ELECTRONIC DATA ACQUISITION IN BANK OF THAILAND

PONCHAI SANGERAMRUANG

MASTER OF SCIENCE PROGRAMME
IN ADVANCED INFORMATION TECHNOLOGY

MAE FAH LUANG UNIVERSITY
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A INDEPENDENT STUDY SUBMITTED TO
MAE FAH LUANG UNIVERSITY IN PARITIAL FULFILLMENT
OF
THE REQUIREMENTS FOR THE DEGREE OF
THE MASTER OF SCIENCE PROGRAMME
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Nevertheless, I solely take full responsibility for any deficiencies and ambiguities which remain in this study. Any criticisms from the readers are welcomed.

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ABSTRACT

The objective of this study is to analyze the current XML Schema and the process of data transferring from Financial Institutions to Bank of Thailand that is called Electronic Data Acquisition, in the Data Acquisition System/Subsystem for Bank of Thailand. The new XML generator for Data Acquisition System/Subsystem will be developed for use as an data entry point for the Financial Institutions to prepare and submit the electronic data required by the Bank of Thailand. The developed XML generator can also handle different types of data exchange format.

The result of this study concluded that the new developed XML generator could help Financial Institutions improving their data entry application for Bank of Thailand by reducing the key-in process time and the risk of typing error. The new XML Generator Tool generates all data that already prepare in worksheet prompt to key-in to be data set under Bank of Thailand XML Schema in XML format.

In addition, this XML generator help most of Financial Institutions cut down the spending budgets for hiring consultants or vendors to provide or to develop some packages of software for this data exchange under Bank of Thailand XML dataset format.

Keywords: Electronic Data Acquisition / Data Acquisition

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LIST OF ABBREVIATIONS

BOT	Bank of Thailand
DMS	Data Management System
DA	Data Acquisition
CCS	Credir Foncier Companies
CRF	Computer Readable Form
ERS	Electronics Report Submission
FCB	Foreign Commercial Bank -Full Branch
FCS	Financial Companies
FI	Financial Institution
IBF	International Banking Facilities
TCB	Thai Commercial Bank

CHAPTER 1

INTRODUCTION

1.1 Background information

DMS (Data Management System), one of the importances Project that Bank of Thailand, the Central Bank in Thailand, develop by bring Electronic Data Acquisition Technology and Data Warehousing to manage all data from Financial Institution and Economic data in order to support users and make a new standard for all Financial Institutions.

Before implement DMS, Bank of Thailand has many input external source data with many based such as hardcopy, Computer Readable Form (CRF), Electronic Readable System (ERS), Microsoft Excel etc.

The objective and goals for DMS are to have one system to manage all data with high efficiency, quickly, accuracy and response all stakeholders need.

Data Acquisition component is mainly responsible to handle the submission of external data, especially data in XML format, and provide a data entry facility for the entry of unstructured data into the system

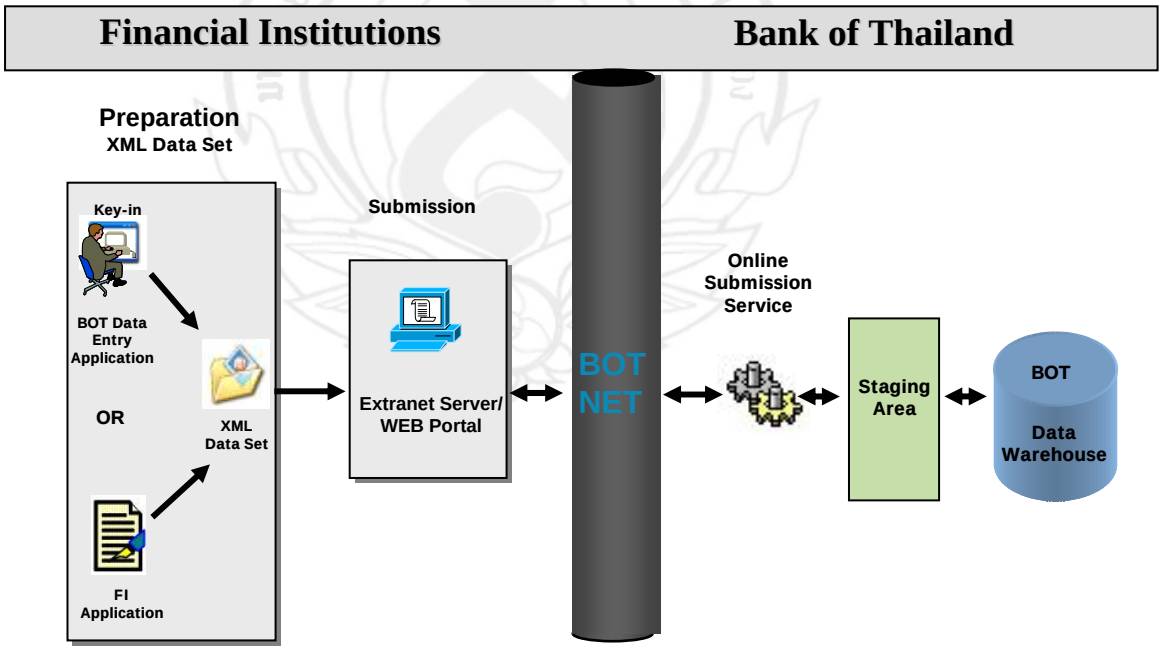


Figure 1.1 Bank of Thailand Electronic Data Acquisition

1.2 Objectives

To study in the Data Acquisition System/Subsystem, XML, XML Schema for Bank of Thailand.

To improve Bank of Thailand data entry application

Build prototype to demonstrate the improvement Bank of Thailand Data Entry Application.

1.3 Scope

The study of this Project is not covered all Project under DMS in Bank of Thailand. The scope of this Project is to:

1. Focus on the component of Data Acquisition System/Subsystem and Functional Requirements: Describing some necessary functions the system needs to support from users or external system.

2. Focus in Bank of Thailand XML Schema and

2.1. Generate Financial Institutions all data that already prepare in worksheet prompt to key-in to be dataset under Bank of Thailand XML Schema easily and test validation by Bank of Thailand Data Entry Application.

2.2 Reduce the key-in process in Bank of Thailand Data Entry Application.

2.3 Try to use all resources or software which Financial Institutions had.

2.4 Test prototype result validate by select the examples from some Financial Institutions or get data from external company that use Bank of Thailand XML Schema to do in the real situation and compare with Bank of Thailand Data Entry Application.

1.4 Expected Benefits

Everyone that works in Financial Institutions or the other companies, which have a view to manage data in Electronic as Bank of Thailand, can be able to know and understand Electronic Data Acquisition System/Subsystem. They can also use prototype in this project to generate their all data to be XML DataSet under Bank of Thailand XML Schema.

CHAPTER 2

FEASIBILITY STUDY

2.1 Introduction

DMS (Data Management System), one of the importances Project that Bank of Thailand, the Central Bank in Thailand, develop by bring Electronic Data Acquisition Technology and Data Warehousing to manage all data from Financial Institution (FI) and Economic data in order to support users and make a new standard for all Financial Institutions.

DMS has objective to be central for collecting economic and Financial Institution data and efficacious improving the ways to transfer data between Bank of Thailand and external organization, redundant and uncoordinated data and reduce provider burden by bring Electronic Data Acquisition Technology and Data Warehousing to manage all data from Financial Institution and Economic data in order to support users and make a new standard for all Financial Institutions.

The process for bring data to DMS) is called Data Acquisition.

2.2 Problem Statement

The Data Acquisition subsystem will be developed for using as an entry point for the Financial Institutions to prepare and submit the electronic data required by the Bank of Thailand. The majority of the data exchange format for electronic data will be in XML format.

The Main problem that Financial Institution found is the way to generate their all data to be dataset under Bank of Thailand XML Schema. Most of Financial Institution spends many budgets and expenses to get some consults or some vendor to provide or to make some packages of software for this purpose.

Although Bank of Thailand distributes one data entry application for every Financial Institutions to fill data that Bank of Thailand wants them to report and in the end its can generate output files with XML format, but Most of Financial Institutions don't use this data entry application for data entry. Because users must key-in each transaction that have many elements, many details, many classifications etc. and must prepare data before key-in. It's taken more time for each dataset to finish key-in.

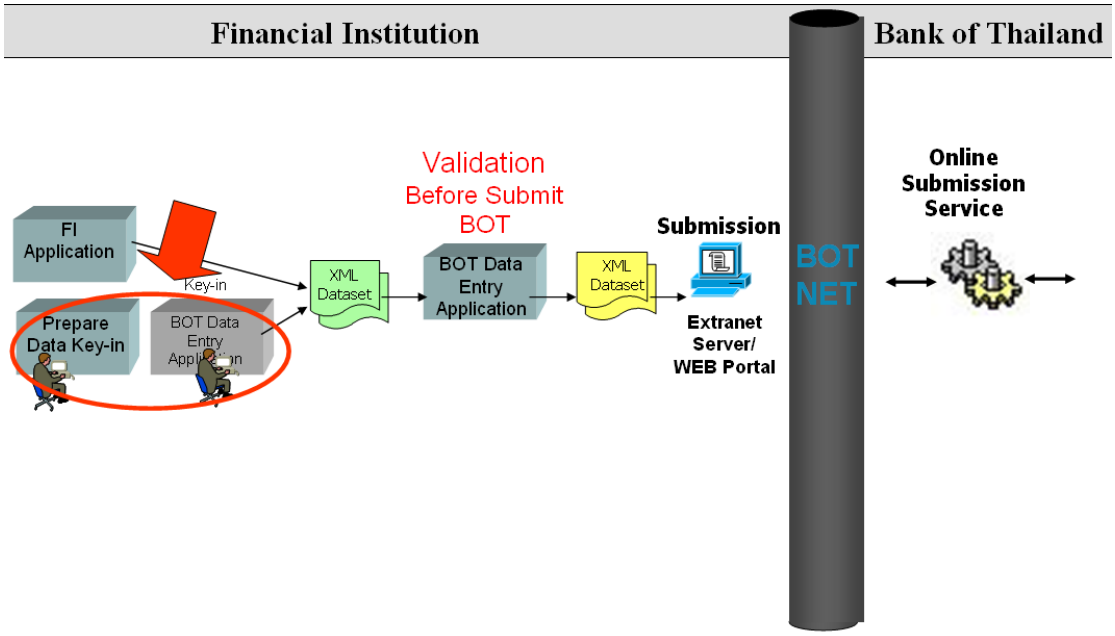


Figure 2.1 Steps for using Bank of Thailand Data Entry Application

Data Acquisition is one part of DMS (Data Management System) that have details component model as Figures below.

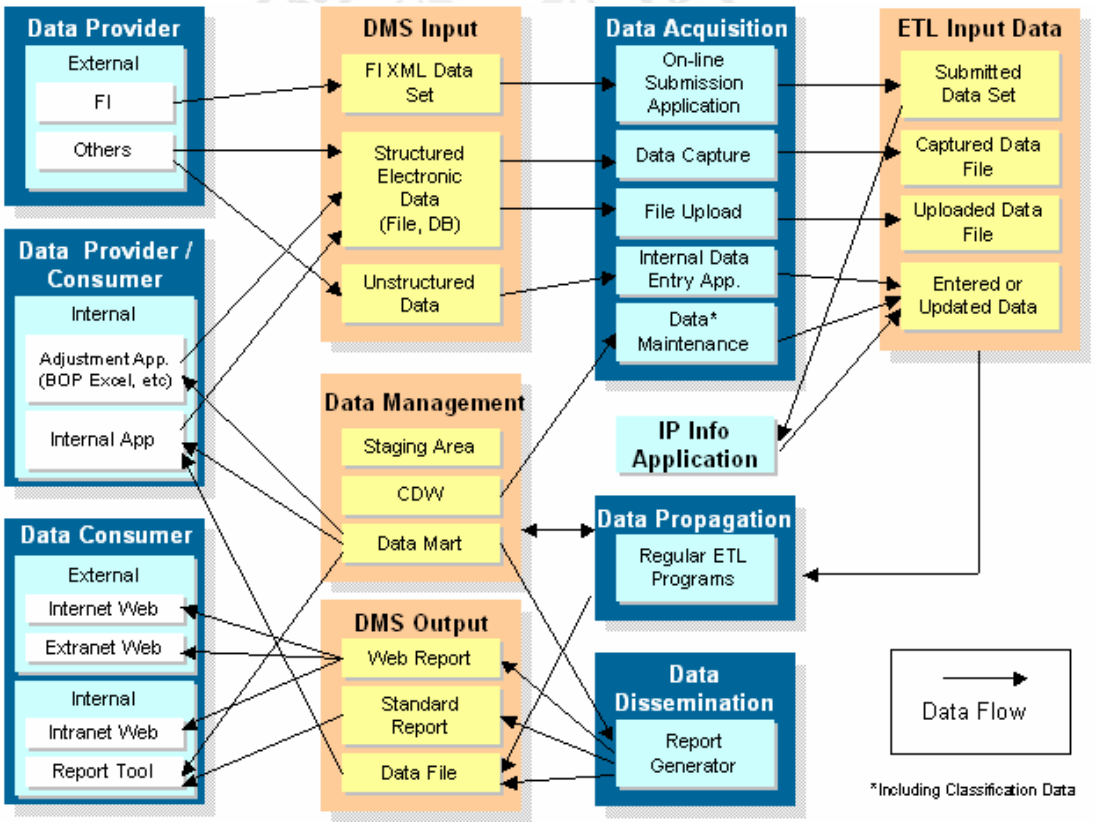


Figure 2.2 DMS Component Model

2.2.1 DMS Component Model

DMS Component Model in 3 main process :

1. Data Acquisition process to receive data from external source to system
2. Data Propagation process to bring data to BOT Central Data Warehouse
3. Data Dissemination process to generate data from BOT Central Data Warehouse

In this project, focus on the component of Data Acquisition System/Subsystem and Functional Requirements: Describing some necessary functions the system needs to support from users or external system.

For Data Acquisition, Financial Institution sent data in XML Data Set Format with 2 Steps :

1. XML Data Set Preparation
2. XML Data Set Submission

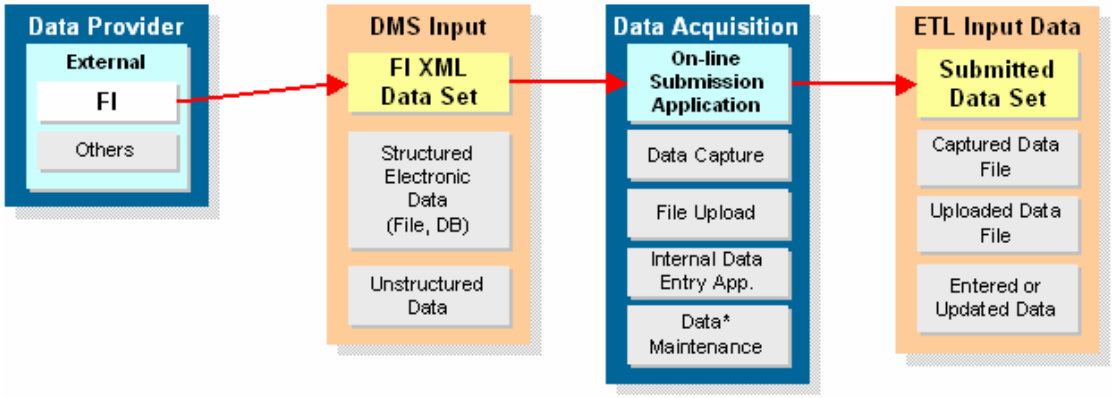


Figure 2.3 Relationship between BOT Electronic Data Acquisition

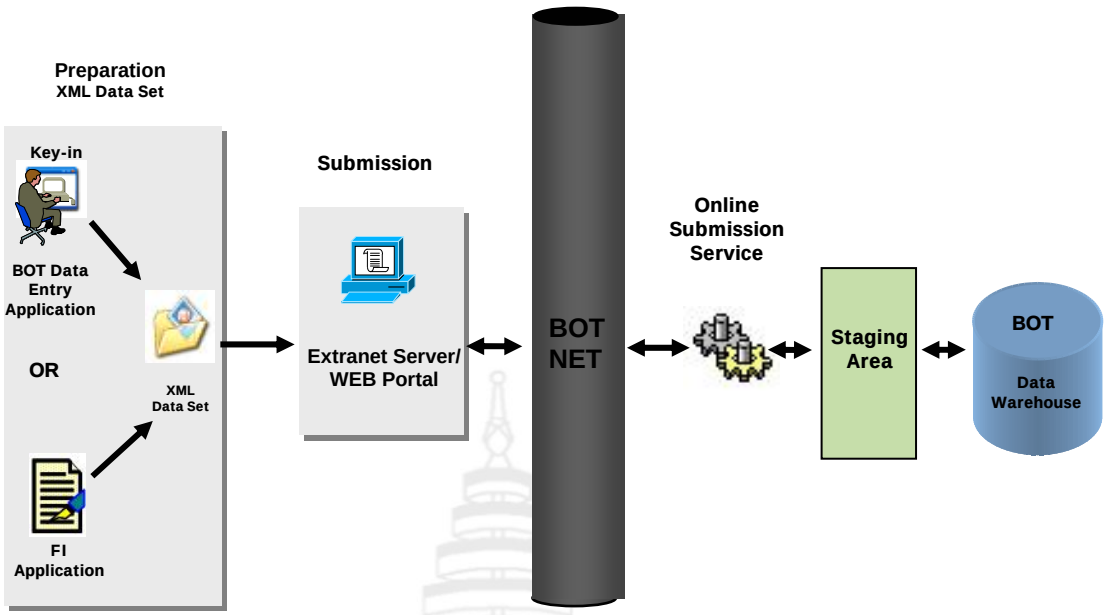


Figure 2.4 Process for receive data from Financial Institution

2.2.2 The Component of BOT Electronic Data Acquisition Systems / Subsystem

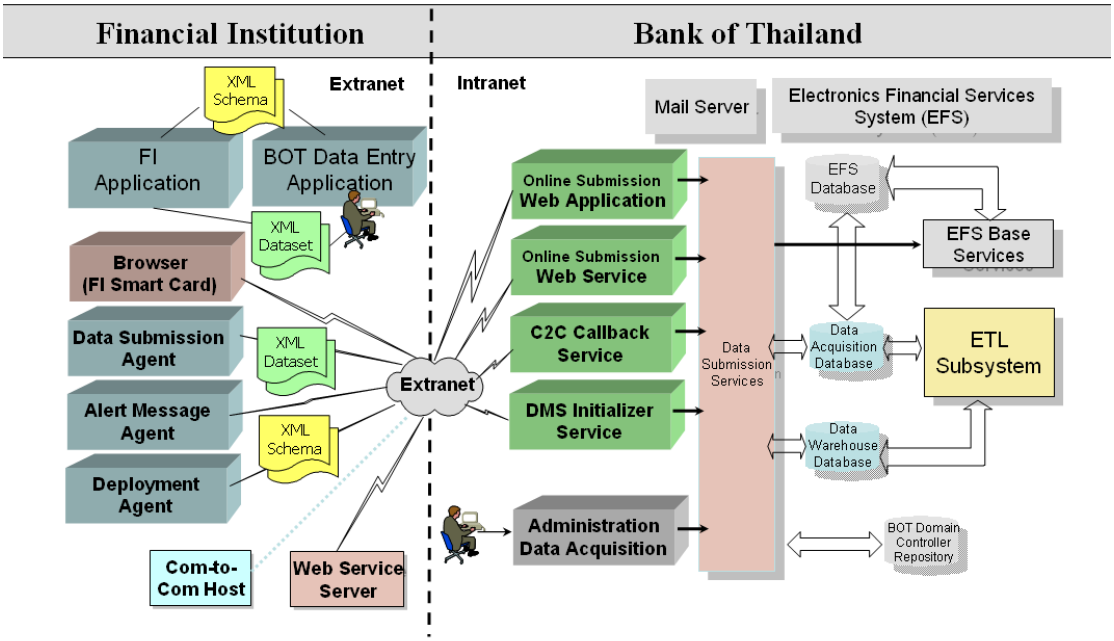


Figure 2.5 Electronic Data Acquisition Component

The Data Acquisition subsystem comprises of four major areas:

BOT Data Entry Application: Providing off-line facilities to allow Financial Institution to prepare the XML DataSets for submission to BOT.

Online Submission Web Application: Providing facility to allow Financial Institution to submit the XML data set(s) to BOT secured network channel.

Online Submission Web Service: Providing functionality to allow Financial Institution to submit the XML data sets to BOT using computer-to-computer interface. (For the future)

Data Acquisition Administration: Providing administration functionality to support all data acquisition operations. Provided functions are such as: generate/deploy data set schema, manage system access control, control data set submission, manage data set submission requirements, broadcast message to external institutions, etc.

2.2.3 BOT Electronic Data Acquisition Function

Table 2.1 Bank of Thailand Electronic Data Acquisition Function

Function		Description
1.	Create Data Set	Data set file
2.	Edit Working Data Set	Updated data set file
3.	Merge Data Set	Merged data set file
4.	Submit Data Set	Submission result (success/fail)
5.	View/Get Submission Status	Submission status. If status is failure, validation error log is also provided.
6.	View/Get Data Set Submission Requirements	Data set submission requirements information
7.	Download/Get Validation Error Log	Validation error log
8.	View/Get Alert Message	Alert/Broadcast Messages
9.	Submit External Data Set Adjustment Request	Submission result (success/fail)
10.	Manage Access Control (for own institution)	Result from managing access control operations
11.	Send Alert Message	Alert messages for failed validation.
12.	Broadcast Message	Broadcast messages
13.	Deployed Data Set Schema	New version of Data Set schemas
14.	Deployed FI Data Entry Application	New version of the BOT Data Entry application
15.	Create & Forward Internal Data Set	Request for submission of the newly created Data Set
16.	Adjust & Forward Warehouse Data	Request for submission of the updated warehouse data
17.	Browse Warehouse Data	Content of warehouse data
18.	Approve & Submit Data Set	Submission status
19.	Maintain Supporting Data	Updated supporting data

Table 2.1 Bank of Thailand Electronic Data Acquisition Function (cont.)

Function		Description
20.	Upload External Data Sources	Uploaded status
21.	View External Data Set Adjustment Request	Requests for external data set adjustment
22.	Submitted Data Set	Data Set Content for ETL processing.
23.	Changed Classification Data	New version of classification data for ETL processing.
24.	Changed Supporting Data	Content of changed supporting data for ETL processing.
25.	Uploaded External Data Sources	External data sources for ETL processing
26.	Validation / Transformation Status	Response from ETL regarding the validation/transformation status of the submitted Data Set
27.	Validation Error Log	Validation Error Log (in case of failed ETL validation)
28.	Update Classification Data	Submission status for new version of classification data
29.	Drop Updated Classification Data	Status where the newly submitted classification data is dropped.
30.	Change Effective Date	Status where the effective date of the newly submitted classification data is changed.
31.	View/Print Classification Data	Classification data
32.	System Generated Alert Message	System generated alert message such as alert message for changed classification data, and failed validation, etc.
33.	Generate Data Set Schemas	Generated data set schemas
34.	Manage Access Control (Extranet/Intranet)	Result from manages access control operations.
35.	Maintain Operational State	Operational state for the subsystem is changed
36.	Control Data Set Submission Time Window	Result from changing data set submission time window operation.
37.	Maintain Data Set Submission Requirements	Data set submission requirements is updated
38.	Query Submission Status	Data Set submission status
39.	View Activity Log	Activity logs information
40.	Broadcast Message	Broadcast message response
41.	Deploy BOT Data Applications	Result from deployment operations

2.2.4 BOT Data Entry Application

Provide generic data entry functions for creating data set file. As a result, the application generates data set file in XML format ready for submission to BOT.

Support for both fixed record data entry and variable record data entry. For the fixed record data entry, XML data set will be generated with fixed number of records. This is the case when we have a main fixed classification structure in the data set. The examples are such as: Balance Sheet data set, Profit & Loss data set, etc. The data entry application will display the fixed number of records for the user to work on. User will be allowed to edit data in each of the records but not to add or remove any of the records.

For the variable record data entry, XML data set will be generated with variable number of records depending on the input data. This is the case when there is no main classification structure in the data set. The examples are Loan data set, Deposit data set, etc. User will be allowed to add or remove records in the data set. Saving the form will trigger the system to generate the XML data set file containing all entered data set records.

The data set schema/XML Schema will be used to describe structure of the data set as well as possible values for each of the attribute. The BOT Data Entry as well as other components of the Data Acquisition subsystem will make use of this data set schema for validating the correctness of the generated/submitted data set file. The data set schema files will be delivered as part of the BOT Data Entry Application.

There can be multiple versions of data set schema associated with each data set. Each version represents structure of data set at different time period as the data set may be changed. This allows for the system to understand the content of the data set files created from different version of the Data Set.

The data entry form will be rendered based on specific version of Data Set schema. The version of Data Set schema is associated with the submission period /submission effective date. The application will automatically choose appropriate version of data set schema based on user's selected data set, and submission period.

Allow for creating new data set file as well as updating existing data set file.

Allow for merging multiple data set files of the same format to support Data Set creation from multiple sources. This function is applicable only to the variable record data entry type where the data set file contains multiple data records of the same structure.

Allow for printing data set file.

The BOT Data Entry application will be used by the Data Entry User to create the data set file, then pass-over the files to the Data Submission User for review and submit to the BOT Online Submission Web Application.

Support for basic key validation based on Data Set schema such as data type, data length, mandatory field, predefined values, and simple fields relationship validation within the same data set file.

To allow any user to be able to create data set, no authorization or access control will be required for the BOT Data Entry Application. If there is any need for the access control, it is responsible for each Financial Institution to set-up access control at the machine or operating system-level for each individual workstation.

Support for automatic data set schema/application deployment. Once published, the new data set schema(s) will be automatically sent to the gateway computer located at the financial institutions. It is responsible for each Financial Institution to distribute the data set schemas to their own workstations installing the BOT Data Entry Application.

The data entry form should allow for quick navigation to jump to specific record on the data set file.

The BOT Data Entry Application should provide the quick link button to activate BOT Online Submission Web Application.

2.2.5 Online Submission Web Application

Web-Based Application provide secured interface for the Data Submission User to submit data set files created from BOT Data Entry Application or other sources to Bank of Thailand.

Data submission process will be done through the BOT extranet network.

Support for immediate submission.

Submitted data set files will be automatically zipped and digitally signed before sending to BOT using a client digital certificate stored on the data submission user's smartcard. Once received at the BOT the submitted data set file will be verified to ensure confidentiality, integrity and non-repudiation of data.

The system will not allow for data set submission for data set file that is still under processing by ETL subsystem or the data set file that has already been processed by the ETL subsystem for each particular submission period. To adjust the already processed data set file, FI user must send request to BOT describing data adjustment.

The Figure 2.6 below illustrates state of submitted data set. Once successfully, state will be set to "New". After the system has performed key basic validation on the received data set, state will be set to either "Received", or "Rejected" depending on result from key basic validation process. When the data set is picked-up for processing by ETL, the state will be set to "Processing". Once ETL finishes processing the data set, state will be set to either "Validated", or "Invalidated" depending on result from processing.

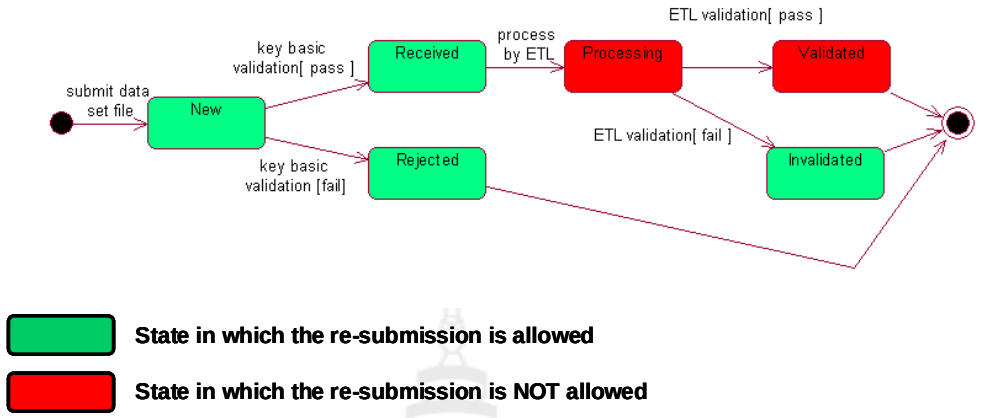


Figure 2.6 Diagram for Submitted Data Set

The system should provide facility to allow Financial Institution user to submit external data set adjustment request (message text + attached file) to BOT. During submission, the message text and attached file will be digitally singed with the user's certificate stored on the smartcard before sending request to BOT to ensure the message authenticity. The submitted message will be logged and archived by the system. At the same time, the original message and attached file will be forwarded to the BOT designated local email address for further follow-up.

The Online Submission Web Application should be implemented based on the Electronics Report Submission (ERS) framework to utilize the security services on the existing public key infrastructure.

Following access control & authorization checking will be performed before allowing Data Submission User to submit the data set file:

Check to ensure that the specified data set type and submission period match content of the details to be submitted data set file.

Check for valid user,

Check that the user is authorized to submit specified data set file,

Check that the data set type and submission period is valid for submission,

Access control can be assigned to the user at the Data Set level. All users will have privilege to access any provided functions. However, different user may have different privilege to submit different type of Data Set file.

Once the submitted file is received, the application will verify the file's digital signature and then perform basic key validation on the data before marking the data set file as officially received. If validation is success, the data set file will be forwarded to the ETL subsystem for further processing.

Provide functionality to allow the Data Submission User to view/print status of the submitted Data Set:

1. View Submission Status by Data Set (all Data Set types or specific Data Set Type)
2. View Submission Status by Date
3. Following information will be available for viewing:
    3.1 Data set type
    3.2 Type of submission period (e.g., daily, weekly, etc.)
4. Submission period
5. Submission status
6. Sender
7. Submission timestamp
8. ETL validation timestamp
9. Submitted filename and file size
10. Validation Error Log file for download (if invalidated)

In case of failed validation by both key basic validation and ETL validation, the validation error log will be available for downloading.

Allow for the Data Submission User to view data set submission requirements.

Provide message alert/broadcasting mechanism for data submission user to view alert/broadcast messages.

The alert message will be automatically generated to notify data submission user when the submitted data set failed validation process.

Provide facility to support message broadcasting by BOT Administrator. Receiver of a broadcast message can be specified at the level of individual user, institution, or group of institution.

2.3 Related projects

2.3.1. XML Documents and XML Files (Harold & Means, 2002)

An XML document contains text, never binary data. It can be opened with any program that knows how to read a text file.

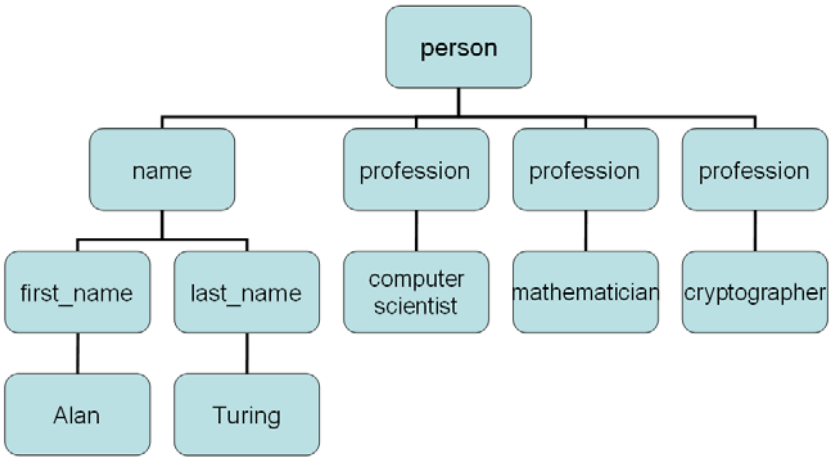


Figure 2.7 A tree diagram for XML Examples below

2.3.2. Elements, Tags, and Character Data

The element is delimited by the start-tag <person> and the end-tag </person>. Everything between the start-tag and the end-tag of the element (exclusive) is called the element's content. The content of this element is the text string:

The whitespace is part of the content, though many applications will choose to ignore it. <person> and </person> are markup. The string "Alan Turing" and its surrounding whitespace are character data. The tag is the most common form of markup in an XML document, but there are other kinds we'll discuss later.

1) Tag Syntax

XML tags look superficially like HTML tags. Start-tags begin with < and end-tags begin with </. Both of these are followed by the name of the element and are closed by >. However, unlike HTML tags, you are allowed to make up new XML tags as you go along. To describe a person, use <person> and </person> tags. To describe a calendar, use <calendar> and </calendar> tags. The names of the tags generally reflect the type of content inside the element, not how that content will be formatted.

2) Empty elements

There's also a special syntax for empty elements, i.e., elements that have no content. Such an element can be represented by a single empty-element tag that begins with < but ends with />. For instance, in XHTML, an XMLized reformulation of standard HTML, the line-break and horizontal-rule elements are written as <br /> and <hr /> instead of <br> and <hr>. These are exactly equivalent to
</br> and <hr></hr>, however. Which form you use for empty elements is

completely up to you. However, what you cannot do in XML and XHTML (unlike HTML) is use only the start-tag--for instance <br> or <hr>--without using the matching the end-tag. That would be a well-formedness error.

3) Case sensitivity

XML, unlike HTML, is case sensitive. <Person> is not the same as <PERSON> is not the same as <person>. If you open an element with a <person> tag, you can't close it with a </PERSON> tag. You're free to use upper- or lowercase or both as you choose. You just have to be consistent within any one element.

4) XML Trees

Look at a slightly more complicated XML document. The element contains more information suitably marked up to show its meaning.

1. Parents and children

This XML document is still composed of one person element. However, now this element doesn't merely contain undifferentiated character data. It contains four child elements: a name element and three profession elements. The name element contains two child elements of its own, first_name and last_name.

The person element is called the parent of the name element and the three profession elements. The name element is the parent of the first_name and last_name elements. The name element and the three profession elements are sometimes called each other's siblings. The first_name and last_name elements are also siblings.

XML gives each child exactly one parent, not two or more. Each element has exactly one parent element. That is, it is completely enclosed by another element. If an element's start-tag is inside some element, then its end-tag must also be inside that element. Overlapping tags, as in this common example from HTML, are prohibited in XML. Since the em element begins inside the strong element, it must also finish inside the strong element.

2. The root element

Every XML document has one element that does not have a parent. This is the first element in the document and the element that contains all other elements. In the person element filled this role. It is called the root element of the document. It is also sometimes called the document element. Every well-formed XML document has exactly one root element. Since elements may not overlap, and since all elements except the root have exactly one parent, XML documents form a data structure programmers call a tree.

5) Mixed Content

The contents of the first_name, last_name, and profession elements were character data, that is, text that does not contain any tags. The contents of the person and name elements were child elements and some whitespace that most applications will ignore. This dichotomy between elements that contain only character data and elements that contain only child elements (and possibly a little whitespace) is common in documents that are data oriented. However, XML can also be used for more free-form, narrative documents such as business reports, magazine articles, student essays, short stories, web pages, and so forth

2.3.3. Attributes

XML elements can have attributes. An attribute is a name-value pair attached to the element's start-tag. Names are separated from values by an equals sign and optional whitespace. Values are enclosed in single or double quotation marks. For example, this person element has a born attribute with the value 1962-06-23 and a died attribute with the value 2004-06-07:

2.3.4. CDATA Sections

When an XML document includes samples of XML or HTML source code, the < and & characters in those samples must be encoded as < and &. The more sections of literal code a document includes and the longer they are, the more tedious this encoding becomes. Instead you can enclose each sample of literal code in a CDATA section. A CDATA section is set off by a <![CDATA[and]]>. Everything between the <![CDATA[and the]]> is treated as raw character data. Less-than signs don't begin. Ampersands don't start entity references. Everything is simply character data, not markup.

The only thing that can not appear in a CDATA section is the CDATA section end delimiter]]>.

CDATA sections exist for the convenience of human authors, not for programs. Parsers are not required to tell you whether a particular block of text came from a CDATA section, from normal character data, or from character data that contained entity references such as < and &. By the time you get access to the data, these differences will have been washed away.

2.3.5. Comments

XML documents can be commented so that coauthors can leave notes for each other and themselves, documenting why they've done what they've done or items that remain to be done. XML comments are syntactically similar to HTML comments. Just as in HTML, they begin with <!-- and end with the first occurrence of -->.

The double hyphen -- should not appear anywhere inside the comment until the closing -->. In particular, a three hyphen close like ---> is specifically forbidden.

Comments may appear anywhere in the character data of a document. They may also appear before or after the root element. However, comments may not appear inside a tag or inside another comment.

Applications that read and process XML documents may or may not pass along information included in comments. They are certainly free to drop them out if they choose. Do not write documents or applications that depend on the contents of comments being available. Comments are strictly for making the raw source code of an XML document more legible to human readers. They are not intended for computer programs. For this purpose you should use a processing instruction instead.

2.3.6. Processing Instructions

In HTML, comments are sometimes abused to support nonstandard extensions. For instance, the contents of the script element are sometimes enclosed in a comment to protect it from display by a nonscript-aware browser.

XML provides the processing instruction as an alternative means of passing information to particular applications that may read the document. A processing

instruction begins with <? and ends with ?>. Immediately following the <? is an XML name called the target, possibly the name of the application for which this processing instruction is intended or possibly just an identifier for this particular processing instruction. The rest of the processing instruction contains text in a format appropriate for the applications for which the instruction is intended.

Processing instructions are markup, but they're not elements. Consequently, like comments, processing instructions may appear anywhere in an XML document outside of a tag, including before or after the root element. The most common processing instruction, xml-stylesheet, is used to attach stylesheets to documents. It always appears before the root element, as Example 2-6 demonstrates. In this example, the xml-stylesheet processing instruction tells browsers to apply the CSS stylesheet person.css to this document before showing it to the reader.

2.3.7. The XML Declaration

XML documents should begin with an XML declaration. The XML declaration looks like a processing instruction with the name xml and version, standalone, and encoding attributes. Technically, it's not a processing instruction though, just the XML declaration; nothing more, nothing less.

XML documents do not have to have an XML declaration. However, if an XML document does have an XML declaration, then that declaration must be the first thing in the document. It must not be preceded by any comments, whitespace, processing instructions, and so forth. The reason is that an XML parser uses the first five characters (<?xml) to make some reasonable guesses about the encoding, such as whether the document uses a single byte or multibyte character set. The only thing that may precede the XML declaration is an invisible Unicode byte-order mark.

1) Encoding

By default XML documents are assumed to be encoded in the UTF-8 variable-length encoding of the Unicode character set. This is a strict superset of ASCII, so pure ASCII text files are also UTF-8 documents. However, most XML processors, especially those written in Java, can handle a much broader range of character sets. All you have to do is tell the parser which character encoding the document uses. Preferably this is done through Meta information, stored in the file system or provided by the server. However, not all systems provide character-set metadata so XML also allows documents to specify their own character set with an encoding declaration inside the XML declaration.

The encoding attribute is optional in an XML declaration. If it is omitted and no metadata is available, then the Unicode character set is assumed. The parser may use the first several bytes of the file to try to guess which encoding of Unicode is in use. If metadata is available and it conflicts with the encoding declaration, then the encoding specified by the metadata wins. For example, if an HTTP header says a document is encoded in ASCII but the encoding declaration says it's encoded in UTF-8, then the parser will pick ASCII.

2) Standalone

If the standalone attribute has the value no, then an application may be required to read an external DTD (that is a DTD in a file other than the one it's reading now) to determine the proper values for parts of the document. For instance, a

DTD may provide default values for attributes that a parser is required to report even though they aren't actually present in the document.

Documents that do not have DTDs, like all the documents in this chapter, can have the value yes for the standalone attribute. Documents that do have DTDs can also have the value yes for the standalone attribute if the DTD doesn't in any way change the content of the document or if the DTD is purely internal.

The standalone attribute is optional in an XML declaration. If it is omitted, then the value no is assumed.

2.3.8. Checking Documents for Well-Formedness

Every XML document, without exception, must be well-formed. This means it must adhere to a number of rules, including the following:

1) Every start-tag must have a matching end-tag.
2) Elements may nest, but may not overlap.
3) There must be exactly one root element.
4) Attribute values must be quoted.
5) An element may not have two attributes with the same name.
6) Comments and processing instructions may not appear inside tags.
7) No unescaped < or & signs may occur in the character data of an element or attribute.

This is not an exhaustive list. There are many, many ways a document can be malformed. Some of these involve constructs that we have not yet discussed such as DTDs. Others are extremely unlikely to occur if you follow the examples in this chapter (for example, including whitespace between the opening < and the element name in a tag).

Whether the error is small or large, likely or unlikely, an XML parser reading a document is required to report it. It may or may not report multiple well-formedness errors it detects in the document. However, the parser is not allowed to try to fix the document and make a best-faith effort of providing what it thinks the author really meant. It can't fill in missing quotes around attribute values, insert an omitted end-tag, or ignore the comment that's inside a start-tag. The parser is required to return an error. The objective here is to avoid the bug-for-bug compatibility wars that plagued early web browsers and continue to this day. Consequently, before you publish an XML document, whether that document is a web page, input to a database, or something else, you'll want to check it for well-formedness.

You can use DTDs and schemas to validate documents. When the document has been corrected to be well-formed, it can be passed to a web browser, a database, or whatever other program is waiting to receive it.

2.3.9 Document Type Definitions (DTDs)

While XML is extremely flexible, not all the programs that read particular XML documents are so flexible. Many programs can work with only some XML applications but not others. And within a particular XML application, it's often important to ensure that a given document indeed adheres to the rules of that XML application. For instance, in XHTML, li elements should only be children of ul or ol elements. Browsers may not know what to do with them, or may act inconsistently, if li elements appear in the middle of a blockquote or p element.

A document type definition (DTD), DTDs are written in a formal syntax that explains precisely which elements and entities may appear where in the document and what the elements' contents and attributes are. A DTD can make statements such as "A ul element only contains li elements" or "Every employee element must have a social_security_number attribute." Different XML applications can use different DTDs to specify what they do and do not allow.

A validating parser compares a document to its DTD and lists any places where the document differs from the constraints specified in the DTD. The program can then decide what it wants to do about any violations. Some programs may reject the document. Others may try to fix the document or reject just the invalid element. Validation is an optional step in processing XML. A validity error is not necessarily a fatal error like a well-formedness error, though some applications may choose to treat it as one.

1) Validation

A valid document includes a document type declaration that identifies the DTD the document satisfies. The DTD lists all the elements, attributes, and entities the document uses and the contexts in which it uses them. The DTD may list items the document does not use as well. Validity operates on the principle that everything not permitted is forbidden. Everything in the document must match a declaration in the DTD. If a document has a document type declaration and the document satisfies the DTD that the document type declaration indicates, then the document is said to be valid. If it does not, it is said to be invalid.

There are many things the DTD does not say. In particular, it does not say the following:

1. What the root element of the document is
2. How many of instances of each kind of element appear in the document
3. What the character data inside the elements looks like
4. The semantic meaning of an element; for instance, whether it contains a date or a person's name

DTDs allow you to place some constraints on the form an XML document takes, but there can be quite a bit of flexibility within those limits. A DTD never says anything about the length, structure, meaning, allowed values, or other aspects of the text content of an element.

Validity is optional. A parser reading an XML document may or may not check for validity. If it does check for validity, the program receiving data from the parser may or may not care about validity errors. In some cases, such as feeding records into a database, a validity error may be quite serious, indicating that a required field is missing, for example. In other cases, rendering a web page perhaps, a validity error may not be so important, and you can work around it. Well-formedness is required of all XML documents; validity is not. Your documents and your programs can use it or not as you find needful.

DTD would probably be stored in a separate file from the documents it describes. This allows it to be easily referenced from multiple XML documents. However, it can be included inside the XML document if that's convenient, using the document type declaration we discuss later in this section. If it is stored in a separate file, then that file would most likely be named person.dtd, or

something similar. The .dtd extension is fairly standard though not specifically required by the XML specification.

A valid document includes a reference to the DTD to which it should be compared. This is given in the document's single document type declaration. The document type declaration is included in the prolog of the XML document after the XML declaration but before the root element.

When you use an external DTD subset, you should give the standalone attribute of the XML declaration the value no.

A validating processor is required to read the external DTD subset. A non-validating processor may do so, but is not required to, even if standalone has the value no. This means that if the external subset makes declarations that have consequences for the content of a document (for instance, providing default values for attributes) then the content of the document depends on which parser you're using and how it's configured. This has led to no end of confusion. Although some of the earliest XML parsers did not resolve external entities, most of the parsers still being used can do so and generally will do so. You should read the external DTD subset unless efficiency is a major concern or you're very familiar with the structure of the documents you're parsing.

2) Element Declarations

Every element used in a valid document must be declared in the document's DTD with an element declaration. Element declarations have this basic form:

<!ELEMENT element_name content_specification>

The name of the element can be any legal XML name. The content specification specifies what children the element may or must have in what order. Content specifications can be quite complex. They can say, for example, that an element must have three child elements of a given type, or two children of one type followed by another element of a second type, or any elements chosen from seven different types interspersed with text.

1. #PCDATA

About the simplest content specification is one that says an element may only contain parsed character data, but may not contain any child elements of any type. In this case the content specification consists of the keyword #PCDATA inside parentheses. For example, this declaration says that a phone_number element may contain text, but may not contain elements:

<!ELEMENT phone_number (#PCDATA)>

2. Child Elements

Another simple content specification is one that says the element must have exactly one child of a given type. In this case, the content specification simply consists of the name of the child element inside parentheses

3. Sequences

A content specification that lists exactly one child element is rare. Most elements contain either parsed character data or multiple child elements. The simplest way to indicate multiple child elements is to separate them with commas. This is called a sequence. It indicates that the named elements must appear in the specified order.

4. The Number of Children

As the previous examples indicate, not all instances of a given element necessarily have exactly the same children. You can affix one of three suffixes to an element name in a content specification to indicate how many of that element are expected at that position. These suffixes are:

?

Zero or one of the element is allowed.

*

Zero or more of the element is allowed.

+

One or more of the element is required.

5. Choices

Sometimes one instance of an element may contain one kind of child, and another instance may contain a different child. This can be indicated with a choice. A choice is a list of element names separated by vertical bars.

Choices can be extended to an indefinite number of possible elements.

6. Parentheses

Choices, sequences, and suffixes are fairly limited. However, they can be combined in arbitrarily complex fashions to describe most reasonable content models. Either a choice or a sequence can be enclosed in parentheses. When so enclosed, the choice or sequence can be suffixed with a ?, *, or +. Furthermore, the parenthesized item can be nested inside other choices or sequences.

7. Mixed Content

In narrative documents it's common for a single element to contain both child elements and un-marked up, nonwhitespace character data.

A definition element may contain parsed character data and term children. It does not specify in which order they appear, nor how many instances of each appear. This declaration allows a definition to have one term child, no term children, or twenty-three term children.

You can add any number of other child elements to the list of mixed content, though #PCDATA must always be the first child in the list.

8. Empty Elements

Some elements do not have any content at all. These are called empty elements and are sometimes written with a closing />.

These elements are declared by using the keyword EMPTY for the content specification.

If an element is empty, then it can contain nothing, not even whitespace.

9. ANY

DTDs occasionally want to say that an element exists without making any assertions about what it may or may not contain. In this case you can specify the keyword ANY as the content specification.

ANY is sometimes useful when you're just beginning to design the DTD and document structure and you don't yet have a clear picture of how everything fits together. However, it's extremely bad form to use ANY in finished DTDs. About the only time you'll see it used is when external DTD subsets and

entities may change in uncontrollable ways. However, this is actually quite rare. You'd really only need this if you were writing a DTD for an application like XSLT or RDF that wraps content from arbitrary, unknown XML applications.

2.3.10 Attribute Declarations

As well as declaring its elements, a valid document must declare all the elements' attributes. This is done with ATTLIST declarations. A single ATTLIST can declare multiple attributes for a single element type. However, if the same attribute is repeated on multiple elements, then it must be declared separately for each element where it appears.

It says that the image element has an attribute named source. The value of the source attribute is character data, and instances of the image element in the document are required to provide a value for the source attribute.

A single ATTLIST declaration can declare multiple attributes for the same element.

1) Attribute Types

In merely well-formed XML, attribute values can be any string of text. The only restrictions are that any occurrences of < or & must be escaped as < and & and whichever kind of quotation mark, single or double, is used to delimit the value must also be escaped. However, a DTD allows you to make somewhat stronger statements about the content of an attribute value. Indeed, these are stronger statements than can be made about the contents of an element. For instance, you can say that an attribute value must be unique within the document, that it must be a legal XML name token, or that it must be chosen from a fixed list of values.

There are ten attribute types in XML. They are:

1. CDATA
2. NMTOKEN
3. NMTOKENS
4. Enumeration
5. ENTITY
6. ENTITIES
7. ID
8. IDREF
9. IDREFS
10. NOTATION

2) Attribute Defaults

As well as providing a data type, each ATTLIST declaration includes a default declaration for that attribute. There are four possibilities for this default:

#IMPLIED

The attribute is optional. Each instance of the element may or may not provide a value for the attribute. No default value is provided.

#REQUIRED

The attribute is required. Each instance of the element must provide a value for the attribute. No default value is provided.

#FIXED

The attribute value is constant and immutable. This attribute has the specified value regardless of whether the attribute is explicitly noted on an individual instance of the element. If it is included, though, it must have the specified value.

Literal

The actual default value is given as a quoted string.

2.3.11 General Entity Declarations

XML predefines five entities for your convenience:

<

The less-than sign; a.k.a. the opening angle bracket (<)

&

The ampersand (&)

>

The greater-than sign; a.k.a. the closing angle bracket (>)

"

The straight, double quotation marks (")

'

The apostrophe; a.k.a. the straight single quote (')

The DTD can define many more. This is useful not just in valid documents, but even in documents you don't plan to validate.

Entity references are defined with an ENTITY declaration in the DTD. This gives the name of the entity, which must be an XML name, and the replacement text of the entity. For example, this entity declaration defines &super; as an abbreviation for supercalifragilisticexpialidocious:

2.3.12 Namespaces

Namespaces have two purposes in XML:

1). To distinguish between elements and attributes from different vocabularies with different meanings and that happen to share the same name.

2). To group all the related elements and attributes from a single XML application together so that software can easily recognize them.

The first purpose is easier to explain and to grasp, but the second purpose is more important in practice.

Namespaces are implemented by attaching a prefix to each element and attribute. Each prefix is mapped to a URI by an xmlns:prefix attribute. Default URIs can also be provided for elements that don't have a prefix by xmlns attributes. Elements and attributes that are attached to the same URI are in the same namespace. Elements from many XML applications are identified by standard URIs.

1) The Need for Namespaces

Some documents combine markup from multiple XML applications. In some cases, these applications may use the same name to refer to different things. Several elements have been overloaded with different meanings in different parts of the document. The title element is used for both the title of the page and the title of a painting. The date element is used for both the date the page was written and the date the painting was painted. One description element describes pages, while another describes paintings.

We could change the names of the elements from our vocabulary, painting_title instead of title, date_painted instead of date, and so on. However, this is inconvenient if you already have a lot of documents marked up in the old version of the vocabulary. And it may not be possible to do this in all cases, especially if the name collisions occur not because of conflicts between your vocabulary and a standard vocabulary, but because of conflicts between two or more standard vocabularies. For instance, RDF just barely avoids a collision with the Dublin Core over the Description and description elements.

In other cases, there may not be any name conflicts, but it may still be important for software to determine quickly and decisively to which XML application a given element or attribute belongs.

2) Namespace Syntax

Namespaces disambiguate elements with the same name from each other by assigning elements and attributes to URIs. Generally, all the elements from one XML application are assigned to one URI, and all the elements from a different XML application are assigned to a different URI. These URIs are sometimes called namespace names. The URIs partition the elements and attributes into disjoint sets. Elements with the same name but different URIs are different elements. Elements with the same name and the same URIs are the same. Most of the time there's a one-to-one mapping between namespaces and XML applications, though a few applications use multiple namespaces to subdivide different parts of the application.

3) Namespaces and DTDs

Namespaces are completely independent of DTDs and can be used in both valid and invalid documents. A document can have a DTD but not use namespaces or use namespaces but not have a DTD. It can use both namespaces and DTDs or neither namespaces nor DTDs. Namespaces do not in any way change DTD syntax nor do they change the definition of validity. For instance, the DTD of a valid document that uses an element named dc:title must include an ELEMENT declaration properly specifying the content of the dc:title element.

The name of the element in the document must exactly match the name of the element in the DTD including the prefix. The DTD cannot omit the prefix and simply declare a title element. The same is true of prefixed attributes.

2.3.13 W3C XML Schema (Vlist, 2002)

XML, the Extensible Markup Language, lets developers create their own formats for storing and sharing information. Using that freedom, developers have created documents representing an incredible range of information, and XML can ease many different information-sharing problems. A key part of this process is formal declaration and documentation of those formats, providing a foundation on which software developers can build software.

2.3.14 What Schemas Do for XML

An XML schema language is a formalization of the constraints, expressed as rules or a model of structure, that apply to a class of XML documents. In many ways, schemas serve as design tools, establishing a framework on which implementations can be built. Since formalization is a necessary ground for software designers, formalizing the constraints and structures of XML instance documents can

lead to very diverse applications. Although new applications for schemas are being invented every day, most of them can be classified as validation, documentation, query, binding, or editing.

2.3.15 Validation

Validation is the most common use for schemas in the XML world. There are many reasons and opportunities to validate an XML document: when we receive one, before importing data into a legacy system, when we have produced or hand-edited one, to test the output of an application, etc. In all these cases, a schema helps to accomplish a substantial part of the job. Different kinds of schemas perform different kinds of validation, and some especially complex rules may be better expressed in procedural code rather than in a descriptive schema, but validation is generally the initial purpose of a schema, and often the primary purpose as well.

Validation can be considered a "firewall" against the diversity of XML. We need such firewalls principally in two situations: to serve as actual firewalls when we receive documents from the external world (as is commonly the case with Web Services and other XML communications), and to provide check points when we design processes as pipelines of transformations. By validating documents against schemas, you can ensure that the documents' contents conform to your expected set of rules, simplifying the code needed to process them.

Validation of documents can substantially reduce the risk of processing XML documents received from sources beyond your control. It doesn't remove either the need to follow the administration rules of your chosen communication protocol or the need to write robust applications, but it's a useful additional layer of tests that fits between the communications interface and your internal code.

Validation can take place at several levels. Structural validation makes certain that XML element and attribute structures meet specified requirements, but doesn't clarify much about the textual content of those structures. Data validation looks more closely at the contents of those structures, ensuring that they conform to rules about what type of information should be present. Other kinds of validation, often called business rules, may check relationships between information and a higher level of sanity-checking, but this is usually the domain of procedural code, not schema-based validation.

2.4 Requirement specifications for BOT Data Application after improvements

Financial Institutions in Control of Bank of Thailand	
FI Type	**Number**
Commercial Banks registered in Thailand	17 Banks
-IBF License	5 Banks
Foreign Banks	17 Banks
-IBF License	9 Banks
Finance Companies	7 Companies
Credit Foncier Companies	4 Companies
Credit Card Companies	12 Companies
Remark : Not included Branches	

Figure 2.8 Number of Financial Institution in Control of Bank of Thailand

Financial Institutions in Control of Bank of Thailand consist with Commercial Banks (registered in Thailand), Foreign Banks, Finance Companies, Credit Foncier Companies and Credit Card Companies. All of Financial Institutions are necessary to follow by Bank of Thailand Policy to come in DMS Project and make a new standard in XML format data.

Electronic Data Acquisition is new technology for Central Bank in Thailand that has never done it before, like some Central Bank in other countries. The problem that Financial Institution found is the way to generate their all data to be dataset under Bank of Thailand XML Schema. Most of Financial Institution spends many budgets and expenses to get some consults or some vendor to provide or to make some packages of software for this purpose.

Bank of Thailand distributes one data entry application for every Financial Institutions to fill data that Bank of Thailand wants them to report and in the end its can generate output files with XML format, but Most of Financial Institutions don't use this data entry application for data entry. Because users must key-in each transaction that has many elements, many details, many classifications etc. and must prepare data before key-in. It's taken more time for each dataset to finish key-in.

So, the specifications for BOT Data Application after improvements are :

1. To reduce Key-in process in BOT Data Application
2. To reduce times for making XML DataSet under BOT XML Schema
3. To help Financial Institution generate XML DataSet under BOT XML Schema by making templates for DataSet in each Structure Data
4. Make Data Templates for DataSet in each Structure Data to support in generator
5. Use Programming and coding the relations for Structure Data Template and Data Template to make Prototype for implement
6. Testing Prototype result validate by select the examples for some Financial Institutions or get data from external company that use Bank of Thailand XML Schema to do in the real situation and compare with Bank of Thailand data entry application.

2.5 Implementation Techniques

2.5.1 Prototype for generating XML DataSet under BOT XML Schema

2.5.2 Programming and Coding by using Visual Basic for Application in Microsoft Excel (Marco).

2.5.3 Study in the Data Acquisition System/Subsystem, XML, Bank of Thailand XML Schema in order to improve Bank of Thailand Data Entry Application.

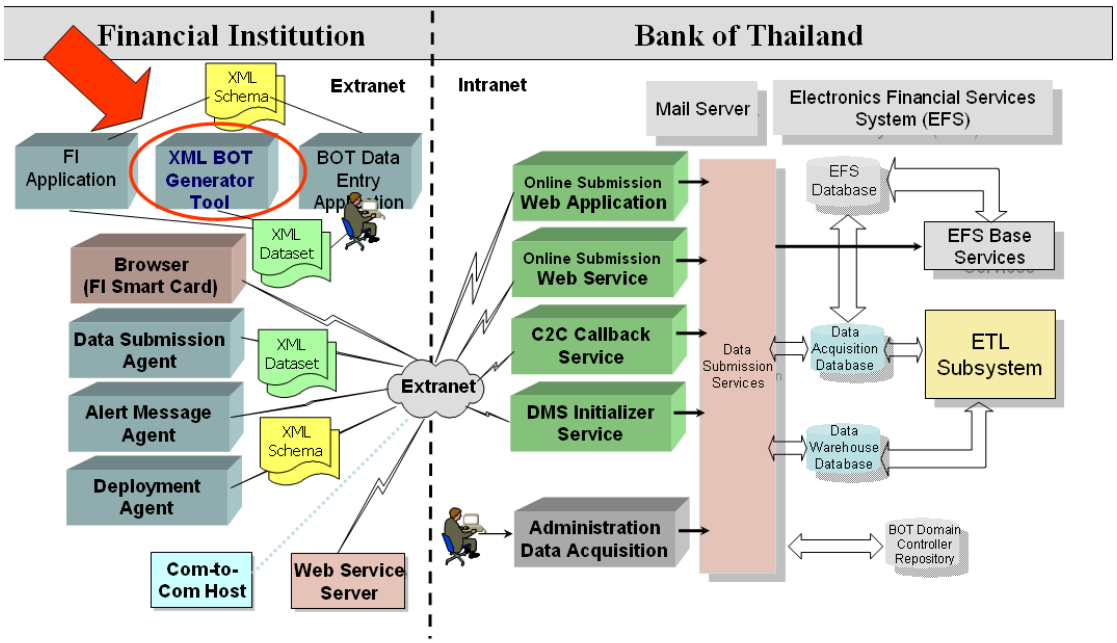


Figure 2.9 New Electronic Data Acquisition Component

2.6 Deliverables

CD containing source code, Documentation

2.7 Implementation plan

Implement Prototype that makes Master Template and Data Template by Programming and coding the relations for Master Template and Data Template to show the XML DataSet (Output) under Bank of Thailand XML Schema

CHAPTER 3

SYSTEM ANALYSIS AND DESIGN

3.1 Introduction

For generating Financial Institution data in XML format under BOT XML Schema ready for submission to BOT must know about BOT XML Schema Structure, Financial Institution Data Set and Financial Institution XML Schema Etc. For Examples: DataSet Element , DataSet Type, Fixed record data entry and variable record data entry.

The data set schema will be used to describe structure of the data set as well as possible values for each of the attribute. Other components of the Data Acquisition subsystem will make use of this data set schema for validating the correctness of the generated/submitted data set file.

3.2 Analysis of the existing system

3.2.1. Bank of Thailand XML Structure

XML Data Set is the standard for XML for Financial Institution to make XML Data in format XML (EXtensible Markup Language) and also to communication between Bank to Bank for the same standard. XML can show the details of the data and XML Structure that manage by XML Schema. In this part XML Structure include XML Declaration, XML Element, Root Element and Attribute with details below

1) XML Declaration

XML General starts with XML Declaration that used to show XML Version and Character Set in the document. Example:

```
<?xml version="1.0" encoding="UTF-8"?>
```

2) XML Element

XML use Markup Tag to explain the meaning for value of data. By Tag are any massage that between the sign < and > and the value of data must fill between Open Tag and Closing Tag (Closing Tag must have the sign / in front of that massage) Example :

```
<InterestRate>12.45</InterestRate>
```

For Example : 1 XML Element contain with the value of data that contain with Open Tag and Closing Tag for explain that InterestRate = 12.45

3) Root Element

First Element that below XML Declaration is called Root Element by 1 XML Document has only 1 Root Element only Inside Root Element can have Sub-Element in hierarchy

For Example: email Root Element contain with Sub-Element to, from, subject and body And in the same time body can have Sub-Element paragraph and attachment etc.

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<email>
        <to>Tove</to>
        <from>Jani</from>
        <subject>Reminder</subject>
        <body>
                <paragraph>This is a paragraph.</paragraph>
                <attachment>computer.gif</attachment>
        </body>
</email>
```

Root Element

4) Attribute

Inside Open Tag can explain data Attribute such as Tag attachment attribute type = ”gif” and size = ”100KB” etc.

```
<attachment type=”gif” size=”100KB” >computer.gif</attachment>
```

3.2.2. Financial Institution Data Set

In each XML Data Set that Financial Institution to sent between Bank must have 5 parts with details below

1) XML Declaration

Financial Institution XML Data Set must start with XML Declaration the same standard for general XML such as version=”1.0” and encoding =UTF-8

```
<?xml version="1.0" encoding="UTF-8"?>
```

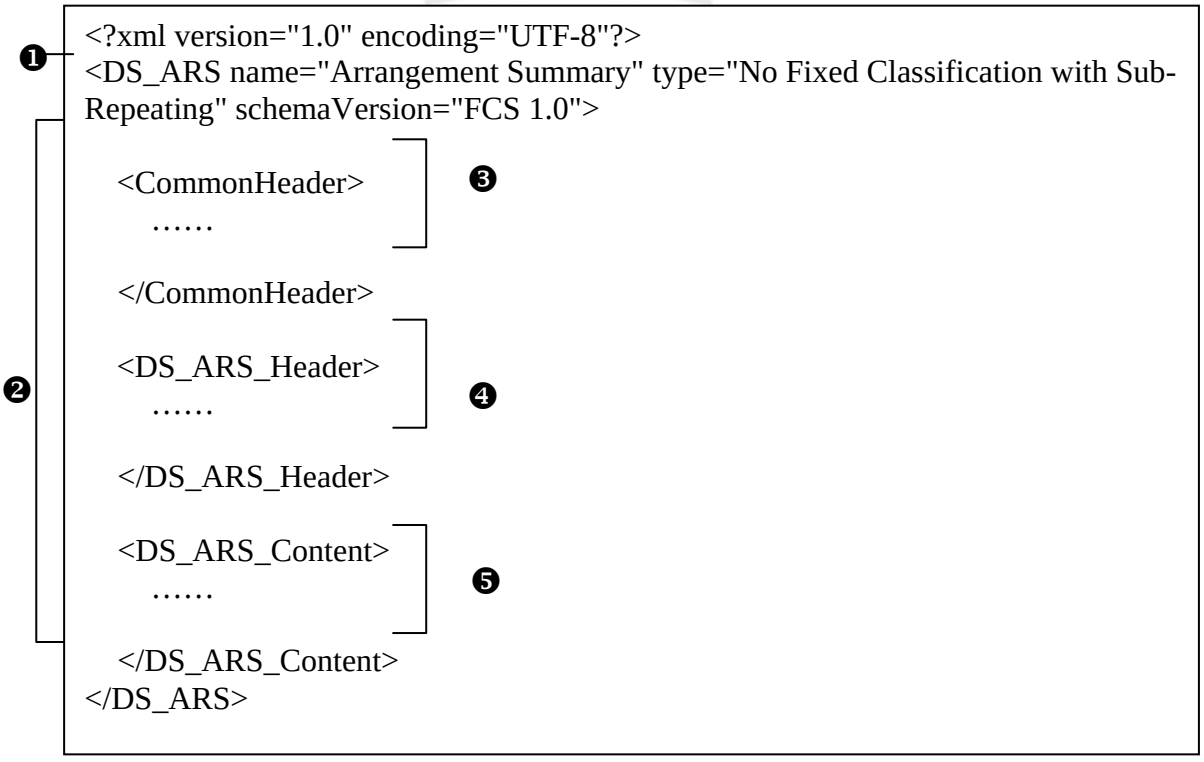
2) Root Element

Root Element for Data Set in the specification Tag start with DS_ and follow with abbreviation of Data Set and also have some Attribute to explain data such as

1. name : the full name for Data Set
2. type : specific Data Set Structure such as Fixed Classification No Sub-Repeating,Fixed Classification with Sub-Repeating, No Fixed Classification No Sub-Repeating and No Fixed Classification with Sub-Repeating
3. schemaVersion Version Schema

```
<DS_ARS name="Arrangement Summary" type="No Fixed Classification with Sub-Repeating"
" schemaVersion=”CBS 1.0”>
```

Inside Root Element Financial Institution Data Set have 3 parts: Common Header, Data Set Header and Content Records



3) Common Header

Common Header to be defined for the first Sub-Element inside Root Element for every Data Set by specific with Tag **CommonHeader** inside this part there have 2 Sub-Element

OrganizationId

DataSetDate

```
<?xml version="1.0" encoding="UTF-8"?>
<DS_ARS name="Arrangement Summary" type="No Fixed Classification with Sub-Repeating" schemaVersion="FCS 1.0">
   <CommonHeader>
      <OrganizationId>002</OrganizationId>
      <DataSetDate>2005-09-30</DataSetDate>
   </CommonHeader>
   ……
</DS_ARS>
```

4) Data Set Header

Data Set Header the second Sub-Element inside Root Element Tag start with DS_ and follow with abbreviation of Data Set and close with _Header such as *DS_ARS_Header* inside Data Set Header have some Sub-Element that have specific data for that Data Set. For every Data Set can also have difference Element.

```
<?xml version="1.0" encoding="UTF-8"?>
    <DS_ARS name="Arrangement Summary" type="No Fixed Classification with Sub-Repeating" schemaVersion="FCS 1.0">
   <CommonHeader>
      <OrganiztionId>002</OrganizationId>
      <DataSetDate>2005-09-30</DataSetDate>
   </CommonHeader>
   <DS_ARS_Header>
      < FiReportingGroupId>238001</FiReportingGroupId>
   </DS_ARS_Header>
   ……
</DS_ARS>
```

5) Content Records

The last parts of Data Set Content Records are transaction for that data. Tag start with DS_ follow with abbreviation of Data Set and close with _Content Such as DS_ARS_Content For the structure of Sub-Element inside Content Record depend on the type of Data Set

```
<?xml version="1.0" encoding="UTF-8"?>
    <DS_ARS name="Arrangement Summary" type="No Fixed Classification
    with Sub-Repeating" schemaVersion="FCS 1.0">
  <CommonHeader>
     <OrganiztionId>002</OrganizationId>
     <DataSetDate>2005-09-30</DataSetDate>
  </CommonHeader>
  <DS_ARS_Header>
     < FiReportingGroupId>238001</FiReportingGroupId>
  </DS_ARS_Header>
  <DS_ARS_Content>
     ……
  </DS_ARS_Content>
</DS_ARS>
```

3.2.3. Financial Institution XML Schema

Financial Institution XML Schema is the way to control data and structure data for Data Set 1 Data Set (extension XML) must have 1 XML Schema (extension XSD) together.

Example XML Data Set in these research show only some sample for some important data but not complete details and conditions, so when Bank want to develop program for generate XML Data Set must study document about Data Set, Classification, XML Schema and Validation Rules.

XML Schema is written an XML. The first line set XML Declaration such as general XML. For Root Element show Tag as schema. For Example:

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema targetNamespace="http://www.bank.co.th"
          xmlns:xs=”http://www.w3.org/2001/XMLSchema”
          xmlns=”http://www.bank.co.th” elementFormDefault="qualified"
          version="FCS 1.0">
     ……

</xs:schema>
```

Root Element

1) Main Component Financial Institution XML Schema

Financial Institution XML Schema contain with 3 main parts

1. Key Basic Validation Rules
2. Structure Data Set
3. Based and Classification Data Type

```
<?xml version="1.0" encoding="UTF-8" ?>
<xs:schema targetNamespace="http://www.bank.co.th"
    xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns="http://www.bank.co.th"
    elementFormDefault="qualified" version="FCS 1.0">
    <xsd:annotation>
        <xsd:appinfo>                          ❶ Key Basic Validation Rules
            ……
        </xsd:appinfo>
    </xsd:annotation>
    <xs:element name="DS_CAP">                 ❷ Structure Data Set
        <xs:complexType>
            ……
        </xs:complexType>                      ❸ Based and Classification
    </xs:element>
    <!-- Based Data Type -->
    <xs:simpleType name="M_Date">
        <xs:restriction base="xs:date" />
    </xs:simpleType>
    ……
</xs:schema>
```

2) Key Basic Validation Rules

Key Basic Validation Rules first part of Root Element for Financial Institution XML Schema. Validation Rules for development program to generate XML Data Set can study from Data Set Manual that cover Key Basic Validation Rules

```
<?xml version="1.0" encoding="UTF-8" ?>
<xs:schema targetNamespace="http://www.bank.co.th"
    xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns="http://www.bank.co.th"
    elementFormDefault="qualified" version="FCS 1.0">
  <xsd:annotation>
    <xsd:appinfo>
        <DataSetBusinessRule>
        ……
        </DataSetBusinessRule>
        <ElementBusinessRule>
        ……
        </ElementBusinessRule>
        ……
    </xsd:appinfo>
  </xsd:annotation>

  ……
</xs:schema>
```

Key Basic Validation Rules

3) Structure Data Set

The next part after Key Basic Validation Rules is Structure Data Set

For Example : Data Set Arrangement Summary set Root Element Data Set name *DS_ARS* that is ***complexType*** contain with Sub-Element name *CommonHeader*, *DS_ARS_Header* and *DS_ARS_Content* (Ref. follow with data 3 parts Data Set in 2.3, 2.4, 2.5) That Sub-Element all inside Element ***sequence*** in the meaning that 3 Sub-Element must arrange in order sequence

Next , Set Attribute for explain Element DS_ARS such as Attribute : name, type and schema Version

And the last is Sub-Element for *CommonHeader* that have the same every Data Set and Bank such as *OrganizationId* and *DataSetDate* by Ref. from Attribute *Type="DataSetCommonHeader"*

Remark Setting Structure Element can set inside its Element. For Example: Element DS_ARS_Header and DS_ARS_Content or Setting after such as Element CommonHeader

```
<?xml version="1.0" encoding="UTF-8" ?>
<xs:schema targetNamespace="http://www.bank.co.th"
            xmlns:xs="http://www.w3.org/2001/XMLSchema"
            xmlns="http://www.bank.co.th" elementFormDefault="qualified"
version="FCS 1.0">

  <xs:element name="DS_ARS">
    <xs:complexType>

      <xs:sequence>
        <xs:element name="CommonHeader" type="DataSetCommonHeader"/>
        <xs:element name="DS_ARS_Header">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="FiReportingGroupId"
                          type="M_CLFIReportingGroupId"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element name="DS_ARS_Content">
          ……
        </xs:element>
      </xs:sequence>


      <xs:attribute name="name" type="xs:string" use="required"
                    fixed="Arrangement Summary"/>
      <xs:attribute name="type" type="xs:string"
                    use="required" fixed="No Fixed Classification with Sub-
    Repeating"/>
      <xs:attribute name="schemaVersion" type="xs:string" use="required"
                    fixed="FCS 1.0"/>

    </xs:complexType>
  </xs:element>

  <xs:complexType name="DataSetCommonHeader">
    <xs:sequence>
      <xs:element name="OrganizationId" type="M_FICode"/>
      <xs:element name="DataSetDate" type="M_Date"/>
    </xs:sequence>
  </xs:complexType>

  ……
</xs:schema>
```

☆Set Structure CommonHeader

For Example: XML Schema below Set XML Data Set Structure such as

```
<?xml version="1.0" encoding="UTF-8"?>
    <DS_ARS name="Arrangement Summary" type="No Fixed Classification with Sub-
    Repeating" schemaVersion="FCS 1.0">
  <CommonHeader>
     <OrganizationId>002</OrganizationId>
     <DataSetDate>2005-09-30</DataSetDate>
  </CommonHeader>
  <DS_ARS_Header>
     <FiReportingGroupId>116002</FiReportingGroupId>
  </DS_ARS_Header>
  <DS_ARS_Content>
     ……

  </DS_ARS_Content>
</DS_ARS>
```

Structure Data Financial Institution XML Data Set can classify 4 types

1. Fixed Content Records –Fixed Classification No Sub-Repeating (Single Level Scheme)

Data Set that has this structure below Root Element will have Sub-Element in limited quality by Classification and under that Sub-Element will have Predefined Sub-Element again

Data Set that in these type Fixed Content Records – Fixed Classification No Sub-Repeating such as Data Set

1. Branch summary
2. Capital Fund
3. Foreign Currency Position
4. Foreign Currency Transaction Summary
5. Interim Data on Deposit and Balance Sheet Items
6. Items Between Organization Units
7. Liquidity Assessment
8. Net Profit Distribution
9. Profit and Loss
10. Provision Summary
11. Risk Weighted Assets

For Example: is some parts of XML Schema specific only Structure Data type Fixed

Content Records – Single Level Scheme for Data Set Capital Fund

```
<xs:element name="DS_CAP_Content">
   <xs:complexType>
      <xs:sequence>

         <xs:element name="CapitalFundItem940004">        Element No. 1Set by Classification
            <xs:complexType>
               <xs:sequence>                              Predefined Sub-Element
                  <xs:element name="OutstandingAmountperBook" type="M_Amount" />
                  <xs:element name="ApplicableCapitalFundAmount" type="O_Amount" />
                  <xs:element name="NetCapitalFundAmount" type="O_Amount" />
                  <xs:element name="RegisteredCapitalFundValue" type="O_Amount" />
                  <xs:element name="ApplicableCapitalFundValue" type="O_Amount" />
               </xs:sequence>
               <xs:attribute name="name" type="xs:string"
                             default="Capital Fund
                             …… />

            </xs:complexType>
         </xs:element>

         <xs:element name="CapitalFundItem940005">        Element No.2 Set by Classification
            ……

         </xs:element>

         ……
      <xs:sequence>
   </xs:complexType>
</xs:element>
```

2. Fixed Content Records –Fixed Classification With Sub-Repeating (Multi Level Scheme)

Data Set that has this structure below Root Element will have Sub-Element in limited quality by Classification and under that Sub-Element will also have Predefined Sub-Element again

Data Set that in these type Fixed Content Records – Fixed Classification with Sub-Repeating such as Data Set

Balance Sheet

For Example: is some parts of XML Schema specific only Structure Data type Fixed

Content Records – With Sub-Repeating for Data Set Balance Sheet

```
<xs:element name="DS_BLS_Content">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="BalanceSheetItem950005">

        <xs:complexType>                                  ← Set by Classification
          <xs:sequence>

            <xs:element name="BalanceSheetAmountType014028">
              <xs:complexType>
                <xs:simpleContent>                        ← Set by Classification
                  <xs:extension base="M_Amount">
                    <xs:attribute name="name" type="xs:string" default="Beginning
                        Balance"/>
                  </xs:extension>
                </xs:simpleContent>
              </xs:complexType>
            </xs:element>
            <xs:element name="BalanceSheetAmountType014029">

              <xs:complexType>
                <xs:simpleContent>
                        <xs:extension base="M_Amount">
                                <xs:attribute name="name" type="xs:string"
                          default="Transaction Increase"/>
                  </xs:extension>
                </xs:simpleContent>
              </xs:complexType>
            </xs:element>
            <xs:element name="BalanceSheetAmountType014030">

              ……
            </xs:element>

            ……

</xs:element>
```

3. Variable Content Records –No Fixed Classification No Sub-Repeating (Single Level)

Data Set that have these structure below Root Element will have only 1 Sub-Element ContentRecord that contain with Predefined Sub-Element another1 Level and must have at least 1 Element ContentRecord , but not limited number of ContentRecord its depend on Bank Transaction (Set by Attribute minOccurs="1" maxOccurs="unbounded")

Data Set that in these type Variable Content Records –No Fixed Classification No Sub-Repeating such as

1. Card Usage Summary
2. Classified Lending Movement
3. Credit Card Summary
4. Cross Currency and Interest Rate Swap Arrangement
5. Export Payment Exemption
6. Foreign Currency Deposit and Investment Position
7. Fee Rate Summary
8. Forward Rate Agreement Arrangement
9. Future Arrangement
10. Foreign Exchange Arrangement
11. Foreign Currency Transaction Under 20,000 USD Summary
12. Income Expense Summary by Branch
13. Instrument Issue
14. Interest Rate Summary
15. Interest Rate Outstanding
16. Lending Operation Progress Summary
17. Lending Purpose Summary
18. Options Arrangement
19. Receive Payment Transaction

For Example : is some parts of XML Schema specific only Structure Data Type Variable Content Records – Single Level for Data Set Arrangement Summary

```
<xs:element name="DS_ARS_Content">
  <xs:complexType>
    <xs:sequence>

      <xs:element name="ContentRecord" minOccurs="1" maxOccurs="unbounded">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="ArrangementType" type="M_CLArrangementType" />
            <xs:element name="InvolvedPartyResidenceFlag" type="M_Flag" />
            <xs:element name="InvolvedPartyType" type="M_CLInvolvedPartyType" />
            <xs:element name="InvolvedPartyBusinessType" type="M_BusinessType" />

            ……
          </xs:sequence>

        </xs:complexType>
      </xs:element>

    </xs:sequence>
  </xs:complexType>
</xs:element>
```

Variable Content Records

Predefined Element 1 Level

4. Variable Content Records –No Fixed Classification with Sub-Repeating (Multi Level)

The same as Variable Content Records – Single Level Data Set that have these structure below Root Element will have only 1 Sub-Element ContentRecord that contain with Predefined Sub-Element another 1 Level and must have at least 1 Element ContentRecord , but not limited number of ContentRecord its depend on Bank Transaction (Set by Attribute minOccurs="1" maxOccurs= "unbounded")

Data Set that in these type Variable Content Records – No Fixed Classification with Sub-Repeating such as

The difference is Sub-Element below ContentRecord that contain with Predefined Sub-Element not limited to have only 1 Level , but it can have Sub-Element drill down many Level depend on Data Set Data

Data Set that in these type Variable Content Records No Fixed Classification with Sub-Repeating such as

1. Contingent Arrangement
2. Deposit Arrangement
3. Electronic Banking Service Summary
4. FX Trading Transaction
5. Investment Position
6. Involved Party
7. Loan Arrangement
8. Foreign Currency Loan Arrangement
9. Loan Deposit Transaction

For Example : is some parts of XML Schema specific only Structure Data type Variable Content Records – Multi Level for Data Set Foreign Currency Loan Arrangements that have Sub-Element DS_FLA_Content 3 Level

```
<xs:element name="DS_FLA_Content">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="ContentRecord" minOccurs="1" maxOccurs="unbounded">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="DataProviderBranchNumber" type="O_BranchCode"/>
            <xs:element name="FiArrangementNumber" type="M_IdentificationNumber"/>
            <xs:element name="PreviousArrangementNumber" type="O_IdentificationNumber"/>
            <xs:element name="LoanType" type="M_CLArrangementType"/>
            <xs:element name="SetUpReasonType" type="O_CLSetUpReasonType" />
            ……

            <xs:element name="RelatedInvolvedPartyRecord">
              <xs:complexType>
                <xs:sequence>
                  <xs:element name="RelatedInvolvedPartyInfo"
                              minOccurs="0" maxOccurs="unbounded">
                    <xs:complexType>
                      <xs:sequence>
                        <xs:element name="RelatedInvolvedPartyName"
                                    type="M_LongName"/>
                      </xs:sequence>
                    </xs:complexType>
                  </xs:element>

                </xs:sequence>
              </xs:complexType>
            </xs:element>

          </xs:sequence>
        </xs:complexType>
      </xs:element>

    </xs:sequence>
  </xs:complexType>
</xs:element>
```

Variable Content Records

Sub-Element Level 1

Sub-Element Level 2

Sub-Element Level 3

4) Based and Classification Data Type

Data Type in Specification of W3C XML Schema not enough for validation data in Financial Institution Data Set, So in necessary to develop some specific Data Type in the end of Financial Institution XML Schema to explain Data Type which used inside that Data Set . They have 2 type : Based Data Type and Classification Data Type and also set Mandatory/Optional separate by Data Type (Data Type Mandatory Start with *M_* and Optional Start with *O_*)

1) Based Data Type

For setting Based Data Type it stills Data Type follow W3C XML Schema further in the part of size and type of data

For Example : Setting *O_Number* and *M_Number* by reference W3C XML Schema Type *integer* but specific number of Digit that have 9 numbers and also for Mandatory (M_Number) must have at least 1 number (\d+) and for Optional (O_Number) maybe have no data.

```
<xs:simpleType name="O_Number">
    <xs:restriction base="xs:integer">
        <xs:totalDigits value="9"/>
    </xs:restriction>
</xs:simpleType>

<xs:simpleType name="M_Number">
    <xs:restriction base="xs:integer">
            <xs:totalDigits value="9"/>
            <xs:pattern value="\d+"/>
    </xs:restriction>
</xs:simpleType>
```

Optional

Mandatory

2) Classification Data Type

For Classification Data Type must set the value as Center Bank Classification Database in the type of enumeration

In that Data Type can set Mandatory/Optional by M_ and O_ the same as Based Data Type and follow by CL (Classification) such as M_CLUniqueIDType or O_CLIBFIndicator

For Example : Setting Data Type Element PrimaryInvolvedParty UniqueIdType to M_CLUniqueIDType and Setting Data Type Element PrimaryInvolvedParty IBFIndicator to O_CLIBFIndicator

For Example : Element must found in XML Data Set

```
<PrimaryInvolvedPartyUniqueIdType>324001</PrimaryInvolvedPartyUniqueIdType>
<PrimaryInvolvedPartyIBFIndicator></PrimaryInvolvedPartyIBFIndicator>
```

Specific Data Type Element

```
……
<xs:element name="PrimaryInvolvedPartyUniqueIdType"
type="M_CLUniqueIDType" />
<xs:element name="PrimaryInvolvedPartyIBFIndicator"
type="O_CLIBFIndicator" />
……
```

Classification Data Type

```
<xs:simpleType name="M_CLUniqueIDType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="324001" id="Personal" />
            <xs:enumeration value="324002" id="Passport" />
            <xs:enumeration value="324003" id="Tax" />
            ……

    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="M_CLIBFIndicator">
    <xs:restriction base="xs:string">
            <xs:enumeration value="145001"
            id="BIBF
                Out-Out" />
            <xs:enumeration value="145002"
            id="BIBF
                Out-In" />
            <xs:enumeration value="145003"
            id="PIBF" />
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="O_CLIBFIndicator">
    <xs:union memberTypes="M_CLIBFIndicator">
        <xs:simpleType>
            <xs:restriction base="xs:string">
                <xs:enumeration value="" />
            </xs:restriction>
        </xs:simpleType>
    </xs:union>
</xs:simpleType>
……
```

3.3 User requirement analysis

Financial Institution , they have many Financial Institution Type :

TCB = Thai Commercial Bank
FCB = Foreign Commercial Bank -Full Branch
IBF = International Banking Facilities
FCS = Financial Companies
CCS = Credir Foncier Companies

New standard for sending Electronic Data Acquisition to Bank of Thailand is to submit data in XML format under Bank of Thailand XML Schema.

Financial Institution Data Set submission requirement can classify by Financial Institution Type :-

3.3.1 TCB = Thai Commercial Bank Total 49 DataSet

	Subject Area & Data Set	ABBR	Schema Type	Schema TCB
	1. FI Financial Position			
1	Balance Sheet	DS_BLS	Fixed CL with sub-repeating	✓
2	Branch Summary	DS_BSM	Fixed CL no sub-repeating	✓
3	Capital Fund	DS_CAP	Fixed CL no sub-repeating	✓
4	Items Between Organization Units	DS_IBO	Fixed CL no sub-repeating	✓
5	FI Investment Position	DS_IVP	No Fixed CL with sub-repeating	✓
6	Provision Summary	DS_PVS	Fixed CL with sub-repeating	✓
7	Risk Weighted Assets	DS_RWA	Fixed CL no sub-repeating	✓
8	Total Trading Book Position	DS_TBP	Fixed CL no sub-repeating	✓
9	Interest Rate Risk	DS_IRR	Fixed CL with sub-repeating	✓
	2. Arrangement Summary			
10	Arrangement Summary	DS_ARS	No Fixed CL with sub-repeating	✓
11	Classified Lending Movement Summary	DS_CLS	No Fixed CL no sub-repeating	✓
12	Lending Operation Progress Outstanding	DS_LOS	No Fixed CL with sub-repeating	✓
13	Lending Purpose Summary	DS_LPS	No Fixed CL with sub-repeating	✓
14	Lending Summary Classified by Business	DS_LSB	No Fixed CL no sub-repeating	✓
15	Total Classified Lending Summary	DS_TCS	No Fixed CL no sub-repeating	✓
16	Lending Movement Summary	DS_LMS	No Fixed CL no sub-repeating	✓
17	Trouble Debts Restructuring Summary	DS_TDR	No Fixed CL no sub-repeating	✓
18	Deposit Classified by Type of Depositor	DS_DCD	No Fixed CL with sub-repeating	✓
19	Arrangement Movement Summary	DS_AMS	No Fixed CL with sub-repeating	✓
	3. FI Liquidity Status			
20	Liquidity Assessment	DS_LQA	Fixed CL no sub-repeating	✓
	4. FI Financial Performance			
21	Net Profit Distribution	DS_PDS	Fixed CL no sub-repeating	✓
22	Profit and Loss	DS_PNL	Fixed CL no sub-repeating	✓
	5. Key Customer Position			
23	Contingent Arrangement	DS_CAR	No Fixed CL with sub-repeating	✓
24	Involved Party	DS_IPI	No Fixed CL with sub-repeating	✓
25	Loan Arrangement	DS_LAR	No Fixed CL with sub-repeating	✓

Figure 3.1 Data Set submission requirement TCB

	Subject Area & Data Set	ABBR	Schema Type	Schema TCB
	6. Foreign Currency Position			
26	Foreign Currency Position	DS_FCP	Fixed CL with sub-repeating	✓
27	Foreign Currency Deposit and Investment Position	DS_DIP	No Fixed CL with sub-repeating	✓
28	Foreign Currency Loan Arrangements	DS_FLA	No Fixed CL with sub-repeating	✓
29	Deposit Arrangements	DS_DAR	No Fixed CL with sub-repeating	✓
30	Foreign Exchange Arrangement	DS_FXA	No Fixed CL no sub-repeating	✓
31	Forward Rate Agreement Arrangement	DS_FRA	No Fixed CL no sub-repeating	✓
32	Future Arrangement	DS_FTA	No Fixed CL no sub-repeating	✓
33	Options Arrangement	DS_OPA	No Fixed CL no sub-repeating	✓
34	Cross Currency and Interest Rate Swap Arrangement	DS_SWA	No Fixed CL no sub-repeating	✓
	7. Foreign Currency Transactions			
35	FX Trading Transaction	DS_FTX	No Fixed CL with sub-repeating	✓
36	Loan/Deposit Transaction	DS_LTX	No Fixed CL with sub-repeating	✓
37	Receive Payment Transaction	DS_PTX	No Fixed CL with sub-repeating	✓
38	Foreign Exchange Trading Transaction Under 20,000 USD Summary	DS_FTU	No Fixed CL with sub-repeating	✓
39	Foreign Currency Transaction Summary	DS_FTS	Fixed CL with sub-repeating	✓
	8. Other FI Summary			
40	Credit Card Summary	DS_CCS	No Fixed CL no sub-repeating	✓
41	Card Usage Summary	DS_CUS	No Fixed CL with sub-repeating	✓
42	Electronic Banking Services Summary	DS_EBS	No Fixed CL with sub-repeating	✓
43	Export Payment Exemption	DS_EPE	No Fixed CL with sub-repeating	✓
44	Fee Rate Summary	DS_FRS	No Fixed CL no sub-repeating	✓
45	Interim Data on Deposit and Balance Sheet Items	DS_IDB	Fixed CL no sub-repeating	✓
46	Income and Expense by Branch	DS_IEB	No Fixed CL no sub-repeating	✓
47	Interest Rate Outstanding	DS_IRO	No Fixed CL no sub-repeating	✓
48	Interest Rates Summary	DS_IRS	No Fixed CL no sub-repeating	✓
49	Instrument Issue	DS_ISI	No Fixed CL no sub-repeating	✓

Figure 3.1 Data Set submission requirement TCB (cont.)

3.3.2 FCB = Foreign Commercial Bank -Full Branch Total 47 DataSet

	Subject Area & Data Set	ABBR	Schema Type	Schema FCB
	1. FI Financial Position			
1	Balance Sheet	DS_BLS	Fixed CL with sub-repeating	✓
2	Capital Fund	DS_CAP	Fixed CL no sub-repeating	✓
3	Items Between Organization Units	DS_IBO	Fixed CL no sub-repeating	✓
4	FI Investment Position	DS_IVP	No Fixed CL with sub-repeating	✓
5	Provision Summary	DS_PVS	Fixed CL with sub-repeating	✓
6	Risk Weighted Assets	DS_RWA	Fixed CL no sub-repeating	✓
7	Total Trading Book Position	DS_TBP	Fixed CL no sub-repeating	✓
8	Interest Rate Risk	DS_IRR	Fixed CL with sub-repeating	✓
	2. Arrangement Summary			
9	Arrangement Summary	DS_ARS	No Fixed CL with sub-repeating	✓
10	Classified Lending Movement Summary	DS_CLS	No Fixed CL no sub-repeating	✓
11	Lending Operation Progress Outstanding	DS_LOS	No Fixed CL with sub-repeating	✓
12	Lending Purpose Summary	DS_LPS	No Fixed CL with sub-repeating	✓
13	Lending Summary Classified by Business	DS_LSB	No Fixed CL no sub-repeating	✓
14	Total Classified Lending Summary	DS_TCS	No Fixed CL no sub-repeating	✓
15	Lending Movement Summary	DS_LMS	No Fixed CL no sub-repeating	✓
16	Trouble Debts Restructuring Summary	DS_TDR	No Fixed CL no sub-repeating	✓
17	Deposit Classified by Type of Depositor	DS_DCD	No Fixed CL with sub-repeating	✓
18	Arrangement Movement Summary	DS_AMS	No Fixed CL with sub-repeating	✓
	3. FI Liquidity Status			
19	Liquidity Assessment	DS_LQA	Fixed CL no sub-repeating	✓
	4. FI Financial Performance			
20	Net Profit Distribution	DS_PDS	Fixed CL no sub-repeating	✓
21	Profit and Loss	DS_PNL	Fixed CL no sub-repeating	✓
	5. Key Customer Position			
22	Contingent Arrangement	DS_CAR	No Fixed CL with sub-repeating	✓
23	Involved Party	DS_IPI	No Fixed CL with sub-repeating	✓
24	Loan Arrangement	DS_LAR	No Fixed CL with sub-repeating	✓

Figure 3.2 Data Set submission requirement FCB

	Subject Area & Data Set	ABBR	Schema Type	Schema FCB
	6. Foreign Currency Position			
25	Foreign Currency Position	DS_FCP	Fixed CL with sub-repeating	✓
26	Foreign Currency Deposit and Investment Position	DS_DIP	No Fixed CL with sub-repeating	✓
27	Foreign Currency Loan Arrangements	DS_FLA	No Fixed CL with sub-repeating	✓
28	Deposit Arrangements	DS_DAR	No Fixed CL with sub-repeating	✓
29	Foreign Exchange Arrangement	DS_FXA	No Fixed CL no sub-repeating	✓
30	Forward Rate Agreement Arrangement	DS_FRA	No Fixed CL no sub-repeating	✓
31	Future Arrangement	DS_FTA	No Fixed CL no sub-repeating	✓
32	Options Arrangement	DS_OPA	No Fixed CL no sub-repeating	✓
33	Cross Currency and Interest Rate Swap Arrangement	DS_SWA	No Fixed CL no sub-repeating	✓
	7. Foreign Currency Transactions			
34	FX Trading Transaction	DS_FTX	No Fixed CL with sub-repeating	✓
35	Loan/Deposit Transaction	DS_LTX	No Fixed CL with sub-repeating	✓
36	Receive Payment Transaction	DS_PTX	No Fixed CL with sub-repeating	✓
37	Foreign Exchange Trading Transaction Under 20,000 USD Summary	DS_FTU	No Fixed CL with sub-repeating	✓
38	Foreign Currency Transaction Summary	DS_FTS	Fixed CL with sub-repeating	✓
	8. Other FI Summary			
39	Credit Card Summary	DS_CCS	No Fixed CL no sub-repeating	✓
40	Card Usage Summary	DS_CUS	No Fixed CL with sub-repeating	✓
41	Electronic Banking Services Summary	DS_EBS	No Fixed CL with sub-repeating	✓
42	Export Payment Exemption	DS_EPE	No Fixed CL with sub-repeating	✓
43	Fee Rate Summary	DS_FRS	No Fixed CL no sub-repeating	✓
44	Interim Data on Deposit and Balance Sheet Items	DS_IDB	Fixed CL no sub-repeating	✓
45	Interest Rate Outstanding	DS_IRO	No Fixed CL no sub-repeating	✓
46	Interest Rates Summary	DS_IRS	No Fixed CL no sub-repeating	✓
47	Instrument Issue	DS_ISI	No Fixed CL no sub-repeating	✓

Figure 3.2 Data Set submission requirement FCB (cont.)

3.3.3 IBF = International Banking Facilities Total 27 DataSet

	Subject Area & Data Set	ABBR	Schema Type	Schema IBF
	1. FI Financial Position			
1	Balance Sheet	DS_BLS	Fixed CL with sub-repeating	✓
2	Items Between Organization Units	DS_IBO	Fixed CL no sub-repeating	✓
3	FI Investment Position	DS_IVP	No Fixed CL with sub-repeating	✓
	2. Arrangement Summary			
4	Arrangement Summary	DS_ARS	No Fixed CL with sub-repeating	✓
5	Lending Operation Progress Outstanding	DS_LOS	No Fixed CL with sub-repeating	✓
6	Lending Purpose Summary	DS_LPS	No Fixed CL with sub-repeating	✓
	3. FI Liquidity Status			
7	Liquidity Assessment	DS_LQA	Fixed CL no sub-repeating	✓
	4. FI Financial Performance			
8	Profit and Loss	DS_PNL	Fixed CL no sub-repeating	✓
	5. Key Customer Position			
9	Contingent Arrangement	DS_CAR	No Fixed CL with sub-repeating	✓
10	Involved Party	DS_IPI	No Fixed CL with sub-repeating	✓
11	Loan Arrangement	DS_LAR	No Fixed CL with sub-repeating	✓
	6. Foreign Currency Position			
12	Foreign Currency Position	DS_FCP	Fixed CL with sub-repeating	✓
13	Foreign Currency Deposit and Investment Position	DS_DIP	No Fixed CL with sub-repeating	✓
14	Foreign Currency Loan Arrangements	DS_FLA	No Fixed CL with sub-repeating	✓
15	Deposit Arrangements	DS_DAR	No Fixed CL with sub-repeating	✓
16	Foreign Exchange Arrangement	DS_FXA	No Fixed CL no sub-repeating	✓
17	Forward Rate Agreement Arrangement	DS_FRA	No Fixed CL no sub-repeating	✓
18	Future Arrangement	DS_FTA	No Fixed CL no sub-repeating	✓
19	Options Arrangement	DS_OPA	No Fixed CL no sub-repeating	✓
20	Cross Currency and Interest Rate Swap Arrangement	DS_SWA	No Fixed CL no sub-repeating	✓
	7. Foreign Currency Transactions			
21	FX Trading Transaction	DS_FTX	No Fixed CL with sub-repeating	✓
22	Loan/Deposit Transaction	DS_LTX	No Fixed CL with sub-repeating	✓
23	Receive Payment Transaction	DS_PTX	No Fixed CL with sub-repeating	✓
24	Foreign Exchange Trading Transaction Under 20,000 USD Summary	DS_FTU	No Fixed CL with sub-repeating	✓
25	Foreign Currency Transaction Summary	DS_FTS	Fixed CL with sub-repeating	✓
	8. Other FI Summary			
26	Interest Rates Summary	DS_IRS	No Fixed CL no sub-repeating	✓
27	Instrument Issue	DS_ISI	No Fixed CL no sub-repeating	✓

Figure 3.3 Data Set submission requirement IBF

3.3.4 FCS = Financial Companies Total 42 DataSet

	Subject Area & Data Set	ABBR	Schema Type	Schema FCS
	1. FI Financial Position			
1	Balance Sheet	DS_BLS	Fixed CL with sub-repeating	✓
2	Branch Summary	DS_BSM	Fixed CL no sub-repeating	✓
3	Capital Fund	DS_CAP	Fixed CL no sub-repeating	✓
4	FI Investment Position	DS_IVP	No Fixed CL with sub-repeating	✓
5	Provision Summary	DS_PVS	Fixed CL with sub-repeating	✓
6	Risk Weighted Assets	DS_RWA	Fixed CL no sub-repeating	✓
7	Total Trading Book Position	DS_TBP	Fixed CL no sub-repeating	✓
8	Interest Rate Risk	DS_IRR	Fixed CL with sub-repeating	✓
	2. Arrangement Summary			
9	Arrangement Summary	DS_ARS	No Fixed CL with sub-repeating	✓
10	Classified Lending Movement Summary	DS_CLS	No Fixed CL no sub-repeating	✓
11	Lending Operation Progress Outstanding	DS_LOS	No Fixed CL with sub-repeating	✓
12	Lending Purpose Summary	DS_LPS	No Fixed CL with sub-repeating	✓
13	Lending Summary Classified by Business	DS_LSB	No Fixed CL no sub-repeating	✓
14	Total Classified Lending Summary	DS_TCS	No Fixed CL no sub-repeating	✓
15	Lending Movement Summary	DS_LMS	No Fixed CL no sub-repeating	✓
16	Trouble Debts Restructuring Summary	DS_TDR	No Fixed CL no sub-repeating	✓
17	Deposit Classified by Type of Depositor	DS_DCD	No Fixed CL with sub-repeating	✓
18	Arrangement Movement Summary	DS_AMS	No Fixed CL with sub-repeating	✓
	3. FI Financial Performance			
19	Net Profit Distribution	DS_PDS	Fixed CL no sub-repeating	✓
20	Profit and Loss	DS_PNL	Fixed CL no sub-repeating	✓
	4. Key Customer Position			
21	Contingent Arrangement	DS_CAR	No Fixed CL with sub-repeating	✓
22	Involved Party	DS_IPI	No Fixed CL with sub-repeating	✓
23	Loan Arrangement	DS_LAR	No Fixed CL with sub-repeating	✓
	5. Foreign Currency Position			
24	Foreign Currency Position	DS_FCP	Fixed CL with sub-repeating	✓
25	Foreign Currency Deposit and Investment Position	DS_DIP	No Fixed CL with sub-repeating	✓
26	Foreign Currency Loan Arrangements	DS_FLA	No Fixed CL with sub-repeating	✓
27	Deposit Arrangements	DS_DAR	No Fixed CL with sub-repeating	✓
28	Foreign Exchange Arrangement	DS_FXA	No Fixed CL no sub-repeating	✓
29	Forward Rate Agreement Arrangement	DS_FRA	No Fixed CL no sub-repeating	✓
30	Future Arrangement	DS_FTA	No Fixed CL no sub-repeating	✓
31	Options Arrangement	DS_OPA	No Fixed CL no sub-repeating	✓
32	Cross Currency and Interest Rate Swap Arrangement	DS_SWA	No Fixed CL no sub-repeating	✓
	Subject Area & Data Set	**ABBR**	**Schema Type**	**Schema FCS**
	6. Foreign Currency Transactions			
33	FX Trading Transaction	DS_FTX	No Fixed CL with sub-repeating	✓
34	Loan/Deposit Transaction	DS_LTX	No Fixed CL with sub-repeating	✓
35	Receive Payment Transaction	DS_PTX	No Fixed CL with sub-repeating	✓
36	Foreign Exchange Trading Transaction Under 20,000 USD Summary	DS_FTU	No Fixed CL with sub-repeating	✓
37	Foreign Currency Transaction Summary	DS_FTS	Fixed CL with sub-repeating	✓
	7. Other FI Summary			
38	Export Payment Exemption	DS_EPE	No Fixed CL with sub-repeating	✓
39	Fee Rate Summary	DS_FRS	No Fixed CL no sub-repeating	✓
40	Interim Data on Deposit and Balance Sheet Items	DS_IDB	Fixed CL no sub-repeating	✓
41	Interest Rates Summary	DS_IRS	No Fixed CL no sub-repeating	✓
42	Instrument Issue	DS_ISI	No Fixed CL no sub-repeating	✓

Figure 3.4 Data Set submission requirement FCS

3.3.5 CCS = Credir Foncier Companies Total 23 DataSet

	Subject Area & Data Set	ABBR	Schema Type	Schema CCS
	1. FI Financial Position			
1	Balance Sheet	DS_BLS	Fixed CL with sub-repeating	✓
2	Branch Summary	DS_BSM	Fixed CL no sub-repeating	✓
3	Capital Fund	DS_CAP	Fixed CL no sub-repeating	✓
4	FI Investment Position	DS_IVP	No Fixed CL with sub-repeating	✓
5	Provision Summary	DS_PVS	Fixed CL with sub-repeating	✓
6	Risk Weighted Assets	DS_RWA	Fixed CL no sub-repeating	✓
7	Total Trading Book Position	DS_TBP	Fixed CL no sub-repeating	✓
8	Interest Rate Risk	DS_IRR	Fixed CL with sub-repeating	✓
	2. Arrangement Summary			
9	Arrangement Summary	DS_ARS	No Fixed CL with sub-repeating	✓
10	Classified Lending Movement Summary	DS_CLS	No Fixed CL no sub-repeating	✓
11	Lending Operation Progress Outstanding	DS_LOS	No Fixed CL with sub-repeating	✓
12	Lending Purpose Summary	DS_LPS	No Fixed CL with sub-repeating	✓
13	Lending Summary Classified by Business	DS_LSB	No Fixed CL no sub-repeating	✓
14	Total Classified Lending Summary	DS_TCS	No Fixed CL no sub-repeating	✓
15	Lending Movement Summary	DS_LMS	No Fixed CL no sub-repeating	✓
16	Trouble Debts Restructuring Summary	DS_TDR	No Fixed CL no sub-repeating	✓
17	Deposit Classified by Type of Depositor	DS_DCD	No Fixed CL with sub-repeating	✓
	3. FI Financial Performance			
18	Net Profit Distribution	DS_PDS	Fixed CL no sub-repeating	✓
19	Profit and Loss	DS_PNL	Fixed CL no sub-repeating	✓
	4. Key Customer Position			
20	Involved Party	DS_IPI	No Fixed CL with sub-repeating	✓
21	Loan Arrangement	DS_LAR	No Fixed CL with sub-repeating	✓
	5. Other FI Summary			
22	Interim Data on Deposit and Balance Sheet Items	DS_IDB	Fixed CL no sub-repeating	✓
23	Interest Rates Summary	DS_IRS	No Fixed CL no sub-repeating	✓

Figure 3.5 Data Set submission requirement CCS

Financial Institution wants to generate their all data to be dataset under Bank of Thailand XML Schema. Most of Financial Institution spends many budgets and expenses to get some consults or some vendor to provide or to make some packages of software for this purpose

BOT Data Entry Application can help Financial Institutions to fill data that Bank of Thailand wants them to report and in the end its can generate output files with XML format, but most of Financial Institutions don't use this data entry application for data entry. Because users must key-in each transaction that has many elements, many details, many classifications etc. and must prepare data before key-in. It's taken more time for each dataset to finish key-in.

So, Financial Institution want BOT data entry application improve :

1. To have a tools further to generate BOT XML DataSet
2. To reduce key-in process in BOT Data Application
3. To reduce times for making XML DataSet under BOT XML Schema
4. To compatible with BOT data entry application
5. To use easy tools than BOT data entry application.

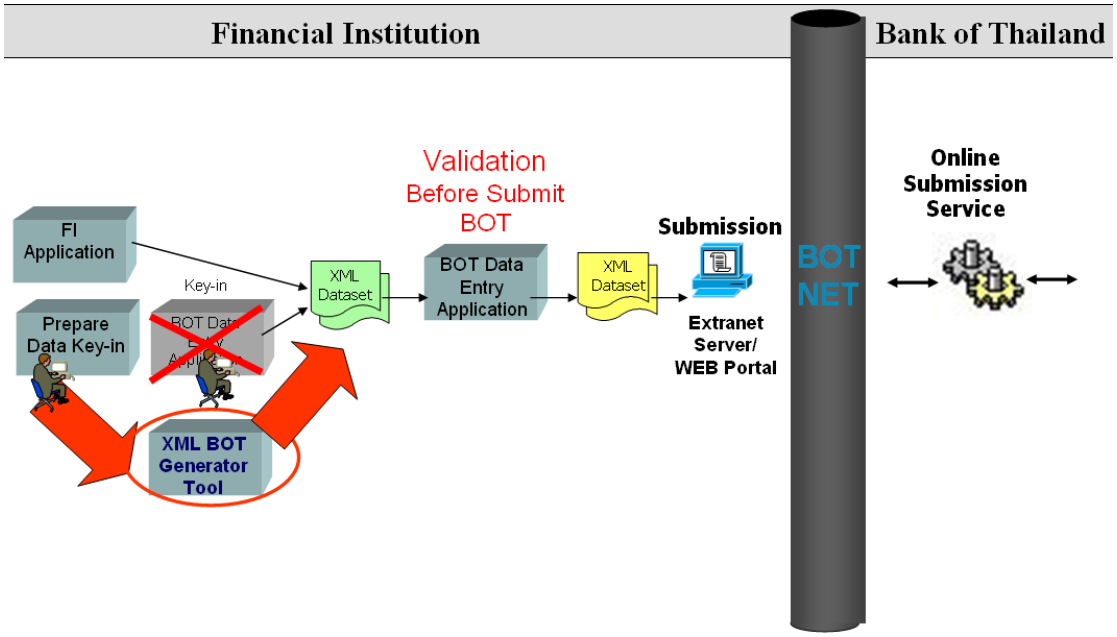


Figure 3.6 The New tools further to generate BOT XML DataSet

This information about BOT data entry application require / inquire from many users in Financial Institution that ever use its before.

3.4 New Tools Design

For the New Tools Design, we design User interface by using the XML Massage Box for users to select Financial Institution Type and Data Set Type

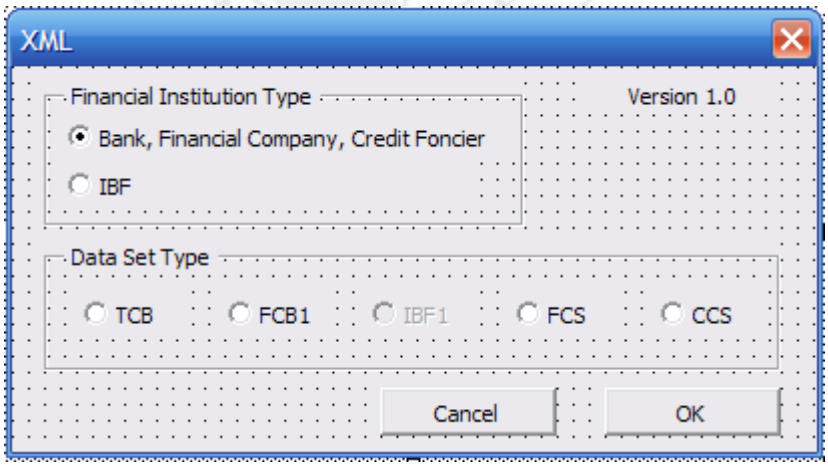
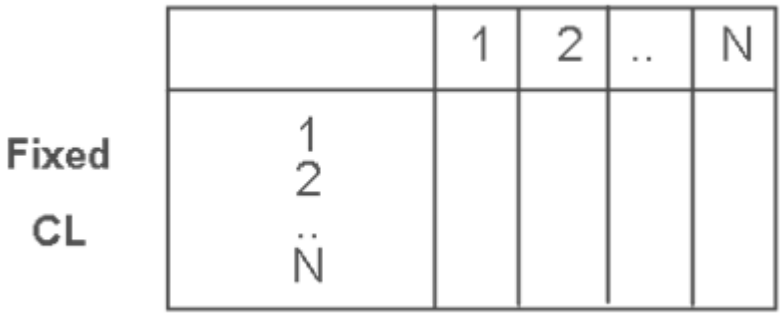


Figure 3.7 User interface for the New Tools Design

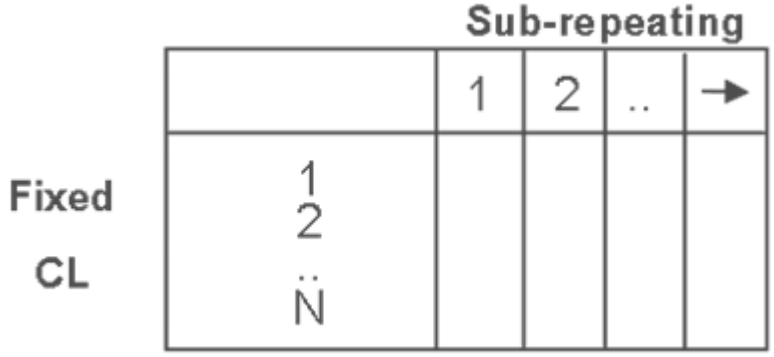
3.4.1 BOT XML Data Set Structure

Type 1 = Fixed CL No Sub-repeating
Type 2 = Fixed CL with Sub-repeating
Type 3 = No Fixed CL No Sub-repeating
Type 4 = No Fixed CL with Sub-repeating

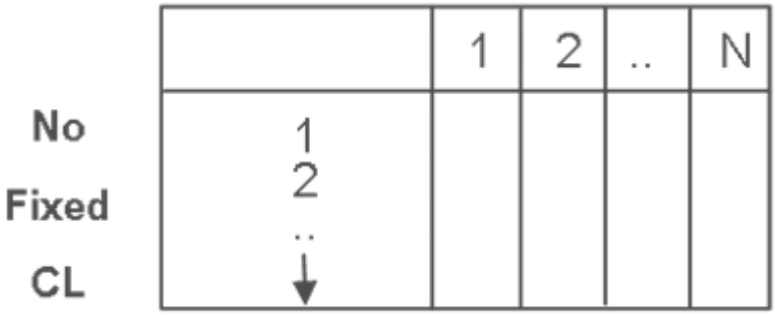
Type 1 Fixed CL No Sub-repeating



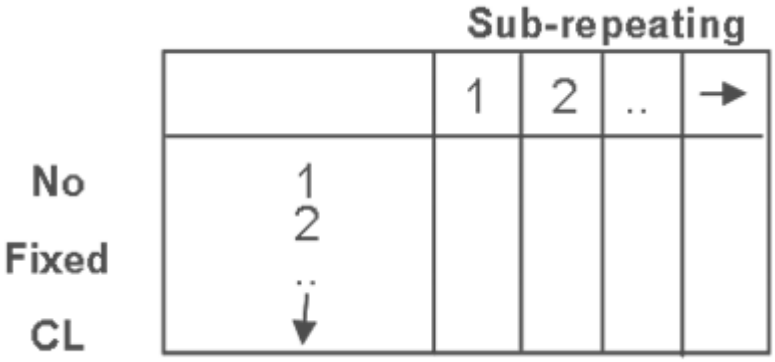
Type 2 Fixed CL with Sub-repeating



Type 3 No Fixed CL No Sub-repeating



Type 4 No Fixed CL with Sub-repeating



3.4.2 Main Steps System Flow Design

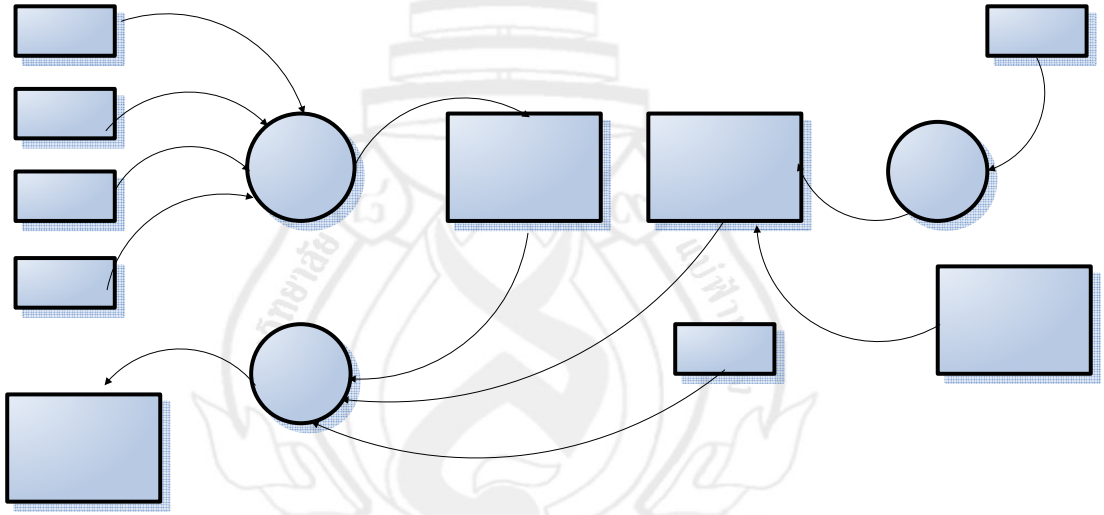


Figure 3.8 Main Steps Design

In the process 1, we get all about information details to make Master Template from

DataSet Manual for the details of Key Basic Validation Rules
DataSet Element for the details of each DataSet Element
DataSet Classification for the details of each DataSet Element Classification and possible Value
DataSet Structure for the details of each DataSet Structure Type

In the process 2, we get DataSet Element to make Data Template from each DataSet Structure Type. And after that we get Financial Institution data follow Data Template format

In the process 3, process to make the tools for generating XML DataSet under BOT XML Schema by using Microsoft Excel with Visual Basic Application for Excel (Marco) and relationship between Master Template and Data Template

In the process 3, we also use Based Data Type to assign Mandatory / Optional data items before coding and attach all data for each DataSet to generate XML DataSet under BOT XML Schema

3.4.3 How Financial Institution generates data to XML DataSet under BOT XML Schema

Financial Institution can export data from every source from internal or external data in CSV Format before link or import into each Schema Type Data Template

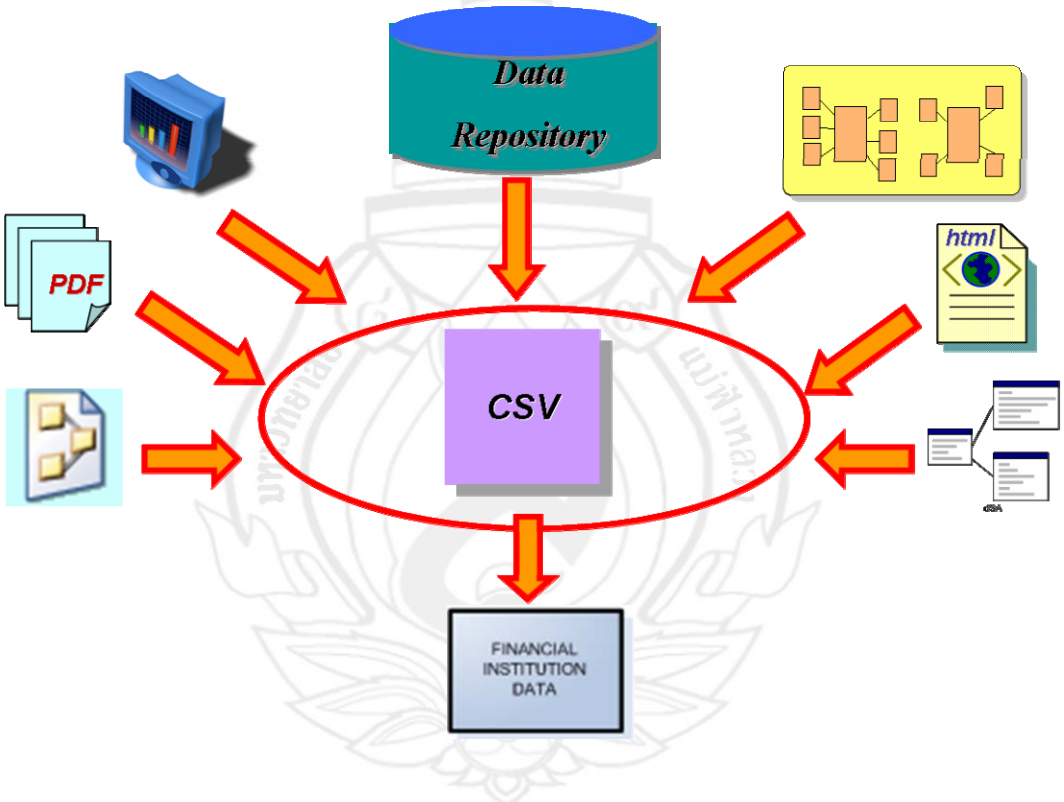


Figure 3.9 Financial Institution export data source to CSV

3.4.4 Complicated Steps System Flow Design:

1) Type 1 Fixed CL No Sub-repeating

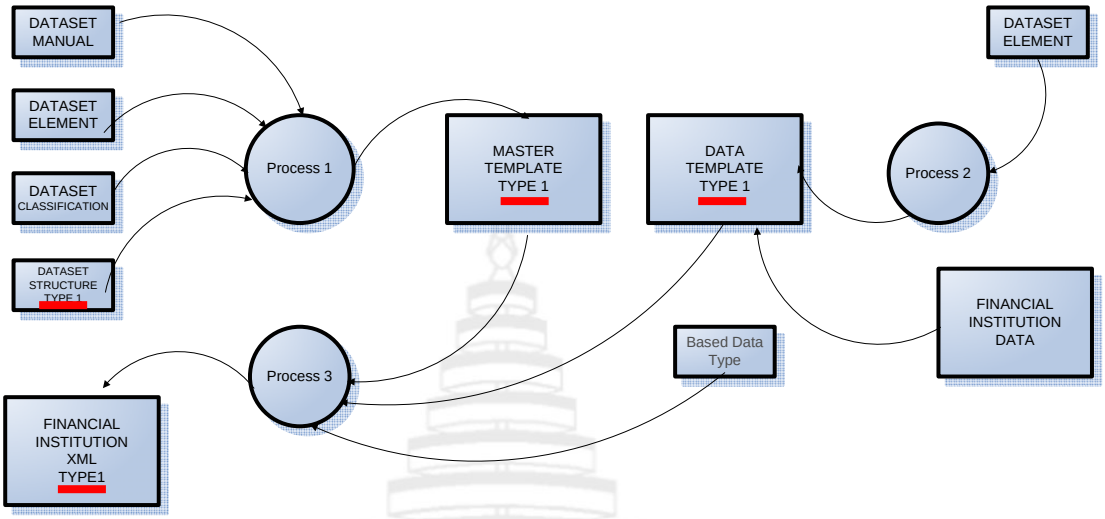


Figure 3.10 Design Steps for TYPE 1

2) Type 2 Fixed CL with Sub-repeating

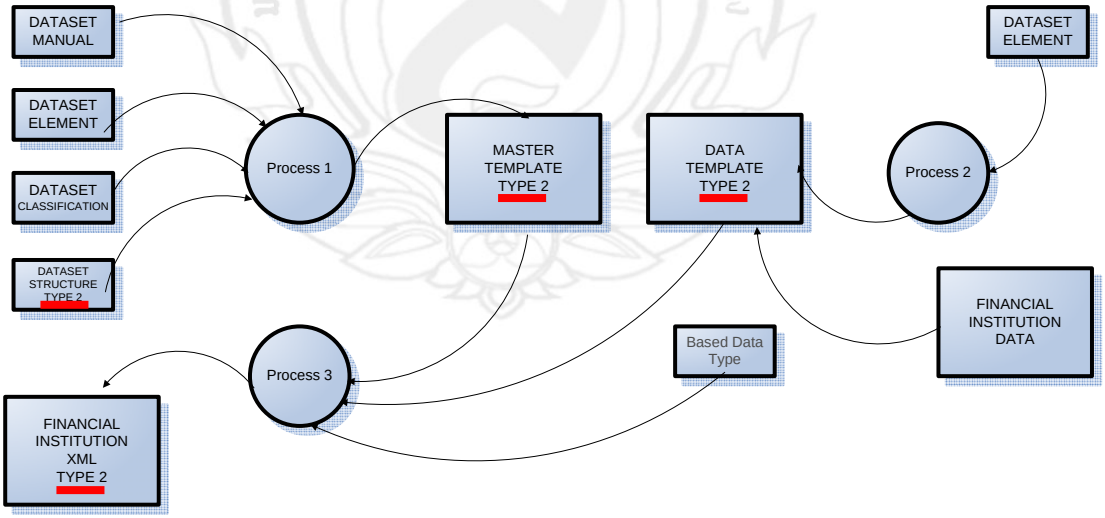


Figure 3.11 Design Steps for TYPE 2

3) Type 3 No Fixed CL No Sub-repeating

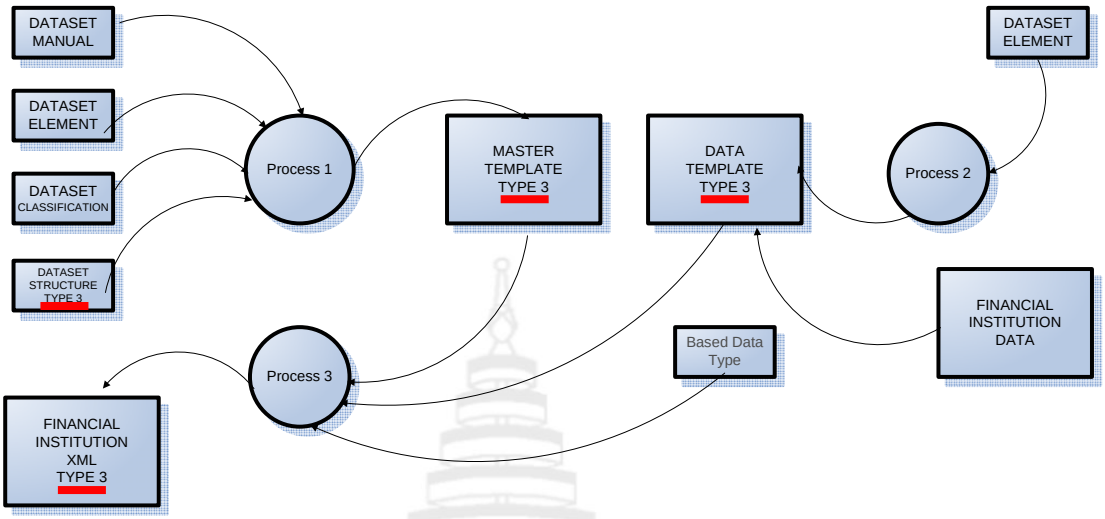


Figure 3.12 Design Steps for TYPE 3

4) Type 4 No Fixed CL with Sub-repeating

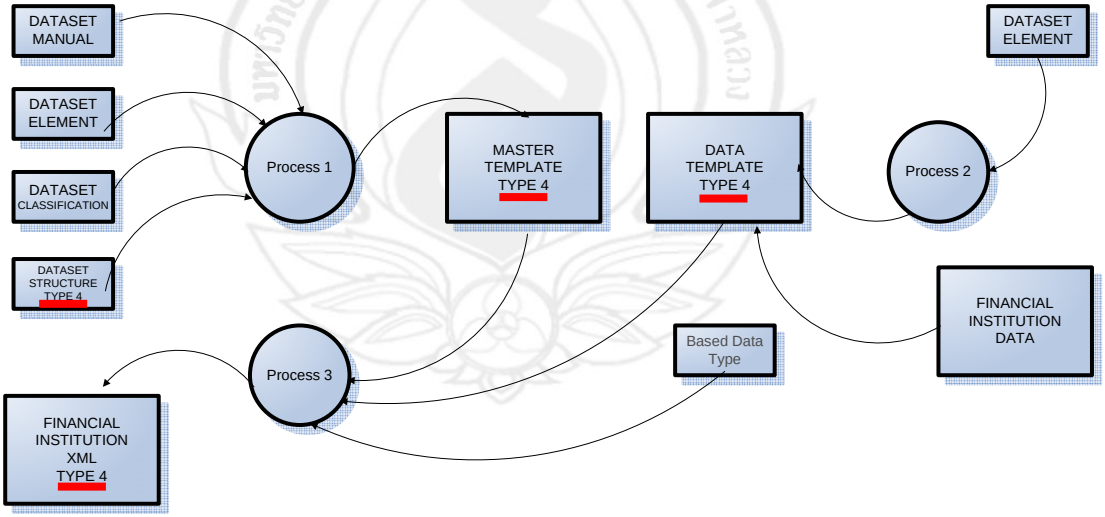


Figure 3.13 Design Steps for TYPE 4

CHAPTER 4

SYSTEM FUNCTIONALITY

BOT Data Entry Application has component for checking BOT XML Schema and generate Data Set file in XML format under BOT XML Schema. So, the new tools design must support all the component for BOT XML Schema such as BOT DataSet Elements, Classification Data Type in BOT DataSet Classification, Structure Data Set, Key Basic Validation Rules in Data Set Manual, Based Data Type for Mandatory & Optional etc.

4.1 System Architecture

4.1.1 Groups of System Functions

For the new tools, we use Microsoft Excel to make Master Template to keep some necessary details about BOT XML Schema and Data Template to get all data in each DataSet by using Microsoft Visual Basic for Application (Marco) in Microsoft Excel to code program and control procedure by using Command / Function /Modules.

We make Master Template and Data Template in 4 Master Templates and Data Templates.

For this Project Prototypes ; we use

DateSet TBP = TYPE 1
DateSet IRR = TYPE 2
DateSet LMS = TYPE 3
DateSet ARS = TYPE 4

1) TYPE 1_TBP Master Template, we use each XML Common Header (OrganizationId and DataSetDate), Data Set Header (FiReportingGroupId), Each Data Set Header , Each Data Set Content , Each Data Set Content Record Group by using Data Element and Data Classification in each Data Set Document to make details in Master Template. Not only that, but also include XML File Location paths for XML Output and Schema version number to adjust XML Schema version the same as Bank of Thailand XML Schema version.

	HEADER	DETAIL_ITEMS	
TCB , FCB and FCS	<DS_TBP name="Trading Book Position" type="Fixed CL no sub-repeating" schemaVersion=	<FiReportingGroupId>	
	<CommonHeader>	<Month>	
	<OrganizationId>	<TradingBookPosition970003>	<OutstandingAmount>
	<DataSetDate>	<TradingBookPosition970004>	
	<DS_TBP_Header>	<TradingBookPosition970005>	
	<DS_TBP_Content>	<TradingBookPosition970007>	
	<ContentRecordGroup>	<TradingBookPosition970008>	
		<TradingBookPosition970009>	
		<TradingBookPosition970010>	
		<TradingBookPosition970011>	
		<TradingBookPosition970012>	
	<?xml version="1.0" encoding="utf-8"?>		
XML File Location	C:\		
Schema Version	3.0		

Figure 4.1 Master Template TYPE 1_TBP

TYPE 1_TBP Data Template, we use each Data Element and Data Classification in each Data Set Document to make details in Data Template. And also separate Data Template with number of FiReportingGroupId.

Organization Id							
FI Reporting Group Id							
Data Set Date							
Month		1	2	3	4	5	6
Trading Book Position	970001.....1.Total transactions in trading book						
	970002..... 1.1 On-balance sheet transactions in trading book						
	970003..... 1.1.1 Debt instruments position						
	970004..... 1.1.2 Repo /Reverse Repo and Security Borrowing /Lending position						
	970005..... 1.1.3 Equity position						
	970006..... 1.2 Derivatives transactions in trading book						
	970007..... 1.2.1 Interest rate and debt instrument related derivatives						
	970008..... 1.2.2 Equity price and equity index related derivatives						
	970009..... 1.2.3 Foreign Exchange related derivatives						
	970010..... 1.2.4 Commodity price related derivatives						
	970011..... 1.3 Foreign exchange position of all currencies						
	970012.....2. Derivatives transactions in banking book						

Figure 4.2 Data Template TYPE 1_TBP

Organization Id	100						
FI Reporting Group Id	116002 - Solo Basic						
Data Set Date	2006-06-30						
Month		1	2	3	4	5	6
Trading Book Position	970001.....1.Total transactions in trading book	86,841,255,522.96	96,772,308,101.88	103,113,895,601.54	96,675,103,749.18	105,994,927,634.54	100,008,751,115.76
	970002..... 1.1 On-balance sheet transactions in trading book	691,590,416.04	2,607,680,454.40	3,572,914,821.59	2,464,534,615.74	4,977,745,923.39	2,481,052,577.18
	970003..... 1.1.1 Debt instruments position	691,590,416.04	2,607,680,454.40	3,572,914,821.59	2,464,534,615.74	4,977,745,923.39	2,481,052,577.18
	970004..... 1.1.2 Repo /Reverse Repo and Security Borrowing /Lending position	-	-	-	-	-	-
	970005..... 1.1.3 Equity position	-	-	-	-	-	-
	970006..... 1.2 Derivatives transactions in trading book	85,939,659,934.92	93,674,863,073.48	99,415,702,295.95	93,890,789,605.44	100,886,704,273.15	97,436,230,899.58
	970007..... 1.2.1 Interest rate and debt instrument related derivatives	27,472,380,150.00	26,272,380,150.00	26,530,929,850.00	26,747,712,100.00	26,995,499,725.00	31,751,001,075.00
	970008..... 1.2.2 Equity price and equity index related derivatives	-	-	-	-	-	-
	970009..... 1.2.3 Foreign Exchange related derivatives	58,467,279,784.92	67,402,482,923.48	72,884,772,445.95	67,143,077,505.44	73,891,204,548.15	65,685,229,824.58
	970010..... 1.2.4 Commodity price related derivatives	-	-	-	-	-	-
	970011..... 1.3 Foreign exchange position of all currencies	210,005,172.00	489,764,574.00	125,278,484.00	319,779,528.00	130,477,438.00	91,467,639.00
	970012.....2. Derivatives transactions in banking book	600,000,000.00	600,000,000.00	600,000,000.00	600,000,000.00	600,000,000.00	600,000,000.00

Figure 4.3 Sample Data Template TYPE 1_TBP

2) TYPE 2_IRR Master Template, we use each XML Common Header (OrganizationId and DataSetDate), Data Set Header (FiReportingGroupId), Each Data Set Header , Each Data Set Content , Each Data Set Content Record Group and details in Sub-Repeating by using Data Element and Data Classification in each Data Set Document to make details in Master Template. Not only that, but also include XML File Location paths for XML Output and Schema version number to adjust XML Schema version the same as Bank of Thailand XML Schema version.

	HEADER	DETAIL_ITEMS	
TCB , FCB and FCS	<DS_IRR name="Interest Rate Risk" type="Fixed CL with sub-repeating" schemaVersion=	<FiReportingGroupId>	
	<CommonHeader>	<BankingBookPositionItem990003>	<BankingBookPositionItemInfo>
	<OrganizationId>	<BankingBookPositionItem990004>	<RepricingTermRange>
	<DataSetDate>	<BankingBookPositionItem990005>	<CurrencyId>
	<DS_IRR_Header/>	<BankingBookPositionItem990007>	<Amount>
	<DS_IRR_Content>	<BankingBookPositionItem990008>	</BankingBookPositionItemInfo>
	<ContentRecordGroup>	<BankingBookPositionItem990010>	
		<BankingBookPositionItem990012>	
		<BankingBookPositionItem990013>	
		<BankingBookPositionItem990015>	
		<BankingBookPositionItem990016>	
		<BankingBookPositionItem990019>	
		<BankingBookPositionItem990020>	
		<BankingBookPositionItem990022>	
		<BankingBookPositionItem990023>	
		<BankingBookPositionItem990024>	
	<?xml version="1.0" encoding="utf-8"?>	<BankingBookPositionItem990025>	
		<BankingBookPositionItem990027>	
		<BankingBookPositionItem990028>	
		<BankingBookPositionItem990030>	
		<BankingBookPositionItem990031>	
		<BankingBookPositionItem990033>	
XML File Location	C:\	<BankingBookPositionItem990034>	
Schema Version	3.0	<BankingBookPositionItem990035>	

Figure 4.4 Master Template TYPE 2_IRR

TYPE 2_IRR Data Template; we use each Data Element and Data Classification in each Data Set Document to make details in Data Template. And also separate Data Template with number of FiReportingGroupId.

Organization Id						
Fi Reporting Group Id						
Dataset Date						
		THB	THB	THB	THB	THB
		439002 (0 - 1 Month)	439003 (> 1 - 3 Month)	439004 (> 3 - 6 Month)	439005 (> 6 - 12 Month)	439007 (> 1 - 2 Year)
Interest Rate Risk	990001 ... Assets Items					
	990002 ... Due from financial institutions and money market					
	990003 ... Rate Sensitive Items					
	990004 ... Non Rate Sensitive Items					
	990005 ... Securities bought under resale agreement					
	990006 ... Investments (net)					
	990007 ... Rate Sensitive Investments					
	990008 ... Non Rate Sensitive Investments					
	990009 ... Loans					
	990010 ... Pass & Special Mention					
	990011 ... NPL					
	990012 ... Rate Sensitive NPL					
	990013 ... Non Rate Sensitive NPL					
	990014 ... Others Assets					
	990015 ... Rate Sensitive Others Assets					
	990016 ... Non Rate Sensitive Others Assets					
	990017 ... Liabilities Items					
	990018 ... Deposit					
	990019 ... Rate Sensitive Deposit					
	990020 ... Non Rate Sensitive Deposit					
	990021 ... Due from financial institutions and money market					
	990022 ... Rate Sensitive Items					
	990023 ... Non Rate Sensitive Items					
	990024 ... Securities sold under repurchase agreement					
	990025 ... Borrowing					
	990026 ... Other Liabilities					
	990027 ... Rate Sensitive Other Liabilities					
	990028 ... Non Rate Sensitive Other Liabilities					
	990029 ... Net Position Off Balance Sheet Not Include Options Item					
	990030 ... Long Position Off Balance Sheet Not Include Options Item					
	990031 ... Short Position Off Balance Sheet Not Include Options Item					
	990032 ... Net Position Off Balance Sheet Include Options Item					
	990033 ... Long Position Off Balance Sheet Include Options Item					
	990034 ... Short Position Off Balance Sheet Include Options Item					
	990035 ... Estimate Net Interest Income 1 yr					

Figure 4.5 Data Template TYPE 2_IRR

Organization Id	100					
Fi Reporting Group Id	116002 - Solo Basic					
Dataset Date	2006-06-30					
		THB	THB	THB	THB	THB
		439002 (0 - 1 Month)	439003 (> 1 - 3 Month)	439004 (> 3 - 6 Month)	439005 (> 6 - 12 Month)	439007 (> 1 - 2 Year)
Interest Rate Risk	990001 ... Assets Items	109,488,324,896.35	24,023,225,195.20	13,214,647,762.11	6,256,053,810.80	1,503,847,000.52
	990002 ... Due from financial institutions and money market	3,771,143,304.43	-	-	-	-
	990003 ... Rate Sensitive Items	-	-	-	-	-
	990004 ... Non Rate Sensitive Items	3,771,143,304.43				
	990005 ... Securities bought under resale agreement	1,000,000,000.00				
	990006 ... Investments (net)	3,209,336,230.69	212,120,484.87	1,763,054,401.60	2,286,304,793.28	723,385,981.60
	990007 ... Rate Sensitive Investments	2,531,402,324.96	212,120,484.87	1,763,054,401.60	2,286,304,793.28	723,385,981.60
	990008 ... Non Rate Sensitive Investments	677,933,905.73				
	990009 ... Loans	100,524,683,092.23	23,811,104,710.33	11,451,593,360.51	3,969,749,017.52	780,461,018.92
	990010 ... Pass & Special Mention	89,337,821,497.59	23,811,104,710.33	11,451,593,360.51	3,969,749,017.52	780,461,018.92
	990011 ... NPL	11,186,861,594.64	-	-	-	-
	990012 ... Rate Sensitive NPL					
	990013 ... Non Rate Sensitive NPL	11,186,861,594.64				
	990014 ... Others Assets	983,162,269.00	-	-	-	-
	990015 ... Rate Sensitive Others Assets					
	990016 ... Non Rate Sensitive Others Assets	983,162,269.00				
	990017 ... Liabilities Items	112,422,953,093.85	27,816,446,890.50	22,153,143,272.10	5,455,438,728.79	2,948,801,745.76
	990018 ... Deposit	93,297,186,792.62	26,946,659,490.50	19,879,345,272.10	5,425,438,728.79	2,948,801,745.76
	990019 ... Rate Sensitive Deposit	93,264,223,730.60	26,946,659,490.50	19,879,345,272.10	5,425,438,728.79	2,948,801,745.76
	990020 ... Non Rate Sensitive Deposit	32,963,062.02				
	990021 ... Due from financial institutions and money market	-	-	-	-	-
	990022 ... Rate Sensitive Items					
	990023 ... Non Rate Sensitive Items					
	990024 ... Securities sold under repurchase agreement					
	990025 ... Borrowing	16,277,791,696.54	869,787,400.00	2,273,798,000.00	30,000,000.00	-
	990026 ... Other Liabilities	2,847,974,604.69	-	-	-	-
	990027 ... Rate Sensitive Other Liabilities					
	990028 ... Non Rate Sensitive Other Liabilities	2,847,974,604.69				
	990029 ... Net Position Off Balance Sheet Not Include Options Item	-	-	(590,700,000.00)	7,279,894,000.00	55,834,500,000.00
	990030 ... Long Position Off Balance Sheet Not Include Options Item	820,000,000.00	1,800,000,000.00	2,815,000,000.00	15,260,600,000.00	65,834,500,000.00
	990031 ... Short Position Off Balance Sheet Not Include Options Item	820,000,000.00	1,800,000,000.00	3,405,700,000.00	7,980,706,000.00	10,000,000,000.00
	990032 ... Net Position Off Balance Sheet Include Options Item	-	-	-	-	-
	990033 ... Long Position Off Balance Sheet Include Options Item					
	990034 ... Short Position Off Balance Sheet Include Options Item					
	990035 ... Estimate Net Interest Income 1 yr					

Figure 4.6 Sample Data Template TYPE 2_IRR

3) TYPE 3_LMS Master Template, we use each XML Common Header (OrganizationId and DataSetDate), Data Set Header (FiReportingGroupId), Each Data Set Header , Each Data Set Content , Each Data Set Content Record Group by using Data Element and Data Classification in each Data Set Document to make details in Master Template. Not only that, but also include XML File Location paths for XML Output and Schema version number to adjust XML Schema version the same as Bank of Thailand XML Schema version.

	HEADER	DETAIL_ITEMS	
TCB, FCB1, FCS and CCS	<DS_LMS name="Lending Movement Summary" type="No Fixed CL no sub-	<FiReportingGroupId>	
	<CommonHeader>	<ArrangementType>	
	<OrganizationId>	<LendingBusinessType>	
	<DataSetDate>	<NplFlag>	
	<DS_LMS_Header/>	<MovementType>	
	<DS_LMS_Content>	<MovementAmount>	
	<ContentRecordGroup>		
	<?xml version="1.0" encoding="utf-8"?>		
XML File Location	C:\		
Schema Version	3.0		

Figure 4.7 Master Template TYPE 3_LMS

TYPE 3_LMS Data Template; we use each Data Element and Data Classification in each Data Set Document to make details in Data Template. And also separate Data Template with number of FiReportingGroupId

Organization Id FI Reporting Group Id Data Set Date				
Arrangement Type	Lending Business Type	NPL Flag	Movement Type	Movement Amount

Figure 4.8 Data Template TYPE 3_LMS

Organization Id	100
FI Reporting Group Id	116002 - Solo Basic
Data Set Date	2006-06-30

Arrangement Type	Lending Business Type	NPL Flag	Movement Type	Movement Amount
018003	241003	0	202004	6,573.06
018003	241007	0	202004	7,549,016.02
018003	241008	0	202004	7,000,923.61
018003	241011	0	202004	700,343.22
018003	241014	0	202004	1,145,790.29
018003	241025	0	202004	16,135.61
018003	241026	0	202004	699,424,153.80
018003	A011100	0	202004	22,881,227.51
018003	A011200	0	202004	4,618,521.76
018003	A011300	0	202004	6,666,083.30
018003	A012100	0	202004	95,178.68
018003	A012200	0	202004	19,306,755.63
018003	A014000	0	202004	406,197.47
018003	B050000	0	202004	27,655,648.95
018003	C111000	0	202004	106,179.60
018003	C112000	0	202004	39,192.17
018003	C141000	0	202004	3,582,609.16
018003	C142900	0	202004	25,785,688.89
018003	D151100	0	202004	244,073.79
018003	D151200	0	202004	49,613,691.61
018003	D151300	0	202004	15,774,686.61

Figure 4.9 Sample Data Template TYPE 3_LMS

4) TYPE 4_ARS Master Template, we use each XML Common Header (OrganizationId and DataSetDate), Data Set Header (FiReportingGroupId), Each Data Set Header , Each Data Set Content , Each Data Set Content Record Group and details in Sub-Repeating by using Data Element and Data Classification in each Data Set Document to make details in Master Template. Not only that, but also include XML File Location paths for XML Output and Schema version number to adjust XML Schema version the same as Bank of Thailand XML Schema version.

	HEADER	DETAIL_ITEMS	
TCB , FCB , FCS and CCS	<DS_ARS name="Arrangement Summary" type="No Fixed CL with sub-repeating" schemaVersion=	<FiReportingGroupId>	
	<CommonHeader>	<DataGroupInfo>	
	<OrganizationId>	<DataGroupDetails>	
	<DataSetDate>	<ArrangementType>	
	<DS_ARS_Header/>	<InvolvedPartyType>	
	<DS_ARS_Content>	<ArrangementTermRange>	
	<ContentRecordGroup>	<RemainingTermRange>	
		<RepricingTermRange>	
IBF1	<DS_ARS_IBF name="Arrangement	<ArrangementCurrencyFlag>	
	<CommonHeader>	<OutstandingAmountRange>	
	<OrganizationId>	<NumberOfAccounts>	
	<DataSetDate>	<TotalOutstandingAmount>	
	<DS_ARS_IBF_Header/>	<DataGroupDetails>	
	<DS_ARS_IBF_Content>	<DataGroupInfo>	
	<ContentRecordGroup>		
	<?xml version="1.0" encoding="utf-8"?>		
XML File Location	C:\		
Schema Version	5.0		

Figure 4.10 Master Template TYPE 4_ARS

TYPE 4_ARS Data Template; we use each Data Element and Data Classification in each Data Set Document to make details in Data Template. And also separate Data Template with number of FiReportingGroupId

Organization ID FI Reporting Group ID Data Set Date							
Arrangement Type	Involved Party Type	Arrangement Term Range	Remaining Term Range	Repricing Term Range	Arrangement Currency Flag	Number of Accounts	Total Outstanding Amount

Figure 4.11 Data Template TYPE 4_ARS

Organization ID	100						
FI Reporting Group ID	116002 - Solo Basic						
Data Set Date	2006-06-30						
Arrangement Type	Involved Party Type	Arrangement Term Range	Remaining Term Range	Repricing Term Range	Arrangement Currency Flag	Number of Accounts	Total Outstanding Amount
018003	176001	310002	310002	310002	1	8,524	7,048,541,194.93
018003	176003	310002	310002	310002	1	3,356	9,280,232,545.42
018003	176012	310002	310002	310002	1	3	1,712,434.58
018003	176017	310002	310002	310002	1	1	17,763,312.17
018003	176064	310002	310002	310002	1	14	74,368,488.05
018003	176067	310002	310002	310002	1	8	3,235,503.68
018005	176003	310002	310002	310002	1	18	229,573,563.34
018005	176003	310006	310006	310006	1	24	123,610,000.00
018005	176003	310007	310006	310006	1	10	60,402,000.00
018005	176003	310007	310006	310007	1	2	83,131,000.00
018005	176003	310008	310006	310006	1	8	49,312,800.00
018005	176003	310008	310006	310007	0	2	23,889,375.00
018005	176003	310008	310006	310007	1	32	248,756,000.00
018005	176003	310008	310007	310007	1	1	400,000,000.00
018005	176003	310008	310007	310008	1	38	448,437,000.00
018005	176003	310009	310006	310006	1	10	31,867,000.00
018005	176003	310009	310006	310007	0	1	3,248,955.00
018005	176003	310009	310006	310007	1	13	49,647,000.00
018005	176003	310009	310007	310007	1	4	33,390,000.00
018005	176003	310009	310007	310008	0	4	27,367,668.00
018005	176003	310009	310007	310008	1	10	34,050,000.00
018005	176003	310009	310008	310009	0	4	21,022,650.00
018005	176003	310009	310008	310009	1	10	85,866,000.00
018005	176003	310010	310006	310006	1	3	7,575,000.00
018005	176003	310010	310006	310007	1	6	158,700,000.00

Figure 4.12 Sample Data Template TYPE 4_ARS

4.1.2 Modules and their functionality

New Tools Modules and their functionality, we make the tools for generating XML DataSet under BOT XML Schema by using Microsoft Excel with Visual Basic Application for Excel (Marco) and relationship between Master Template and Data Template

(Example Source Codes Type 1 – 4 See in Appendix A)

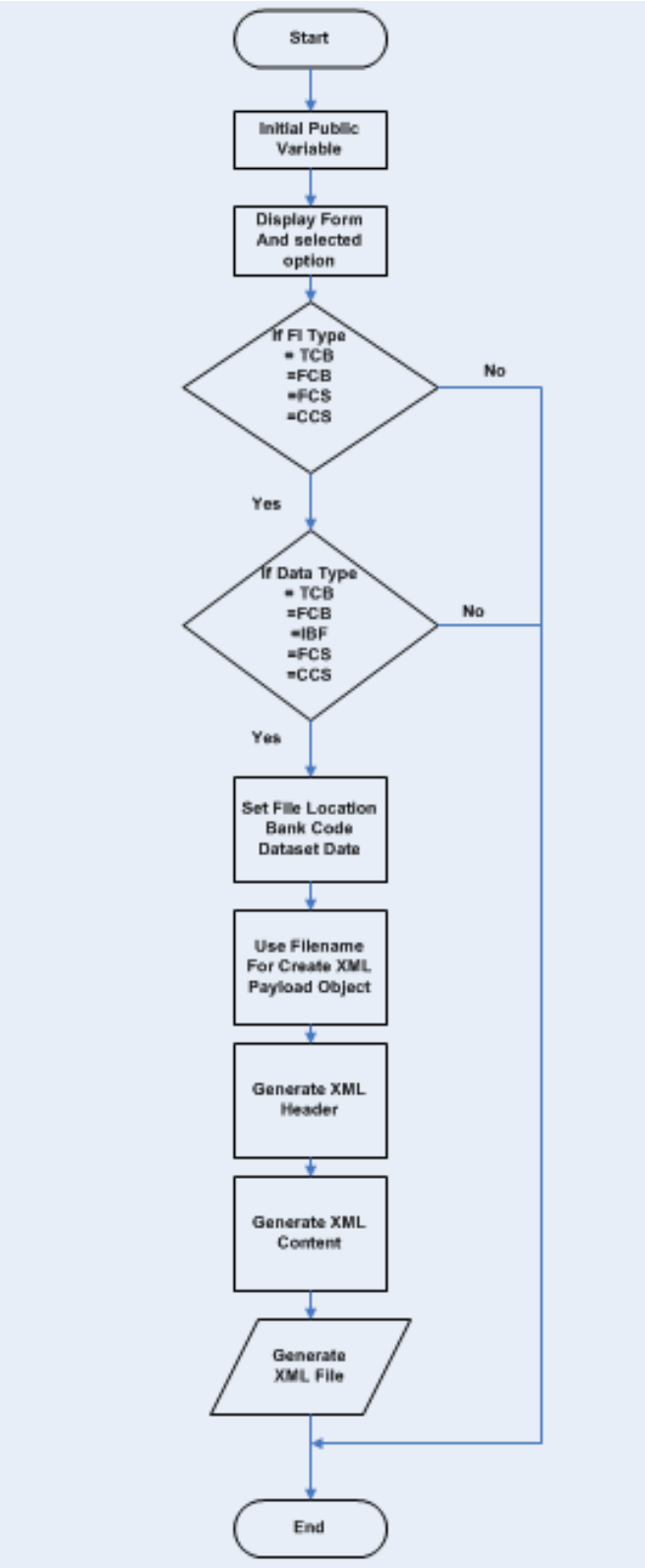


Figure 4.13 Flow Chart show Modules in Main Process

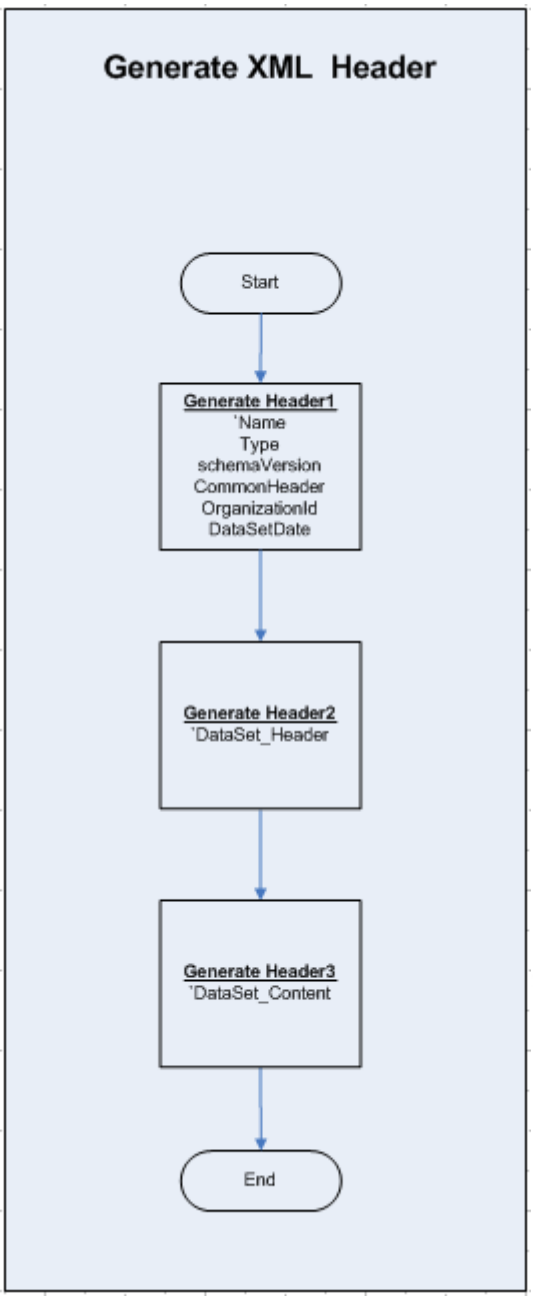


Figure 4.14 Flow Chart show Modules in Sub Process (Generate XML Header)

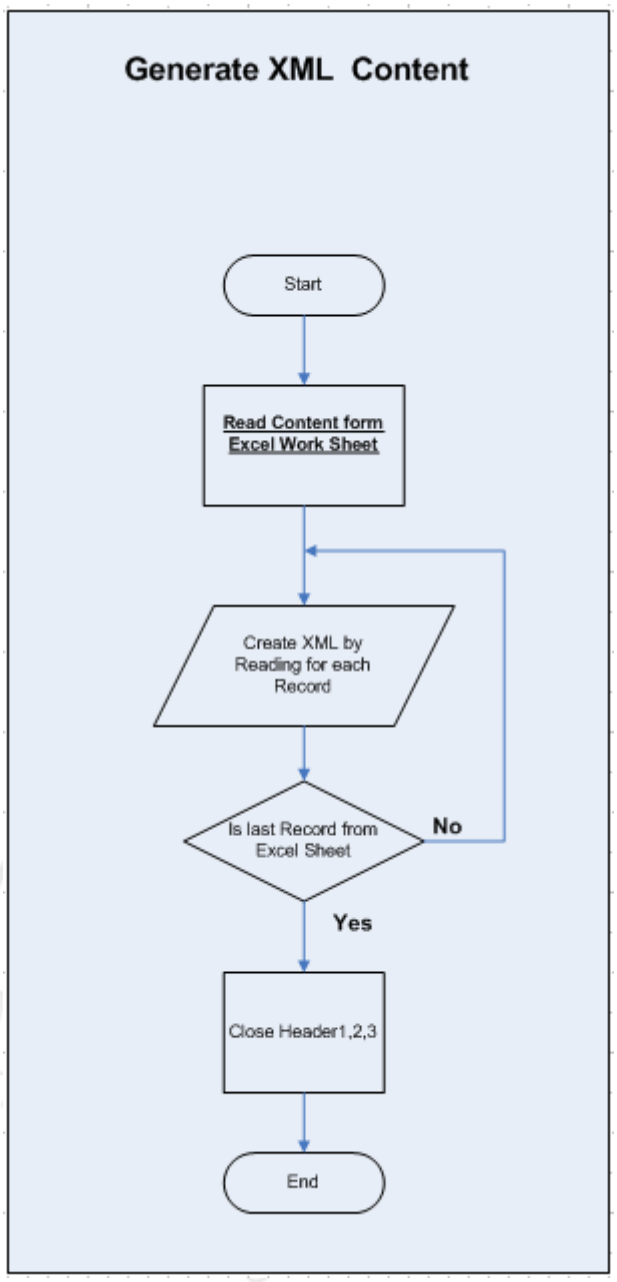


Figure 4.15 Flow Chart show Modules in Sub Process (Generate XML Content)

1) TYPE 1_TBP

1. Module Form_TBP

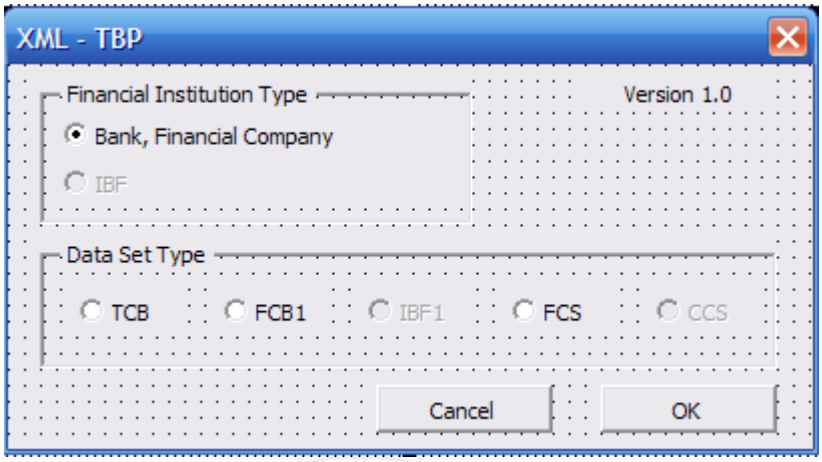


Figure 4.16 FORM TYPE 1_TBP

2. Module PublicVar_TBP

3. Module GenXML_TBP

2) TYPE 2_IRR

1. Module Form_IRR

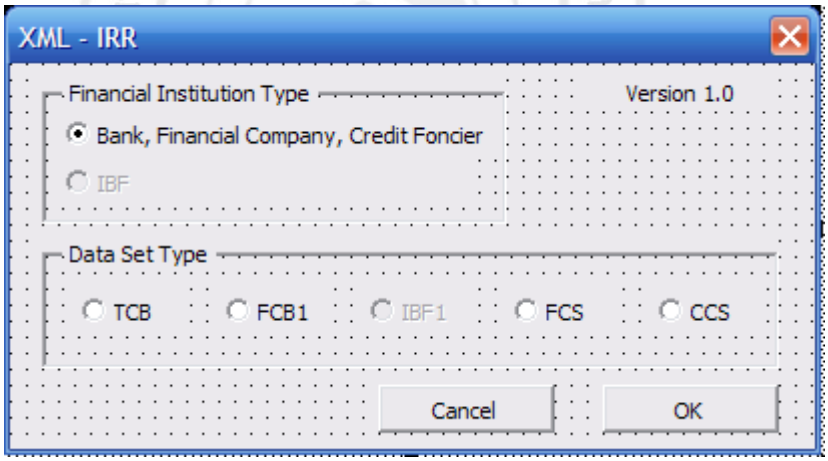


Figure 4.17 FORM TYPE 2_IRR

2. Module PublicVar_IRR

3 Module GenXML_IRR

3) TYPE 3_LMS

1. Module Form_LMS

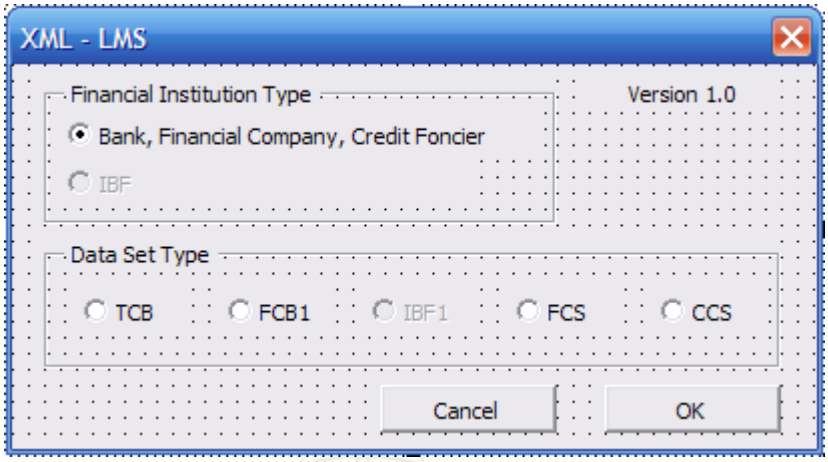


Figure 4.18 FORM TYPE 3_LMS

2. Module PublicVar _LMS

3. Module GenXML _LMS

4) TYPE 4_ARS

1. Module Form_ARS

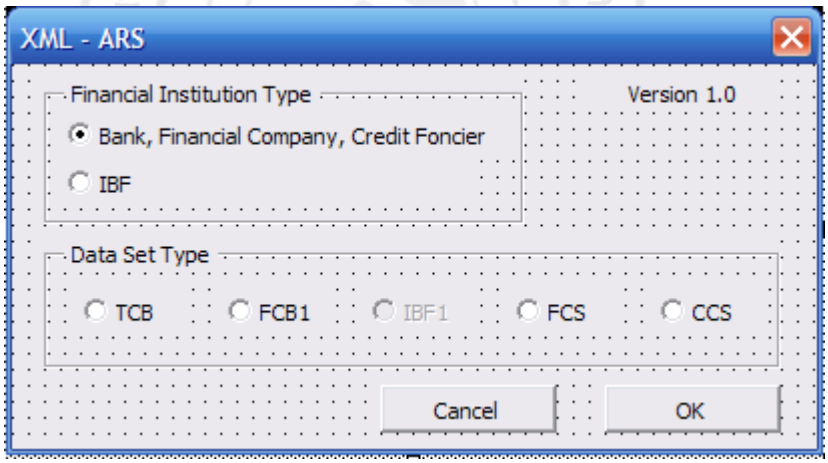


Figure 4.19 FORM TYPE 4_ARS

2. Module PublicVar _ARS

3. Module GenXML _ARS

4.1.3 Validation with BOT Data Entry Application

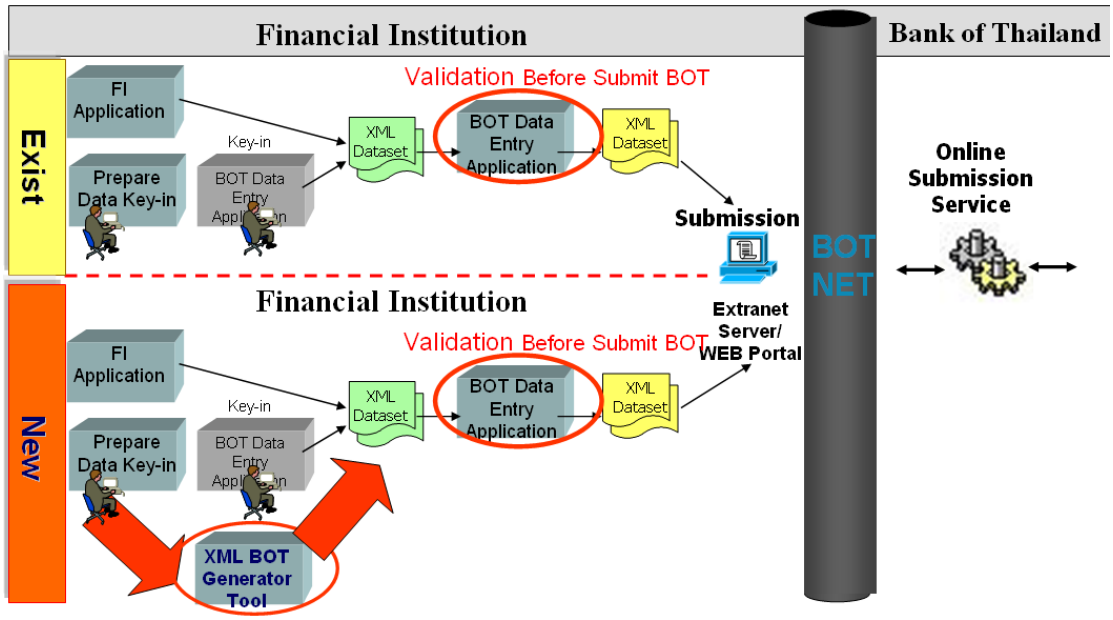


Figure 4.20 Compare Steps for the New Tools & BOT Data Entry Application

For all XML DataSet (TYPE 1-4) output that Financial Institution make from FI Application or key-in with BOT Data Entry Application or generate by the new tools XML BOT Generator can check basic validation before submit to BOT online submission service by using BOT Data Entry Application that Bank of Thailand distributes for every Financial Institutions to key-in or check basic validation in order to make sure that every one use the same standard before submit XML to Bank of Thailand.

Data Set Name	Error Type	Error Message
BLS	Data Type / Possible Value incorrect	An error occurred at file:///Drive used:/path of file.xml(Number, Number), DAQEDS001 Element 'ContentRecordGroup' has invalid child element 'BalanceSheetItem950159'. Expected 'BalanceSheetItem950160'.
ARS	Data Type / Possible Value	An error occurred at file:///Drive used:/path of file.xml(Number, Number), DAQEDS001 The 'OrganizationId' element has an invalid value according to its data type.
ARS	Data Type / Possible Value	An error occurred at file:///Drive used:/path of file.xml(Number, Number), DAQEDS001 The 'DataSetDate' element has an invalid value according to its data type.
ARS	Data Type / Possible Value	An error occurred at file:///Drive used:/path of file.xml(Number, Number), DAQEDS001 The 'FiReportingGroupId' element has an invalid value according to its data type.
ARS	Data Type / Possible Value	An error occurred at file:///Drive used:/path of file.xml(Number, Number), DAQEDS001 The 'ArrangementType' element has an invalid value according to its data type.
ARS	Data Type / Possible Value	An error occurred at file:///Drive used:/path of file.xml(Number, Number), DAQEDS001 The 'ArrangementCurrencyFlag' element has an invalid value according to its data type.
ARS	Data Type / Possible Value	An error occurred at file:///Drive used:/path of file.xml(Number, Number), DAQEDS001 The 'NumberOfAccounts' element has an invalid value according to its data type.
ARS	Data Type / Possible Value	An error occurred at file:///Drive used:/path of file.xml(Number, Number), DAQEDS001 The 'TotalOutstandingAmount' element has an invalid value according to its data type.
CAR	Data Type / Possible Value	An error occurred at file:///Drive used:/path of file.xml(Number, Number), DAQEDS001 The 'MinimumFeeRate' element has an invalid value according to its data type.
CAR	Data Type / Possible Value	An error occurred at file:///Drive used:/path of file.xml(Number, Number), DAQEDS001 The 'PrimaryInvolvedPatryId' element has an invalid value according to its data type.
LAR	Data Type / Possible Value	An error occurred at file:///Drive used:/path of file.xml(Number, Number), DAQEDS001 The 'BranchNumber' element has an invalid value according to its data type.
LAR	Data Type / Possible Value	An error occurred at file:///Drive used:/path of file.xml(Number, Number), DAQEDS001 The 'MinimumInterestRate' element has an invalid value according to its data type.

Character_Error

Line Error

Figure 4.21 Sample Error Message show by BOT Data Entry Application

4.2 Test Plan

4.2.1 Introduction

For improve Bank of Thailand Data Entry Application by making prototype to demonstrate the improvement Bank of Thailand Data Entry Application

4.2.2 Scope

Test prototype result valid with XML DataSet under Bank of Thailand XML Schema

4.2.3 Role and Responsibility

Tester as Status Users from each Financial Institutions use BOT XML Generator tool prototype to generate XML DataSet under Bank of Thailand XML Schema by using BOT Data Entry Application.

4.2.4 Test Methodology

1) Testing Approach
   SIT & UAT
2) Reference Material
   BOT Data Set Document &
   BOT Classification &
   BOT Data Set Manual (Key Basic Validation Etc..)
3) Control Procedure
   Visual Basic Application for Excel (Marco)

4.2.5 Environment Requirements

1) Technical Configuration

1. Hardware Requirement
   Computer 1 Set (Spec. Pentium up or more,
   Memory 512 or more)
2. Software Requirement
   Microsoft Office - : Microsoft Excel
   Bank of Thailand Data Entry Application
   Microsoft .Net Framework

2) How to Setup Test Environment
   Real Financial Institution Situation

3) Security
   Normal

4) Tools
   Marco

4.2.6 Test Phase

1) Participants
   Users

2) Sources of Data
   Financial Institution Data Source with CSV Format

3) Entry and Exit Criteria
   Entry - Generate XML from Master Template & Data Template
   Exit - XML DataSet under Bank of Thailand XML Schema

4.2.7 Test Scenario

TABLE 4.1 TEST SCENARIO

Test Scenario Ref#	Prerequisite Scenario	Scenario Description	Test Data Requirement
Scenario_1		**Type1**	
		Data Set TBP	XML Data
		TCB	
		FCB	
		FCS	
Scenario_2		**Type2**	
		Data Set IRR	XML Data
		TCB	
		FCB	
		FCS	
		CCS	
Scenario_3		**Type3**	
		Data Set LMS	XML Data
		TCB	
		FCB	
		FCS	
		CCS	
Scenario_4		**Type4**	
		Data Set ARS	XML Data
		TCB	
		FCB	
		IBF	
		FCS	
		CCS	

4.2.8 Test Script (Test Script & Test Data Details See in Appendix C)

1) TYPE 1 – TBP
   Test Scenario Ref #Scenario_1
   Test Level : SIT & UAT
   Test Date :

TABLE 4.2 TEST SCRIPT SCENARIO #1

Ref. #	Description	Expected Results	Tested By	Pass / Fail
1.	**XML Valid Test Case**			
1.1	TCB			
1.1.1	FI_100_Period-2006-06-30	XML is valid Document		
1.2	FCB			
1.2.1	FI_200_Period-2006-06-30	XML is valid Document		
1.3	FCS			
1.3.1	FI_400_Period-2006-06-30	XML is valid Document		
2.	**XML Invalid Test Case**			
2.1	TCB			
2.1.1	FI_100_Period-2006-06-30	XML is Invalid Document		
2.2	TCB			
2.2.1	FI_200_Period-2006-06-30	XML is Invalid Document		
2.3	FCS			
2.3.1	FI_400_Period-2006-06-30	XML is Invalid Document		

2) TYPE 2 – IRR
Test Scenario Ref #Scenario_2
Test Level : SIT & UAT
Test Date :

TABLE 4.3 TEST SCRIPT SCENARIO #2

Ref. #	Description	Expected Results	Tested By	Pass / Fail
1.	**XML Valid Test Case**			
1.1	TCB			
1.1.1	FI_100_Period-2006-06-30	XML is valid Document		
1.2	FCB			
1.2.1	FI_200_Period-2006-06-30	XML is valid Document		
1.3	FCS			
1.3.1	FI_400_Period-2006-06-30	XML is valid Document		
1.4	CCS			
1.4.1	FI_400_Period-2006-06-30	XML is valid Document		
2.	**XML Invalid Test Case**			
2.1	TCB			
2.1.1	FI_100_Period-2006-06-30	XML is Invalid Document		
2.2	FCB			
2.2.1	FI_200_Period-2006-06-30	XML is Invalid Document		
2.3	FCS			
2.3.1	FI_400_Period-2006-06-30	XML is Invalid Document		
2.4	CCS			
2.4.1	FI_400_Period-2006-06-30	XML is Invalid Document		

3) TYPE 3– LMS
Test Scenario Ref #Scenario_3
Test Level : SIT & UAT
Test Date :

TABLE 4.4 TEST SCRIPT SCENARIO #3

Ref. #	Description	Expected Results	Tested By	Pass / Fail
1.	**XML Valid Test Case**			
1.1	TCB			
1.1.1	FI_100_Period-2006-06-30	XML is valid Document		
1.2	FCB			
1.2.1	FI_200_Period-2006-06-30	XML is valid Document		
1.3	FCS			
1.3.1	FI_400_Period-2006-06-30	XML is valid Document		
1.4	CCS			
1.4.1	FI_400_Period-2006-06-30	XML is valid Document		
2.	**XML Invalid Test Case**			
2.1	TCB			
2.1.1	FI_100_Period-2006-06-30	XML is Invalid Document		
2.2	FCB			
2.2.1	FI_200_Period-2006-06-30	XML is Invalid Document		
2.3	FCS			
2.3.1	FI_400_Period-2006-06-30	XML is Invalid Document		
2.4	CCS			
2.4.1	FI_400_Period-2006-06-30	XML is Invalid Document		

4) TYPE 4 – ARS
Test Scenario Ref #Scenario_4
Test Level : SIT & UAT
Test Date :

TABLE 4.5 TEST SCRIPT SCENARIO #4

Ref. #	Description	Expected Results	Tested By	Pass / Fail
1.	**XML Valid Test Case**			
1.1	TCB			
1.1.1	FI_100_Period-2006-06-30	XML is valid Document		
1.2	FCB			
1.2.1	FI_200_Period-2006-06-30	XML is valid Document		
1.3	IBF			
1.3.1	FI_400_Period-2006-06-30	XML is valid Document		
1.4	FCS			
1.4.1	FI_400_Period-2006-06-30	XML is valid Document		
1.5	CCS			
1.5.1	FI_400_Period-2006-06-30	XML is valid Document		
2.	**XML Invalid Test Case**			
2.1	TCB			
2.1.1	FI_100_Period-2006-06-30	XML is Invalid Document		
2.2	FCB			
2.2.1	FI_200_Period-2006-06-30	XML is Invalid Document		
2.3	IBF			
2.3.1	FI_400_Period-2006-06-30	XML is Invalid Document		
2.4	FCS			
2.4.1	FI_400_Period-2006-06-30	XML is Invalid Document		
2.5	CCS			
2.5.1	FI_400_Period-2006-06-30	XML is Invalid Document		

4.2.9 Test Results

1) TYPE 1 – TBP
   Test Scenario Ref #Scenario_1
   Test Level : SIT & UAT
   Test Date : 2007-02-11

TABLE 4.6 TEST RESULTS SCENARIO #1

Ref. #	Description	Expected Results	Tested By	Pass / Fail
1.	**XML Valid Test Case**			
1.1	TCB			
1.1.1	FI_100_Period-2006-06-30	XML is valid Document		Pass
1.2	FCB			
1.2.1	FI_200_Period-2006-06-30	XML is valid Document		Pass
1.3	FCS			
1.3.1	FI_400_Period-2006-06-30	XML is valid Document		Pass
2.	**XML Invalid Test Case**			
2.1	TCB			
2.1.1	FI_100_Period-2006-06-30	XML is Invalid Document		Fail
2.2	TCB			
2.2.1	FI_200_Period-2006-06-30	XML is Invalid Document		Fail
2.3	FCS			
2.3.1	FI_400_Period-2006-06-30	XML is Invalid Document		Fail

2) TYPE 2 – IRR
Test Scenario Ref #Scenario_2
Test Level : SIT & UAT
Test Date : 2007-02-11

TABLE 4.7 TEST RESULTS SCENARIO #2

Ref. #	Description	Expected Results	Tested By	Pass / Fail
1.	**XML Valid Test Case**			
1.1	TCB			
1.1.1	FI_100_Period-2006-06-30	XML is valid Document		Pass
1.2	FCB			
1.2.1	FI_200_Period-2006-06-30	XML is valid Document		Pass
1.3	FCS			
1.3.1	FI_400_Period-2006-06-30	XML is valid Document		Pass
1.4	CCS			
1.4.1	FI_400_Period-2006-06-30	XML is valid Document		Pass
2.	**XML Invalid Test Case**			
2.1	TCB			
2.1.1	FI_100_Period-2006-06-30	XML is Invalid Document		Fail
2.2	FCB			
2.2.1	FI_200_Period-2006-06-30	XML is Invalid Document		Fail
2.3	FCS			
2.3.1	FI_400_Period-2006-06-30	XML is Invalid Document		Fail
2.4	CCS			
2.4.1	FI_400_Period-2006-06-30	XML is Invalid Document		Fail

3) TYPE 3 – LMS
Test Scenario Ref #Scenario_3
Test Level : SIT & UAT
Test Date : 2007-02-11

TABLE 4.8 TEST RESULTS SCENARIO #3

Ref. #	Description	Expected Results	Tested By	Pass / Fail
1.	**XML Valid Test Case**			
1.1	TCB			
1.1.1	FI_100_Period-2006-06-30	XML is valid Document		Pass
1.2	FCB			
1.2.1	FI_200_Period-2006-06-30	XML is valid Document		Pass
1.3	FCS			
1.3.1	FI_400_Period-2006-06-30	XML is valid Document		Pass
1.4	CCS			
1.4.1	FI_400_Period-2006-06-30	XML is valid Document		Pass
2.	**XML Invalid Test Case**			
2.1	TCB			
2.1.1	FI_100_Period-2006-06-30	XML is Invalid Document		Fail
2.2	FCB			
2.2.1	FI_200_Period-2006-06-30	XML is Invalid Document		Fail
2.3	FCS			
2.3.1	FI_400_Period-2006-06-30	XML is Invalid Document		Fail
2.4	CCS			
2.4.1	FI_400_Period-2006-06-30	XML is Invalid Document		Fail

4) TYPE 4 – ARS
Test Scenario Ref #Scenario_4
Test Level : SIT & UAT
Test Date : 2007-02-11

TABLE 4.9 TEST RESULTS SCENARIO #4

Ref. #	Description	Expected Results	Tested By	Pass / Fail
1.	**XML Valid Test Case**			
1.1	TCB			
1.1.1	FI_100_Period-2006-06-30	XML is valid Document		Pass
1.2	FCB			
1.2.1	FI_200_Period-2006-06-30	XML is valid Document		Pass
1.3	IBF			
1.3.1	FI_400_Period-2006-06-30	XML is valid Document		Pass
1.4	FCS			
1.4.1	FI_400_Period-2006-06-30	XML is valid Document		Pass
1.5	CCS			
1.5.1	FI_400_Period-2006-06-30	XML is valid Document		Pass
2.	**XML Invalid Test Case**			
2.1	TCB			
2.1.1	FI_100_Period-2006-06-30	XML is Invalid Document		Fail
2.2	FCB			
2.2.1	FI_200_Period-2006-06-30	XML is Invalid Document		Fail
2.3	IBF			
2.3.1	FI_400_Period-2006-06-30	XML is Invalid Document		Fail
2.4	FCS			
2.4.1	FI_400_Period-2006-06-30	XML is Invalid Document		Fail
2.5	CCS			
2.5.1	FI_400_Period-2006-06-30	XML is Invalid Document		Fail

4.2.10 Conclusion :

1) TYPE 1 – TBP
   Test Scenario Ref #Scenario_1
   Test Level : SIT & UAT
   Test Date : 2007-02-11
   XML Valid Test Case Pass
   XML Invalid Test Case Fail
2) TYPE 2 – IRR
   Test Scenario Ref #Scenario_2
   Test Level : SIT & UAT
   Test Date : 2007-02-11
   XML Valid Test Case Pass
   XML Invalid Test Case Fail
3) TYPE 3 – LMS
   Test Scenario Ref #Scenario_3
   Test Level : SIT & UAT
   Test Date : 2007-02-11
   XML Valid Test Case Pass
   XML Invalid Test Case Fail
4) TYPE 4 – ARS
   Test Scenario Ref #Scenario_4
   Test Level : SIT & UAT
   Test Date : 2007-02-11
   XML Valid Test Case Pass
   XML Invalid Test Case Fail

CHAPTER 5

SUMMARY AND SUGGESTIONS

Bank of Thailand Electronic Data Acquisition; this Project improve Bank of Thailand Data Entry Application by making prototype to generate XML BOT DataSet prompt for Financial Institution to submit in Bank of Thailand Electronic Data Acquisition.

5.1 Project Summary

5.1.1 In the Chapter 3, we design the system flow for develop the new prototype XML BOT Generator Tools in each BOT XML Schema Type. Details of system flow are making Master Templates and Data Templates to keep all data details in BOT XML Schema, BOT Data Element, BOT Classification, Structure DataSet , Based Data Type for Mandatory and Optional, Key Basic Validation Rules in BOT Data Set Manual etc. For Data Templates, we use Financial Institution Data in CSV Formats.

In the Chapter 4, we show about system architecture in groups of system functions for the new tools, we use Microsoft Excel to make Master Template to keep some necessary details about BOT XML Schema and Data Template to get all data in each DataSet by using Microsoft Visual Basic for Application (Marco) in Microsoft Excel to code program and control procedure by using Command / Function /Modules.

We make Master Template and Data Template in 4 Master Templates and Data Templates and then show you about details for each Modules and Coding for each steps in process and function and the way to validate all XML before submit to Bank of Thailand.

In the end of the Chapter 4 , we show about testing results of my new XML BOT Generator Tools . We make XML Test Valid Case and XML Test Invalid Case for each type of DataSet and each type of Financial Institutions that related .

The Final Results show that

XML Test Valid Case	Pass
XML Test Invalid Case	Fail

In the end of Project ; we build prototype for the new prototype XML BOT Generator Tools that all features/functions are complete in my objectives and scopes all of my Project.

5.1.2 The performance goals that I achieve this Project can show in the table below

TABLE 5.1 New XML BOT Generator Tools Performance

Dataset	Schema Type	Transactions	Items/ Transactions/ Group	Data Element	Key-in BOT Data Entry	Check Step 1 Key-in BOT Data Entry	New XML BOT Generator Tools	Check Step 2 Duplicacate & Sum up etc.
DS_BLS	TYPE 2	40	2	268	35 Minutes		**2 - 5 Minutes**	15 Minutes
DS_CAP	TYPE 1	15	3	57	10 Minutes		**2 - 5 Minutes**	10 Minutes
DS_IVP	TYPE 4	100	15	393	45 Minutes		**2 - 5 Minutes**	25 Minutes
DS_RWA	TYPE 1	8	2	198	10 Minutes		**2 - 5 Minutes**	10 Minutes
DS_IPI	TYPE 4	22	27	461	40 Minutes	(5 Days)	**2 - 5 Minutes**	10 Minutes
DS_ARS	TYPE 4	138	11	326	5 Hours		**2 - 5 Minutes**	1 Hours 30 Minutes
DS_LPS	TYPE 4	12	4	167	40 Minutes		**2 - 5 Minutes**	25 Minutes
DS_TCS	TYPE 3	101	7	409	3 Hours		**2 - 5 Minutes**	1 Hours
DS_LAR	TYPE 4	90	23	849	5 Hours		**2 - 5 Minutes**	1 Hours
DS_IDB	TYPE 1	6	1	75	10 Minutes		**2 - 5 Minutes**	10 Minutes
DS_LOS	TYPE 4	42	7	36	30 Minutes		**2 - 5 Minutes**	25 Minutes
DS_LSB	TYPE 3	41	5	203	45 Minutes		**2 - 5 Minutes**	30 Minutes
DS_LMS	TYPE 3	152	6	412	2 Hours		**2 - 5 Minutes**	1 Hours45 Minutes
DS_TDR	TYPE 3	0	6	202	0		**2 - 5 Minutes**	0
DS_DCD	TYPE 4	36	4	234	45 Minutes	(3 Days)	**2 - 5 Minutes**	35 Minutes
DS_PNL	TYPE 1	27	1	152	15 Minutes		**2 - 5 Minutes**	10 Minutes
DS_IRR	TYPE 2	28	3	35	15 Minutes		**2 - 5 Minutes**	15 Minutes
DS_PVS	TYPE 2	26	2	17	15 Minutes		**2 - 5 Minutes**	15 Minutes

In TABLE 5.1 ; show that we can improve Bank of Thailand data entry application :

1. Generate Financial Institutions all data that already prepare in worksheet prompt to key-in to be DataSet under Bank of Thailand XML Schema easily by using the new XML BOT Generator Tools
2. Reduce the key-in process in Bank of Thailand data entry application by using the new XML BOT Generator Tools
3. Try to use all resources or software which Financial Institutions had by using Microsoft Visual Basic for Application (Marco) in Microsoft Excel to code program and control procedure by using Command / Function /Modules.
4. We can reduce many times such as : time to key-in process in Bank of Thailand data entry application, time to check all the data that key-in process in Bank of Thailand data entry application.

5.2 Questionnaire for Financial Institution

In this project , we create questionnaire for Financial Institution to survey users value realization for using prototype in XML BOT Generator Tools .

Questionnaire has 4 parts about:

Part 1 : Details about users

Part 2 : Benefit

Part 3 : Satisfaction

Part 4 : Support Financial Institution

In the end of questionnaire, users can evaluate over all in percentage for value realization. (Questionnaire Details See in Appendix D)

We give questionnaires for 10 users in Financial Institution. We found that

Part 1 : Users work in BOT report data division and use DMS more than 30 times per month

Part 2 : Users all accept to get benefit for using XML BOT Generator Tools in all cases :

1 Reduce time to key-in
2 Work efficiency
3 Easily to make BOT XML
4 Facility
5 Reduce routine tasks
6 Save budgets

Part 3 : Users all accept to satisfy

1 Easily to use
2 Easily to convert
3 Easily to understand/Learn
4 Pattern not confusion
5 Compactable with MS Widows/ MS Excel

Part 4 : Users all accept that this project can support Financial Institution work process and increase work efficiency in the part of prepare data and report.

Evaluate over all in percentage for value realization average in 85 % and we get some comment in the case of only 4 DataSet prototypes in this project.

5.3 Suggestions for further development

In my Project ; for the future or the next steps , we can use this Project to be the guide line to be improved about output process in BOT Data Entry Application that now export in CSV Format . It’s difficult for users in all Financial Institution to print for reading or checking all the input Data that theirs key-in into BOT Data Entry Application

Dataset Name	Name	Schema Type	DSchema Version	(Common Header) Organization Id	(Common Header) Dataset Date	(Specific Header) FiReporting GroupId	Content RecordID	Month	TradingBookPosition	Outstanding Amount
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	1	1	TradingBookPosition970003	691590416
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	1	1	TradingBookPosition970004	0
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	1	1	TradingBookPosition970005	0
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	1	1	TradingBookPosition970007	27472380150
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	1	1	TradingBookPosition970008	0
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	1	1	TradingBookPosition970009	58467279785
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	1	1	TradingBookPosition970010	0
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	1	1	TradingBookPosition970011	210005172
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	1	1	TradingBookPosition970012	600000000
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	2	2	TradingBookPosition970003	2607680454
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	2	2	TradingBookPosition970004	0
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	2	2	TradingBookPosition970005	0
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	2	2	TradingBookPosition970007	26272380150
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	2	2	TradingBookPosition970008	0
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	2	2	TradingBookPosition970009	67402482923
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	2	2	TradingBookPosition970010	0
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	2	2	TradingBookPosition970011	489764574
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	2	2	TradingBookPosition970012	600000000
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	3	3	TradingBookPosition970003	3572914822
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	3	3	TradingBookPosition970004	0
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	3	3	TradingBookPosition970005	0
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	3	3	TradingBookPosition970007	26530929850
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	3	3	TradingBookPosition970008	0
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	3	3	TradingBookPosition970009	72884772446
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	3	3	TradingBookPosition970010	0
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	3	3	TradingBookPosition970011	125278484
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	3	3	TradingBookPosition970012	600000000
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	4	4	TradingBookPosition970003	2464534616
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	4	4	TradingBookPosition970004	0
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	4	4	TradingBookPosition970005	0
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	4	4	TradingBookPosition970007	26747712100
DS_TBP	Trading Book Position	Fixed CL no sub-repeating	TCB 3.0	100	30/06/2006	116002	4	4	TradingBookPosition970008	0

Figure 5.1 BOT Data Entry Application Export in CSV Format

The functions/features that can be improved may be

XML TO XLS BOT Generator Tools with :

XLS in the Format easily for users to read or check

XLS Classify by Schema Type Like my Project in the part of Data Template

XLS can sum up the Data in the case of Parent/Child

Organization Id	100						
FI Reporting Group Id	116002 - Solo Basic						
Data Set Date	2006-06-30						
Month		1	2	3	4	5	6
Trading Book Position	970001.....1.Total transactions in trading book	86,841,255,522.96	96,772,308,101.88	103,113,895,601.54	96,675,103,749.18	105,994,927,634.54	100,008,751,115.76
	970002..... 1.1 On-balance sheet transactions in trading book	691,590,416.04	2,607,680,454.40	3,572,914,821.59	2,464,534,615.74	4,977,745,923.39	2,481,052,577.18
	970003..... 1.1.1 Debt instruments position	691,590,416.04	2,607,680,454.40	3,572,914,821.59	2,464,534,615.74	4,977,745,923.39	2,481,052,577.18
	970004..... 1.1.2 Repo /Reverse Repo and Security Borrowing /Lending position	-	-	-	-	-	-
	970005..... 1.1.3 Equity position	-	-	-	-	-	-
	970006..... 1.2 Derivatives transactions in trading book	85,939,659,934.92	93,674,863,073.48	99,415,702,295.95	93,890,789,605.44	100,886,704,273.15	97,436,230,899.58
	970007..... 1.2.1 Interest rate and debt instrument related derivatives	27,472,380,150.00	26,272,380,150.00	26,530,929,850.00	26,747,712,100.00	26,995,499,725.00	31,751,001,075.00
	970008..... 1.2.2 Equity price and equity index related derivatives	-	-	-	-	-	-
	970009..... 1.2.3 Foreign Exchange related derivatives	58,467,279,784.92	67,402,482,923.48	72,884,772,445.95	67,143,077,505.44	73,891,204,548.15	65,685,229,824.58
	970010..... 1.2.4 Commodity price related derivatives	-	-	-	-	-	-
	970011..... 1.3 Foreign exchange position of all currencies	210,005,172.00	489,764,574.00	125,278,484.00	319,779,528.00	130,477,438.00	91,467,639.00
	970012.....2. Derivatives transactions in banking book	600,000,000.00	600,000,000.00	600,000,000.00	600,000,000.00	600,000,000.00	600,000,000.00

Figure 5.2 Functions/Features can improve in XML TO XLS BOT Generator Tools

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APPENDIX A

EXAMPLE SOURCE CODES TYPE 1 – 4

1. Example Source Codes Type 1_TBP

1.1 Module Form_TBP

```
Option Explicit
Private Sub mCancel_Click()
mExitProg = True
Unload Me
End Sub
Private Sub mOK_Click()
Dim x
mExitProg = False
mSelect1 = False: mSelect2 = False: mSelect3 = False
For Each x In Frame2.Controls
   If x.Value = True And x.Name = "TCB" Then mSelect1 = True
   If x.Value = True And x.Name = "FCB1" Then mSelect2 = True
   If x.Value = True And x.Name = "FCS" Then mSelect3 = True
Next
If mSelect1 = False And mSelect2 = False And mSelect3 = False Then
    MsgBox "Please select data set type.", vbQuestion, "TBP-" & mType
Else
    Unload Me
End If
End Sub
```

1.2 Module PublicVar_TBP

```
Option Explicit
Public mFilesystem, mFile
Public mFileName As String, mFileLocation As String
Public mBank As String, mDate As String, mType As String
Public mHead1 As String, mHead2 As String, mHead3 As String
Public mSelect1 As Boolean, mSelect2 As Boolean, mSelect3 As Boolean
Public mExitProg As Boolean
Public mdSheet As Worksheet, msSheet As Worksheet
```

1.3 Module GenXML_TBP

```
Option Explicit
Sub Gen_TBP_XML()
Set mdSheet = ThisWorkbook.Worksheets("DATA_TEMPLATE")
Set msSheet = ThisWorkbook.Worksheets("TBP_TEMPLATE)
mType = ""
TBP.VersionName = "schema Version " & Trim(msSheet.Cells(25, 3))
TBP.Show
If mExitProg = False Then
    If mSelect1 = True Then mType = "TCB"
    If mSelect2 = True Then mType = "FCB1"
    If mSelect3 = True Then mType = "FCS"
On Error GoTo ErrorMsg
```

```
   mFileLocation = IIf(Right(Trim(msSheet.Cells(24, 3)), 1) = "\", _
                        Trim(msSheet.Cells(24, 3)), Trim(msSheet.Cells(24, 3)) & "\")
   mBank = IIf(Trim(mdSheet.Cells(2, 3)) = "", "000", Trim(mdSheet.Cells(2, 3)))
   mDate = IIf(Trim(mdSheet.Cells(4, 3)) = "", "000", Trim(mdSheet.Cells(4, 3)))
   mFileName = mBank & "_" & Application.Substitute(mDate, "-", "") &
"_DS_TCB_" & mType & ".xml"
   Set mFilesystem = CreateObject("Scripting.FileSystemObject")
   Set mFile = mFilesystem.CreateTextFile(mFileLocation & mFileName, True, True)
' overwrite , unicode
   GenHead mType
   GenContentTBP
   mFile.Close
   MsgBox "Generate xml file from xls TBP-" & mType & " successful.",
vbInformation, "TBP-" & mType
Else
ErrorMsg:
   Select Case True
      Case Err = 71: MsgBox Error(Err), vbCritical, "Convert xls to xml- TBP"
      Case Err = 76: MsgBox Error(Err), vbCritical, "Convert xls to xml- TBP"
   End Select
   MsgBox "Cancel generate xml file from xls TBP.", vbExclamation, "TBP"
End If
End Sub
Private Sub GenHead(mType)
Dim mRow As Byte, mFiType As String
mRow = 2
mHead1 = Mid(Trim(msSheet.Cells(mRow, 3)), 1, 7) & ">"
mFiType = mType & " " & Trim(msSheet.Cells(25, 3))
If Trim(msSheet.Cells(18, 3)) <> "" Then mFile.WriteLine Trim(msSheet.Cells
(18, 3))
mFile.WriteLine Trim(msSheet.Cells(mRow, 3)) & """" & mFiType & """" & ">"
   mFile.WriteLine vbTab & Trim(msSheet.Cells(mRow + 1, 3))
      mFile.WriteLine vbTab & vbTab & Trim(msSheet.Cells(mRow + 2, 3)) &
mBank & AddCloseTag(Trim(msSheet.Cells(mRow + 2, 3)))
      mFile.WriteLine vbTab & vbTab & Trim(msSheet.Cells(mRow + 3, 3)) &
mDate & AddCloseTag(Trim(msSheet.Cells(mRow + 3, 3)))
   mFile.WriteLine vbTab & AddCloseTag(Trim(msSheet.Cells(mRow + 1, 3)))
'  FiReportingGroup
   mFile.WriteLine vbTab & Trim(msSheet.Cells(mRow + 4, 3))
      mFile.WriteLine vbTab & vbTab & Trim(msSheet.Cells(2, 4)) &
Mid(mdSheet.Cells(3, 3), 1, 6) & _
      AddCloseTag(Trim(msSheet.Cells(2, 4)))
   mFile.WriteLine vbTab & AddCloseTag(Trim(msSheet.Cells(mRow + 4, 3)))
mHead2 = Trim(msSheet.Cells(mRow + 5, 3))
mHead3 = Trim(msSheet.Cells(mRow + 6, 3))
   mFile.WriteLine vbTab & mHead2
End Sub
```

```
Private Sub GenContentTBP()
Dim mCol, mRow As Integer
mCol = 4
Do Until mdSheet.Cells(5, mCol) = ""
   mRow = 4
   mFile.WriteLine vbTab & mHead3
'  Month
   mFile.WriteLine vbTab & vbTab & Trim(msSheet.Cells(mRow - 1, 4)) & _
               mdSheet.Cells(5, mCol) & _
               AddCloseTag(Trim(msSheet.Cells(mRow - 1, 4)))
'  TradingBookPosition and OutstandingAmount
   Do Until Trim(msSheet.Cells(mRow, 4)) = ""
      mFile.WriteLine vbTab & vbTab & Trim(msSheet.Cells(mRow, 4))
      mFile.WriteLine vbTab & vbTab & vbTab & msSheet.Cells(4, 5) & _
            FindTBPAmt(Mid(Trim(msSheet.Cells(mRow, 4)), 21, 6), mCol) & _
            AddCloseTag(msSheet.Cells(4, 5))
      mFile.WriteLine vbTab & vbTab & AddCloseTag(Trim(msSheet.Cells
(mRow, 4)))
      mRow = mRow + 1
   Loop
   mFile.WriteLine vbTab & AddCloseTag(mHead3)
   mCol = mCol + 1
Loop
mFile.WriteLine vbTab & AddCloseTag(mHead2)
mFile.WriteLine AddCloseTag(mHead1)
End Sub
Private Function AddCloseTag(mCode)
AddCloseTag = "</" & Mid(mCode, 2, Len(mCode) - 1)
End Function
Private Function FindTBPAmt(mCode, mCol) As Double
Dim mRow As Integer, mChk As Boolean
mChk = False
For mRow = 6 To 17
   If Mid(Trim(mdSheet.Cells(mRow, 3)), 1, 6) = mCode Then
      FindTBPAmt = IIf(Val(mdSheet.Cells(mRow, mCol)) = 0, 0,
Format(mdSheet.Cells(mRow, mCol), "####.##"))
      mChk = True
      Exit For
   End If
Next mRow
If mChk = False Then
   mFile.Close
   Kill mFileLocation & mFileName
   MsgBox "Can not find TradingBookPosition " & mCode & "." & vbCrLf &
"Exit Program", vbCritical, "TBP-" & mType
   End
End If
```

```
End Function
```

2. Example Source Codes Type 2_IRR

2.1 Module Form_IRR

```
Option Explicit
Private Sub mCancel_Click()
mExitProg = True
Unload Me
End Sub
Private Sub mOK_Click()
Dim x
mExitProg = False
mSelect1 = False: mSelect2 = False: mSelect3 = False: mSelect4 = False
For Each x In Frame2.Controls
  If x.Value = True And x.Name = "TCB" Then mSelect1 = True
  If x.Value = True And x.Name = "FCB1" Then mSelect2 = True
  If x.Value = True And x.Name = "FCS" Then mSelect3 = True
  If x.Value = True And x.Name = "CCS" Then mSelect4 = True
Next
If mSelect1 = False And mSelect2 = False And mSelect3 = False And
mSelect4 = False Then
   MsgBox "Please select data set type.", vbQuestion, "IRR-" & mType
Else
   Unload Me
End If
End Sub
```

2.2 Module PublicVar_IRR

```
Option Explicit
Public mFilesystem, mFile
Public mFileName As String, mFileLocation As String
Public mBank As String, mDate As String, mType As String
Public mHead1 As String, mHead2 As String, mHead3 As String
Public mSelect1 As Boolean, mSelect2 As Boolean, mSelect3 As Boolean,
mSelect4 As Boolean
Public mExitProg As Boolean
Public mdSheet As Worksheet, msSheet As Worksheet
```

2.3 Module GenXML_IRR

```
Option Explicit
Sub Gen_IRR_XML()
Set mdSheet = ThisWorkbook.Worksheets("DATA_TEMPLATE")
Set msSheet = ThisWorkbook.Worksheets("IRR_TEMPLATE")
mType = ""
IRR.VersionName = "schema Version " & Trim(msSheet.Cells(25, 3))
IRR.Show
```

```
If mExitProg = False Then
   If mSelect1 = True Then mType = "TCB"
   If mSelect2 = True Then mType = "FCB1"
   If mSelect3 = True Then mType = "FCS"
   If mSelect4 = True Then mType = "CCS"
 On Error GoTo ErrorMsg
   mFileLocation = IIf(Right(Trim(msSheet.Cells(24, 3)), 1) = "\", _
                       Trim(msSheet.Cells(24, 3)), Trim(msSheet.Cells(24, 3)) & "\")
   mBank = IIf(Trim(mdSheet.Cells(2, 3)) = "", "000", Trim(mdSheet.Cells(2, 3)))
   mDate = IIf(Trim(mdSheet.Cells(4, 3)) = "", "000", Trim(mdSheet.Cells(4, 3)))
   mFileName = mBank & "_" & Application.Substitute(mDate, "-", "") &
"_DS_IRR_" & mType & ".xml"
   Set mFilesystem = CreateObject("Scripting.FileSystemObject")
   Set mFile = mFilesystem.CreateTextFile(mFileLocation & mFileName, True,
False)   ' overwrite , ASCII
   mFile.WriteLine "<?xml version=""" & "1.0""" & " encoding=""" & "UTF-8"""
& "?>"
   GenHead mType
   GenContentIRR
   mFile.Close
   MsgBox "Generate xml file from xls IRR-" & mType & " successful.",
vbInformation, "IRR-" & mType
Else
ErrorMsg:
   Select Case True
      Case Err = 71: MsgBox Error(Err), vbCritical, "Convert xls to xml- IRR"
      Case Err = 76: MsgBox Error(Err), vbCritical, "Convert xls to xml- IRR"
   End Select
   MsgBox "Cancel generate xml file from xls IRR.", vbExclamation, "IRR"
End If
End Sub
Private Sub GenHead(mType)
Dim mRow As Byte, mFiType As String
mRow = 2
mHead1 = Mid(Trim(msSheet.Cells(mRow, 3)), 1, 7) & ">"
mFiType = mType & " " & Trim(msSheet.Cells(25, 3))
If Trim(msSheet.Cells(18, 3)) <> "" Then mFile.WriteLine Trim(msSheet.Cells
(18, 3))
mFile.WriteLine Trim(msSheet.Cells(mRow, 3)) & """" & mFiType & """" & ">"
   mFile.WriteLine vbTab & Trim(msSheet.Cells(mRow + 1, 3))
      mFile.WriteLine vbTab & vbTab & Trim(msSheet.Cells(mRow + 2, 3)) &
mBank & AddCloseTag(Trim(msSheet.Cells(mRow + 2, 3)))
      mFile.WriteLine vbTab & vbTab & Trim(msSheet.Cells(mRow + 3, 3)) &
mDate & AddCloseTag(Trim(msSheet.Cells(mRow + 3, 3)))
   mFile.WriteLine vbTab & AddCloseTag(Trim(msSheet.Cells(mRow + 1, 3)))
   mFile.WriteLine vbTab & Trim(msSheet.Cells(mRow + 4, 3))
mHead2 = Trim(msSheet.Cells(mRow + 5, 3))
```

```
mHead3 = Trim(msSheet.Cells(mRow + 6, 3))
   mFile.WriteLine vbTab & mHead2
End Sub
Private Sub GenContentIRR()
Dim mCol As Byte, mRow As Byte, I As Byte, mAmount As Double, mCheck As
Byte
mFile.WriteLine vbTab & mHead3
'  FiReportingGroupId
mFile.WriteLine vbTab & vbTab & Trim(msSheet.Cells(2, 4)) &
Mid(mdSheet.Cells(3, 3), 1, 6) & AddCloseTag(Trim(msSheet.Cells(2, 4)))
mCol = FindEndCol(6, 5)
mRow = 3
'  BankingBookPositionItem
Do Until Trim(msSheet.Cells(mRow, 4)) = ""
   mFile.WriteLine vbTab & vbTab & Trim(msSheet.Cells(mRow, 4))
'  BankingBookPositionItemInfo
mCheck = 0
   For I = 4 To mCol
      mAmount = FindIRRAmt(Mid(Trim(msSheet.Cells(mRow, 4)), 25, 6), I)
         If mAmount <> 0 Then
           mFile.WriteLine vbTab & vbTab & vbTab & msSheet.Cells(3, 5)
              mFile.WriteLine vbTab & vbTab & vbTab & vbTab & msSheet.Cells
(4, 5) & _
                 Mid(Trim(mdSheet.Cells(6, I)), 1, 6) &
AddCloseTag(msSheet.Cells(4, 5))
              mFile.WriteLine vbTab & vbTab & vbTab & vbTab & msSheet.Cells
(5, 5) & _
                 Trim(mdSheet.Cells(5, I)) & AddCloseTag(msSheet.Cells(5, 5))
              mFile.WriteLine vbTab & vbTab & vbTab & vbTab & msSheet.Cells
(6, 5) & _
                 mAmount & AddCloseTag(msSheet.Cells(6, 5))
            mFile.WriteLine vbTab & vbTab & vbTab & msSheet.Cells(7, 5)
            mCheck = mCheck + 1
         End If
   Next I
   If mCheck = 0 Then
           mFile.WriteLine vbTab & vbTab & vbTab & msSheet.Cells(3, 5)
              mFile.WriteLine vbTab & vbTab & vbTab & vbTab & msSheet.Cells
(4, 5) & AddCloseTag(msSheet.Cells(4, 5))
              mFile.WriteLine vbTab & vbTab & vbTab & vbTab & msSheet.Cells
(5, 5) & AddCloseTag(msSheet.Cells(5, 5))
              mFile.WriteLine vbTab & vbTab & vbTab & vbTab & msSheet.Cells
(6, 5) & "0" & AddCloseTag(msSheet.Cells(6, 5))
            mFile.WriteLine vbTab & vbTab & vbTab & msSheet.Cells(7, 5)
   End If
   mFile.WriteLine vbTab & vbTab & AddCloseTag(Trim(msSheet.Cells(mRow, 4)))
   mRow = mRow + 1
```

```
Loop
mFile.WriteLine vbTab & AddCloseTag(mHead3)
mFile.WriteLine vbTab & AddCloseTag(mHead2)
mFile.WriteLine AddCloseTag(mHead1)
End Sub
Private Function AddCloseTag(mCode)
AddCloseTag = "</" & Mid(mCode, 2, Len(mCode) - 1)
End Function
Private Function FindIRRAmt(mCode, mCol) As Double
Dim mRow As Integer, mChk As Boolean
mChk = False
For mRow = 7 To 41
   If Mid(Trim(mdSheet.Cells(mRow, 3)), 1, 6) = mCode Then
      FindIRRAmt = IIf(Val(mdSheet.Cells(mRow, mCol)) = 0, 0,
Format(mdSheet.Cells(mRow, mCol), "####.##"))
      mChk = True
      Exit For
   End If
Next mRow
If mChk = False Then
   mFile.Close
   Kill mFileLocation & mFileName
   MsgBox "Can not find TradingBookPosition " & mCode & "." & vbCrLf &
"Exit Program", vbCritical, "IRR-" & mType
   End
End If
End Function
Private Function FindEndCol(sRow As Byte, sCol As Byte) As Byte
Do Until mdSheet.Cells(sRow, sCol) = ""
   sCol = sCol + 1
Loop
FindEndCol = sCol
End Function
```

3. Example Source Codes Type 3_LMS

3.1 Module Form_LMS

```
Option Explicit
Private Sub mCancel_Click()
mExitProg = True
Unload Me
End Sub
Private Sub mOK_Click()
Dim x
mExitProg = False
mSelect1 = False: mSelect2 = False: mSelect3 = False: mSelect4 = False
For Each x In Frame2.Controls
```

```
   If x.Value = True And x.Name = "TCB" Then mSelect1 = True
   If x.Value = True And x.Name = "FCB1" Then mSelect2 = True
   If x.Value = True And x.Name = "FCS" Then mSelect3 = True
   If x.Value = True And x.Name = "CCS" Then mSelect4 = True
Next
If mSelect1 = False And mSelect2 = False And mSelect3 = False And
mSelect4 = False Then
   MsgBox "Please select data set type.", vbQuestion, "LMS"
Else
   Unload Me
End If
End Sub
```

3.2 Module PublicVar _LMS

```
Option Explicit
Public mFilesystem, mFile
Public mFileName As String, mFileLocation As String
Public mBank As String, mDate As String, mType As String
Public mHead1 As String, mHead2 As String, mHead3 As String
Public mExitProg As Boolean
Public mSelect1 As Boolean, mSelect2 As Boolean, mSelect3 As Boolean,
mSelect4 As Boolean
Public msSheet As Worksheet, mdSheet As Worksheet
```

3.3 Module GenXML _LMS

```
Option Explicit
Sub Gen_LMS_XML()
Set mdSheet = ThisWorkbook.Worksheets("DATA_TEMPLATE1")
Set msSheet = ThisWorkbook.Worksheets("LMS_TEMPLATE")
LMS.VersionName = "schema Version " & Trim(msSheet.Cells(25, 3))
LMS.Show
If mExitProg = False Then
   If mSelect1 = True Then mType = "TCB"
   If mSelect2 = True Then mType = "FCB1"
   If mSelect3 = True Then mType = "FCS"
   If mSelect4 = True Then mType = "CCS"
On Error GoTo ErrorMsg
   mFileLocation = IIf(Right(Trim(msSheet.Cells(24, 3)), 1) = "\", _
                  Trim(msSheet.Cells(24, 3)), Trim(msSheet.Cells(24, 3)) & "\")
   mBank = IIf(Trim(mdSheet.Cells(2, 3)) = "", "000", Trim(mdSheet.Cells(2, 3)))
   mDate = IIf(Trim(mdSheet.Cells(4, 3)) = "", "000", Trim(mdSheet.Cells(4, 3)))
   mFileName = mBank & "_" & Application.Substitute(mDate, "-", "") &
"_DS_LMS_" & mType & ".xml"
   Set mFilesystem = CreateObject("Scripting.FileSystemObject")
   Set mFile = mFilesystem.CreateTextFile(mFileLocation & mFileName, True,
False)   ' overwrite , ANSI
   GenHead mType
```

```
   GenContentLMS
   If mType = "TCB" Then
      Set mdSheet = ThisWorkbook.Worksheets("DATA_TEMPLATE2")
      GenContentLMS
   End If
   mFile.WriteLine vbTab & AddCloseTag(mHead2)
   mFile.WriteLine AddCloseTag(mHead1)
   mFile.Close
   MsgBox "Generate xml file from xls LMS-" & mType & " successful.",
vbInformation, "LMS-" & mType
Else
ErrorMsg:
   Select Case True
      Case Err = 71: MsgBox Error(Err), vbCritical, "Convert xls to xml- LMS"
      Case Err = 76: MsgBox Error(Err), vbCritical, "Convert xls to xml- LMS"
   End Select
   MsgBox "Cancel generate xml file from xls LMS.", vbExclamation, "Convert
xls to xml- LMS"
End If
End Sub
Private Sub GenHead(mType)
Dim mRow As Byte, mFiType As String
mRow = 2: mHead1 = Mid(Trim(msSheet.Cells(mRow, 3)), 1, 7) & ">"
mFiType = mType & " " & Trim(msSheet.Cells(25, 3))
If Trim(msSheet.Cells(18, 3)) <> "" Then mFile.WriteLine Trim(msSheet.Cells
(18, 3))
mFile.WriteLine Trim(msSheet.Cells(mRow, 3)) & """" & mFiType & """" & ">"
   mFile.WriteLine vbTab & Trim(msSheet.Cells(mRow + 1, 3))
      mFile.WriteLine vbTab & vbTab & Trim(msSheet.Cells(mRow + 2, 3)) &
mBank & AddCloseTag(Trim(msSheet.Cells(mRow + 2, 3)))
      mFile.WriteLine vbTab & vbTab & Trim(msSheet.Cells(mRow + 3, 3)) &
mDate & AddCloseTag(Trim(msSheet.Cells(mRow + 3, 3)))
   mFile.WriteLine vbTab & AddCloseTag(Trim(msSheet.Cells(mRow + 1, 3)))
   mFile.WriteLine vbTab & Trim(msSheet.Cells(mRow + 4, 3))
mHead2 = Trim(msSheet.Cells(mRow + 5, 3))
mHead3 = Trim(msSheet.Cells(mRow + 6, 3))
   mFile.WriteLine vbTab & mHead2
End Sub
Private Sub GenContentLMS()
Dim mdRow As Integer, I As Integer, maxRow As Long
mdRow = 6
mdSheet.Activate
maxRow = Cells.Find(what:="*", after:=[a1], searchorder:=xlByRows,
searchdirection:=xlPrevious).Row
Do Until mdRow > maxRow
   mFile.WriteLine vbTab & mHead3
'  Fi Reporting Group Id
```

```
   mFile.WriteLine vbTab & vbTab & Trim(msSheet.Cells(2, 4)) & _
      Trim(mdSheet.Cells(3, 3)) & AddCloseTag(Trim(msSheet.Cells(2, 4)))
   For I = 3 To 7
      FindLMSAmt mdRow, I            '  row data, col data and row schema
   Next I
   mFile.WriteLine vbTab & AddCloseTag(mHead3)
   mdRow = mdRow + 1
Loop
End Sub
Private Sub FindLMSAmt(mRow As Integer, mCol As Integer)
If mCol = 7 Then
   mFile.WriteLine vbTab & vbTab & Trim(msSheet.Cells(mCol, 4)) & _
      Application.Text(Trim(mdSheet.Cells(mRow, mCol - 1)), "####.##") &
AddCloseTag(Trim(msSheet.Cells(mCol, 4)))
Else
   mFile.WriteLine vbTab & vbTab & Trim(msSheet.Cells(mCol, 4)) & _
      Trim(mdSheet.Cells(mRow, mCol - 1)) &
AddCloseTag(Trim(msSheet.Cells(mCol, 4)))
End If
End Sub
Private Function AddCloseTag(mCode)
AddCloseTag = "</" & Mid(mCode, 2, Len(mCode) - 1)
End Function
```

4. Example Source Codes Type 4_ARS

4.1 Module Form_ARS

```
Option Explicit
Private Sub Bank_Click()
IBF1.Enabled = False: IBF1.Value = False
TCB.Enabled = True: FCB1.Enabled = True
FCS.Enabled = True: CCS.Enabled = True
End Sub
Private Sub IBF_Click()
IBF1.Enabled = True: IBF1.Value = True
TCB.Enabled = False: FCB1.Enabled = False
FCS.Enabled = False: CCS.Enabled = False
End Sub
Private Sub mCancel_Click()
mExitProg = True
Unload Me
End Sub
Private Sub mOK_Click()
Dim x
mExitProg = False
mSelect1 = False: mSelect2 = False: mSelect3 = False: mSelect4 = False:
mSelect5 = False
```

```
For Each x In Frame2.Controls
  If x.Value = True And x.Name = "TCB" Then mSelect1 = True
  If x.Value = True And x.Name = "FCB1" Then mSelect2 = True
  If x.Value = True And x.Name = "FCS" Then mSelect4 = True
  If x.Value = True And x.Name = "CCS" Then mSelect5 = True
Next
If mSelect1 = False And mSelect2 = False And mSelect4 = False And
mSelect5 = False Then
   MsgBox "Please select data set type.", vbQuestion, "ARS-" & mType
Else
   Unload Me
End If
End Sub
```

4.2 Module PublicVar _ARS

```
Option Explicit
Public mFilesystem, mFile
Public mFileName As String, mFileLocation As String
Public mBank As String, mDate As String, mType As String
Public mHead1 As String, mHead2 As String, mHead3 As String
Public mFiSelect1 As Boolean, mFiSelect2 As Boolean, mExitProg As Boolean
Public mSelect1 As Boolean, mSelect2 As Boolean, mSelect3 As Boolean,
mSelect4 As Boolean, mSelect5 As Boolean
Public msSheet As Worksheet, mdSheet As Worksheet
```

4.3 Module GenXML _ARS

```
Option Explicit
Sub Gen_ARS_XML()
Set mdSheet = ThisWorkbook.Worksheets("DATA_TEMPLATE1")
Set msSheet = ThisWorkbook.Worksheets("ARS_TEMPLATE")
ARS.VersionName = "schema Version " & Trim(msSheet.Cells(25, 3))
ARS.Show
If mExitProg = False Then
   If mSelect1 = True Then mType = "TCB"
   If mSelect2 = True Then mType = "FCB1"
   If mSelect3 = True Then mType = "IBF1"
   If mSelect4 = True Then mType = "FCS"
   If mSelect5 = True Then mType = "CCS"
On Error GoTo ErrorMsg
   mFileLocation = IIf(Right(Trim(msSheet.Cells(24, 3)), 1) = "\", _
                  Trim(msSheet.Cells(24, 3)), Trim(msSheet.Cells(24, 3)) & "\")
   mBank = IIf(Trim(mdSheet.Cells(2, 3)) = "", "000", Trim(mdSheet.Cells(2, 3)))
   mDate = IIf(Trim(mdSheet.Cells(4, 3)) = "", "000", Trim(mdSheet.Cells(4, 3)))
   mFileName = mBank & "_" & Application.Substitute(mDate, "-", "") &
"_DS_ARS_" & mType & ".xml"
   Set mFilesystem = CreateObject("Scripting.FileSystemObject")
```

```
   Set mFile = mFilesystem.CreateTextFile(mFileLocation & mFileName, True,
False)   ' overwrite , ANSI
   GenHead mType
   If mdSheet.Cells(6, 2).Value <> "" Then GenContentARS
   Set mdSheet = ThisWorkbook.Worksheets("DATA_TEMPLATE2")
   If mdSheet.Cells(6, 2).Value <> "" Then GenContentARS
   mFile.WriteLine vbTab & AddCloseTag(mHead2)
   mFile.WriteLine AddCloseTag(mHead1)
   mFile.Close
   MsgBox "Generate xml file from xls ARS-" & mType & " successful.",
vbInformation, "ARS-" & mType
Else
ErrorMsg:
   Select Case True
      Case Err = 71: MsgBox Error(Err), vbCritical, "Convert xls to xml- ARS"
      Case Err = 76: MsgBox Error(Err), vbCritical, "Convert xls to xml- ARS"
   End Select
   MsgBox "Cancel generate xml file from xls ARS.", vbExclamation, "Convert
xls to xml- ARS"
End If
End Sub
Private Sub GenHead(mType)
Dim mRow As Byte, mFiType As String
If mType <> "IBF1" Then
   mRow = 2: mHead1 = Mid(Trim(msSheet.Cells(mRow, 3)), 1, 7) & ">"
Else
   mRow = 10: mHead1 = Mid(Trim(msSheet.Cells(mRow, 3)), 1, 11) & ">"
End If
mFiType = mType & " " & Trim(msSheet.Cells(25, 3))
If Trim(msSheet.Cells(18, 3)) <> "" Then mFile.WriteLine Trim(msSheet.Cells
(18, 3))     ' First line
mFile.WriteLine Trim(msSheet.Cells(mRow, 3)) & """" & mFiType & """" & ">"
   mFile.WriteLine vbTab & Trim(msSheet.Cells(mRow + 1, 3))
      mFile.WriteLine vbTab & vbTab & Trim(msSheet.Cells(mRow + 2, 3)) &
mBank & AddCloseTag(Trim(msSheet.Cells(mRow + 2, 3)))
      mFile.WriteLine vbTab & vbTab & Trim(msSheet.Cells(mRow + 3, 3)) &
mDate & AddCloseTag(Trim(msSheet.Cells(mRow + 3, 3)))
   mFile.WriteLine vbTab & AddCloseTag(Trim(msSheet.Cells(mRow + 1, 3)))
   mFile.WriteLine vbTab & Trim(msSheet.Cells(mRow + 4, 3))
mHead2 = Trim(msSheet.Cells(mRow + 5, 3))
mHead3 = Trim(msSheet.Cells(mRow + 6, 3))
   mFile.WriteLine vbTab & mHead2
End Sub
Private Sub GenContentARS()
Dim mdRow As Integer, I As Integer, mInfo As String, mDetail As String
mdRow = 6
mInfo = msSheet.Cells(3, 4)
```

```
mDetail = msSheet.Cells(4, 4)
mdSheet.Activate
mFile.WriteLine vbTab & mHead3
mFile.WriteLine vbTab & vbTab & msSheet.Cells(2, 4) & Mid(mdSheet.Cells(3, 3),
1, 6) & _
      AddCloseTag(msSheet.Cells(2, 4))
mFile.WriteLine vbTab & vbTab & mInfo
Do While mdSheet.Cells(mdRow, 2).Value <> ""
   mFile.WriteLine vbTab & vbTab & vbTab & mDetail
   For I = 5 To 13
      Select Case I
         Case 12
            mFile.WriteLine vbTab & vbTab & vbTab & vbTab & _
               Trim(msSheet.Cells(I, 4)) &
Application.Text(Trim(mdSheet.Cells(mdRow, I - 3)), "###0") & _
               AddCloseTag(Trim(msSheet.Cells(I, 4)))
         Case 13
            mFile.WriteLine vbTab & vbTab & vbTab & vbTab & _
               Trim(msSheet.Cells(I, 4)) &
Application.Text(Trim(mdSheet.Cells(mdRow, I - 3)), "###0.00") & _
               AddCloseTag(Trim(msSheet.Cells(I, 4)))
         Case Else
            mFile.WriteLine vbTab & vbTab & vbTab & vbTab & _
               Trim(msSheet.Cells(I, 4)) & Trim(mdSheet.Cells(mdRow, I - 3)) & _
               AddCloseTag(Trim(msSheet.Cells(I, 4)))
   Next I
   mdRow = mdRow + 1
   mFile.WriteLine vbTab & vbTab & vbTab & AddCloseTag(mDetail)
Loop
mFile.WriteLine vbTab & vbTab & AddCloseTag(mInfo)
mFile.WriteLine vbTab & AddCloseTag(mHead3)
End Sub
Private Function AddCloseTag(mCode)
AddCloseTag = "</" & Mid(mCode, 2, Len(mCode) - 1)
End Function
```

APPENDIX B

SAMPLE DATA TYPE 1 - 4

Organization Id	100						
FI Reporting Group Id	116002						
Data Set Date	2006-06-30						
Month		1	2	3	4	5	6
Trading Book Position	970001.....1.Total transactions in trading book	86,841,255,522.96	96,772,308,101.88	103,113,895,601.54	96,675,103,749.18	105,994,927,634.54	100,008,751,115.76
	970002..... 1.1 On-balance sheet transactions in trading book	691,590,416.04	2,607,680,454.40	3,572,914,821.59	2,464,534,615.74	4,977,745,923.39	2,481,052,577.18
	970003..... 1.1.1 Debt instruments position	691,590,416.04	2,607,680,454.40	3,572,914,821.59	2,464,534,615.74	4,977,745,923.39	2,481,052,577.18
	970004..... 1.1.2 Repo /Reverse Repo and Security Borrowing /Lending position	-	-	-	-	-	-
	970005..... 1.1.3 Equity position	-	-	-	-	-	-
	970006..... 1.2 Derivatives transactions in trading book	85,939,659,934.92	93,674,863,073.48	99,415,702,295.95	93,890,789,605.44	100,886,704,273.15	97,436,230,899.58
	970007..... 1.2.1 Interest rate and debt instrument related derivatives	27,472,380,150.00	26,272,380,150.00	26,530,929,850.00	26,747,712,100.00	26,995,499,725.00	31,751,001,075.00
	970008..... 1.2.2 Equity price and equity index related derivatives	-	-	-	-	-	-
	970009..... 1.2.3 Foreign Exchange related derivatives	58,467,279,784.92	67,402,482,923.48	72,884,772,445.95	67,143,077,505.44	73,891,204,548.15	65,685,229,824.58
	970010..... 1.2.4 Commodity price related derivatives	-	-	-	-	-	-
	970011..... 1.3 Foreign exchange position of all	210,005,172.00	489,764,574.00	125,278,484.00	319,779,528.00	130,477,438.00	91,467,639.00
	970012.....2. Derivatives transactions in banking book	600,000,000.00	600,000,000.00	600,000,000.00	600,000,000.00	600,000,000.00	600,000,000.00

Organization Id	200						
FI Reporting Group Id	116008						
Data Set Date	2006-06-30						
Month		1	2	3	4	5	6
Trading Book Position	970001.....1.Total transactions in trading book	866,870,829,961.51	836,567,869,659.43	875,675,447,902.92	812,852,066,055.78	893,509,142,378.13	933,252,606,783.40
	970002..... 1.1 On-balance sheet transactions in trading book	40,391,706,776.98	26,525,184,934.18	27,943,511,303.80	27,585,659,945.68	41,628,013,955.00	30,276,596,282.77
	970003..... 1.1.1 Debt instruments position	22,906,706,776.98	18,236,184,934.18	16,943,511,303.80	20,585,659,945.68	26,604,013,955.00	29,136,596,282.77
	970004..... 1.1.2 Repo /Reverse Repo and Security Borrowing /Lending position	17,485,000,000.00	8,289,000,000.00	11,000,000,000.00	7,000,000,000.00	15,024,000,000.00	1,140,000,000.00
	970005..... 1.1.3 Equity position	-	-	-	-	-	-
	970006..... 1.2 Derivatives transactions in trading book	824,856,564,579.88	809,280,071,622.99	846,529,215,711.87	783,694,205,960.98	850,383,148,558.72	901,337,465,192.36
	970007..... 1.2.1 Interest rate and debt instrument related derivatives	427,814,771,456.56	433,470,826,257.36	448,830,379,870.80	447,936,370,047.76	468,106,057,329.46	506,739,201,683.07
	970008..... 1.2.2 Equity price and equity index related derivatives	-	-	-	310,000,000.00	510,000,000.00	774,200,000.00
	970009..... 1.2.3 Foreign Exchange related derivatives	397,041,793,123.32	375,809,245,365.63	397,698,835,841.07	335,447,835,913.22	381,767,091,229.26	393,824,063,509.29
	970010..... 1.2.4 Commodity price related derivatives	-	-	-	-	-	-
	970011..... 1.3 Foreign exchange position of all	1,622,558,604.65	762,613,102.26	1,202,720,887.25	1,572,200,149.12	1,497,979,864.41	1,638,545,308.27
	970012.....2. Derivatives transactions in banking book	-	-	2,603,240,000.00	2,603,240,000.00	2,603,240,000.00	-

Organization Id	400						
FI Reporting Group Id	116002						
Data Set Date	2006-06-30						
Month		1	2	3	4	5	6
Trading Book Position	970001.....1.Total transactions in trading book	10,082,600,000.00	10,393,400,000.00	9,782,329,000.00	9,535,329,000.00	10,890,729,000.00	12,031,729,000.00
	970002..... 1.1 On-balance sheet transactions in trading book	784,580,000.00	824,580,000.00	983,608,000.00	1,004,608,000.00	1,135,608,000.00	1,081,608,000.00
	970003..... 1.1.1 Debt instruments position	205,000,000.00	208,400,000.00	298,400,000.00	335,400,000.00	428,400,000.00	439,400,000.00
	970004..... 1.1.2 Repo /Reverse Repo and Security Borrowing /Lending position	37,480,000.00	47,480,000.00	92,748,000.00	87,748,000.00	79,748,000.00	84,748,000.00
	970005..... 1.1.3 Equity position	542,100,000.00	568,700,000.00	592,460,000.00	581,460,000.00	627,460,000.00	557,460,000.00
	970006..... 1.2 Derivatives transactions in trading book	5,838,300,000.00	5,819,100,000.00	5,144,001,000.00	4,716,001,000.00	5,989,401,000.00	7,034,401,000.00
	970007..... 1.2.1 Interest rate and debt instrument related derivatives	3,800,000,000.00	3,674,000,000.00	2,674,000,000.00	2,274,000,000.00	2,957,400,000.00	3,457,400,000.00
	970008..... 1.2.2 Equity price and equity index related derivatives	528,900,000.00	539,700,000.00	689,700,000.00	661,700,000.00	741,700,000.00	816,700,000.00
	970009..... 1.2.3 Foreign Exchange related derivatives	1,284,000,000.00	1,344,000,000.00	1,395,740,000.00	1,485,740,000.00	1,895,740,000.00	2,295,740,000.00
	970010..... 1.2.4 Commodity price related derivatives	225,400,000.00	261,400,000.00	384,561,000.00	294,561,000.00	394,561,000.00	464,561,000.00
	970011..... 1.3 Foreign exchange position of all	3,459,720,000.00	3,749,720,000.00	3,654,720,000.00	3,814,720,000.00	3,765,720,000.00	3,915,720,000.00
	970012.....2. Derivatives transactions in banking book	2,789,450,000.00	2,949,450,000.00	3,985,450,000.00	3,946,150,000.00	4,946,150,000.00	5,546,150,000.00

Organization Id	100				
Fi Reporting Group Id	116002				
Dataset Date	2006-06-30				
		THB	THB	THB	THB
		439002 (0 - 1 Month)	439003 (> 1 - 3 Month)	439004 (> 3 - 6 Month)	439005 (> 6 - 12 Month)
Interest Rate Risk	990001 ... Assets Items	109,488,324,896.35	24,023,225,195.20	13,214,647,762.11	6,256,053,810.80
	990002 ... Due from financial institutions and money market	3,771,143,304.43	-	-	-
	990003 ... Rate Sensitive Items	-	-	-	-
	990004 ... Non Rate Sensitive Items	3,771,143,304.43			
	990005 ... Securities bought under resale agreement	1,000,000,000.00			
	990006 ... Investments (net)	3,209,336,230.69	212,120,484.87	1,763,054,401.60	2,286,304,793.28
	990007 ... Rate Sensitive Investments	2,531,402,324.96	212,120,484.87	1,763,054,401.60	2,286,304,793.28
	990008 ... Non Rate Sensitive Investments	677,933,905.73			
	990009 ... Loans	100,524,683,092.23	23,811,104,710.33	11,451,593,360.51	3,969,749,017.52
	990010 ... Pass & Special Mention	89,337,821,497.59	23,811,104,710.33	11,451,593,360.51	3,969,749,017.52
	990011 ... NPL	11,186,861,594.64	-	-	-
	990012 ... Rate Sensitive NPL				
	990013 ... Non Rate Sensitive NPL	11,186,861,594.64			
	990014 ... Others Assets	983,162,269.00	-	-	-
	990015 ... Rate Sensitive Others Assets				
	990016 ... Non Rate Sensitive Others Assets	983,162,269.00			
	990017 ... Liabilities Items	112,422,953,093.85	27,816,446,890.50	22,153,143,272.10	5,455,438,728.79
	990018 ... Deposit	93,297,186,792.62	26,946,659,490.50	19,879,345,272.10	5,425,438,728.79
	990019 ... Rate Sensitive Deposit	93,264,223,730.60	26,946,659,490.50	19,879,345,272.10	5,425,438,728.79
	990020 ... Non Rate Sensitive Deposit	32,963,062.02			
	990021 ... Due from financial institutions and money market	-	-	-	-
	990022 ... Rate Sensitive Items				
	990023 ... Non Rate Sensitive Items				
	990024 ... Securities sold under repurchase agreement				
	990025 ... Borrowing	16,277,791,696.54	869,787,400.00	2,273,798,000.00	30,000,000.00
	990026 ... Other Liabilities	2,847,974,604.69	-	-	-
	990027 ... Rate Sensitive Other Liabilities				
	990028 ... Non Rate Sensitive Other Liabilities	2,847,974,604.69			
	990029 ... Net Position Off Balance Sheet Not Include Options Item	-	-	(590,700,000.00)	7,279,894,000.00
	990030 ... Long Position Off Balance Sheet Not Include Options Item	820,000,000.00	1,800,000,000.00	2,815,000,000.00	15,260,600,000.00
	990031 ... Short Position Off Balance Sheet Not Include Options Item	820,000,000.00	1,800,000,000.00	3,405,700,000.00	7,980,706,000.00
	990032 ... Net Position Off Balance Sheet Include Options Item	-	-	-	-
	990033 ... Long Position Off Balance Sheet Include Options Item				
	990034 ... Short Position Off Balance Sheet Include Options Item				
	990035 ... Estimate Net Interest Income 1 yr				

100					
116002					
2006-06-30					
	THB	THB	THB	THB	THB
	439007 (> 1 - 2 Year)	439008 (> 2 - 3 Year)	439009 (> 3 - 4 Year)	439010 (> 4 - 5 Year)	439011 (> 5 - 7 Year)
990001 ... Assets Items	1,503,847,000.52	1,841,641,630.03	44,463,754.97	16,196,230.23	68,987,709.91
990002 ... Due from financial institutions and money market	-	101,406,300.88	-	-	-
990003 ... Rate Sensitive Items	-	101,406,300.88	-	-	-
990004 ... Non Rate Sensitive Items					
990005 ... Securities bought under resale agreement					
990006 ... Investments (net)	723,385,981.60	1,715,458,671.51	32,558,211.76	16,196,230.23	68,987,709.91
990007 ... Rate Sensitive Investments	723,385,981.60	1,715,458,671.51	32,558,211.76	16,196,230.23	68,987,709.91
990008 ... Non Rate Sensitive Investments					
990009 ... Loans	780,461,018.92	24,776,657.64	11,905,543.21	-	-
990010 ... Pass & Special Mention	780,461,018.92	24,776,657.64	11,905,543.21	-	-
990011 ... NPL	-	-	-	-	-
990012 ... Rate Sensitive NPL					
990013 ... Non Rate Sensitive NPL					
990014 ... Others Assets	-	-	-	-	-
990015 ... Rate Sensitive Others Assets					
990016 ... Non Rate Sensitive Others Assets					
990017 ... Liabilities Items	2,948,801,745.76	624,347,115.32	283,150,768.85	1,031,440.72	-
990018 ... Deposit	2,948,801,745.76	624,347,115.32	283,150,768.85	1,031,440.72	-
990019 ... Rate Sensitive Deposit	2,948,801,745.76	624,347,115.32	283,150,768.85	1,031,440.72	-
990020 ... Non Rate Sensitive Deposit					
990021 ... Due from financial institutions and money market	-	-	-	-	-
990022 ... Rate Sensitive Items					
990023 ... Non Rate Sensitive Items					
990024 ... Securities sold under repurchase agreement					
990025 ... Borrowing	-	-	-	-	-
990026 ... Other Liabilities	-	-	-	-	-
990027 ... Rate Sensitive Other Liabilities					
990028 ... Non Rate Sensitive Other Liabilities					
990029 ... Net Position Off Balance Sheet Not Include Options Item	55,834,500,000.00	15,204,390,000.00	24,814,500,000.00	-	-
990030 ... Long Position Off Balance Sheet Not Include Options Item	65,834,500,000.00	18,183,350,000.00	28,414,500,000.00	500,000,000.00	-
990031 ... Short Position Off Balance Sheet Not Include Options Item	10,000,000,000.00	2,978,960,000.00	3,600,000,000.00	500,000,000.00	-
990032 ... Net Position Off Balance Sheet Include Options Item	-	-	-	-	-
990033 ... Long Position Off Balance Sheet Include Options Item					
990034 ... Short Position Off Balance Sheet Include Options Item					
990035 ... Estimate Net Interest Income 1 yr					

100					
116002					
2006-06-30					
	THB	THB	THB	THB	USD
	439012 (> 7 - 10 Year)	439013 (> 10 - 15 Year)	439014 (> 15 - 20 Year)	439015 (> 20 Year)	439002 (0 - 1 Month)
990001 ... Assets Items	104,591,994.64	402,649,305.15	-	722,633,567.89	2,430,139,787.44
990002 ... Due from financial institutions and money market	-	-	-	-	1,362,831,098.73
990003 ... Rate Sensitive Items	-	-	-	-	
990004 ... Non Rate Sensitive Items					1,362,831,098.73
990005 ... Securities bought under resale agreement					
990006 ... Investments (net)	104,591,994.64	402,649,305.15	-	-	15,172,348.00
990007 ... Rate Sensitive Investments	104,591,994.64	402,649,305.15	-	-	-
990008 ... Non Rate Sensitive Investments					15,172,348.00
990009 ... Loans	-	-	-	722,633,567.89	1,009,778,471.71
990010 ... Pass & Special Mention	-	-	-	722,633,567.89	1,009,505,941.72
990011 ... NPL	-	-	-	-	272,529.99
990012 ... Rate Sensitive NPL					
990013 ... Non Rate Sensitive NPL					272,529.99
990014 ... Others Assets	-	-	-	-	42,357,869.00
990015 ... Rate Sensitive Others Assets					
990016 ... Non Rate Sensitive Others Assets					42,357,869.00
990017 ... Liabilities Items	-	-	-	-	1,403,751,677.11
990018 ... Deposit	-	-	-	-	1,383,948,706.99
990019 ... Rate Sensitive Deposit	-	-	-	-	1,383,948,706.99
990020 ... Non Rate Sensitive Deposit					
990021 ... Due from financial institutions and money market	-	-	-	-	-
990022 ... Rate Sensitive Items					
990023 ... Non Rate Sensitive Items					
990024 ... Securities sold under repurchase agreement					
990025 ... Borrowing	-	-	-	-	19,802,970.12
990026 ... Other Liabilities	-	-	-	-	-
990027 ... Rate Sensitive Other Liabilities					
990028 ... Non Rate Sensitive Other Liabilities					-
990029 ... Net Position Off Balance Sheet Not Include Options Item	-	-	-	-	-
990030 ... Long Position Off Balance Sheet Not Include Options Item	-	-	-	-	-
990031 ... Short Position Off Balance Sheet Not Include Options Item	-	-	-	-	-
990032 ... Net Position Off Balance Sheet Include Options Item	-	-	-	-	-
990033 ... Long Position Off Balance Sheet Include Options Item					
990034 ... Short Position Off Balance Sheet Include Options Item					
990035 ... Estimate Net Interest Income 1 yr					

100					
116002					
2006-06-30					
	USD	USD	USD	USD	USD
	439003 (> 1 - 3 Month)	439004 (> 3 - 6 Month)	439005 (> 6 - 12 Month)	439007 (> 1 - 2 Year)	439008 (> 2 - 3 Year)
990001 ... Assets Items	1,054,688,703.50	803,890,507.17	567,271,481.18	-	-
990002 ... Due from financial institutions and money market	-	-	-	-	-
990003 ... Rate Sensitive Items					
990004 ... Non Rate Sensitive Items					
990005 ... Securities bought under resale agreement					
990006 ... Investments (net)	-	-	567,237,457.25	-	-
990007 ... Rate Sensitive Investments	-	-	567,237,457.25	-	-
990008 ... Non Rate Sensitive Investments					
990009 ... Loans	1,054,688,703.50	803,890,507.17	34,023.93	-	-
990010 ... Pass & Special Mention	1,054,688,703.50	803,890,507.17	34,023.93	-	-
990011 ... NPL	-	-	-	-	-
990012 ... Rate Sensitive NPL					
990013 ... Non Rate Sensitive NPL					
990014 ... Others Assets	-	-	-	-	-
990015 ... Rate Sensitive Others Assets					
990016 ... Non Rate Sensitive Others Assets					
990017 ... Liabilities Items	166,329,546.15	41,196,808.44	4,180,293.71	-	-
990018 ... Deposit	103,259,240.08	41,196,808.44	4,180,293.71	-	-
990019 ... Rate Sensitive Deposit	103,259,240.08	41,196,808.44	4,180,293.71	-	-
990020 ... Non Rate Sensitive Deposit					
990021 ... Due from financial institutions and money market	-	-	-	-	-
990022 ... Rate Sensitive Items					
990023 ... Non Rate Sensitive Items					
990024 ... Securities sold under repurchase agreement					
990025 ... Borrowing	63,070,306.07	-	-	-	-
990026 ... Other Liabilities	-	-	-	-	-
990027 ... Rate Sensitive Other Liabilities					
990028 ... Non Rate Sensitive Other Liabilities					
990029 ... Net Position Off Balance Sheet Not Include Options Item	-	488,446,665.87	171,047,925.00	-	(305,784,000.00)
990030 ... Long Position Off Balance Sheet Not Include Options Item	305,784,000.00	1,835,258,265.87	2,149,088,175.00	-	152,892,000.00
990031 ... Short Position Off Balance Sheet Not Include Options Item	305,784,000.00	1,346,811,600.00	1,978,040,250.00	-	458,676,000.00
990032 ... Net Position Off Balance Sheet Include Options Item	-	-	-	-	-
990033 ... Long Position Off Balance Sheet Include Options Item					
990034 ... Short Position Off Balance Sheet Include Options Item					
990035 ... Estimate Net Interest Income 1 yr					

100					
116002					
2006-06-30					
	USD	USD	USD	USD	USD
	439009 (> 3 - 4 Year)	439010 (> 4 - 5 Year)	439011 (> 5 - 7 Year)	439012 (> 7 - 10 Year)	439013 (> 10 - 15 Year)
990001 ... Assets Items	138,851.23	96,255.51	247,514.18	247,514.18	-
990002 ... Due from financial institutions and money market	-	-	-	-	-
990003 ... Rate Sensitive Items					
990004 ... Non Rate Sensitive Items					
990005 ... Securities bought under resale agreement					
990006 ... Investments (net)	-	-	-	-	-
990007 ... Rate Sensitive Investments	-	-	-	-	-
990008 ... Non Rate Sensitive Investments					
990009 ... Loans	138,851.23	96,255.51	247,514.18	247,514.18	-
990010 ... Pass & Special Mention	138,851.23	96,255.51	247,514.18	247,514.18	-
990011 ... NPL	-	-	-	-	-
990012 ... Rate Sensitive NPL					
990013 ... Non Rate Sensitive NPL					
990014 ... Others Assets	-	-	-	-	-
990015 ... Rate Sensitive Others Assets					
990016 ... Non Rate Sensitive Others Assets					
990017 ... Liabilities Items	-	-	-	-	-
990018 ... Deposit	-	-	-	-	-
990019 ... Rate Sensitive Deposit	-	-	-	-	-
990020 ... Non Rate Sensitive Deposit					
990021 ... Due from financial institutions and money market	-	-	-	-	-
990022 ... Rate Sensitive Items					
990023 ... Non Rate Sensitive Items					
990024 ... Securities sold under repurchase agreement					
990025 ... Borrowing	-	-	-	-	-
990026 ... Other Liabilities	-	-	-	-	-
990027 ... Rate Sensitive Other Liabilities					
990028 ... Non Rate Sensitive Other Liabilities					
990029 ... Net Position Off Balance Sheet Not Include Options Item	(573,345,000.00)	-	-	-	-
990030 ... Long Position Off Balance Sheet Not Include Options Item	-	-	-	-	-
990031 ... Short Position Off Balance Sheet Not Include Options Item	573,345,000.00	-	-	-	-
990032 ... Net Position Off Balance Sheet Include Options Item	-	-	-	-	-
990033 ... Long Position Off Balance Sheet Include Options Item					
990034 ... Short Position Off Balance Sheet Include Options Item					
990035 ... Estimate Net Interest Income 1 yr					

Organization Id	200
FI Reporting Group Id	116002
Data Set Date	2006-06-30

Arrangement Type	Lending Business Type	NPL Flag	Movement Type	Movement Amount
018003	241007	0	202032	32,589.92
018003	241007	0	202037	32,589.92
018003	241021	0	202032	814.02
018003	241021	0	202036	495.65
018003	241021	0	202037	318.37
018003	241026	0	202004	85,079.00
018003	241026	0	202022	20.55
018003	241026	0	202032	39,299,902.05
018003	241026	0	202034	20.55
018003	241026	0	202035	2,858,631.93
018003	241026	0	202036	16,084,583.35
018003	241026	0	202037	26,073,971.18
018003	241026	0	202051	18,792.90
018003	C111000	0	202022	102,980,642.08
018003	C111000	0	202034	102,980,642.08
018003	C111000	0	202037	102,980,642.08
018003	C142900	0	202032	20,000,000.00
018003	C142900	0	202036	5,000,000.00
018003	C142900	0	202037	15,000,000.00
018003	D151200	0	202032	2,000,000.00
018003	D151200	0	202037	2,000,000.00
018003	D151400	0	202032	8,000,000.00
018003	D151400	0	202037	8,000,000.00
018003	D152000	0	202032	38,000,000.00
018003	D152000	0	202037	38,000,000.00
018003	D154200	0	202035	30,000,000.00
018003	D154200	0	202037	30,000,000.00
018003	D154300	0	202032	16,000,000.00
018003	D154300	0	202037	16,000,000.00
018003	D155100	0	202032	33,000,000.00
018003	D155100	0	202037	33,000,000.00
018003	D155300	0	202032	2,000,000.00
018003	D155300	0	202037	2,000,000.00
018003	D155400	0	202032	38,000,000.00
018003	D155400	0	202037	38,000,000.00
018003	D172300	0	202032	2,737,671.29
018003	D172300	0	202036	275,733.52
018003	D172300	0	202037	2,461,937.77
018003	D172300	1	202004	275,733.52
018003	D181000	0	202004	853,134.07
018003	D181000	0	202032	48,200,000.00
018003	D181000	0	202037	48,200,000.00
018003	D181000	0	202051	1,059.05
018003	D192000	0	202032	4,898,558.60
018003	D192000	0	202037	4,898,558.60
018003	D202900	0	202022	29,256,045.55
018003	D202900	0	202032	4,500,000.00
018003	D202900	0	202034	30,000,000.00
018003	D202900	0	202037	34,500,000.00
018003	D210200	0	202032	30,000,000.00
018003	D210200	0	202037	30,000,000.00
018003	D233000	0	202032	5,000,000.00
018003	D233000	0	202037	5,000,000.00
018003	D241100	0	202004	451.61
018003	D241100	0	202032	451.61
018003	D241100	0	202035	10,000,000.00
018003	D241100	0	202036	451.61
018003	D241100	0	202037	10,000,000.00
018003	D241300	0	202032	66,300,170.64
018003	D241300	0	202036	6,300,170.64
018003	D241300	0	202037	60,000,000.00
018003	D241300	1	202047	6,300,170.64
018003	D242300	0	202004	1,468.09
018003	D242300	0	202032	13,000,000.00
018003	D242300	0	202035	27,000,000.00
018003	D242300	0	202037	40,000,000.00

Arrangement Type	Lending Business Type	NPL Flag	Movement Type	Movement Amount
018003	D242400	0	202032	30,000,000.00
018003	D242400	0	202037	30,000,000.00
018003	D242900	0	202032	72,000,000.00
018003	D242900	0	202035	2,000,000.00
018003	D242900	0	202036	15,000,000.00
018003	D242900	0	202037	59,000,000.00
018003	D242900	0	202051	5,750,610.14
018003	D251900	0	202004	7,820,144.43
018003	D251900	0	202032	30,000,000.00
018003	D251900	0	202037	30,000,000.00
018003	D252000	0	202032	98,000,000.00
018003	D252000	0	202035	9,561,444.60
018003	D252000	0	202037	107,561,444.60
018003	D252000	0	202051	9,189,769.44
018003	D261000	0	202032	20,000,000.00
018003	D261000	0	202037	20,000,000.00
018003	D269200	0	202004	120,390.41
018003	D269200	0	202032	120,390.41
018003	D269200	0	202036	120,390.41
018003	D269500	0	202004	5,130,493.84
018003	D269500	0	202032	44,456,200.00
018003	D269500	0	202035	2,671,400.00
018003	D269500	0	202037	47,127,600.00
018003	D269900	0	202032	60,000,000.00
018003	D269900	0	202037	60,000,000.00
018003	D272000	0	202034	10,000,000.00
018003	D272000	0	202037	10,000,000.00
018003	D292300	0	202022	18,654,268.63
018003	D292300	0	202034	20,000,000.00
018003	D292300	0	202037	20,000,000.00
018003	D292400	0	202032	20,000,000.00
018003	D292400	0	202037	20,000,000.00
018003	D292400	0	202051	11,767,689.74
018003	D292600	0	202032	10,000,000.00
018003	D292600	0	202037	10,000,000.00
018003	D312000	0	202032	2,300,000.00
018003	D312000	0	202037	2,300,000.00
018003	D312000	0	202051	169,133.18
018003	D319000	0	202004	1,909.29
018003	D319000	0	202032	40,005,000.00
018003	D319000	0	202036	5,000.00
018003	D319000	0	202037	40,000,000.00
018003	D319000	0	202051	3,024,823.06
018003	D331200	0	202035	28,500,000.00
018003	D331200	0	202037	28,500,000.00
018003	D341000	0	202004	404,341.72
018003	D341000	0	202032	42,000,000.00
018003	D341000	0	202036	4,000,000.00
018003	D341000	0	202037	38,000,000.00
018003	D343000	0	202032	60,000,000.00
018003	D343000	0	202037	60,000,000.00
018003	D353000	0	202032	950.00
018003	D353000	0	202035	2,904.82
018003	D353000	0	202037	3,854.82
018003	D353000	0	202051	2,904.82
018003	D369900	0	202032	3,000,000.00
018003	D369900	0	202037	3,000,000.00
018003	F452013	0	202004	63,157.47
018003	F452013	0	202032	63,157.47
018003	F452013	0	202036	63,157.47
018003	G501000	0	202032	36,000,000.00
018003	G501000	0	202036	2,000,000.00
018003	G501000	0	202037	34,000,000.00
018003	G503000	0	202032	30,000,000.00
018003	G503000	0	202037	30,000,000.00
018003	G512100	0	202032	30,351,141.28
018003	G512100	0	202036	10,000,000.00
018003	G512100	0	202037	20,351,141.28
018003	G512200	0	202032	25,985,235.72
018003	G512200	0	202037	25,985,235.72

Arrangement Type	Lending Business Type	NPL Flag	Movement Type	Movement Amount
018003	G512200	0	202051	193,001.36
018003	G512300	0	202032	34,000,000.00
018003	G512300	0	202037	34,000,000.00
018003	G513100	0	202032	96,500,000.00
018003	G513100	0	202035	8,002,828.85
018003	G513100	0	202037	104,502,828.85
018003	G513100	0	202051	2,707,026.01
018003	G513900	0	202004	4,157,366.21
018003	G513900	0	202032	180,000,000.00
018003	G513900	0	202035	5,100,000.00
018003	G513900	0	202036	35,000,000.00
018003	G513900	0	202037	150,100,000.00
018003	G513900	0	202051	1,010.00
018003	G514200	0	202032	10,000,000.00
018003	G514200	0	202037	10,000,000.00
018003	G514300	0	202032	50,000,000.00
018003	G514300	0	202035	8,000,000.00
018003	G514300	0	202037	58,000,000.00
018003	G514300	0	202051	3,179,728.76
018003	G514900	0	202032	35,000,000.00
018003	G514900	0	202037	35,000,000.00
018003	G515000	0	202032	280,500,000.00
018003	G515000	0	202035	8,000,000.00
018003	G515000	0	202037	288,500,000.00
018003	G515000	0	202051	890,141.03
018003	G519000	0	202022	278,174.40
018003	G519000	0	202032	35,516,749.02
018003	G519000	0	202035	8,000,000.00
018003	G519000	0	202037	43,516,749.02
018003	G521900	0	202032	30,000,000.00
018003	G521900	0	202037	30,000,000.00
018003	G522000	0	202032	5,500,000.00
018003	G522000	0	202037	5,500,000.00
018003	G523200	0	202032	10,000,000.00
018003	G523200	0	202037	10,000,000.00
018003	G523300	0	202032	67,000,000.00
018003	G523300	0	202037	67,000,000.00
018003	G523900	0	202032	25,000,000.00
018003	G523900	0	202034	5,000,000.00
018003	G523900	0	202036	5,000,000.00
018003	G523900	0	202037	25,000,000.00
018003	I621000	0	202032	30,000,000.00
018003	I621000	0	202037	30,000,000.00
018003	I630900	0	202032	30,000,000.00
018003	I630900	0	202037	30,000,000.00
018003	I642000	0	202032	60,000,000.00
018003	I642000	0	202035	8,000,000.00
018003	I642000	0	202037	68,000,000.00
018003	J651911	0	202032	30,000,000.00
018003	J651911	0	202037	30,000,000.00
018003	J659102	0	202032	36,000,000.00
018003	J659102	0	202036	2,000,000.00
018003	J659102	0	202037	34,000,000.00
018003	J659103	0	202032	624.50
018003	J659103	0	202035	1,532.17
018003	J659103	0	202037	2,156.67
018003	J659103	0	202051	1,532.17
018003	J659104	0	202022	200.00
018003	J659104	0	202032	30,000,000.00
018003	J659104	0	202034	200.00
018003	J659104	0	202035	11,821,995.34
018003	J659104	0	202037	41,822,195.34
018003	J659104	0	202051	11,821,995.34
018003	J659250	0	202032	30,000,000.00
018003	J659250	0	202037	30,000,000.00
018003	J659991	0	202032	65,000,000.00
018003	J659991	0	202037	65,000,000.00
018003	J659991	0	202051	1.01
018003	J660100	0	202032	5,000,000.00
018003	J660100	0	202036	5,000,000.00

Arrangement Type	Lending Business Type	NPL Flag	Movement Type	Movement Amount
018003	J660300	0	202035	225.00
018003	J660300	0	202037	225.00
018003	J660300	0	202051	225.00
018003	K701014	0	202035	600.00
018003	K701014	0	202037	600.00
018003	K701014	0	202051	600.00
018003	K701015	0	202004	1,365,944.34
018003	K701015	0	202032	32,000,000.00
018003	K701015	0	202036	2,000,000.00
018003	K701015	0	202037	30,000,000.00
018003	K742100	0	202032	66,000,000.00
018003	K742100	0	202035	10,000,000.00
018003	K742100	0	202036	12,000,000.00
018003	K742100	0	202037	64,000,000.00
018003	K742100	0	202051	1,311,618.33
018003	K743000	0	202035	1,000,000.00
018003	K743000	0	202037	1,000,000.00
018003	K743000	0	202051	550,516.85
018003	K749900	0	202035	8,000,000.00
018003	K749900	0	202037	8,000,000.00
018003	O921200	0	202034	15,000,000.00
018003	O921200	0	202037	15,000,000.00
018012	241007	0	202032	1,040,000.00
018012	241007	0	202037	1,040,000.00
018022	241007	0	202032	190,000.00
018022	241007	0	202037	190,000.00
018022	241021	0	202004	416,459.00
018022	241021	0	202032	4,021,600.00
018022	241021	0	202036	790,000.00
018022	241021	0	202037	3,231,600.00
018022	241026	0	202004	149,707,371.94
018022	241026	0	202022	100,000.00
018022	241026	0	202032	737,082,050.00
018022	241026	0	202034	100,000.00
018022	241026	0	202035	557,600.00
018022	241026	0	202036	637,800,000.00
018022	241026	0	202037	99,939,650.00
018022	241026	0	202051	633,947.81
018022	C142900	0	202004	5,000,000.00
018022	C142900	0	202032	37,666,312.36
018022	C142900	0	202035	862,827.64
018022	C142900	0	202037	38,529,140.00
018022	C142900	0	202051	5,000,000.00
018022	D151400	0	202032	20,500,000.00
018022	D151400	0	202035	139,600,000.00
018022	D151400	0	202037	160,100,000.00
018022	D152000	0	202032	80,500,000.00
018022	D152000	0	202035	139,600,000.00
018022	D152000	0	202037	220,100,000.00
018022	D153300	0	202032	50,000,000.00
018022	D153300	0	202037	50,000,000.00
018022	D154100	0	202022	15,000,000.00
018022	D154100	0	202032	50,000,000.00
018022	D154100	0	202037	50,000,000.00
018022	D154200	0	202032	1,000,000,000.00
018022	D154200	0	202036	30,000,000.00
018022	D154200	0	202037	970,000,000.00
018022	D154200	0	202051	50,000,000.00
018022	D154300	0	202004	800,000,000.00
018022	D154300	0	202032	820,500,000.00
018022	D154300	0	202035	139,600,000.00
018022	D154300	0	202036	639,900,000.00
018022	D154300	0	202037	320,200,000.00
018022	D155100	0	202032	19,000,000.00
018022	D155100	0	202037	19,000,000.00
018022	D155400	0	202032	200,000,000.00
018022	D155400	0	202035	140,100,000.00
018022	D155400	0	202037	340,100,000.00
018022	D172200	0	202032	500,000,000.00
018022	D172200	0	202037	500,000,000.00

Arrangement Type	Lending Business Type	NPL Flag	Movement Type	Movement Amount
018022	D172300	0	202032	48,627,878.12
018022	D172300	0	202037	48,627,878.12
018022	D172300	1	202019	774,788.17
018022	D181000	0	202032	132,382,087.00
018022	D181000	0	202036	10,000,000.00
018022	D181000	0	202037	122,382,087.00
018022	D201000	0	202032	90,000,000.00
018022	D201000	0	202037	90,000,000.00
018022	D202100	0	202004	130,000,000.00
018022	D202100	0	202032	600,000,000.00
018022	D202100	0	202037	600,000,000.00
018022	D202100	0	202051	115,000,000.00
018022	D202900	0	202032	10,000,000.00
018022	D202900	0	202037	10,000,000.00
018022	D210200	0	202004	105,700,000.00
018022	D210200	0	202032	250,000,000.00
018022	D210200	0	202036	5,000,000.00
018022	D210200	0	202037	245,000,000.00
018022	D210200	0	202051	79,900,000.00
018022	D232000	0	202004	400,000,000.00
018022	D232000	0	202032	408,726,750.16
018022	D232000	0	202036	93,726,750.16
018022	D232000	0	202037	315,000,000.00
018022	D232000	0	202051	300,000,000.00
018022	D233000	0	202032	10,000,000.00
018022	D233000	0	202037	10,000,000.00
018022	D241100	0	202032	30,000,000.00
018022	D241100	0	202036	10,000,000.00
018022	D241100	0	202037	20,000,000.00
018022	D241300	0	202032	105,024,053.48
018022	D241300	0	202035	848,456.65
018022	D241300	0	202036	39,449,660.13
018022	D241300	0	202037	66,422,850.00
018022	D241300	1	202047	34,924,351.55
018022	D242300	0	202004	97,000,000.00
018022	D242300	0	202032	297,000,000.00
018022	D242300	0	202036	27,000,000.00
018022	D242300	0	202037	270,000,000.00
018022	D242400	0	202032	70,000,000.00
018022	D242400	0	202037	70,000,000.00
018022	D242900	0	202004	180,000,000.00
018022	D242900	0	202032	394,920,337.80
018022	D242900	0	202035	14,537,356.12
018022	D242900	0	202036	470,493.92
018022	D242900	0	202037	408,987,200.00
018022	D242900	0	202051	89,500,000.00
018022	D251100	0	202032	14,479,098.87
018022	D251100	0	202037	14,479,098.87
018022	D251900	0	202004	3,975,810.00
018022	D251900	0	202032	121,470,857.45
018022	D251900	0	202036	11,470,857.45
018022	D251900	0	202037	110,000,000.00
018022	D252000	0	202032	771,182,069.07
018022	D252000	0	202035	128,000,000.00
018022	D252000	0	202036	15,182,069.07
018022	D252000	0	202037	884,000,000.00
018022	D252000	0	202051	576,000,000.00
018022	D269200	0	202004	27,000,000.00
018022	D269200	0	202032	27,000,000.00
018022	D269200	0	202036	27,000,000.00
018022	D269500	0	202032	320,000,000.00
018022	D269500	0	202037	320,000,000.00
018022	D269600	0	202032	20,000,000.00
018022	D269600	0	202037	20,000,000.00
018022	D269900	0	202004	85,000,000.00
018022	D269900	0	202032	164,525,102.59
018022	D269900	0	202036	1,362,587.59
018022	D269900	0	202037	163,162,515.00
018022	D273100	0	202032	15,000,000.00
018022	D273100	0	202037	15,000,000.00

Arrangement Type	Lending Business Type	NPL Flag	Movement Type	Movement Amount
018022	D281100	0	202032	250,000,000.00
018022	D281100	0	202037	250,000,000.00
018022	D292300	0	202022	10,000,000.00
018022	D292300	0	202034	20,000,000.00
018022	D292300	0	202037	20,000,000.00
018022	D292600	0	202032	10,000,000.00
018022	D292600	0	202037	10,000,000.00
018022	D292600	0	202051	3,000,000.00
018022	D292900	0	202032	150,000,000.00
018022	D292900	0	202037	150,000,000.00
018022	D293000	0	202022	11,000,000.00
018022	D293000	0	202032	2,000,000.00
018022	D293000	0	202034	11,000,000.00
018022	D293000	0	202037	13,000,000.00
018022	D311000	0	202022	180,000,000.00
018022	D311000	0	202034	500,000,000.00
018022	D311000	0	202037	500,000,000.00
018022	D319000	0	202032	318,500,000.00
018022	D319000	0	202037	318,500,000.00
018022	D321000	0	202022	160,000,000.00
018022	D321000	0	202032	325,000,000.00
018022	D321000	0	202037	325,000,000.00
018022	D322000	0	202032	500,000,000.00
018022	D322000	0	202037	500,000,000.00
018022	D323000	0	202032	30,000,000.00
018022	D323000	0	202037	30,000,000.00
018022	D341000	0	202004	925,000,000.00
018022	D341000	0	202032	1,225,000,000.00
018022	D341000	0	202035	230,000,000.00
018022	D341000	0	202036	455,000,000.00
018022	D341000	0	202037	1,000,000,000.00
018022	D341000	0	202051	575,000,000.00
018022	D343000	0	202032	375,000,000.00
018022	D343000	0	202037	375,000,000.00
018022	D369100	0	202032	600,000,000.00
018022	D369100	0	202037	600,000,000.00
018022	D369900	0	202032	10,000,000.00
018022	D369900	0	202037	10,000,000.00
018022	F452013	0	202004	20,000,000.00
018022	F452013	0	202032	38,000,000.00
018022	F452013	0	202037	38,000,000.00
018022	F452013	0	202051	20,000,000.00
018022	F452015	0	202032	140,000,000.00
018022	F452015	0	202037	140,000,000.00
018022	F452019	0	202032	382,000,000.00
018022	F452019	0	202037	382,000,000.00
018022	F454000	0	202032	30,848,456.65
018022	F454000	0	202036	848,456.65
018022	F454000	0	202037	30,000,000.00
018022	G501000	0	202004	340,000,000.00
018022	G501000	0	202032	1,058,000,000.00
018022	G501000	0	202035	27,000,000.00
018022	G501000	0	202037	1,085,000,000.00
018022	G501000	0	202051	220,000,000.00
018022	G503000	0	202004	230,000,000.00
018022	G503000	0	202032	390,000,000.00
018022	G503000	0	202035	310,000,000.00
018022	G503000	0	202037	700,000,000.00
018022	G503000	0	202051	670,000,000.00
018022	G505000	0	202032	17,500,000.00
018022	G505000	0	202035	395,351,000.00
018022	G505000	0	202037	412,851,000.00
018022	G512100	0	202032	20,000,000.00
018022	G512100	0	202035	10,000,000.00
018022	G512100	0	202037	30,000,000.00
018022	G512100	0	202051	10,000,000.00
018022	G512200	0	202004	13,000,000.00
018022	G512200	0	202032	134,981,875.61
018022	G512200	0	202037	134,981,875.61
018022	G512200	0	202051	13,000,000.00

Arrangement Type	Lending Business Type	NPL Flag	Movement Type	Movement Amount
018022	G512300	0	202004	10,000,000.00
018022	G512300	0	202032	85,000,000.00
018022	G512300	0	202037	85,000,000.00
018022	G513100	0	202004	103,000,000.00
018022	G513100	0	202032	582,500,000.00
018022	G513100	0	202035	52,000,000.00
018022	G513100	0	202037	634,500,000.00
018022	G513100	0	202051	73,500,000.00
018022	G513900	0	202004	463,532,900.00
018022	G513900	0	202032	1,483,992,409.32
018022	G513900	0	202035	46,470,200.00
018022	G513900	0	202036	171,887,109.32
018022	G513900	0	202037	1,358,575,500.00
018022	G513900	0	202051	343,000,000.00
018022	G513900	1	202055	50,000,000.00
018022	G514200	0	202004	125,000,000.00
018022	G514200	0	202032	165,000,000.00
018022	G514200	0	202035	325,000,000.00
018022	G514200	0	202037	490,000,000.00
018022	G514200	0	202051	287,000,000.00
018022	G514300	0	202004	12,000,000.00
018022	G514300	0	202032	96,000,000.00
018022	G514300	0	202036	38,000,000.00
018022	G514300	0	202037	58,000,000.00
018022	G514300	0	202051	10,000,000.00
018022	G514900	0	202032	120,000,000.00
018022	G514900	0	202037	120,000,000.00
018022	G515000	0	202004	168,828,435.64
018022	G515000	0	202019	2,603,240,000.00
018022	G515000	0	202032	3,895,885,993.92
018022	G515000	0	202035	14,000,000.00
018022	G515000	0	202036	2,736,710,493.92
018022	G515000	0	202037	1,173,175,500.00
018022	G515000	0	202051	67,500,000.00
018022	G519000	0	202032	578,000,000.00
018022	G519000	0	202035	5,000,000.00
018022	G519000	0	202037	583,000,000.00
018022	G519000	0	202051	9,500,000.00
018022	G521900	0	202032	267,303,750.00
018022	G521900	0	202036	1,732,250.00
018022	G521900	0	202037	265,571,500.00
018022	G521900	1	202044	1,732,250.00
018022	G523100	0	202004	10,000,000.00
018022	G523100	0	202032	38,851,040.00
018022	G523100	0	202037	38,851,040.00
018022	G523100	0	202051	10,000,000.00
018022	G523200	0	202032	110,000,000.00
018022	G523200	0	202037	110,000,000.00
018022	G523300	0	202032	360,000,000.00
018022	G523300	0	202037	360,000,000.00
018022	G523900	0	202022	15,000,000.00
018022	G523900	0	202032	15,000,000.00
018022	G523900	0	202034	88,000,000.00
018022	G523900	0	202036	15,000,000.00
018022	G523900	0	202037	88,000,000.00
018022	H551000	0	202034	8,500,000.00
018022	H551000	0	202037	8,500,000.00
018022	I612000	0	202032	100,000,000.00
018022	I612000	0	202037	100,000,000.00
018022	I630100	0	202032	16,000,000.00
018022	I630100	0	202036	16,000,000.00
018022	I630900	0	202004	75,000,000.00
018022	I630900	0	202032	163,000,000.00
018022	I630900	0	202037	163,000,000.00
018022	I630900	0	202051	120,000,000.00
018022	I642000	0	202004	76,700,000.00
018022	I642000	0	202032	376,000,000.00
018022	I642000	0	202036	6,000,000.00
018022	I642000	0	202037	370,000,000.00
018022	I642000	0	202051	50,000,000.00

Arrangement Type	Lending Business Type	NPL Flag	Movement Type	Movement Amount
018022	J651911	0	202029	11,014,993.30
018022	J651911	0	202032	1,822,162,932.68
018022	J651911	0	202037	1,822,162,932.67
018022	J651913	0	202004	4,272,873,000.00
018022	J651913	0	202032	4,205,861,000.00
018022	J651913	0	202036	4,205,861,000.00
018022	J659102	0	202004	220,000,000.00
018022	J659102	0	202032	2,151,000,000.00
018022	J659102	0	202037	2,151,000,000.00
018022	J659102	0	202051	220,000,000.00
018022	J659104	0	202004	70,000,000.00
018022	J659104	0	202032	518,366,284.61
018022	J659104	0	202035	495,732,625.00
018022	J659104	0	202036	518,366,284.61
018022	J659104	0	202037	495,732,625.00
018022	J659250	0	202032	352,821,493.92
018022	J659250	0	202036	470,493.92
018022	J659250	0	202037	352,351,000.00
018022	J659991	0	202004	66,000,000.00
018022	J659991	0	202029	3,735,952.90
018022	J659991	0	202032	547,155,806.80
018022	J659991	0	202036	470,493.80
018022	J659991	0	202037	546,685,313.00
018022	J659991	0	202051	58,422,251.40
018022	J671201	0	202032	200,000,000.00
018022	J671201	0	202037	200,000,000.00
018022	K701013	0	202032	3,500,000.00
018022	K701013	0	202037	3,500,000.00
018022	K701014	0	202004	226,266,986.68
018022	K701014	0	202032	512,793,875.00
018022	K701014	0	202035	390,000,000.00
018022	K701014	0	202037	902,793,875.00
018022	K701014	0	202051	579,600,000.00
018022	K701015	0	202004	157,525,896.71
018022	K701015	0	202032	292,736,666.08
018022	K701015	0	202036	112,736,666.08
018022	K701015	0	202037	180,000,000.00
018022	K701017	0	202032	48,000,000.00
018022	K701017	0	202037	48,000,000.00
018022	K701018	0	202032	120,000,000.00
018022	K701018	0	202037	120,000,000.00
018022	K701040	0	202004	500,000.00
018022	K701040	0	202032	341,280,910.00
018022	K701040	0	202035	187,351,990.00
018022	K701040	0	202037	528,632,900.00
018022	K701040	0	202051	33,000,000.00
018022	K712900	0	202032	34,411,590.00
018022	K712900	0	202037	34,411,590.00
018022	K741100	0	202004	10,000,000.00
018022	K741100	0	202032	187,500,000.00
018022	K741100	0	202037	187,500,000.00
018022	K742100	0	202004	25,000,000.00
018022	K742100	0	202032	180,000,000.00
018022	K742100	0	202035	10,000,000.00
018022	K742100	0	202036	55,000,000.00
018022	K742100	0	202037	135,000,000.00
018022	K742100	0	202051	35,000,000.00
018022	K743000	0	202032	100,000,000.00
018022	K743000	0	202036	1,000,000.00
018022	K743000	0	202037	99,000,000.00
018022	K743000	0	202051	17,250,000.00
018022	K749900	0	202032	135,000,000.00
018022	K749900	0	202035	15,000,000.00
018022	K749900	0	202036	16,000,000.00
018022	K749900	0	202037	134,000,000.00
018022	O921200	0	202022	35,000,000.00
018022	O921200	0	202034	35,000,000.00
018022	O921200	0	202037	35,000,000.00
018026	241026	0	202004	109,380.86
018026	241026	0	202032	120,235.78

Arrangement Type	Lending Business Type	NPL Flag	Movement Type	Movement Amount
018026	241026	0	202036	112,316.91
018026	241026	0	202037	7,918.87
018026	D242900	0	202004	7,544.00
018026	D242900	0	202032	1,968,633.92
018026	D242900	0	202036	1,968,633.92
018026	G514300	0	202032	9,000,000.00
018026	G514300	0	202037	9,000,000.00
018026	G515000	0	202032	25,000,000.00
018026	G515000	0	202036	5,000,000.00
018026	G515000	0	202037	20,000,000.00
018026	G515000	0	202051	6,971,457.10
018026	J659102	0	202032	18,800,000.00
018026	J659102	0	202037	18,800,000.00
018026	J659102	0	202051	705,723.22
018029	D261000	0	202032	80,000,000.00
018029	D261000	0	202037	80,000,000.00
018029	G512100	0	202004	39,695,147.01
018029	G512100	0	202032	222,858,270.89
018029	G512100	0	202035	110,000,000.00
018029	G512100	0	202037	332,858,270.89
018029	G512100	0	202051	296,184,102.36
018029	G512100	1	202019	443,865.94
018029	G512200	0	202032	112,318,436.41
018029	G512200	0	202036	9,000,000.00
018029	G512200	0	202037	103,318,436.41
018029	G512200	1	202019	291,867.72
018029	G514300	0	202004	8,913,523.17
018029	G514300	0	202032	20,000,000.00
018029	G514300	0	202037	20,000,000.00
018029	G514300	0	202051	12,785,935.88
018029	G519000	0	202032	182,114,250.00
018029	G519000	0	202037	182,114,250.00
018030	D151200	0	202004	183,419,000.00
018030	D151200	0	202032	298,000,000.00
018030	D151200	0	202036	100,000,000.00
018030	D151200	0	202037	198,000,000.00
018030	D151200	0	202051	50,000,000.00
018030	D210100	0	202032	72,845,700.00
018030	D210100	0	202037	72,845,700.00
018030	G515000	0	202004	2,899,724.72
018030	G515000	0	202032	15,000,000.00
018030	G515000	0	202037	15,000,000.00
018030	G515000	0	202051	2,764,737.52
018030	J651911	0	202004	1,092,373.07
018030	J651911	0	202032	1,092,373.07
018030	J651911	0	202035	12,929,242.56
018030	J651911	0	202036	823,732.85
018030	J651911	0	202037	13,197,882.78
018030	J651911	0	202051	13,197,882.78
018030	J651916	0	202004	771,041,826.74
018030	J651916	0	202022	133,496,696.95
018030	J651916	0	202032	745,139,719.30
018030	J651916	0	202034	133,496,696.95
018030	J651916	0	202035	107,306,075.74
018030	J651916	0	202036	575,218,193.66
018030	J651916	0	202037	410,724,298.33
018030	J651916	0	202051	277,227,601.38

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Arrangement Type	Lending Business Type	NPL Flag	Movement Type	Movement Amount
018012	241003	0	202004	329,568.58
018012	241007	0	202004	44,817.43
018012	241008	0	202004	298,099.50
018012	241010	0	202004	344,455.88
018012	241011	0	202004	159,343.72
018012	241015	0	202004	14,473.58
018012	K701011	0	202004	214,009.33
018012	K701012	0	202004	444,899.03
018012	K701040	0	202004	254,919.21
018022	241004	0	202004	107,766.00
018022	241026	0	202004	136,299.15
018022	241026	1	202004	120,452.26
018022	A011200	0	202004	33,337.46
018022	D171100	0	202004	127,508.72
018022	D369100	0	202004	661,088.98
018022	F454000	0	202004	923,872.95
018022	G501000	0	202004	16,350,382.64
018022	G502000	0	202004	68,389.66
018022	G505000	0	202004	999.28
018022	G513100	0	202004	15,995.12
018022	G514100	0	202004	81,365.13
018022	G521100	0	202004	6,529.71
018022	H551000	0	202004	58,353.96
018022	I602200	0	202004	5,056.69
018022	K701040	0	202004	9,353.41
018022	K702000	0	202004	588,731.51
018022	K722000	0	202004	14,891.08
018022	K749100	0	202004	261,207.47
018022	K749900	0	202004	84,544.90
018022	N851900	0	202004	73,757.62
018012	241003	0	202044	7,600.16
018012	241007	0	202044	19,223.00
018012	241008	0	202044	12,939.78
018012	241014	0	202044	295,322.36
018012	241015	0	202044	16,511.86
018012	K701013	0	202044	111,297.72
018022	241002	0	202044	16,475.15
018022	241002	1	202044	10,445.66
018022	D273200	0	202044	15,931.08
018022	G513100	0	202044	3,817.30
018012	241007	0	202022	2,753,260.11
018012	241008	0	202022	14,426,088.07
018012	241010	0	202022	2,642,999.22
018012	241014	0	202022	513,840.91
018012	K701014	0	202022	6,000,000.00
018012	K701017	0	202022	26,000,000.00
018022	241026	0	202022	2,586,239.54
018022	D222100	0	202022	6,288,376.30
018022	D369900	0	202022	965,221.28
018022	F454000	0	202022	8,260,509.19
018022	G521100	0	202022	228,556.83
018022	H551000	0	202022	3,851,400.00
018022	H552000	0	202022	1,024,683.66
018022	K701040	0	202022	17,189,804.10
018022	K742100	0	202022	9,446,044.52
018012	241003	0	202029	345,391.39
018012	K701012	0	202029	6,165,000.00
018022	H552000	0	202029	1,086,495.43
018022	K749900	0	202029	56,879.75
018022	241002	1	202058	123,146.82
018022	K749200	1	202058	136,722.00
018022	241026	1	202060	1,307,011.74
018012	241003	0	202032	4,250,000.00
018012	241007	0	202032	1,200,000.00
018012	241008	0	202032	17,010,000.00
018012	241010	0	202032	710,000.00

Arrangement Type	Lending Business Type	NPL Flag	Movement Type	Movement Amount
018012	241011	0	202032	8,500,000.00
018012	241014	0	202032	17,300,000.00
018012	241015	0	202032	1,570,000.00
018012	K701011	0	202032	5,555,000.00
018012	K701012	0	202032	34,000,000.00
018012	K701013	0	202032	6,000,000.00
018012	K701040	0	202032	5,700,000.00
018022	241002	0	202032	2,270,000.00
018022	241004	0	202032	3,060,000.00
018022	241026	0	202032	8,818,000.00
018022	A011200	0	202032	4,000,000.00
018022	D171100	0	202032	7,500,000.00
018022	D273200	0	202032	400,000.00
018022	D369100	0	202032	10,000,000.00
018022	F454000	0	202032	28,000,000.00
018022	G501000	0	202032	37,000,000.00
018022	G502000	0	202032	2,600,000.00
018022	G505000	0	202032	1,020,000.00
018022	G513100	0	202032	1,170,000.00
018022	G514100	0	202032	3,200,000.00
018022	G521100	0	202032	100,000.00
018022	G522000	0	202032	1,600,000.00
018022	H551000	0	202032	3,000,000.00
018022	H552000	0	202032	3,000,000.00
018022	I602200	0	202032	300,000.00
018022	K701040	0	202032	600,000.00
018022	K722000	0	202032	900,000.00
018022	K749100	0	202032	2,000,000.00
018022	K749200	0	202032	200,000.00
018022	K749900	0	202032	28,200,000.00
018022	N851900	0	202032	5,000,000.00
018012	241007	0	202034	2,780,000.00
018012	241008	0	202034	14,474,000.00
018012	241010	0	202034	2,654,820.00
018012	241014	0	202034	819,000.00
018012	K701014	0	202034	6,000,000.00
018012	K701017	0	202034	29,000,000.00
018022	241026	0	202034	2,600,000.00
018022	D222100	0	202034	6,450,000.00
018022	D369900	0	202034	1,000,000.00
018022	F454000	0	202034	8,700,000.00
018022	G521100	0	202034	234,000.00
018022	H551000	0	202034	25,000,000.00
018022	H552000	0	202034	1,080,000.00
018022	K701040	0	202034	17,500,000.00
018022	K742100	0	202034	9,500,000.00
018012	241015	0	202035	15,980.62
018022	241002	0	202035	26,658.04
018012	241008	0	202036	500,000.00
018012	241010	0	202036	480,000.00
018012	241015	0	202036	114,878.53
018022	241002	0	202036	155,028.79
018022	F454000	0	202036	15,000,000.00
018022	G501000	0	202036	14,000,000.00
018022	G505000	0	202036	1,020,000.00
018022	K702000	0	202036	600,000.00
018022	K749200	0	202036	63,278.00
018012	241003	0	202037	4,520,000.00
018012	241007	0	202037	4,180,000.00
018012	241008	0	202037	30,584,000.00
018012	241010	0	202037	2,884,820.00
018012	241011	0	202037	8,500,000.00
018012	241014	0	202037	18,119,000.00
018012	241015	0	202037	1,471,102.09
018012	K701011	0	202037	5,555,000.00
018012	K701012	0	202037	34,000,000.00
018012	K701013	0	202037	6,000,000.00
018012	K701014	0	202037	6,000,000.00
018012	K701017	0	202037	29,000,000.00
018012	K701040	0	202037	5,000,000.00

Arrangement Type	Lending Business Type	NPL Flag	Movement Type	Movement Amount
018022	241002	0	202037	791,629.25
018022	241004	0	202037	3,940,000.00
018022	241026	0	202037	13,418,000.00
018022	A011200	0	202037	4,000,000.00
018022	D171100	0	202037	7,500,000.00
018022	D222100	0	202037	6,450,000.00
018022	D273200	0	202037	400,000.00
018022	D369100	0	202037	10,000,000.00
018022	D369900	0	202037	1,000,000.00
018022	F454000	0	202037	21,700,000.00
018022	G501000	0	202037	23,000,000.00
018022	G502000	0	202037	2,600,000.00
018022	G513100	0	202037	1,170,000.00
018022	G514100	0	202037	3,200,000.00
018022	G521100	0	202037	334,000.00
018022	H551000	0	202037	28,000,000.00
018022	H552000	0	202037	4,080,000.00
018022	I602200	0	202037	300,000.00
018022	K701040	0	202037	18,800,000.00
018022	K722000	0	202037	900,000.00
018022	K742100	0	202037	9,500,000.00
018022	K749100	0	202037	2,000,000.00
018022	K749200	0	202037	136,722.00
018022	K749900	0	202037	28,200,000.00
018022	N851900	0	202037	5,000,000.00
018022	K702000	0	202032	600,000.00
018022	F454000	1	202004	49,347.09
018026	J651920	0	202022	50,000,000.00
018026	J651920	0	202034	50,000,000.00
018026	J651920	0	202037	50,000,000.00

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Arrangement Type	Involved Party Type	Arrangement Term Range	Remaining Term Range	Repricing Term Range	Arrangement Currency Flag	Outstanding Amount Range	Number of Accounts	Total Outstanding Amount
018012	176001	310022	310028	310028	1		1	1,049,391.90
018012	176001	310024	310028	310028	1		1	1,431,101.96
018012	176001	310027	310006	310006	1		1	472,312.52
018012	176001	310028	310006	310006	1		1	164,965.20
018012	176001	310028	310028	310028	1		6	4,352,041.24
018012	176003	310008	310028	310028	1		1	90,032,000.00
018012	176003	310028	310028	310028	1		2	146,671,533.06
018016	176001	310017	310006	310006	1		17	651,074.08
018016	176001	310017	310007	310007	1		5	423,758.54
018016	176001	310017	310008	310008	1		12	1,510,540.34
018016	176001	310017	310009	310009	1		3	492,982.29
018016	176001	310017	310010	310010	1		9	1,141,209.20
018016	176001	310017	310011	310011	1		9	1,902,353.35
018016	176001	310017	310012	310012	1		5	1,219,561.73
018016	176001	310017	310013	310013	1		7	1,352,540.40
018016	176001	310017	310014	310014	1		7	2,171,592.70
018016	176001	310017	310015	310015	1		7	1,726,666.28
018016	176001	310017	310016	310016	1		8	2,432,036.44
018016	176001	310019	310006	310006	1		117	2,857,656.25
018016	176001	310019	310007	310007	1		64	2,854,467.78
018016	176001	310019	310008	310008	1		83	4,981,967.77
018016	176001	310019	310009	310009	1		83	6,929,063.97
018016	176001	310019	310010	310010	1		67	5,822,253.39
018016	176001	310019	310011	310011	1		61	6,935,307.52
018016	176001	310019	310012	310012	1		60	7,536,039.46
018016	176001	310019	310013	310013	1		92	12,294,464.93
018016	176001	310019	310014	310014	1		64	11,637,772.84
018016	176001	310019	310015	310015	1		60	9,303,162.93
018016	176001	310019	310016	310016	1		58	9,827,785.22
018016	176001	310019	310017	310017	1		65	10,883,994.32
018016	176001	310019	310019	310019	1		584	129,024,692.84
018016	176001	310019	310028	310028	1		9	2,115,292.57
018016	176001	310020	310006	310006	1		136	3,021,211.11
018016	176001	310020	310007	310007	1		87	2,982,589.33
018016	176001	310020	310008	310008	1		90	4,292,069.51
018016	176001	310020	310009	310009	1		117	7,048,154.65
018016	176001	310020	310010	310010	1		140	10,918,949.29
018016	176001	310020	310011	310011	1		145	11,987,037.99
018016	176001	310020	310012	310012	1		155	13,770,638.31
018016	176001	310020	310013	310013	1		132	12,395,671.44
018016	176001	310020	310014	310014	1		126	13,318,568.48
018016	176001	310020	310015	310015	1		138	15,362,476.04
018016	176001	310020	310016	310016	1		139	17,469,343.75
018016	176001	310020	310017	310017	1		130	17,181,798.22
018016	176001	310020	310019	310019	1		1,770	342,209,277.17
018016	176001	310020	310020	310020	1		1,874	397,342,141.81
018016	176001	310020	310028	310028	1		70	15,163,746.90
018016	176001	310021	310006	310006	1		736	12,418,075.86
018016	176001	310021	310007	310007	1		469	14,714,414.30
018016	176001	310021	310008	310008	1		469	18,162,763.82
018016	176001	310021	310009	310009	1		550	26,759,731.27
018016	176001	310021	310010	310010	1		522	30,734,466.94
018016	176001	310021	310011	310011	1		607	39,729,017.02
018016	176001	310021	310012	310012	1		655	49,646,370.52
018016	176001	310021	310013	310013	1		626	50,825,779.73
018016	176001	310021	310014	310014	1		744	69,358,586.91
018016	176001	310021	310015	310015	1		581	59,566,057.09
018016	176001	310021	310016	310016	1		511	59,045,069.92
018016	176001	310021	310017	310017	1		437	56,007,927.59
018016	176001	310021	310019	310019	1		8,154	1,428,671,279.32
018016	176001	310021	310020	310020	1		9,636	2,296,161,019.69
018016	176001	310021	310021	310021	1		8,924	2,148,058,408.69
018016	176001	310021	310028	310028	1		720	178,138,247.80
018016	176001	310022	310006	310006	1		40	700,551.50
018016	176001	310022	310007	310007	1		19	612,640.62
018016	176001	310022	310008	310008	1		23	940,635.63
018016	176001	310022	310009	310009	1		23	862,394.50
018016	176001	310022	310010	310010	1		22	1,195,207.00
018016	176001	310022	310011	310011	1		26	1,386,470.89
018016	176001	310022	310012	310012	1		26	1,704,749.73
018016	176001	310022	310013	310013	1		61	4,024,631.31
018016	176001	310022	310014	310014	1		94	7,033,778.18

Arrangement Type	Involved Party Type	Arrangement Term Range	Remaining Term Range	Repricing Term Range	Arrangement Currency Flag	Outstanding Amount Range	Number of Accounts	Total Outstanding Amount
018016	176001	310022	310015	310015	1		115	9,908,542.11
018016	176001	310022	310016	310016	1		129	11,647,717.38
018016	176001	310022	310017	310017	1		143	14,468,038.33
018016	176001	310022	310019	310019	1		4,211	616,358,658.93
018016	176001	310022	310020	310020	1		10,451	2,356,649,123.63
018016	176001	310022	310021	310021	1		16,125	4,913,738,426.10
018016	176001	310022	310022	310022	1		14,572	5,024,830,057.26
018016	176001	310022	310028	310028	1		430	148,787,409.92
018016	176001	310023	310014	310014	1		2	168,260.57
018016	176001	310023	310019	310019	1		9	1,754,378.54
018016	176001	310023	310020	310020	1		44	12,003,696.33
018016	176001	310023	310021	310021	1		54	18,031,659.71
018016	176001	310023	310028	310028	1		4	1,529,399.24
018016	176003	310017	310006	310006	1		5	215,362.94
018016	176003	310017	310007	310007	1		2	107,963.15
018016	176003	310017	310008	310008	1		3	236,536.82
018016	176003	310017	310009	310009	1		1	149,140.34
018016	176003	310017	310011	310011	1		1	200,649.04
018016	176003	310017	310012	310012	1		1	236,124.80
018016	176003	310017	310014	310014	1		1	250,356.35
018016	176003	310017	310015	310015	1		3	900,357.51
018016	176003	310017	310016	310016	1		2	495,000.00
018016	176003	310017	310017	310017	1		1	466,355.14
018016	176003	310017	310028	310028	1		1	38,300.46
018016	176003	310019	310006	310006	1		30	945,211.36
018016	176003	310019	310007	310007	1		6	300,610.51
018016	176003	310019	310008	310008	1		14	980,351.14
018016	176003	310019	310009	310009	1		12	935,455.90
018016	176003	310019	310010	310010	1		14	1,252,203.45
018016	176003	310019	310011	310011	1		7	871,049.89
018016	176003	310019	310012	310012	1		9	1,408,469.23
018016	176003	310019	310013	310013	1		12	2,409,987.86
018016	176003	310019	310014	310014	1		4	541,082.39
018016	176003	310019	310015	310015	1		19	3,320,219.16
018016	176003	310019	310016	310016	1		16	3,701,842.71
018016	176003	310019	310017	310017	1		11	2,033,883.73
018016	176003	310019	310019	310019	1		60	15,196,966.22
018016	176003	310019	310028	310028	1		2	474,177.78
018016	176003	310020	310006	310006	1		28	493,212.53
018016	176003	310020	310007	310007	1		13	527,389.58
018016	176003	310020	310008	310008	1		11	500,222.55
018016	176003	310020	310009	310009	1		19	1,305,199.01
018016	176003	310020	310010	310010	1		14	871,967.40
018016	176003	310020	310011	310011	1		20	1,749,371.60
018016	176003	310020	310012	310012	1		19	1,922,778.78
018016	176003	310020	310013	310013	1		11	1,031,548.34
018016	176003	310020	310014	310014	1		15	1,938,836.58
018016	176003	310020	310015	310015	1		16	1,736,265.57
018016	176003	310020	310016	310016	1		21	3,450,412.59
018016	176003	310020	310017	310017	1		17	3,019,072.22
018016	176003	310020	310019	310019	1		157	42,241,961.81
018016	176003	310020	310020	310020	1		87	36,100,428.12
018016	176003	310020	310028	310028	1		4	1,013,558.76
018016	176003	310021	310006	310006	1		70	1,201,668.11
018016	176003	310021	310007	310007	1		56	1,567,875.71
018016	176003	310021	310008	310008	1		38	1,485,112.76
018016	176003	310021	310009	310009	1		38	2,000,723.55
018016	176003	310021	310010	310010	1		30	2,020,022.24
018016	176003	310021	310011	310011	1		44	2,980,349.53
018016	176003	310021	310012	310012	1		48	3,588,693.93
018016	176003	310021	310013	310013	1		42	3,653,737.17
018016	176003	310021	310014	310014	1		58	6,128,228.35
018016	176003	310021	310015	310015	1		53	5,909,887.24
018016	176003	310021	310016	310016	1		48	5,785,679.61
018016	176003	310021	310017	310017	1		53	7,033,583.74
018016	176003	310021	310019	310019	1		568	114,927,441.97
018016	176003	310021	310020	310020	1		443	153,684,064.79
018016	176003	310021	310021	310021	1		188	78,692,797.19
018016	176003	310021	310028	310028	1		52	17,400,272.11
018016	176003	310022	310006	310006	1		15	204,620.80
018016	176003	310022	310009	310009	1		2	66,804.80
018016	176003	310022	310012	310012	1		1	99,535.77
018016	176003	310022	310013	310013	1		2	146,563.20
018016	176003	310022	310015	310015	1		1	79,856.08
018016	176003	310022	310016	310016	1		1	76,121.72

Arrangement Type	Involved Party Type	Arrangement Term Range	Remaining Term Range	Repricing Term Range	Arrangement Currency Flag	Outstanding Amount Range	Number of Accounts	Total Outstanding Amount
018016	176003	310022	310017	310017	1		2	184,980.43
018016	176003	310022	310019	310019	1		45	7,787,698.48
018016	176003	310022	310020	310020	1		129	33,132,774.55
018016	176003	310022	310021	310021	1		140	50,054,450.65
018016	176003	310022	310022	310022	1		106	46,558,189.79
018016	176003	310022	310028	310028	1		5	1,795,959.59
018016	176003	310023	310020	310020	1		1	272,970.04
018016	176003	310023	310021	310021	1		1	264,990.75
018016	176012	310020	310011	310011	1		1	63,447.99
018016	176012	310021	310009	310009	1		1	91,729.95
018016	176012	310021	310012	310012	1		1	68,618.08
018016	176029	310020	310019	310019	1		1	97,603.50
018016	176029	310021	310020	310020	1		2	720,014.66
018016	176062	310021	310017	310017	1		1	106,247.63
018016	176062	310021	310019	310019	1		1	137,503.44
018016	176067	310021	310020	310020	1		1	156,103.44
018016	176067	310022	310022	310022	1		1	257,418.12
018021	176003	310028	310028	310028	1		5	174,382,919.02
018022	176001	310006	310028	310028	1		1	4,980,000.00
018022	176001	310008	310028	310028	1		2	5,500,000.00
018022	176001	310009	310028	310028	1		5	9,800,000.00
018022	176001	310017	310006	310006	1		3	63,848.87
018022	176001	310017	310007	310007	1		8	207,636.88
018022	176001	310017	310008	310008	1		6	222,333.74
018022	176001	310017	310009	310009	1		6	305,754.79
018022	176001	310017	310010	310010	1		4	179,632.54
018022	176001	310017	310011	310011	1		4	298,471.81
018022	176001	310017	310013	310013	1		2	114,821.17
018022	176001	310017	310014	310014	1		1	221,809.06
018022	176001	310019	310006	310006	1		11	252,005.90
018022	176001	310019	310007	310007	1		29	746,878.13
018022	176001	310019	310008	310008	1		18	807,603.08
018022	176001	310019	310009	310009	1		19	1,316,425.33
018022	176001	310019	310010	310010	1		12	1,048,229.05
018022	176001	310019	310011	310011	1		2	180,179.17
018022	176001	310019	310012	310012	1		1	61,803.81
018022	176001	310019	310014	310014	1		1	58,150.85
018022	176001	310019	310016	310016	1		1	120,033.11
018022	176001	310019	310019	310019	1		69	4,730,886.94
018022	176001	310019	310028	310028	1		11	676,146.19
018022	176001	310020	310019	310019	1		244	25,035,008.58
018022	176001	310020	310020	310020	1		62	7,304,273.62
018022	176001	310020	310028	310028	1		26	2,135,199.51
018022	176001	310021	310006	310006	1		1	8,000,000.00
018022	176001	310021	310020	310020	1		258	33,387,049.98
018022	176001	310021	310021	310021	1		38	3,799,972.00
018022	176001	310021	310028	310028	1		9	1,297,583.83
018022	176001	310022	310021	310021	1		327	36,018,406.02
018022	176001	310022	310028	310028	1		2	3,030,034.94
018022	176001	310023	310028	310028	1		1	6,246,169.24
018022	176001	310025	310028	310028	1		1	6,941,179.46
018022	176001	310026	310028	310028	1		1	1,444,963.89
018022	176001	310027	310006	310006	1		1	3,774,912.92
018022	176001	310027	310010	310010	1		1	958,667.42
018022	176001	310027	310028	310028	1		11	29,926,021.91
018022	176001	310028	310006	310006	1		1	137,917.01
018022	176001	310028	310028	310028	1		10	27,393,500.08
018022	176003	310008	310006	310006	1		57	32,814,759.34
018022	176003	310008	310007	310007	1		73	43,272,599.47
018022	176003	310008	310028	310028	1		3	55,817,049.44
018022	176003	310011	310006	310006	1		4	1,886,201.48
018022	176003	310024	310019	310019	1		1	4,040,000.00
018022	176003	310024	310028	310028	1		1	800,000.00
018022	176003	310025	310028	310028	1		1	529,992.82
018022	176003	310026	310028	310028	1		1	466,065.94
018022	176003	310027	310006	310006	1		1	2,000,000.00
018022	176003	310027	310028	310028	1		1	17,733,486.76
018022	176003	310028	310028	310028	1		10	40,537,130.73
018299	176040	310019	310019	310019	1	004010	1	200,000,000.00
018299	176040	310019	310019	310019	1	004011	1	400,000,000.00
018299	176040	310020	310019	310019	1	004011	3	1,300,000,000.00
018299	176040	310020	310019	310019	1	004012	1	700,000,000.00
018299	176040	310020	310020	310020	1	004011	2	700,000,000.00
018093	176068	310023	310022	310007	1	004009	1	100,000,000.00
018034	176039	310002	310002	310002	1	004007	1	22,610,288.51

Arrangement Type	Involved Party Type	Arrangement Term Range	Remaining Term Range	Repricing Term Range	Arrangement Currency Flag	Outstanding Amount Range	Number of Accounts	Total Outstanding Amount
018043	176001	310006	310006	310006	1	004002	2	200,000.00
018043	176001	310006	310006	310006	1	004003	1	200,000.00
018043	176001	310006	310006	310006	1	004004	10	4,087,891.26
018043	176001	310006	310006	310006	1	004005	4	3,211,942.22
018043	176001	310006	310006	310006	1	004006	16	41,667,921.48
018043	176001	310006	310006	310006	1	004007	2	22,126,801.38
018043	176001	310006	310006	310006	1	004008	1	32,047,241.11
018043	176001	310007	310006	310006	1	004004	2	1,000,000.00
018043	176001	310007	310006	310006	1	004005	1	1,000,000.00
018043	176001	310007	310006	310006	1	004006	3	3,022,384.11
018043	176001	310008	310006	310006	1	004001	21	413,092.62
018043	176001	310008	310006	310006	1	004002	10	812,694.51
018043	176001	310008	310006	310006	1	004003	15	2,192,974.92
018043	176001	310008	310006	310006	1	004004	18	7,303,472.00
018043	176001	310008	310006	310006	1	004005	29	23,898,038.58
018043	176001	310008	310006	310006	1	004006	71	171,360,998.53
018043	176001	310008	310006	310006	1	004007	1	20,000,000.00
018043	176001	310008	310006	310006	1	004008	1	35,000,000.00
018043	176001	310008	310007	310007	1	004001	7	162,469.97
018043	176001	310008	310007	310007	1	004002	2	133,391.65
018043	176001	310008	310007	310007	1	004003	6	857,405.80
018043	176001	310008	310007	310007	1	004004	6	2,075,690.76
018043	176001	310008	310007	310007	1	004005	11	8,970,558.22
018043	176001	310008	310007	310007	1	004006	19	74,582,125.61
018043	176001	310008	310007	310007	1	004007	5	61,264,992.23
018043	176001	310008	310007	310007	1	004009	1	60,000,000.00
018043	176001	310009	310006	310006	1	004006	9	25,582,773.13
018043	176001	310009	310006	310006	1	004007	1	20,000,000.00
018043	176001	310009	310006	310006	1	004008	1	30,000,000.00
018043	176001	310009	310007	310007	1	004001	1	10,339.74
018043	176001	310009	310007	310007	1	004004	1	500,000.00
018043	176001	310009	310007	310007	1	004006	15	57,683,987.35
018043	176001	310009	310007	310007	1	004007	1	20,505,808.22
018043	176001	310009	310008	310008	1	004005	10	5,682,605.93
018043	176001	310009	310008	310008	1	004006	64	145,273,930.01
018043	176001	310009	310008	310008	1	004007	3	30,919,209.82
018043	176001	310009	310008	310008	1	004008	1	41,093,347.79
018043	176001	310010	310006	310006	1	004002	1	58,958.07
018043	176001	310010	310007	310007	1	004003	1	101,271.51
018043	176001	310010	310008	310008	1	004004	1	500,000.00
018043	176001	310010	310008	310008	1	004006	9	60,042,500.00
018043	176001	310010	310009	310009	1	004003	4	412,263.15
018043	176001	310010	310009	310009	1	004004	1	302,225.14
018043	176001	310010	310009	310009	1	004005	2	1,503,708.56
018043	176001	310010	310009	310009	1	004006	14	69,042,054.29
018043	176001	310010	310009	310009	1	004007	4	60,371,765.54
018043	176001	310011	310006	310006	1	004001	7	174,559.69
018043	176001	310011	310006	310006	1	004002	8	664,178.25
018043	176001	310011	310006	310006	1	004003	16	1,999,619.57
018043	176001	310011	310006	310006	1	004004	17	6,070,111.11
018043	176001	310011	310006	310006	1	004005	23	20,898,510.24
018043	176001	310011	310006	310006	1	004006	27	92,943,742.89
018043	176001	310011	310006	310006	1	004007	4	52,078,962.64
018043	176001	310011	310006	310006	1	004009	2	171,418,105.55
018043	176001	310011	310007	310007	1	004001	8	137,648.28
018043	176001	310011	310007	310007	1	004002	2	168,472.25
018043	176001	310011	310007	310007	1	004003	4	513,045.57
018043	176001	310011	310007	310007	1	004004	13	5,370,430.88
018043	176001	310011	310007	310007	1	004005	19	14,441,348.43
018043	176001	310011	310007	310007	1	004006	31	65,703,532.31
018043	176001	310011	310007	310007	1	004007	2	32,544,760.63
018043	176001	310011	310008	310008	1	004001	2	42,441.96
018043	176001	310011	310008	310008	1	004003	1	200,000.00
018043	176001	310011	310008	310008	1	004004	2	928,351.05
018043	176001	310011	310008	310008	1	004005	5	4,650,000.00
018043	176001	310011	310008	310008	1	004006	4	4,135,455.93
018043	176001	310011	310009	310009	1	004001	2	51,052.46
018043	176001	310011	310009	310009	1	004002	4	299,344.37
018043	176001	310011	310009	310009	1	004003	3	385,616.94
018043	176001	310011	310009	310009	1	004004	8	3,155,084.32
018043	176001	310011	310009	310009	1	004005	7	4,599,398.91
018043	176001	310011	310009	310009	1	004006	13	39,505,730.52
018043	176001	310011	310009	310009	1	004007	1	13,000,000.00
018043	176001	310011	310009	310009	1	004008	2	97,000,000.00
018043	176001	310011	310010	310010	1	004001	6	129,072.52

Arrangement Type	Involved Party Type	Arrangement Term Range	Remaining Term Range	Repricing Term Range	Arrangement Currency Flag	Outstanding Amount Range	Number of Accounts	Total Outstanding Amount
018043	176001	310011	310010	310010	1	004002	1	67,490.31
018043	176001	310011	310010	310010	1	004003	4	506,608.72
018043	176001	310011	310010	310010	1	004004	3	923,933.68
018043	176001	310011	310010	310010	1	004005	3	2,304,820.55
018043	176001	310011	310010	310010	1	004006	10	31,475,840.24
018043	176001	310011	310010	310010	1	004007	3	63,370,597.99
018043	176001	310011	310010	310010	1	004009	1	56,753,059.40
018043	176001	310011	310010	310010	1	004010	1	117,454,065.20
018043	176001	310011	310011	310011	1	004005	1	1,000,000.00
018043	176001	310012	310011	310011	1	004004	1	222,241.80
018043	176001	310012	310012	310012	1	004002	1	79,017.11
018043	176001	310013	310006	310006	1	004005	1	890,000.00
018043	176001	310013	310007	310007	1	004001	1	10,684.39
018043	176001	310013	310009	310009	1	004006	1	1,855,821.77
018043	176001	310013	310012	310012	1	004001	1	39,652.50
018043	176001	310014	310006	310006	1	004003	1	103,792.24
018043	176001	310014	310007	310007	1	004001	1	10,684.39
018043	176001	310014	310009	310009	1	004002	1	67,054.20
018043	176001	310014	310010	310010	1	004001	1	13,558.27
018043	176001	310015	310007	310007	1	004001	1	10,339.73
018043	176001	310015	310010	310010	1	004005	1	680,400.00
018043	176001	310016	310007	310007	1	004001	2	20,689.46
018043	176001	310016	310010	310010	1	004003	1	183,573.89
018043	176001	310016	310010	310010	1	004004	2	500,000.00
018043	176001	310016	310011	310011	1	004001	1	12,332.28
018043	176001	310016	310011	310011	1	004004	1	250,000.00
018043	176001	310016	310012	310012	1	004001	1	14,158.91
018043	176001	310016	310012	310012	1	004004	1	250,000.00
018043	176001	310016	310016	310016	1	004001	1	27,730.00
018043	176001	310017	310006	310006	1	004001	10	302,268.25
018043	176001	310017	310006	310006	1	004002	2	200,000.00
018043	176001	310017	310006	310006	1	004003	7	811,390.05
018043	176001	310017	310006	310006	1	004004	14	5,683,978.92
018043	176001	310017	310006	310006	1	004005	6	5,500,000.00
018043	176001	310017	310006	310006	1	004006	10	31,805,547.95
018043	176001	310017	310007	310007	1	004001	5	222,708.41
018043	176001	310017	310007	310007	1	004002	3	203,851.53
018043	176001	310017	310007	310007	1	004003	3	476,453.64
018043	176001	310017	310007	310007	1	004004	11	5,276,283.22
018043	176001	310017	310007	310007	1	004005	31	30,380,000.00
018043	176001	310017	310007	310007	1	004006	36	80,488,653.73
018043	176001	310017	310007	310007	1	004007	2	30,000,000.00
018043	176001	310017	310008	310008	1	004001	25	722,081.61
018043	176001	310017	310008	310008	1	004002	3	208,242.96
018043	176001	310017	310008	310008	1	004004	9	3,377,030.17
018043	176001	310017	310008	310008	1	004005	14	12,101,024.56
018043	176001	310017	310008	310008	1	004006	15	30,214,217.53
018043	176001	310017	310009	310009	1	004001	4	107,323.62
018043	176001	310017	310009	310009	1	004002	3	267,054.20
018043	176001	310017	310009	310009	1	004003	2	283,245.06
018043	176001	310017	310009	310009	1	004004	2	863,952.08
018043	176001	310017	310009	310009	1	004005	3	2,188,978.72
018043	176001	310017	310009	310009	1	004006	8	23,007,200.46
018043	176001	310017	310009	310009	1	004007	1	16,000,000.00
018043	176001	310017	310010	310010	1	004001	6	166,188.15
018043	176001	310017	310010	310010	1	004002	5	325,034.34
018043	176001	310017	310010	310010	1	004003	3	352,084.20
018043	176001	310017	310010	310010	1	004004	439	166,683,289.28
018043	176001	310017	310010	310010	1	004005	147	119,168,361.04
018043	176001	310017	310010	310010	1	004006	96	235,138,141.00
018043	176001	310017	310011	310011	1	004001	6	182,791.64
018043	176001	310017	310011	310011	1	004002	4	376,000.00
018043	176001	310017	310011	310011	1	004003	1	200,000.00
018043	176001	310017	310011	310011	1	004004	557	208,152,568.92
018043	176001	310017	310011	310011	1	004005	131	109,970,590.90
018043	176001	310017	310011	310011	1	004006	70	228,321,914.97
018043	176001	310017	310012	310012	1	004001	6	197,068.31
018043	176001	310017	310012	310012	1	004002	2	196,000.00
018043	176001	310017	310012	310012	1	004003	42	6,427,690.13
018043	176001	310017	310012	310012	1	004004	99	36,471,016.44
018043	176001	310017	310012	310012	1	004005	26	19,912,766.44
018043	176001	310017	310012	310012	1	004006	9	19,926,836.86
018043	176001	310017	310013	310013	1	004001	4	116,195.72
018043	176001	310017	310013	310013	1	004002	1	92,558.00
018043	176001	310017	310013	310013	1	004003	13	2,100,000.00

Arrangement Type	Involved Party Type	Arrangement Term Range	Remaining Term Range	Repricing Term Range	Arrangement Currency Flag	Outstanding Amount Range	Number of Accounts	Total Outstanding Amount
018043	176001	310017	310013	310013	1	004004	30	11,670,539.55
018043	176001	310017	310013	310013	1	004005	15	11,353,978.71
018043	176001	310017	310013	310013	1	004006	12	35,138,825.79
018043	176001	310017	310014	310014	1	004001	9	263,006.32
018043	176001	310017	310015	310015	1	004001	18	560,000.00
018043	176001	310017	310015	310015	1	004002	1	100,000.00
018043	176001	310017	310015	310015	1	004003	2	251,709.32
018043	176001	310017	310015	310015	1	004004	1	265,995.71
018043	176001	310017	310015	310015	1	004005	1	1,000,000.00
018043	176001	310017	310016	310016	1	004001	4	107,356.34
018043	176001	310017	310016	310016	1	004003	1	109,500.00
018043	176001	310017	310016	310016	1	004006	1	2,000,000.00
018043	176001	310019	310006	310006	1	004001	7	199,571.94
018043	176001	310019	310006	310006	1	004002	3	255,050.00
018043	176001	310019	310006	310006	1	004003	9	1,177,652.85
018043	176001	310019	310006	310006	1	004004	27	12,681,352.05
018043	176001	310019	310006	310006	1	004005	41	40,600,000.00
018043	176001	310019	310006	310006	1	004006	27	68,679,133.18
018043	176001	310019	310007	310007	1	004001	1	48,788.18
018043	176001	310019	310007	310007	1	004003	1	150,281.00
018043	176001	310019	310007	310007	1	004004	4	1,449,226.89
018043	176001	310019	310007	310007	1	004005	3	2,204,949.10
018043	176001	310019	310007	310007	1	004006	3	15,000,000.00
018043	176001	310019	310007	310007	1	004007	1	11,000,000.00
018043	176001	310019	310008	310008	1	004001	1	50,000.00
018043	176001	310019	310008	310008	1	004002	1	59,623.03
018043	176001	310019	310008	310008	1	004003	2	242,832.78
018043	176001	310019	310008	310008	1	004004	3	849,000.00
018043	176001	310019	310008	310008	1	004005	25	24,042,000.00
018043	176001	310019	310008	310008	1	004006	3	20,000,000.00
018043	176001	310019	310009	310009	1	004001	5	170,329.70
018043	176001	310019	310009	310009	1	004002	8	661,976.04
018043	176001	310019	310009	310009	1	004003	6	987,581.31
018043	176001	310019	310009	310009	1	004004	21	9,758,882.82
018043	176001	310019	310009	310009	1	004005	34	32,079,119.95
018043	176001	310019	310009	310009	1	004006	11	39,453,632.80
018043	176001	310019	310009	310009	1	004007	1	18,000,000.00
018043	176001	310019	310009	310009	1	004008	1	42,300,000.00
018043	176001	310019	310010	310010	1	004001	8	215,777.51
018043	176001	310019	310010	310010	1	004002	5	471,927.83
018043	176001	310019	310010	310010	1	004003	3	549,400.00
018043	176001	310019	310010	310010	1	004004	64	29,377,140.85
018043	176001	310019	310010	310010	1	004005	46	44,358,627.58
018043	176001	310019	310010	310010	1	004006	50	176,774,802.75
018043	176001	310019	310010	310010	1	004007	2	21,693,497.61
018043	176001	310019	310011	310011	1	004001	7	229,576.59
018043	176001	310019	310011	310011	1	004002	11	1,075,000.00
018043	176001	310019	310011	310011	1	004003	7	1,000,624.77
018043	176001	310019	310011	310011	1	004004	36	14,710,812.61
018043	176001	310019	310011	310011	1	004005	58	55,495,383.86
018043	176001	310019	310011	310011	1	004006	20	82,938,159.49
018043	176001	310019	310011	310011	1	004007	4	73,809,615.48
018043	176001	310019	310012	310012	1	004001	3	83,140.12
018043	176001	310019	310012	310012	1	004002	3	252,218.41
018043	176001	310019	310012	310012	1	004003	2	330,000.00
018043	176001	310019	310012	310012	1	004004	18	8,126,536.71
018043	176001	310019	310012	310012	1	004005	26	20,739,220.48
018043	176001	310019	310012	310012	1	004006	18	83,337,480.03
018043	176001	310019	310013	310013	1	004001	3	55,640.12
018043	176001	310019	310013	310013	1	004002	7	675,000.00
018043	176001	310019	310013	310013	1	004003	1	150,000.00
018043	176001	310019	310013	310013	1	004004	11	4,744,169.69
018043	176001	310019	310013	310013	1	004005	12	11,425,000.00
018043	176001	310019	310013	310013	1	004006	5	9,300,000.00
018043	176001	310019	310013	310013	1	004007	1	15,000,000.00
018043	176001	310019	310014	310014	1	004001	4	91,534.25
018043	176001	310019	310014	310014	1	004002	2	190,000.00
018043	176001	310019	310014	310014	1	004003	1	108,445.78
018043	176001	310019	310014	310014	1	004004	6	3,000,000.00
018043	176001	310019	310014	310014	1	004005	12	10,648,300.00
018043	176001	310019	310014	310014	1	004006	4	9,905,931.62
018043	176001	310019	310015	310015	1	004002	7	653,783.04
018043	176001	310019	310015	310015	1	004003	3	341,929.90
018043	176001	310019	310015	310015	1	004004	11	4,247,735.54
018043	176001	310019	310015	310015	1	004005	6	5,502,983.71

Arrangement Type	Involved Party Type	Arrangement Term Range	Remaining Term Range	Repricing Term Range	Arrangement Currency Flag	Outstanding Amount Range	Number of Accounts	Total Outstanding Amount
018043	176001	310019	310015	310015	1	004006	10	21,472,234.26
018043	176001	310019	310015	310015	1	004007	2	20,183,137.20
018043	176001	310019	310016	310016	1	004001	1	25,000.00
018043	176001	310019	310016	310016	1	004002	3	300,000.00
018043	176001	310019	310016	310016	1	004004	23	11,312,500.00
018043	176001	310019	310016	310016	1	004005	15	13,061,210.47
018043	176001	310019	310016	310016	1	004006	9	30,768,000.46
018043	176001	310019	310017	310017	1	004001	1	15,000.00
018043	176001	310019	310017	310017	1	004002	1	100,000.00
018043	176001	310019	310017	310017	1	004003	7	1,084,845.89
018043	176001	310019	310017	310017	1	004004	114	56,095,773.83
018043	176001	310019	310017	310017	1	004005	187	145,549,183.03
018043	176001	310019	310017	310017	1	004006	84	184,639,172.06
018043	176001	310019	310017	310017	1	004007	1	16,000,000.00
018043	176001	310019	310017	310017	1	004008	2	60,419,865.74
018043	176001	310019	310019	310019	1	004001	18	525,454.52
018043	176001	310019	310019	310019	1	004002	41	3,847,706.95
018043	176001	310019	310019	310019	1	004003	69	10,645,209.66
018043	176001	310019	310019	310019	1	004004	148	60,484,708.63
018043	176001	310019	310019	310019	1	004005	174	148,783,973.25
018043	176001	310019	310019	310019	1	004006	135	356,880,980.26
018043	176001	310019	310019	310019	1	004007	8	113,436,057.14
018043	176001	310019	310019	310019	1	004008	3	91,508,602.74
018043	176001	310020	310006	310006	1	004001	6	159,356.69
018043	176001	310020	310006	310006	1	004002	4	355,500.00
018043	176001	310020	310006	310006	1	004003	5	548,590.40
018043	176001	310020	310006	310006	1	004004	9	3,339,445.16
018043	176001	310020	310006	310006	1	004005	18	16,160,420.00
018043	176001	310020	310006	310006	1	004006	13	36,730,420.26
018043	176001	310020	310007	310007	1	004002	5	500,000.00
018043	176001	310020	310007	310007	1	004003	3	513,624.36
018043	176001	310020	310007	310007	1	004004	6	2,400,000.00
018043	176001	310020	310007	310007	1	004005	7	5,226,375.00
018043	176001	310020	310007	310007	1	004006	5	26,000,000.00
018043	176001	310020	310007	310007	1	004007	1	13,000,000.00
018043	176001	310020	310008	310008	1	004001	1	35,774.39
018043	176001	310020	310008	310008	1	004002	4	400,000.00
018043	176001	310020	310008	310008	1	004003	2	324,080.00
018043	176001	310020	310008	310008	1	004004	6	2,401,713.97
018043	176001	310020	310008	310008	1	004005	5	5,000,000.00
018043	176001	310020	310008	310008	1	004006	3	19,200,000.00
018043	176001	310020	310008	310008	1	004007	1	12,000,000.00
018043	176001	310020	310009	310009	1	004001	5	221,239.96
018043	176001	310020	310009	310009	1	004003	1	153,030.00
018043	176001	310020	310009	310009	1	004004	1	500,000.00
018043	176001	310020	310009	310009	1	004006	1	1,230,891.00
018043	176001	310020	310009	310009	1	004007	1	16,000,000.00
018043	176001	310020	310010	310010	1	004001	2	100,000.00
018043	176001	310020	310010	310010	1	004002	5	500,000.00
018043	176001	310020	310010	310010	1	004004	3	1,500,000.00
018043	176001	310020	310010	310010	1	004006	4	10,000,000.00
018043	176001	310020	310011	310011	1	004001	1	35,774.37
018043	176001	310020	310011	310011	1	004003	1	200,000.00
018043	176001	310020	310011	310011	1	004005	3	2,500,093.16
018043	176001	310020	310012	310012	1	004004	1	500,000.00
018043	176001	310020	310012	310012	1	004006	5	20,366,000.00
018043	176001	310020	310013	310013	1	004004	1	500,000.00
018043	176001	310020	310013	310013	1	004005	5	5,000,000.00
018043	176001	310020	310013	310013	1	004006	8	24,000,000.00
018043	176001	310020	310014	310014	1	004006	1	2,000,000.00
018043	176001	310020	310015	310015	1	004004	3	1,500,000.00
018043	176001	310020	310015	310015	1	004005	4	3,560,000.00
018043	176001	310020	310015	310015	1	004006	1	2,240,130.06
018043	176001	310020	310016	310016	1	004001	1	36,244.31
018043	176001	310020	310016	310016	1	004004	8	3,680,665.20
018043	176001	310020	310016	310016	1	004005	19	16,786,458.78
018043	176001	310020	310016	310016	1	004006	3	12,000,000.00
018043	176001	310020	310017	310017	1	004001	1	25,000.00
018043	176001	310020	310017	310017	1	004002	1	74,700.00
018043	176001	310020	310017	310017	1	004003	1	128,800.00
018043	176001	310020	310017	310017	1	004004	2	1,000,000.00
018043	176001	310020	310017	310017	1	004005	8	7,765,000.00
018043	176001	310020	310017	310017	1	004006	8	23,640,810.69
018043	176001	310020	310019	310019	1	004001	30	839,008.99
018043	176001	310020	310019	310019	1	004002	19	1,667,845.38

Arrangement Type	Involved Party Type	Arrangement Term Range	Remaining Term Range	Repricing Term Range	Arrangement Currency Flag	Outstanding Amount Range	Number of Accounts	Total Outstanding Amount
018043	176001	310020	310019	310019	1	004003	23	3,733,689.58
018043	176001	310020	310019	310019	1	004004	109	49,068,054.26
018043	176001	310020	310019	310019	1	004005	149	138,827,061.20
018043	176001	310020	310019	310019	1	004006	64	213,696,685.87
018043	176001	310020	310019	310019	1	004007	1	12,000,000.00
018043	176001	310020	310020	310020	1	004001	25	551,584.72
018043	176001	310020	310020	310020	1	004002	6	509,522.33
018043	176001	310020	310020	310020	1	004003	10	1,423,026.92
018043	176001	310020	310020	310020	1	004004	15	6,048,972.86
018043	176001	310020	310020	310020	1	004005	58	53,302,607.33
018043	176001	310020	310020	310020	1	004006	48	167,792,932.46
018043	176001	310020	310020	310020	1	004007	5	66,141,544.69
018043	176001	310020	310020	310020	1	004008	1	33,748,885.05
018043	176001	310021	310016	310016	1	004005	1	809,250.00
018043	176001	310021	310016	310016	1	004006	1	1,835,478.16
018043	176001	310021	310019	310019	1	004004	75	37,500,000.00
018043	176001	310021	310019	310019	1	004005	85	78,595,341.46
018043	176001	310021	310019	310019	1	004006	66	224,428,691.62
018043	176001	310021	310019	310019	1	004007	2	40,000,000.00
018043	176001	310021	310019	310019	1	004008	3	99,148,786.47
018043	176001	310021	310019	310019	1	004009	1	65,000,000.00
018043	176001	310021	310020	310020	1	004004	75	37,500,000.00
018043	176001	310021	310020	310020	1	004005	92	85,549,870.22
018043	176001	310021	310020	310020	1	004006	83	348,786,585.28
018043	176001	310021	310020	310020	1	004007	4	58,797,902.89
018043	176003	310006	310006	310006	1	004004	1	500,000.00
018043	176003	310006	310006	310006	1	004005	1	1,000,000.00
018043	176003	310006	310006	310006	1	004006	20	102,099,135.63
018043	176003	310006	310006	310006	1	004007	4	54,000,000.00
018043	176003	310006	310006	310006	1	004008	1	35,000,000.00
018043	176003	310006	310006	310006	1	004009	1	100,000,000.00
018043	176003	310006	310006	310006	1	004010	1	150,000,000.00
018043	176003	310006	310006	310006	1	004011	1	250,000,000.00
018043	176003	310007	310006	310006	1	004007	1	20,085,031.51
018043	176003	310007	310006	310006	1	004009	2	200,000,000.00
018043	176003	310007	310006	310006	1	004010	1	100,378,369.87
018043	176003	310008	310006	310006	1	004004	2	711,228.14
018043	176003	310008	310006	310006	1	004005	8	8,000,000.00
018043	176003	310008	310006	310006	1	004006	35	216,188,455.31
018043	176003	310008	310006	310006	1	004007	3	52,276,304.22
018043	176003	310008	310006	310006	1	004008	1	30,576,143.58
018043	176003	310008	310006	310006	1	004009	2	171,344,335.01
018043	176003	310008	310007	310007	1	004004	1	500,000.00
018043	176003	310008	310007	310007	1	004005	4	4,000,000.00
018043	176003	310008	310007	310007	1	004006	37	277,124,638.49
018043	176003	310008	310007	310007	1	004007	13	205,012,625.12
018043	176003	310008	310007	310007	1	004008	5	195,724,628.61
018043	176003	310008	310007	310007	1	004009	3	260,675,651.50
018043	176003	310008	310008	310008	1	004006	4	35,000,000.00
018043	176003	310008	310008	310008	1	004007	4	65,207,938.14
018043	176003	310008	310008	310008	1	004008	8	316,000,000.00
018043	176003	310008	310008	310008	1	004010	4	502,670,846.80
018043	176003	310009	310006	310006	1	004007	2	40,000,000.00
018043	176003	310009	310006	310006	1	004008	4	170,303,916.44
018043	176003	310009	310007	310007	1	004006	2	20,000,000.00
018043	176003	310009	310007	310007	1	004007	4	68,000,000.00
018043	176003	310009	310008	310008	1	004006	2	12,000,000.00
018043	176003	310009	310008	310008	1	004007	1	12,000,000.00
018043	176003	310010	310009	310009	1	004006	4	20,000,000.00
018043	176003	310010	310009	310009	1	004007	2	30,000,000.00
018043	176003	310011	310006	310006	1	004004	1	285,487.23
018043	176003	310011	310006	310006	1	004005	3	3,000,000.00
018043	176003	310011	310006	310006	1	004006	7	30,200,766.04
018043	176003	310011	310007	310007	1	004004	1	500,000.00
018043	176003	310011	310007	310007	1	004006	3	10,532,232.88
018043	176003	310011	310008	310008	1	004005	4	4,000,000.00
018043	176003	310011	310008	310008	1	004006	3	14,807,404.66
018043	176003	310011	310008	310008	1	004007	1	25,000,000.00
018043	176003	310011	310008	310008	1	004008	2	90,000,000.00
018043	176003	310011	310009	310009	1	004004	1	500,000.00
018043	176003	310011	310009	310009	1	004006	9	41,600,000.00
018043	176003	310011	310009	310009	1	004007	2	30,000,000.00
018043	176003	310011	310010	310010	1	004002	1	100,000.00
018043	176003	310011	310010	310010	1	004004	1	500,000.00
018043	176003	310011	310010	310010	1	004005	5	5,000,000.00

Arrangement Type	Involved Party Type	Arrangement Term Range	Remaining Term Range	Repricing Term Range	Arrangement Currency Flag	Outstanding Amount Range	Number of Accounts	Total Outstanding Amount
018043	176003	310011	310010	310010	1	004006	5	30,000,000.00
018043	176003	310011	310010	310010	1	004007	1	15,000,000.00
018043	176003	310017	310006	310006	1	004004	1	270,749.84
018043	176003	310017	310006	310006	1	004005	1	1,000,000.00
018043	176003	310017	310007	310007	1	004006	2	7,000,000.00
018043	176003	310017	310007	310007	1	004009	1	99,970,200.00
018043	176003	310017	310008	310008	1	004001	5	150,000.00
018043	176003	310017	310008	310008	1	004006	2	15,000,000.00
018043	176003	310017	310009	310009	1	004005	4	4,000,000.00
018043	176003	310017	310009	310009	1	004007	2	41,001,590.56
018043	176003	310017	310009	310009	1	004008	1	26,340,387.90
018043	176003	310017	310010	310010	1	004004	14	6,000,000.00
018043	176003	310017	310010	310010	1	004005	8	6,900,000.00
018043	176003	310017	310010	310010	1	004006	6	23,381,831.14
018043	176003	310017	310010	310010	1	004009	1	61,820,123.89
018043	176003	310017	310011	310011	1	004004	6	2,500,000.00
018043	176003	310017	310011	310011	1	004005	5	4,017,453.50
018043	176003	310017	310011	310011	1	004006	9	27,583,565.23
018043	176003	310017	310011	310011	1	004009	1	95,835,599.47
018043	176003	310017	310012	310012	1	004004	2	500,000.00
018043	176003	310017	310012	310012	1	004005	1	516,752.02
018043	176003	310017	310012	310012	1	004008	1	32,000,000.00
018043	176003	310017	310013	310013	1	004005	2	1,007,594.52
018043	176003	310017	310013	310013	1	004006	1	7,000,000.00
018043	176003	310017	310015	310015	1	004005	1	1,000,000.00
018043	176003	310017	310015	310015	1	004010	1	100,344,948.28
018043	176003	310017	310016	310016	1	004005	1	1,000,000.00
018043	176003	310019	310006	310006	1	004005	1	1,000,000.00
018043	176003	310019	310006	310006	1	004007	3	60,000,000.00
018043	176003	310019	310008	310008	1	004006	1	2,000,000.00
018043	176003	310019	310010	310010	1	004006	1	3,000,000.00
018043	176003	310019	310012	310012	1	004008	1	50,000,000.00
018043	176003	310019	310013	310013	1	004006	2	20,000,000.00
018043	176003	310019	310014	310014	1	004006	1	10,000,000.00
018043	176003	310019	310015	310015	1	004005	2	1,582,963.84
018043	176003	310019	310017	310017	1	004004	1	500,000.00
018043	176003	310019	310017	310017	1	004005	7	6,506,170.55
018043	176003	310019	310017	310017	1	004006	3	21,500,000.00
018043	176003	310019	310017	310017	1	004007	2	35,000,000.00
018043	176003	310019	310019	310019	1	004004	6	2,502,955.65
018043	176003	310019	310019	310019	1	004005	11	9,251,558.64
018043	176003	310019	310019	310019	1	004006	3	5,150,000.00
018043	176003	310019	310019	310019	1	004007	2	20,595,661.92
018043	176003	310020	310006	310006	1	004006	7	35,000,000.00
018043	176003	310020	310009	310009	1	004005	1	800,000.00
018043	176003	310020	310010	310010	1	004004	1	300,000.00
018043	176003	310020	310010	310010	1	004005	1	1,000,000.00
018043	176003	310020	310013	310013	1	004006	1	1,001,206.99
018043	176003	310020	310016	310016	1	004004	1	500,000.00
018043	176003	310020	310019	310019	1	004005	13	13,000,000.00
018043	176003	310020	310019	310019	1	004006	9	79,415,800.00
018043	176003	310020	310020	310020	1	004001	1	18,131.01
018043	176003	310020	310020	310020	1	004005	3	3,000,000.00
018043	176003	310020	310020	310020	1	004006	1	10,000,000.00
018043	176003	310020	310020	310020	1	004007	1	20,000,000.00
018043	176003	310020	310020	310020	1	004008	3	110,000,000.00
018043	176003	310021	310019	310019	1	004006	1	10,000,000.00
018043	176003	310021	310020	310020	1	004006	8	75,000,000.00
018043	176003	310021	310020	310020	1	004008	1	50,000,000.00
018043	176012	310007	310006	310006	1	004007	1	25,000,000.00
018043	176012	310007	310006	310006	1	004008	1	40,000,000.00
018043	176012	310008	310006	310006	1	004006	3	10,060,410.96
018043	176012	310008	310007	310007	1	004006	1	4,000,000.00
018043	176012	310009	310008	310008	1	004008	1	30,000,000.00
018043	176012	310011	310010	310010	1	004006	1	6,000,000.00
018043	176012	310017	310010	310010	1	004004	1	500,000.00
018043	176012	310017	310010	310010	1	004006	3	15,000,000.00
018043	176012	310019	310007	310007	1	004002	1	97,545.22
018043	176012	310019	310019	310019	1	004004	1	207,592.65
018043	176012	310020	310019	310019	1	004006	2	10,000,000.00
018043	176029	310011	310011	310011	1	004006	1	1,500,000.00
018043	176029	310017	310011	310011	1	004006	3	5,740,000.00
018043	176029	310017	310012	310012	1	004006	1	3,000,000.00
018043	176029	310017	310016	310016	1	004010	1	200,000,000.00
018043	176033	310006	310006	310006	1	004003	1	200,000.00

Arrangement Type	Involved Party Type	Arrangement Term Range	Remaining Term Range	Repricing Term Range	Arrangement Currency Flag	Outstanding Amount Range	Number of Accounts	Total Outstanding Amount
018043	176033	310019	310006	310006	1	004001	1	50,000.00
018043	176033	310019	310006	310006	1	004002	3	250,000.00
018043	176033	310019	310006	310006	1	004003	2	278,563.97
018043	176033	310019	310006	310006	1	004004	13	5,383,000.00
018043	176033	310019	310006	310006	1	004005	9	8,385,000.00
018043	176033	310019	310006	310006	1	004006	14	29,999,000.00
018043	176033	310019	310007	310007	1	004002	3	260,000.00
018043	176033	310019	310007	310007	1	004004	1	240,000.00
018043	176033	310019	310008	310008	1	004004	6	2,400,000.00
018043	176033	310019	310008	310008	1	004005	9	7,300,000.00
018043	176033	310019	310008	310008	1	004006	18	49,800,000.00
018043	176033	310019	310011	310011	1	004003	1	151,140.41
018043	176033	310019	310011	310011	1	004005	1	709,353.24
018043	176033	310019	310012	310012	1	004006	3	17,500,000.00
018043	176033	310020	310006	310006	1	004001	7	223,000.00
018043	176033	310020	310006	310006	1	004002	12	987,500.00
018043	176033	310020	310006	310006	1	004003	27	4,388,625.34
018043	176033	310020	310006	310006	1	004004	56	20,649,400.00
018043	176033	310020	310006	310006	1	004005	66	60,409,000.00
018043	176033	310020	310006	310006	1	004006	61	218,623,300.00
018043	176033	310020	310007	310007	1	004002	5	428,000.00
018043	176033	310020	310007	310007	1	004003	1	120,000.00
018043	176033	310020	310007	310007	1	004004	5	1,753,000.00
018043	176033	310020	310007	310007	1	004005	1	700,000.00
018043	176033	310020	310008	310008	1	004002	1	100,000.00
018043	176033	310020	310008	310008	1	004003	1	130,600.00
018043	176033	310020	310008	310008	1	004004	3	1,028,200.00
018043	176033	310020	310009	310009	1	004001	7	210,000.00
018043	176033	310020	310009	310009	1	004002	17	1,520,500.00
018043	176033	310020	310009	310009	1	004003	49	8,347,800.00
018043	176033	310020	310009	310009	1	004004	42	13,225,800.00
018043	176033	310020	310009	310009	1	004005	17	15,122,000.00
018043	176033	310020	310009	310009	1	004006	5	7,821,000.00
018043	176033	310020	310019	310019	1	004005	1	1,000,000.00
018043	176033	310020	310019	310019	1	004006	6	18,000,000.00
018043	176033	310020	310020	310020	1	004006	16	71,900,000.00
018043	176033	310020	310020	310020	1	004007	2	27,500,000.00
018043	176033	310020	310020	310020	1	004008	1	26,300,000.00
018043	176033	310020	310020	310020	1	004009	2	114,600,000.00
018043	176033	310020	310020	310020	1	004010	1	125,500,000.00
018043	176033	310021	310019	310019	1	004004	4	1,500,000.00
018043	176033	310021	310019	310019	1	004005	11	9,800,000.00
018043	176033	310021	310019	310019	1	004006	18	49,800,000.00
018043	176033	310021	310019	310019	1	004007	3	42,500,000.00
018043	176033	310021	310020	310020	1	004003	3	600,000.00
018043	176033	310021	310020	310020	1	004004	3	1,300,000.00
018043	176033	310021	310020	310020	1	004005	3	2,600,000.00
018043	176033	310021	310020	310020	1	004006	5	17,300,000.00
018043	176033	310021	310020	310020	1	004007	3	45,600,000.00
018043	176033	310021	310020	310020	1	004009	1	51,800,000.00
018043	176033	310028	310008	310008	1	004004	1	500,000.00
018043	176034	310019	310006	310006	1	004009	1	100,000,000.00
018043	176034	310019	310006	310006	1	004011	1	400,000,000.00
018043	176034	310019	310009	310009	1	004010	1	190,000,000.00
018043	176037	310006	310006	310006	1	004006	1	10,000,000.00
018043	176037	310008	310006	310006	1	004006	2	12,000,000.00
018043	176037	310011	310010	310010	1	004009	1	60,500,000.00
018043	176037	310017	310016	310016	1	004005	1	1,000,000.00
018043	176037	310020	310020	310020	1	004006	1	10,000,000.00
018043	176037	310021	310019	310019	1	004006	1	6,000,000.00
018043	176037	310021	310019	310019	1	004009	2	125,000,000.00
018043	176059	310006	310006	310006	1	004006	3	19,000,000.00
018043	176059	310008	310006	310006	1	004007	2	33,240,000.00
018043	176059	310009	310007	310007	1	004007	1	15,151,643.84
018043	176059	310020	310019	310019	1	004007	1	13,000,000.00
018043	176061	310017	310010	310010	1	004006	2	5,000,000.00
018043	176061	310020	310020	310020	1	004011	2	1,000,000,000.00
018043	176061	310021	310019	310019	1	004009	1	85,000,000.00
018043	176061	310021	310019	310019	1	004010	2	315,000,000.00
018043	176067	310006	310006	310006	1	004005	1	1,000,000.00
018043	176067	310008	310007	310007	1	004006	1	5,131,274.40
018043	176067	310008	310008	310008	1	004004	1	302,570.97
018043	176067	310017	310006	310006	1	004002	1	100,000.00
018043	176067	310017	310006	310006	1	004004	1	300,000.00
018043	176067	310017	310007	310007	1	004005	2	2,000,000.00

Arrangement Type	Involved Party Type	Arrangement Term Range	Remaining Term Range	Repricing Term Range	Arrangement Currency Flag	Outstanding Amount Range	Number of Accounts	Total Outstanding Amount
018043	176067	310017	310010	310010	1	004004	6	2,500,000.00
018043	176067	310017	310010	310010	1	004005	1	650,000.00
018043	176067	310017	310011	310011	1	004005	6	4,308,616.44
018043	176067	310017	310012	310012	1	004003	1	150,000.00
018043	176067	310017	310016	310016	1	004001	4	120,000.00
018043	176067	310019	310010	310010	1	004004	1	350,000.00
018043	176067	310019	310010	310010	1	004006	1	3,000,000.00
018043	176067	310019	310015	310015	1	004005	3	3,000,000.00
018043	176067	310019	310016	310016	1	004004	1	350,000.00
018043	176067	310019	310017	310017	1	004005	5	3,754,677.33
018043	176067	310019	310017	310017	1	004006	1	1,100,000.00
018043	176067	310019	310019	310019	1	004004	4	2,000,000.00
018043	176067	310020	310019	310019	1	004004	5	2,100,000.00
018043	176067	310020	310019	310019	1	004005	5	5,000,000.00
018043	176067	310021	310019	310019	1	004004	1	500,000.00
018043	176070	310011	310006	310006	1	004005	1	1,000,000.00
018043	176070	310011	310007	310007	1	004006	1	2,025,786.30
018043	176070	310017	310007	310007	1	004006	1	4,000,000.00
018043	176070	310017	310008	310008	1	004006	1	3,169,097.35
018043	176070	310017	310010	310010	1	004006	3	11,252,554.30
018043	176070	310019	310010	310010	1	004007	1	20,800,000.00
018043	176070	310019	310014	310014	1	004005	2	1,756,561.78
018043	176070	310019	310015	310015	1	004008	1	40,316,608.55
018043	176070	310019	310017	310017	1	004005	1	800,000.00
018043	176070	310019	310017	310017	1	004006	1	1,517,749.27
018043	176070	310019	310019	310019	1	004005	1	1,000,000.00
018043	176070	310019	310019	310019	1	004007	1	20,000,000.00
018047	176039	310002	310002	310002	1	004001	2	43,495.56
018047	176039	310002	310002	310002	1	004002	2	197,812.70
018047	176039	310002	310002	310002	1	004003	1	142,556.52
018047	176039	310002	310002	310002	1	004004	1	427,250.06
018047	176039	310002	310002	310002	1	004005	3	2,100,676.72
018047	176039	310002	310002	310002	1	004006	7	18,602,253.36
018047	176039	310002	310002	310002	1	004007	2	29,637,660.94
018047	176039	310002	310002	310002	1	004010	1	194,916,731.63
018047	176040	310002	310002	310002	1	004005	1	609,443.68
018047	176043	310002	310002	310002	1	004010	1	120,329,082.01
018043	176001	310008	310008	310008	1	004006	2	20,000,000.00
018043	176001	310008	310008	310008	1	004009	1	53,734,714.75
018043	176003	310008	310008	310008	1	004009	3	221,680,538.27
018043	176037	310006	310006	310006	1	004012	1	800,000,000.00
018043	176037	310008	310008	310008	1	004010	1	170,000,000.00

APPENDIX C

TEST SCRIPT & TEST DATA DETAILS

FI Test Script & Test Data Details # 1
Data Set Name : Trading Book Position - TBP - TYPE 1
Level : SIT & UAT
Application : XML BOT Generator Tools
Test Data Reference No. : Validation Checklist Test - TBP

Case No.	Description	Expected Results	Pass/Fail	Test Result Details	Test Date	Tested By	Remarks
1	**Check Data Set schema & Data Set Element in Master Template list**						
	1.1 Select DataSet Type	TCB, FCB1, FCS					
	1.2 Data Set Name & schemaVersion	Last Day of Month > or = Effective schema version					
	1.3 CommonHeader	OrganizationId					
		DataSetDate					
	1.4 DS_TBP_Header	FiReportingGroupId					
	1.5 DS_TBP_Content	ContentRecordGroup					
		Month					
		TradingBookPosition970003					
		TradingBookPosition970004					
		TradingBookPosition970005					
		TradingBookPosition970007					
		TradingBookPosition970008					
		TradingBookPosition970009					
		TradingBookPosition970010					
		TradingBookPosition970011					
		TradingBookPosition970012					
		OutstandingAmount					
2	**Check Data Set Element in Data Template list**						
	1.1 Organization Id						
	1.2 FI Reporting Group ID	TCB, FCB1, FCS 116002--Solo					
	1.3 Data Set Date						
	1.4 Month	Document Details in TBP_Classification					
	1.5 Trading Book Position	Document Details in TBP_Classification					
	1.6 Outstanding Amount	Document Details in TBP_Classification					
3	**Create Data Sets with XML BOT Generator Tools**						
	2.1 Tester import data to Data Template						
	2.2 Tester use XML BOT Generator Tools to generate BOT XML DataSet	Generate success					
	2.3 Tester open with BOT Data Entry Application	Open					
	2.4 Validate Data Set	XML is Valid					
4	**Submit Data Set** (Match Data and Period + Valid Client and Digital Signature + Valid Format)	XML File to BOT Success and Submission Status = "Received (1)"					

Validation Checklist Test - TBP

Data Set Name : Trading Book Position - TBP - TYPE 1

Level : SIT & UAT

Application : XML BOT Generator Tools

Test Reference No. : FI Test Script & Test Data Details # 1

Data Item	Condition	Test Data	Expected Result	Valid Case	InValid Case	Pass/ Fail	Detailed Test Result	Test Date	Tested by	Remarks
Organization Id	Classification	blank, 2, 1000	Error		×					
		blank, 1000, 2	Error		×					
		100, 200, 400	Accept	✓						
FI Reporting Group ID	Classification	Value = 116002 in TCB, FCS	Accept	✓						
		Value = 116008 in FCB1	Accept	✓						
		Vaule = 116002, 116003 in TCB, FCS, CCS	Error		×					
Data Set Date	Date	2006-06-30	Accept	✓						
		Last Day of Month < Effective schema version	Error		×					
		31-03-20024, blank,20020331	Error		×					
Month	Number	blank	Error		×					
		7/8/9/10/11/12 If month of Data Set Date = 6	Error		×					
		1/2/3/4/5/6 If month of Data Set Date = 06	Accept	✓						
Trading Book Position	Classification	970003, 970004, 970005	Accept		×					
		970001, 970002, 970006	Error		×					
OutstandingAmount	Amount	0, blank, a, 99999999999999999999.99, 9.999	Error		×					
		0.00, 9,999,999,999,999,990.00	Accept	✓						

FI Test Script & Test Data Details # 2
Data Set Name : Trading Book Position - IRR - TYPE 2
Level : SIT & UAT
Application : XML BOT Generator Tools
Test Data Reference No. : Validation Checklist Test - IRR

Case No.	Description	Expected Results	Pass/Fail	Test Result Details	Test Date	Tested By	Remarks
1	**Check Data Set schema & Data Set Element in Master Template list**						
	1.1 Select DataSet Type	TCB, FCB1, FCS					
	1.2 Data Set Name & schemaVersion	Last Day of Month > or = Effective schema version					
	1.3 CommonHeader	OrganizationId					
		DataSetDate					
	1.4 DS_IRR_Header	DS_IRR_Header					
	1.5 DS_IRR_Content	ContentRecordGroup					
		FiReportingGroupId					
		BankingBookPositionItem99003					
		BankingBookPositionItem99004					
		BankingBookPositionItem99005					
		BankingBookPositionItem99007					
		BankingBookPositionItem99008					
		BankingBookPositionItem99010					
		BankingBookPositionItem99012					
		BankingBookPositionItem99013					
		BankingBookPositionItem99015					
		BankingBookPositionItem99016					
		BankingBookPositionItem99019					
		BankingBookPositionItem99020					
		BankingBookPositionItem99022					
		BankingBookPositionItem99023					
		BankingBookPositionItem99024					
		BankingBookPositionItem99025					
		BankingBookPositionItem99027					
		BankingBookPositionItem99028					
		BankingBookPositionItem99030					
		BankingBookPositionItem99031					
		BankingBookPositionItem99033					
		BankingBookPositionItem99034					
		BankingBookPositionItem99035					
		BankingBookPositionItemInfo					
		RepricingTermRange					
		CurrencyId					
		Amount					

Case No.	Description	Expected Results	Pass/Fail	Test Result Details	Test Date	Tested By	Remarks
2	**Check Data Set Element in Data Template list**						
	1.1 Organization Id						
	1.2 FI Reporting Group ID	TCB, FCB1, FCS 116002--Solo					
	1.3 Data Set Date						
	1.4 Banking Book Position Item	Document Details in IRR_Classification					
	1.5 Repricing Term Range	Document Details in IRR_Classification					
	1.6 Currency Id	Document Details in IRR_Classification					
	1.7 Amount	Document Details in IRR_Classification					
3	**Create Data Sets with XML BOT Generator Tools**						
	2.1 Tester import data to Data Template						
	2.2 Tester use XML BOT Generator Tools to generate BOT XML DataSet	Generate success					
	2.3 Tester open with BOT Data Entry Application	Open					
	2.4 Validate Data Set	XML is Valid					
4	**Submit Data Set** (Match Data and Period + Valid Client and Digital Signature + Valid Format)	XML File to BOT Success and Submission Status = "Received (1)"					

Validation Checklist Test - IRR

Data Set Name : Trading Book Position - IRR - TYPE 2

Level : SIT & UAT

Application : XML BOT Generator Tools

Test Reference No. : FI Test Script & Test Data Details # 2

Data Item	Condition	Test Data	Expected Result	Valid Case	InValid Case	Pass/Fail	Detailed Test Result	Test Date	Tested by	Remarks
Organization Id	Classification	blank, 2, 1000	Error		×					
		blank, 1000, 2	Error		×					
		100, 200, 400	Accept	✓						
FI Reporting Group ID	Classification	Value = 116010,116011,116008 in TCB, FCS, CCS	Error		×					
		Value = 116010, 116011 in FCB1	Error		×					
		Vaule = 116002, 116003 in TCB	Accept	✓						
Data Set Date	Date	2006-06-30	Accept	✓						
		Last Day of Month < Effective schema version	Error		×					
		31-03-20024, blank,20020331	Error		×					
Banking Book Position Item	Classification	990003, 990004, 990007, 990008	Accept	✓						
		990001, 990002, 990006, 9900098	Error		×					
Repricing Term Range	Classification	310006, 310017, 310019, 310028	Accept	✓						
		310001, 310003, 310004, 310005, 310018, 310030, 1, 99999	Error		×					
		blank Arrangement Type = 018077, 018290	Accept	✓						
		blank Arrangement Type = 018005, 018049	Error		×					
Currency ID	Classification	=AUD, USD, CAD, CHF	Accept	✓						
		=blank , AAA ,ABC, BCD	Error		×					
		1, blank, A2A	Error		×					
Amount	Amount	0, blank, a, 9999999999999999999.99, 9.999	Error		×					
		0.00, 9,999,999,999,999,990.00	Accept	✓						

FI Test Script & Test Data Details # 3
Data Set Name : Lending Movement Summary - LMS - TYPE 3
Level : SIT & UAT
Application : XML BOT Generator Tools
Test Data Reference No. : Validation Checklist Test - LMS

Case No.	Description	Expected Results	Pass/Fail	Test Result Details	Test Date	Tested By	Remarks
1	**Check Data Set schema & Data Set Element in Master Template list**						
	1.1 Select DataSet Type	TCB, FCB1, FCS, CCS					
	1.2 Data Set Name & schemaVersion	Last Day of Month > or = Effective schema version					
	1.3 CommonHeader	OrganizationId					
		DataSetDate					
	1.4 DS_LMS_Header	DS_LMS_Header					
	1.5 DS_LMS_Content	ContentRecordGroup					
		FiReportingGroupId					
		ArrangementType					
		LendingBusinessType					
		NplFlag					
		MovementType					
		MovementAmount					
2	**Check Data Set Element in Data Template list**						
	1.1 Organization Id						
	1.2 Data Set Date						
	1.3 FI Reporting Group ID	TCB, FCB1, FCS, CCS 116003--Local					
	1.4 Arrangement Type	Document Details in LMS_Classification					
	1.5 Lending Business Type	Document Details in LMS_Classification					
	1.6 Npl Flag	Document Details in LMS_Classification					
	1.7 Movement Type	Document Details in LMS_Classification					
	1.8 Movement Amount	Document Details in LMS_Classification					
3	**Create Data Sets with XML BOT Generator Tools**						
	2.1 Tester import data to Data Template						
	2.2 Tester use XML BOT Generator Tools to generate BOT XML DataSet	Generate success					
	2.3 Tester open with BOT Data Entry Application	Open					
	2.4 Validate Data Set	XML is Valid					
4	**Submit Data Set** (Match Data and Period + Valid Client and Digital Signature + Valid Format)	XML File to BOT Success and Submission Status = "Received (1)"					

Validation Checklist Test - LMS

Data Set Name : Lending Movement Summary - LMS - TYPE 3

Level : SIT & UAT

Application : XML BOT Generator Tools

Test Reference No. : FI Test Script & Test Data Details # 3

Data Item	Condition	Test Data	Expected Result	Valid Case	InValid Case	Pass/ Fail	Detailed Test Result	Test Date	Tested by	Remarks
Organization Id	Classification	blank, 2, 1000	Error		×					
		blank, 1000, 2	Error		×					
		'100, 200, 400, 500	Accept	✓						
Data Set Date	Date	2006-06-30	Accept	✓						
		Last Day of Month < Effective schema version	Error		×					
		31-03-20024, blank,20020331	Error		×					
FI Reporting Group ID	Classification	Vaule = 116002, 116003 in TCB	Accept	✓						
		Value = 116010, 116011 in FCB1	Error		×					
		Vaule = 116002, 116003 in TCB, FCS, CCS	Error		×					
Arrangement Type	Classification	018005, 018049, 018077, 018290	Accept	✓						
		blank, 1, 018002, 018004, 018014, 018023, 018032, 018037, 018045, 018055, 018099,018014, 018999	Error		×					
Lending Business Type	Classification	176001, 176017, 176027, 176070	Accept	✓						
		blank, 2, 10000000, 9.9	Error		×					
Npl Flag	Classification	blank	Error		×					
		blank, 3	Error		×					
		1, 0	Accept	✓						
Movement Type	Classification	202002, 202041	Accept	✓						
		310001, 310003, 310004, 310005, 310018, 310030, 1, 99999	Error		×					
		blank Arrangement Type = 018077, 018290	Accept	✓						
		blank Arrangement Type = 018005, 018049	Error		×					
Movement Amount	Amount	0, blank, a, 9999999999999999999.99, 9.999	Error		×					
		0.00, 9,999,999,999,999,990.00	Accept	✓						
		0, blank, a, 9999999999999999999.99, 9.999	Error		×					

FI Test Script & Test Data Details # 4
Data Set Name : Arrangement Summary - ARS - TYPE 4
Level : SIT & UAT
Application : XML BOT Generator Tools
Test Data Reference No. : Validation Checklist Test - ARS

Case No.	Description	Expected Results	Pass/Fail	Test Result Details	Test Date	Tested By	Remarks
1	**Check Data Set schema & Data Set Element in Master Template list**						
	1.1 Select DataSet Type	TCB, FCB1, FCS, CCS, IBF1					
	1.2 Data Set Name & schemaVersion	Last Day of Month > or = Effective schema version					
	1.3 CommonHeader	OrganizationId					
		DataSetDate					
		FiReportingGroupId					
	1.4 DS_ARS_Header/DS_ARS_Header_IBF	DS_ARS_Header					
	1.5 DS_ARS_Content/DS_ARS_Content_IBF	ContentRecordGroup					
		FiReportingGroupId					
		DataGroupInfo					
		DataGroupDetails					
		ArrangementType					
		InvolvedPartyType					
		ArrangementTermRange					
		RemainingTermRange					
		RepricingTermRange					
		ArrangementCurrencyFlag					
		OutstandingAmountRange					
		NumberOfAccounts					
		TotalOutstandingAmount					
2	**Check Data Set Element in Data Template list**						
	1.1 Organization Id						
	1.2 FI Reporting Group ID	TCB, FCS, CCS 116002--Solo 116003--Local					
		FCB1 116002--Solo 116003--Local 116008--Local Exculde IBF					
		IBF1 116010--IBF Out-Out 116011--IBF Out-In					

Case No.	Description	Expected Results	Pass/Fail	Test Result Details	Test Date	Tested By	Remarks
	1.3 Data Set Date						
	1.4 Arrangement Type	Document Details in ARS_Classification					
	1.5 Involved Party Type	Document Details in ARS_Classification					
	1.6 Arrangement Term Range	Document Details in ARS_Classification					
	1.7 Remaining Term Range	Document Details in ARS_Classification					
	1.8 Repricing Term Range	Document Details in ARS_Classification					
	1.9 Outstanding Amount Range	Document Details in ARS_Classification					
3	**Create Data Sets with XML BOT Generator Tools**						
	2.1 Tester import data to Data Template						
	2.2 Tester use XML BOT Generator Tools to generate BOT XML DataSet	Generate success					
	2.3 Tester open with BOT Data Entry Application	Open					
	2.4 Validate Data Set	XML is Valid					
4	**Submit Data Set** (Match Data and Period + Valid Client and Digital Signature + Valid Format)	XML File to BOT Success and Submission Status = "Received (1)"					

Validation Checklist Test - ARS

Data Set Name : Arrangement Summary - ARS - TYPE 4

Level : SIT & UAT

Application : XML BOT Generator Tools

Test Reference No. : FI Test Script & Test Data Details # 4

Data Item	Condition	Test Data	Expected Result	Valid Case	InValid Case	Pass/ Fail	Detailed Test Result	Test Date	Tested by	Remarks
Organization Id	Classification	blank, 2, 1000	Error		×					
		blank, 1000, 2	Error		×					
		'100, 200, 300, 400, 500	Accept	✓						
Data Set Date	Date	2006-06-30	Accept	✓						
		Last Day of Month < Effective schema version	Error		×					
		31-03-20024, blank,20020331	Error		×					
FI Reporting Group ID	Classification	Value = 116010,116011,116008 in TCB, FCS, CCS	Error		×					
		Value = 116010, 116011 in FCB1	Error		×					
		Vaule = 116002, 116003 in TCB, FCS, CCS	Error		×					
Arrangement Type	Classification	018005, 018049, 018077, 018290	Accept	✓						
		blank, 1, 018002, 018004, 018014, 018023, 018032, 018037, 018045, 018055, 018099 018014 018999	Error		×					
Involved Party Type	Classification	176001, 176017, 176027, 176070	Accept	✓						
		blank, 1, 176002, 176004, 176005, 176011, 176013, 176014, 176018, 176026, 176028, 176032, 176038, 176042, 176066, 176071, 999999	Error		×					
Arrangement Term Range	Classification	310006, 310017, 310019, 310028	Accept	✓						
		310001, 310003, 310004, 310005, 310018, 310030, 1, 99999	Error		×					
		blank Arrangement Type = 018077, 018290	Accept	✓						
		blank Arrangement Type = 018005, 018049	Error		×					
Remaining Term Range	Classification	310006, 310017, 310019, 310028	Accept	✓						
		310001, 310003, 310004, 310005, 310018, 310030, 1, 99999	Error		×					
		blank Arrangement Type = 018077, 018290	Accept	✓						
		blank Arrangement Type = 018005, 018049	Error		×					

Data Item	Condition	Test Data	Expected Result	Valid Case	InValid Case	Pass/ Fail	Detailed Test Result	Test Date	Tested by	Remarks
Repricing Term Range	Classification	310006, 310017, 310019, 310028	Accept	✓						
		310001, 310003, 310004, 310005, 310018, 310030, 1, 99999	Error		×					
		blank Arrangement Type = 018077, 018290	Accept	✓						
		blank Arrangement Type = 018005, 018049	Error		×					
Arrangement Currency Flag	Flag	blank	Error		×					
		blank, 3	Error		×					
		1, 0	Accept	✓						
Outstanding Amount Range	Classification	088001, 088010	Accept	✓						
		1, 088000, 088003, 088008, 088011	Error		×					
		Arrangement Type = 018039, 018240.018042.018044	Error		×					
		blank Arrangement Type = 018077, 018290	Accept	✓						
		blank Arrangement Type = 018039, 018240.018042.018044	Error		×					
Number of Accounts	Number	a, 9999999999999, 99.9	Error		×					
		blank Arrangement Type = 018077, 018290	Accept	✓						
		blank Arrangement Type = 018005, 018049	Error		×					
Total Outstanding Amount	Amount	0, blank, a, 99999999999999999999.99, 9.999	Error		×					
		0.00, 9,999,999,999,999,990.00	Accept	✓						

APPENDIX D

QUESTIONNAIRE

แบบสอบถาม Value Realization
โครงการ Electronic Data Acquisition

กรุณาตอบภายในวันที่ .....

*** แบบสำรวจนี้มีวัตถุประสงค์เพื่อประเมินโครงการ ขอขอบพระคุณทุกท่านที่ให้ความอนุเคราะห์ในการตอบแบบสำรวจ ***

คำแนะนำในการตอบแบบสอบถาม

1. แบบสอบถามชุดนี้ประกอบด้วย 4 ส่วน โดย — ส่วนที่ 1 เป็นข้อมูลทั่วไปของท่าน ส่วนที่ 2-4 เป็นคำถามเพื่อประเมินผลโครงการ

2. การตอบแบบสอบถาม
   - กรอกข้อความลงในช่องว่างที่กำหนดให้
   - เลือกคำตอบที่ตรงกับข้อเท็จจริง หรือความเห็นของท่าน

กลุ่มเป้าหมาย

เจ้าหน้าที่ ที่รับผิดชอบในการจัดทำข้อมูล ในรูปแบบ XML ส่ง Bank of Thailand และผู้ใช้งาน

ส่วนที่ 1 : ข้อมูลทั่วไป

ฝ่ายงานที่สังกัด ○ ฝ่ายพัฒนาข้อมูล BOT ○ ฝ่ายอื่นๆ โปรดระบุ _____

ตำแหน่ง _____

ความถี่ที่ท่านใช้ระบบนี้

○ ใช้ระบบ 1 -10 ครั้งต่อเดือน
○ ใช้ระบบ 11-30 ครั้งต่อเดือน
○ ใช้ระบบมากกว่า 30 ครั้งต่อเดือน

ส่วนที่ 2 : ประโยชน์ของโครงการ

หัวข้อการประเมิน	เห็นด้วยอย่างยิ่ง	เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย	ไม่เห็นด้วยอย่างยิ่ง	ไม่เกี่ยวข้อง	เหตุผลเพิ่มเติม (กรณีตอบไม่เห็นด้วย, ไม่เห็นด้วยอย่างยิ่ง)
2.1 ช่วยเพิ่มประสิทธิภาพในการทำงาน	○	○	○	○	○	○	
2.2 ช่วยเพิ่มประสิทธิภาพในการตรวจสอบข้อมูลเบื้องต้น	○	○	○	○	○	○	
2.3 ช่วยเพิ่มความรวดเร็วในการแปลงข้อมูล XML	○	○	○	○	○	○	
2.4 ช่วยลดขั้นตอนในการปฏิบัติงานประจำ	○	○	○	○	○	○	
2.5 ช่วยลดเวลา Key-in ข้อมูลแต่ละรายการ	○	○	○	○	○	○	
2.6 ช่วยลดค่าใช้จ่ายงบประมาณในการพัฒนาระบบงาน	○	○	○	○	○	○	
2.7 ช่วยเพิ่มความสะดวกในการจัดทำข้อมูลเป็น XML	○	○	○	○	○	○	

ความเห็นเพิ่มเติม

ส่วนที่ 3 : ความพึงพอใจในการใช้งาน

หัวข้อการประเมิน	ดีมาก	ดี	พอใช้	ไม่ดี	ไม่ดีอย่างยิ่ง	ไม่เกี่ยวข้อง	เหตุผลเพิ่มเติม (กรณีตอบไม่ดี, ไม่ดีอย่างยิ่ง)
3.1 มีความสะดวกในการใช้งาน	○	○	○	○	○	○	
3.2 มีความสะดวกในการเรียกใช้/แปลงข้อมูลเป็น XML	○	○	○	○	○	○	
3.3 มีรูปแบบการใช้งานง่าย	○	○	○	○	○	○	
3.4 เรียนรู้การใช้งานได้ง่าย	○	○	○	○	○	○	
3.5 สนับสนุนระบบปฏิบัติการ Windows/Microsoft Excel	○	○	○	○	○	○	

ความเห็นเพิ่มเติม

ส่วนที่ 4 : สนับสนุนกระบวนการทำงานของระบบการจัดส่งข้อมูล (Electronic Data Acquisition)

หัวข้อการประเมิน	เห็นด้วยอย่างยิ่ง	เห็นด้วย	ไม่มีความเห็น	ไม่เห็นด้วย	ไม่เห็นด้วยอย่างยิ่ง
4.1 โครงการนี้สนับสนุนกระบวนการทำงานในส่วนของการเตรียมการและจัดทำข้อมูลให้มีประสิทธิภาพ	○	○	○	○	○

ความเห็นเพิ่มเติม

โดยรวม _____ %

ขอขอบคุณ ที่กรุณาสละเวลาของท่านตอบแบบสอบถาม

CURRICULUM VITAE

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