30/06/2014 – 05/07/2014	Completed	Proposed solution: APC InfraStruXure InRow RP DX Air Cooled
	Install and configure CISCO network for DC and DR	03/07/2014 – 27/07/2014	Completed	
	Hitachi HDS VDS: ► Upgrade micro code firmware for SAN storage ► Add 20TB license	18/07/2014 – 19/07/2014	Completed	Proposed solution: ► Hitachi VSP Hardware Upgrade ► License for using total extended storage ► Capacity in RAID 10
	Install and configure IBM Server System X, System P at DC	10/7/2014 – 21/8/2014	Completed	Proposed solution: ► IBM System x3850 X5 and accompanied Software ► IBM P780:9179 Model MHD and accompanied Software
Training				
	Local training	21/04/2014 – 20/06/2014	Completed	

Project progress assessment:

During bi-annual report period, June 2014, project progress was completed in accordance with the deployment milestones set out in the implementation plan of the vendor.

1.2.2 Implementation Issues

There was no major issue and concern identified during this bi-annual report period.

2. Detailed Review of CG1 - CIC Data Management Applications (Servers, core data warehouse, communication & related applications)

2.1 General Information

The Credit Information Center (CIC) is a public service agency directly under the SBV, performing the function of a credit information agency. CIC has the functions to gather, analyze, forecast, exploit and provide enterprise information services and other information related to monetary and banking activities to SBV, credit institutions, other international / domestic organizations and individuals. With the above strategic guideline, the reform and master development process of the banking industry shall also provide support to the CIC as an important agency in the role of providing adequate information to Credit Institutions on potential risks from the market as well as from the borrowers, by supporting information to the management of the credit institutions for their decision making.

- ***CIC Component 1 - Functional Strengthening:*** Assist the CIC to re-engineer business processes; improve the quality of the products and services provided to customers; and develop and train staff on new credit reporting knowledge and equip them with the skills required to use the new knowledge and procedures.
- ***CIC Component 2- ICT Platform Development and Implementation:*** Assist the CIC to acquire and install centralized data management systems for the collection, storage, processing, analysis and sharing of information on credit. The direct beneficiary and main implementing unit will be CIC's IT department.

2.1.1 Objectives of the package

The CIC aims to become the leading credit information registry in the region through its commitments to develop professionals and modern technological capacity so as to offer the best quality products and services in compliance with international standards, meeting the needs of the State Bank of Vietnam and credit institutions for enhancing risk management, and securing fair access to credit by the borrowers.

- ***Key Objective 1 - Create a Nationwide Lending Data Repository:*** Creating a nationwide credit database satisfactory to the stakeholders both in quality and quantity by improving the data quality and increasing the coverage of data which is the key to being an efficient PCR. Although the PCR has the mandatory power to collect information, it is necessary to check the credibility of collected data by comparing it with data from other sources. It is also necessary to use efficient statistical knowhow to verify the accuracy of collected data with the actual situation of the economy. Collecting negative information is increasingly important for sound loan management. Information about loans to individuals is becoming important, too, in line with the rapid increase of credit cards issuances and mortgage loans. As the CIC is the only credit information agency now active in Vietnam, it is necessary for the CIC to have a clear perspective on the collection and feeding back of information on loans for individuals too.

- ***Key Objective 2 - Develop Credit Risk Management Products for Vietnam:*** Developing products and services which ultimately strengthen risk management by the SBV as well as the CI's. The credit risk rating related products are to be provided to only the SBV for its use, while the general trends analysis on economic activities and patterns will be made available to the CI's. For instance the CI's wish to have an overview of each industrial sector they are engaged in when evaluating the loan applications from potential borrowers. In this connection, having data and analysis broken down by industrial sector is much needed by CI to identify the situations of potential borrowers in each industrial sector. Also, with the management purposes of SBV, CIC is looking for a risk management solution with advanced risk modeling capability supporting baseline indicators.
- ***Key Objective 3 - Develop a Sound CIC IT Infrastructure & Strengthen Human Resource Capabilities:*** Developing an IT infrastructure and Human Resources are prerequisite to realize our Mission. Efficient data collection and feedback procedures and IT facilities need to be upgraded constantly. In addition, the CIC needs to consider extending assistance and training programs to reporting CI that cover smaller sized institutions such as provincial credit funds and micro finance institutions. This will require the CIC to make continuous investment in IT equipment, software and related training programs reached (e.g. 15 % of capital, etc.).

2.1.2 Selected vendor and proposed solution

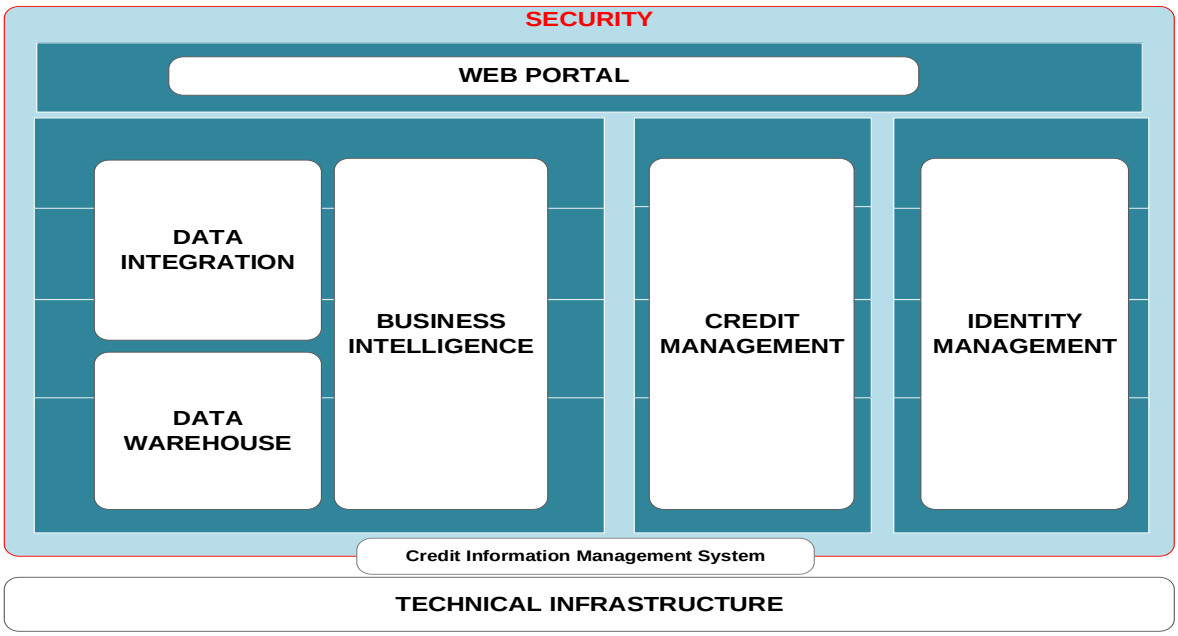
2.1.2.1 Joint Venture of FPT Information System (FIS) & DP Information Network Pte. Ltd. (DP)

FPT and DP have entered into a consortium agreement to establish a partnership to engage and implement the project. FIS is appointed as the lead consortium partner.

FIS (as the lead of consortium) is expected to perform the systems infrastructure implementation and integration services and localization work. DP will provide credit bureau software solution framework, and services for the application customization and implementation work. DP software solution is considered as one of the leading package in the industry. FIS is the leading IT integrator with good reputations in Vietnam. FIS is known as a leader to custom build solutions for IT systems in various industries. DP information network are Singapore's trusted credit information bureau for large share of financial institutions and legal firms. DP has international experiences implemented projects outside of Singapore including the "Japan BI Project" to provide a Business Information Management System.

2.1.2.2 Proposed Business Software Solution

The proposed solution is an integrated system comprised of subsystems as being depicted below:



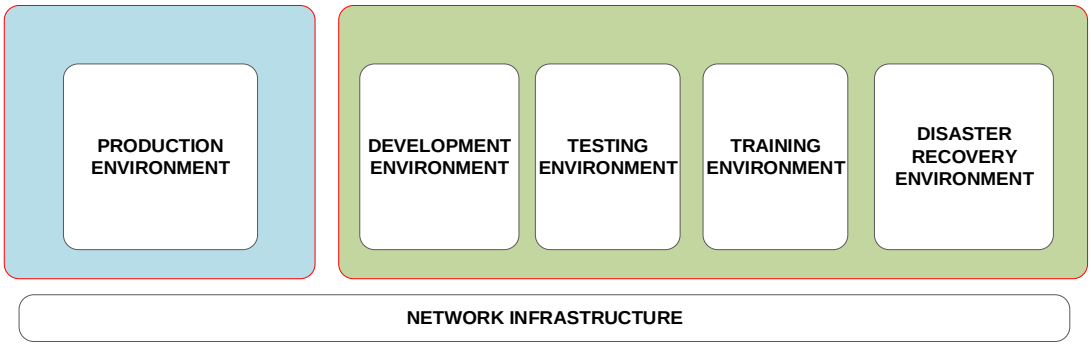
Each subsystem has several key roles forming a complete solution that can fully satisfy specific requirements.

- The data warehouse and data integration subsystems play as the complete data store for all data sources consolidated from multiple systems. It also organizes data into appropriate models, typically multidimensional model, for convenient data analysis of business users.
- The proposed Data Warehouse is based on the technology of Oracle Database Enterprise Edition; and the proposed subsystem to collect data, transform, cleanse, standardize and enrich data are based on Oracle Data Integrator, Data Quality and Data Profiling technologies.
- The Business Intelligence subsystem provides reporting, analytics, dash-boarding as well as various display, query, or analytic tools for business users. The proposed Business Intelligence module is based on Oracle Business Intelligence technology.
- Credit Management subsystem provides specialized functions for CIC business users to manage credit rules, models and other required business operations.
- The Identity management provides the underlying identity database for all types of users in CIC, from SBV departments, other Government agencies, etc. The proposed Identity and Access Management solution is based on Oracle Identity Management solution.
- The web portal provides a single access gate for internal or external users to log in and manage their contents and access to software functions. This proposed web portal is based on Oracle WebCenter Portal technology.

2.1.2.3 Technical Infrastructure

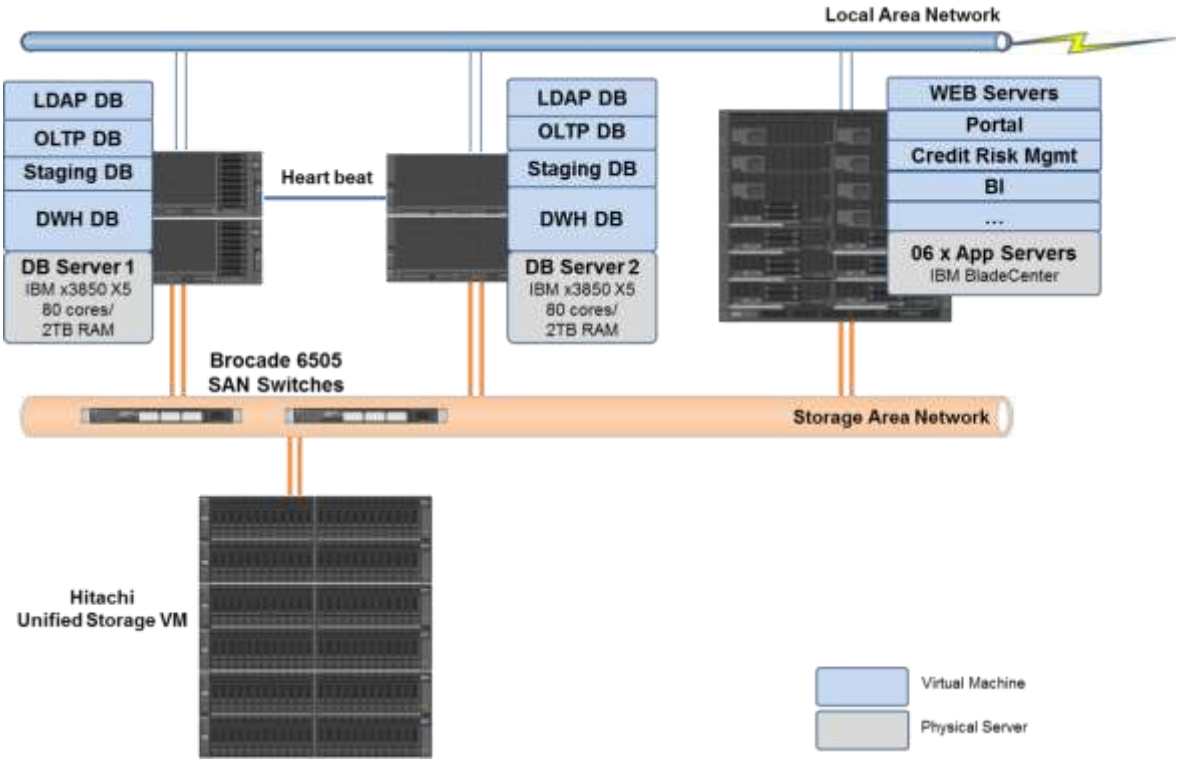
Technical environments

The proposed solution includes five technical environments in two sites, CIC Data Center and CIC Disaster Recovery Center as illustrated in the figure below:



The production environment and the local backup data will be implemented in the main data center; the disaster recovery environment will be implemented in the disaster recovery center by re-using the existing Data center hardware; while the development environment, testing environment, training environment will be discussed between FIS-DP and CIC to decide whether they will be in main data center or disaster recovery center.

Server and storage

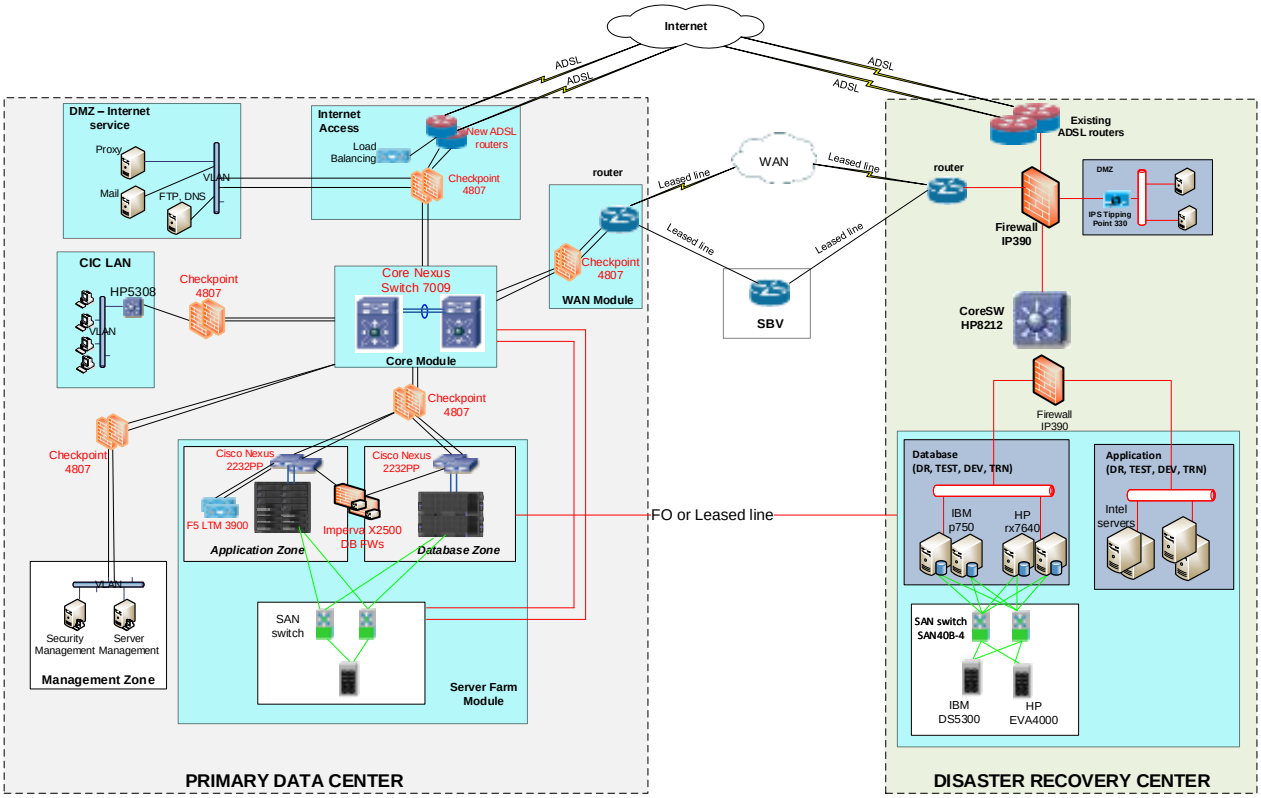


The proposed technical solution architecture includes following components:

- Servers
  - Web Servers
  - Application Servers
  - Database Servers
  - Backup/Management Servers
- SAN Storage System:
  - SAN Switches
  - Storage Disk System

Network and security

FIS-DP proposed the solution for upgrading network infrastructure at DC and DRC as shown in following diagram:



2.1.3 Package implementation scope

The implementation scope of project “Procurement of CIC Data Management System” includes:

- Assessment of existing technical infrastructure, application software systems, and business processes.
- Delivery and installation of technical hardware, standard software packages
- Performing fit-and-gap analysis to define the detailed requirements
- Defining business processes in details, and designing gap-closing solution.
- Solution development & implementation of application software
- Implementation of backup and disaster recovery system
- Migration of existing data to the new system
- Integration of the new system with billing, scoring and rating system
- Conducting training to technical users, end-users, and managers

After being implemented and going live, the system will be under warranty service.

The followings works are not in the scope of work to be conducted by FIS-DP:

- Providing and installation of data center facilities such as raised floor, cooling system, electricity cabling from the power grid to the data center

- Installation of wide area network connectivity between the main data center and disaster recovery center.
- Development of payment/billing system.
- Maintenance (post warranty) service for both hardware and software.

2.1.4 Implementation schedule

Project Milestones and Acceptance:

No	Project Milestones	Completion Date	Deliverables/Work complete	Acceptance Criteria
1	Agreed and Finalized Project Plan	21-Nov-2013	▶ Project Management Plan	Project Management Plan approved by FSMIMS Project Manager
2	Sign-off hardware and software acceptance at the End of Software and Hardware Installation	18-Feb-2014	▶ Hardware and standard software delivery report ▶ Infrastructure system specification document ▶ Standard software system specification document	Installation Certificate issued by PIU-CG1 Head when work deliverables approved.
3	Agreed and Finalized Software Requirements Specification at the end of Gap Analysis	28-Feb-2014	▶ Software Requirement Specification Document	Software Requirements Specification document approved by PIU-CG1 Head
4	Customize/Develop Data Management System at the end of Design & Development period	16-Jul-2014	▶ Application software customization specification Document	Application software customization specification Document approved by PIU-CG1 Head
5	System Integration Test (SIT)	15-Aug-2014	▶ SIT Test Plan ▶ SIT Test Report	SIT test report approved by PIU-CG1 Head.

No	Project Milestones	Completion Date	Deliverables/Work complete	Acceptance Criteria
6	Training for Technical Staff, Management and End-Users	14-Nov-2014	► Training plan document (including Training curriculum, knowledge transfer plan) ► Technical manuals ► End-user manuals ► Operations manual ► Training reports	Training report approved by PIU-CG1 Head
7	User Acceptance Test (UAT)	03-Oct-2014	► UAT Test Plan ► UAT Test Report	UAT Test Report approved by PIU-CG1 Head
8	Operational Acceptance Test	14-Nov-2014	► Operational Acceptance Test Plan ► Operational Acceptance Test Report	Operational Acceptance Certificate issued by FSMIMS Project Manager when work deliverables are approved

2.2 Review of Business Processes

2.2.1 Business processes in scope

The business processes in scope contain the following:

- Data Entry and Automatic Data Entry Validation
- Database and data warehouse
- Reporting application in accordance with SBV requirements
- Credit Risk Management solutions
- Credit register and credit report of Borrowers
- User management solution

2.2.2 Solution architecture delivered by FIS-DP

FIS-DP delivered a solution architecture which consists of business architecture, application software, data management; infrastructure solution such as virtualization, server, storage, network and security.

The functions of Logic architecture's components are described in the following table:

Index	Function Ref.	Function	Description	BU
1 – Data Entry and Data Entry Validation (M1)				
1.1 – Data Entry (M1.1)				
1.	M1.1.1	Data Upload	For receipt of incoming data from CI via HTTP and FTP	BU.001, BU.004, BU.005, BU.006, BU.007, BU.008, BU.009, BU.011, BU.012, BU.014, BU.015, BU.016, BU.017, BU.019
2.	M1.1.2	Reports for CIs	Integrate to upload CIs' reports to the portal	
1.2 – File Store (M1.2)				
3.	M1.2.1	Temporary Storing	Temporarily store files to process	BU.012, BU.015
4.	M1.2.2	Archiving	Archive old data files	
5.	M1.2.3	House keeping	Clean and organize old data files	
1.3 - Administration & Monitoring (M1.3)				
6.	M1.3.1	Data quality statistics & storing	Perform statistic upon data quality and scoring	BU.018
7.	M1.3.2	Audit Trail & Log	Audit Trail & Log	BU.013
8.	M1.3.3	Usage Monitoring	Monitor System data usage	BU.013
9.	M1.3.4	Service monitoring & control	Service monitoring & control	BU.028
1.4 – Data Quality (M1.4)				
10.	M1.4.1	Data Logic Validation	Data logic validation	BU.004, BU.009, BU.010
11.	M1.4.2	Data Content Validation	Data Content Validation	BU.004, BU.009, BU.010
12.	M1.4.3	Data Rules	Data Rules	BU.011
13.	M1.4.4	Data Cleansing	Data Cleansing	BU.020
14.	M1.4.5	Data Match & merge	Data Match & merge	BU.021, BU.022, BU.024, BU.025, BU.027
15.	M1.4.6	Data	Data Adjustment	BU.021, BU.029,

Index	Function Ref.	Function	Description	BU
		Adjustment		BU.026
2. Data base & Data Warehouse (M2)				
16.	M2.1	ETL1	ETL tools with Data Quality function to extract, transfer and loading data into databases ETL1: Read data from input file, and load them to Staging DB Staging DB: staging database to process input data Application DB: CIC's existing Application database	BU.034, BU.035
17.	M2.2	ETL2	ETL2: Load data from staging DB into Normalized DB Data Warehouse: Normalized DB, Historical DB, Metadata, SOR (System of Records)	BU.023, BU.030, BU.031, BU.032, BU.036, BU.003
18.	M2.3	ETl3	Load Normalized DB to Data Marts Data Marts: for generation of reports for Cis, Borrowers, SBV, Credit Rating, Credit Scoring, etc.	BU.032, BU.038, BU.033, BU.037, BU.003
19.	M2.4	Configuration & management	Configuration and management DB: Database for configuration management and governing tool for Portal, ODI, OEDQ, OBI, IAM, etc.	
3. Reporting for SBV (M3)				
20.	M3.1	Report for SBV	Users are granted for exploiting SBV's reports	BU.042, BU.043, BU.044, BU.045
21.	M3.2	Report for Policy Users	Policy Users are granted for exploiting reports generated for Policy users	BU.042, BU.043, BU.044, BU.045
22.	M3.3	Manage and Maintain report for SBV and Policy Users	CIC's administrative user manage and maintain reports for SBV and Policy Users	BU.039, BU.040, BU.041
4. Credit Risk Management (M4)				

Index	Function Ref.	Function	Description	BU
23.	M4.1	Probability of Default Module	Managing enterprise's PD parameter and calculation process.	BU.046, BU.047, BU.048, BU.049
24.	M4.2	Industry Analysis Module	Managing industry index parameters and process.	BU.050, BU.051, BU.0522, BU.053, BU.054, BU.055
5. Credit Register and Credit Report of Borrowers (M5)				
25.	M5.1	Credit Registry	Register borrower's information	BU.056, BU.059
26.	M5.2	Report of Borrowers	Exploit reports of borrowers	BU.057, BU.060, BU.061
27.	M5.3	Smartphone display	Graphic interface for smartphone users	BU.057
28.	M5.4	Online help	Online support and FAQs for borrowers	BU.058
29.	M5.5	Registry user	Register borrower's user	BU.059
6. User Management (M6)				
30.	M6.1	External Users Management	Managing external users	BU.062, BU.063, BU.064, BU.065, BU.066, BU.067, BU.068, BU.069, BU.070, BU.071, BU.002
31.	M6.2	Internal Users Management	Managing internal users	BU.062, BU.063, BU.064, BU.065, BU.066, BU.067, BU.068, BU.069, BU.070, BU.071, BU.002
7. Integration (M7)				
32.	M7.1	Internal Integration	Integrate between different components in the new system	
33.	M7.2	Integrate with Existing System	Integrate with CIC's Existing System	
34.	M7.4	Integrate with Existing Websites	Integrate with CIC's Existing Websites	
35.		Integrate with other systems	Integrate with other systems	

The solution is developed upon the following integrated software components:

- Presentation Level: Apply Oracle Webcenter Portal to provide web application for CIC's internal users as well as external users.
- Business Logic Level: business processes to process input data, generate reports, manage credit risk or user management are performed by the following solution components:
    - DP Credit Bureau Application provides capabilities to process data from CI to database, generate credit bureau report, manage credit risk, etc.
    - Oracle Data Integrator: a tool to integrate data from various sources into database
    - Oracle Data Quality Profiling: a tool to clean data, normalized data, etc.
    - Oracle Business Intelligence: a tool for reporting, dynamic report, dashboard, etc.
    - Oracle Identity & Access Management: a tool to manage user identity and access.
- Data level: Data is organized and managed on Oracle database Enterprise Edition.

Database Logic Architecture combines the following components:

- Config Database schemas:
    - System Configuration schemas (OBI, ODI, …)
- Staging database schemas:
    - Tables as instructed by K file of Circular 03
    - Error in Log form
    - TempNorm table
- Application Databases
    - Tables used for existing applications
- Data Warehouse Database schemas
    - Normalize DB
    - Metadata DB
    - Historical DB
- Data Marts
    - StarSchema model
    - Cube(s) used for reporting purpose
- Established Product Database schemas

2.2.3 Finding and Recommendation

FIS-DP delivered to CIC the document of Solution Architecture design with the description covered all the business functions in scope. There was no major issue and concern identified from reviewing of Solution Architecture design document.

Based on this design, FIS-DP has been performing GAP analysis and application customization design. Basically, this design is in line and complying with process design principles and objectives.

2.3 Review of Package Implementation

2.3.1 Implementation Progress

Project progress until 31/07/2014:

	Task name	Planning date	Actual Status	Note
Project management		18/10/2013 – 10/12/2014		
1.1	Project management planning	18/10/2013 – 21/11/2013	Completed	Milestone 1 Delivery date: 10/01/2014. Later than deadline 1.5 months
1.2	Project management activities	11/03/2014 – 10/12/2014	In progress	
Technical infrastructure installation		18/10/2013 – 28/11/2014		
2.1.1	Analyze Existing Technical infrastructure	18/10/2013 – 07/11/2013	Completed	
2.1.2	Design technical infrastructure	08/11/2013 – 17/01/2014	Completed	
2.1.3	Preparation of goods (order and delivery)	18/10/2013 – 26/12/2013	Completed	
2.1.4	Installation of Technical infrastructure and Standard software at CIC data center	20/01/2014 - 24/01/2014	Completed	
2.1.5	Implement backup solution	27/01/2014 - 06/02/2014	Delayed	This task will be performed in task 2.2. Implementation of the Solution at DR center from 01/08/2014 – 17/11/2014
2.1.6	Conduct testing of Technical Infrastructure and Standard software	07/02/2014 - 13/02/2014	Completed	
2.1.7	Sign-off hardware and standard software Acceptance	14/02/2014 - 18/02/2014	Completed	Milestone 2
2.1.8	Complete installation acceptance procedure	07/03/2014	Completed	Adjusted since 02/2014, however

	Task name	Planning date	Actual Status	Note
				this task has not been updated in Project Plan
2.1.9	Complete and deliver documents	18/03/2014	Completed	Adjusted since 02/2014, however this task has not been updated in Project Plan
Application software system implementation		18/10/2013 – 19/12/2014		
3.1.1	Assessment of business processes and data source specification	18/10/13 – 21/11/2013	Completed	
3.1.2	Fit and Gap Analysis	22/11/2013 – 28/02/2014	Completed	Milestone 3 M4 was later than the deadline 1,5 months, delivery date: 23/04/2014
3.1.3	Design software customization solution	03/03/14 -21/04/2014	In progress	Later than the deadline
3.1.4	Customize application software solution	22/04/14 - 09/07/2014	In progress	
3.1.5	Develop Integration interfaces	22/04/14 - 09/07/2014	In progress	
3.1.6	Sign-off customization specification document	10/07/2014 – 16/07/2014	In progress	Milestone 4 Later than deadline
3.2.1	Define overall software test plan	03/03/14 Mon 14/04/2014		
3.2.2	Conduct Unit Test	15/4/2014 – 16/7/2014	In progress	
3.2.3	Conduct System Integration Test (SIT)	15/4/2014 – 15/08/2014	In progress	Milestone 5
3.2.4	Conduct User Acceptance Test (UAT)	15/04/2014 - 03/10/2014	In progress	
3.2.5	Conduct performance test	15/04/2014 - 15/09/2014	In progress	
3.3	Data migration	10/07/2014 - 30/10/2014	In progress	
Training and knowledge transfer		22/11/2013 – 09/12/2014		
	Define training plan	22/11/2013 – 24/01/2014	Completed	

	Task name	Planning date	Actual Status	Note
	Oversea course 1 (5 days x 6 users)	01/04/2014 – 22/04/2014	Delayed	
	Technical training - Infrastructure (local course)	19/02/2014 – 18/03/2014	Completed	Later than deadline

Since 10/06/2014, because of late delivery of Gap Analysis, project plan was rescheduled in detailed tasks, but still keep the key project milestones and overall project progression.

Project Progress Assessment:

Project management:

- Project management planning was late about 1.5 months.

Infrastructure Implementation:

- FIS-DP completed delivery as planned.
- Large amount and volume of documents for major technical items were delivered (installation guidelines, governance document, operation guidelines, specification document).
- Large amount of documents were reviewed for acceptance (48 documents).

GAP Analysis:

- FIS-DP completed the delivery of the Modules (M1, M2, M3, M5, M6 and M7) as planned.
- Module M4, in particularly, which consists of module M4.A – Industry Analysis and M4.B – Probability of Default, has a high complexity in professional knowledge as well as the significant differences between CIC's existing and desired solution. Due to such instance, the FIS sought for analysis advices from foreign experts as well as coordination with PIU-CG1 to find different suitable solutions. The Gap Analysis was completed in 23/04/2014 after the deadline 1 month and a half.

Design Customization:

- FIS-DP sent out the 1st version of design portfolio on May 30th, later than the deadline 1 month.
- Due to the significant difference during the Gap Analysis of Module M1.B, M4.A, M4.B, the design phase was extended.
- A General FSD after the 2nd review round was submitted on July 31, 2014.

Technical Specification Document (TSD):

- TSD will be updated for finalization by October 2014.

Customization Implementation:

- M1, M2: complete SIT.
- M3: in progress of SIT
- M5 and M6: will be SIT from August 11th, 2014.
- M1.B, M4.A (IND), M4.B (PD): is currently being developed and unit tested.

Training:

- SIT training was on July 16th, 2014.
- Training was late than schedule.
- Overseas training: organized 01 training courses for senior management officials in the United States from 28/07/2014 - 08/08/2014.
- Local training: organized 02 training courses on technical.

2.3.2 Implementation Issues

Through studying project's documents, working session with CIC implementation team and the vendor FIS-DP, there are implementation issues on project management, GAP analysis, customization design and testing plan.

Project management issues:

- The Project consists of various items of different technical & technological field including infrastructure facilities, hardware and software. In each technological field, it contains different technical groups: Technology Infrastructure (networking, securities, virtual servers, storage) & Application Software (database, data warehouse, ETL, web application, modern and updated Oracle portal). Therefore, the Project requires recruiting personnel and experts from various fields leading to difficulties for project organization and governance.
- The Project requires complex business knowledge in the professional field such as credit scoring analysis; as well as integration requirements. Prioritizing detailed project schedule became difficult to follow up with the projected plan.
- The Project has enormous volume of work for each item and high quality standards to be met. These require human-intensive, working efficiency and intense concentration from team members for the project.
- The Project requires close coordination between parties and foreign experts. Proactive works were sometime affected by coordination plan of the parties.

GAP analysis & Customization Design issues:

- Due to the complexity of modules M1.B (CIC Internal Report), M4.A (Industry Analysis) and M4.B (Probability of Default) and the significant different between FIS-DP's proposed solution and CIC's User Requirements caused the delay in completion of Gap Analysis; as well as the review of adjusted design regardless FIS-DP's increase in personnel and working hours.
- The customization was implemented before approval of the design. Because there was large number of Design documents delivered by FIS-DP, while CIC must finish reviewing in a short time with a short of personnel resource.

Testing schedule:

- Due to the unforeseen complexity and large scope of testing, the timeline planned for SIT process is tightly so that project team can achieve progress.

To improve project progress, a numbers of measures have been proposed, agreed and implemented through working sessions of 3 parties, CIC implementation team, FIS-DP vendor and PMU. The measures contain as below:

- Resource Reinforcement:
    - FIS-DP reinforced an addition of 5 personnel in May 2014.
    - Upon June 2014, FIS-DP has recruited an addition of 25 personnel (programmers and testers), providing a total of 50 regular personnel for the project.
    - The human resource for this project has increased to a total of 60 by June 2014.

- Working Hours Increase:
  - The team now also worksovertime in the weekdays and at the weekends.
- Parallelization of Tasks:
  - Module customization is now performed concurrently with presenting the FSD to the Implementation team.
  - TSD is now under customization phase.
- Enhancing Communication and Coordination with Implementation Team:
  - FIS-DP and CIC holds weekly meeting and is proactive in informing issues and resolutions.
  - Three-party meetings, including PMU, CIC-PIU and FIS-DP, were held monthly.
- Querying CIC for testing data:
  - The Vendor performs more details for Unit Test.
- Performing SIT:
  - Optimizing Gantt's critical path for improvement of workflows and deadlines.
  - Prioritizing major business modules and reports:
    - M1.A – Data Entry and Automatic Data Validation
    - M2 – Database and Data Warehouse
    - M3 – SBV Reports
    - M5 – Reports of Borrowers
    - M6, M7
  - Executing the following reporting modules:
    - M1.B – CIC reports
    - M4.A-IND – Industry Analysis (report)
  - Executing dedicated module as adjusted schedule:
    - M4.B-PD – Probability of Default