

Straight through Processing using Standardization of Financial Messages Format: Case of Ethiopia

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Abstract

Financial institutions are exchanging massive amounts of information with their customers and among themselves. Such exchanges only work if both the sender and the receiver of a message have common understanding on the format, syntax, semantics and how to interpret the information. Presently in Ethiopia, domestic financial message exchange is mainly applied and developed to meet regulatory and business requirements. The message exchange format used locally for both regulatory and business requirements is mainly hardcopy/paper based. However, for businesses that cover different geographies and business areas different international standards have been used. Many institutions even use their own proprietary standards internally and/or with their customers.

The need for a common messaging standard is of paramount importance as the scale and complexity of transactions increases. This has resulted in the origin of financial message standards such as SWIFT, FIX, FpML and many others. This research identified ISO 20022 Universal Financial Industry (UNIFI) message scheme to describe a process for defining electronic financial messages.

It is in this context the adoption of common message format such as ISO 20022 XML has become important to enable portability and interoperability in order to achieve Straight Through Processing (STP) and simplify electronic messages.

STP encompasses a set of standards, business processes, and applications that will redefine the settlement and processing paradigm within the financial industry. In this research, ISO 20022 as a financial message standard for Bank to Customer account statement business process is used, and web service and web based applications are united to demonstrate STP.

This research also underlines the benefit of using ISO 20022 message standards in improving collaboration and interoperability among stakeholders and recommends the National Bank of Ethiopia to initiate large scale adoption of the standard.

Keywords: ISO 20022; STP; XML; UNIFI; Standards; Business Process; Applications

1. Introduction

As the financial service industry is growing the need to use technologies that improve efficiency, reduce transaction latency time, reduce cost of processing and minimize risks become mandatory. Days of fax messaging are a thing of the past and automation and straight through processing become essential to outplay competition. To eliminate the need for human intervention in interpreting financial

data, the financial industry has created message definitions – that is, agreements on how to organize the data they want to exchange in structured formats (syntax) and meaning (semantics) [6]. Based on such message definitions, they are exchanging data.

Currently in Ethiopia financial institutions and their stakeholders are using different message formats. These cause challenge in achieving portability, interoperability and integration. It is in

this context that adoption of common message format has become important to enable portability and interoperability in order to achieve STP and simplify electronic messages. STP is a solution that automates end-to-end processing of transactions for all financial instruments, from initiation to resolution.

In this work, appropriate business process, global message standards and appropriate Information Technology solutions required to integrate and achieve STP are investigated.

2. Related Work

At present, domestic financial message exchange is mainly applied and developed to meet financial regulatory body and business requirements. Their requirements have been achieved mainly through paper based format.

The used message standards are different for different business systems and financial institutions; there are no unified standards and specifications. The way messages are exchanged vary from each other and resulted in imbalance of information among financial institutions. This section discusses the different financial message standards that have been used in Ethiopia and worldwide standards.

2.1 Domestic Message Standards

The National Bank of Ethiopia has established Ethiopian Automatic Transfer System (ATS) having Automatic Clearing House (ACH) and Real-time Gross system (RTGS). The system uses SWIFT standards, for the exchange of individual payment and security messages as well as other financial information, and UNIFI ISO 20022 XML standards for bulk payments [4].

The Ethiopian Commodity Exchange (ECX) has developed its own proprietary messaging format to integrate their trading application with selected banks for account settlement. On one hand, ECX is sending and receiving financial messages with files to facilitate the real time payments and settlements. On the other hand, financial messages received from banks are processed in their trading application.

Financial Intelligence Center: All banks in Ethiopia are required to report to the Financial Intelligence Center of the Federal Democratic Republic of Ethiopia as per Directives No. SBB/46/2010 (Customer Due Diligence of Banks). The message format is proprietary which is challenging and time consuming.

Bank to Customer Account Statement: The Bank to Customer Statement message is sent by a bank to an account owner (i.e., mainly corporate customer) or to a party authorized by the account owner to receive the message. It is used to inform the account owner on the transaction activity of the account at a given point in time.

2.2 International Message Standards

Banks/Financial institutions interact with dozens of other institutions/counterparties in their day to day transactions.

The increasing risk and development cost associated to integration of such systems has made it imperative for institutions to follow and use the same standard. Growing number of mergers and acquisitions have also proven that no bank can develop in silos; and every system should follow basic standards to foster integration. The following are major reasons for the adoption and use of standardized messaging in the financial industry [2].

- *To reduce time to transact:* Shorter trade - settlement cycles are needed technologies in straight through processing. Common standard reduces the time to transact by increasing efficiencies and decreasing the number of manual corrections.
- *Common language:* Every transaction goes through multiple parties. Hence there is a need to invent a common language for players that work together irrespective of geography.
- *Regulatory norms:* Growing emphasis on regulatory reports is expected from banks to reduce both operational and market related risk. Providing such report has renewed the

importance of a standard that would comply with the regulations.

The following are the major standards that customers in the Banking industry use to enable business processes between applications.

1. SWIFT
2. Financial Information eXchange (FIX)
3. Financial eXtensible Markup Language (FinXML)
4. Market Data Definition Language (MDDL)
5. Vendor Reporting Extensible Markup Language (VRXML)
6. Research Information Exchange Markup Language (RIXML)
7. Financial Products Mark-up Language (FpML)
- eXtensible Business Reporting Language (XBRL)
8. Interactive Financial eXchange (IFX)
9. UNIFI - ISO 20022 Message Standards
10. ISO 15022
11. ISO 8583

3. Survey on Domestic Message Standards

To examine the bank to bank account statements and other account notification systems, a survey was conducted and questionnaire was distributed to 30 employees working in 19 banks (using online Google form). A total of 23 responses have been obtained. The survey result reveals that there are considerable challenges for integrating banking system with corporate customer's accounting or ERP system. The following are the main challenges cited by survey participants.

- Lack of standardization of financial messages
- Security issue of paper based information
- Capacity of corporate customers
- Capacity of banks
- Lack of regulatory requirements

Besides, interviewed corporate customers stated that:

- Getting e-Statement from banks is challenging,

- There is no secured, standardized file standard and transfer mechanism to receive e-statements,
- Though customers need to receive account statement in standardize format in order to integrate with their account system, this is not possible.

4. Selection of Message Standards

The international message standards listed in Section 2 are reviewed using the assessment metric for selection of suitable standards for Ethiopia's domestic financial messages.

After reviewing the above international message standards, the following metric have been developed for selection of suitable standards.

- Application Area,
- XML Specification,
- Model for Developing Standard,
- STP Rate,
- Global Standard,
- Unified Standard,
- International Adaption.
- Domestic Adaption, and
- Interoperability

The standards are then evaluated using subjective evaluation method. The result indicates that ISO 20022 scored the highest point (1,760 points out of 2,000).

Apart from the metric there is also sufficient Business Justification/Motivation for Adopting ISO 20022. The following are some of the motivations for the adoption of ISO 20022

- *Global interoperability:* In recent years, ISO 20022 has been touted as the definitive globally interoperable payments standard. This fact was consistently mentioned by systems that are in varying levels of ISO adoption. Japan and Australia [2] both cited global operability as a motivating factor in choosing ISO 20022, and Canada [2] sees it as a plus as they look to

update their system. In Single Euro Payments Area (SEPA) and Southern African Development Community (SADC) [2], an interoperable data standard that eliminates the need for correspondent banking relationships was a major reason for choosing ISO 20022.

- *Availability of IT solutions:* XML-based systems like ISO 20022 have a wide range of available IT solutions that can enhance efficiency and improve services at a lower cost than legacy systems. ISO-based messages can also be mapped to other standards, thereby ensuring interoperability even if one party does not use ISO 20022. This interoperability goes beyond ACH payments: ISO 20022 can also be used for foreign exchange trading, security, investment funds orders, and card payments. As the barriers between industries and regions continue to dissipate, the importance of having a modern, efficient standard that can operate between countries and industries are growing.
- *Promoting innovation:* A number of key regions such as South Africa, Canada and Finland [2] considered the importance of ISO 20022 as a platform for developing innovative payment products and services. Moreover, ISO 20022 has already become the standard of choice for developing entirely new payments systems as in Australia, Poland, Singapore, and Sweden.
- *Richer information:* The flexibility of ISO 20022 is not limited to its ability to operate between different standards, countries, and industries. The standard also enables extensive remittance information, which has become a key driver of ISO adoption in some markets [2]. Benefits to various markets depend upon the amount of remittance information already available in their existing standard, and the degree to which the information can be utilized in a standardized manner.

Besides, a research conducted on ISO 20022 implementation best practices [1] points out that the

adoption of the standard is rising around the world. As usage grows, banks and corporates perceived the advantage to adopting ISO 20022.

5. The Proposed Solution

As stated above, a new message standard (ISO 20022 XML) is proposed for bank to customer account reporting. However, to achieve STP, standards are not enough as STP encompasses a set of internal and external applications, business processes and standards [5]. Allowing STP-related business processes to be carried out without unnecessary human intervention, and thereby reducing to a minimum the overall processing lead time and the related risks, including inevitable human errors are also essential.

Therefore to make the research complete the business process and technology requirements are examined as illustrated in Figure 1.

5.1 Applying the Selected Financial Message Standards

As stated in the above section, both message analysis metric and business justification favor the selection of ISO 20022 as National Financial Message standard. Hence in this section we will try to apply this message standard in selected business processes.

The naming conventions for the ISO 20022 messages are based on a format of: xxxx.aaa.bbb.cc where:

- xxxx - 4 char representing business area; e.g. pacs
- aaa - 3 digit representing message type; e.g. 008
- bbb - 3 digit variant number representing Message Functionality,; e.g. 001
- cc - 2 digit representing version number; e.g 01

5.2 Business Process

The BankToCustomerStatement message is sent by the account servicer (i.e., Bank) to an account owner or to a party authorized by the account owner to receive the message. It is used to inform the account owner, or authorized party, of the entries booked to the account, and to provide the owner with

balance information on the account at a given point in time.

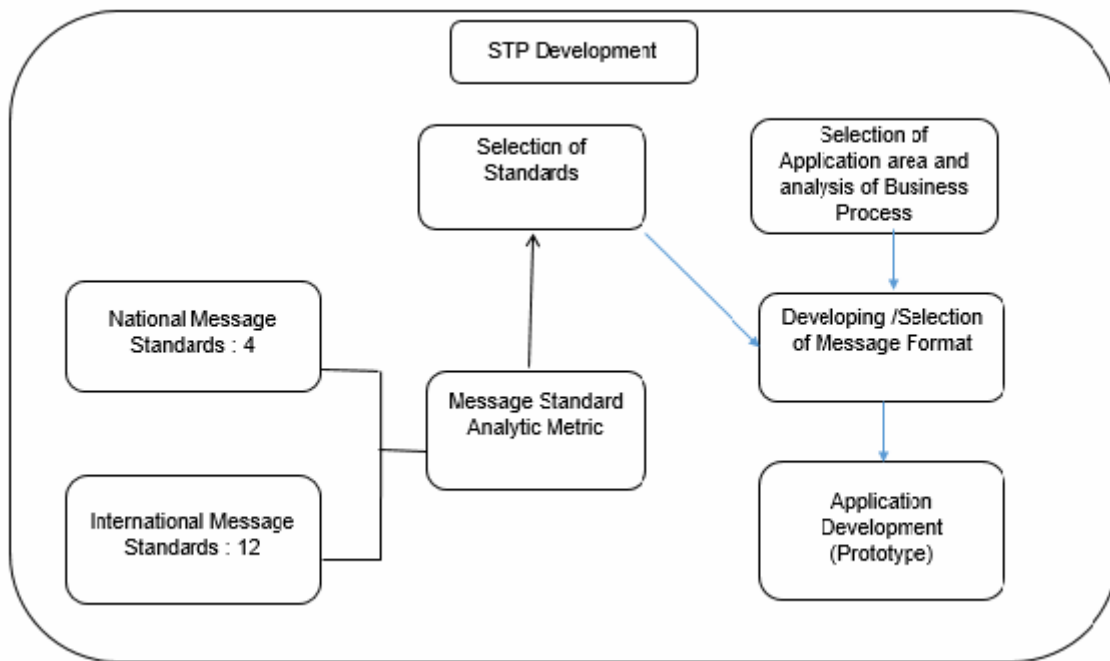


Figure 1: STP Components

5.3 Application of ISO 20022 Message Standard

To develop the standard, the following procedures are required

- To retrieve ISO 20022 Catalogue [3] from ISO 20022 website.
- From catalogue locate Identifier/Business Area (In our case it is Cash Management)
- For cash management message catalogue, identify Msg ID (Schema) and Message Name.

5.4 Proposed Solution Architecture

The prototype development of this research is based on Enat Bank S.C banking system, specifically on current account system. Derba Medroc SCA corporate customer is used to test the application. The proposed architecture is shown in Figure 2.

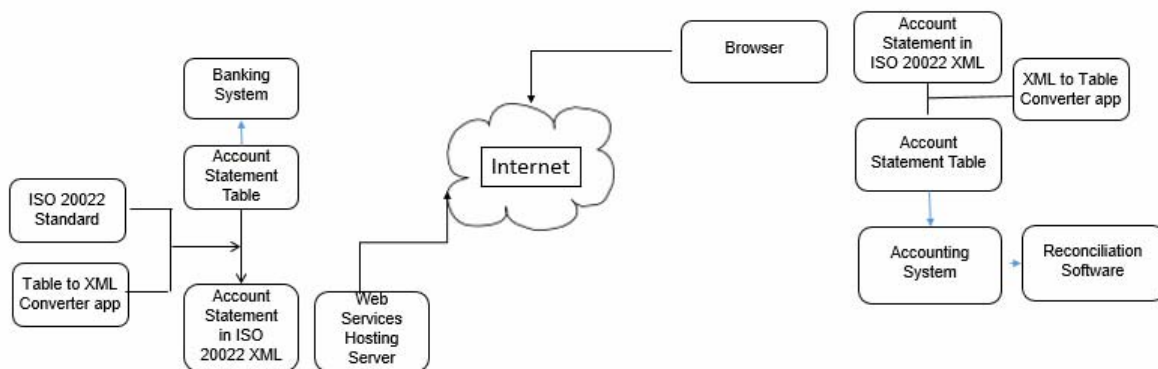


Figure 2: Proposed Solution Architecture

The prototype has two components that will be used in the bank side and the corporate. From the bank side, we have Web service application and XML

extracting tools. The corporate side is a web application that uses XML converting tools.

6. Application Development

An STP-based framework can enable financial companies to achieve business goals by providing a service-based platform to integrate new and existing applications and systems with STP functionality, implementing industry standards, and building an infrastructure that would support the dynamic financial messaging required for continuous processing for all types of financial instruments. Service-oriented architecture can provide the foundation and Web services can provide the building blocks of the application architecture to achieve seamless STP process.

Technical implementations of STP for Bank- to-customer account statement as depicted in Figure 3 involves the following four distinct but related applications.

- Generating account statement in ISO 20022 XML format;
- Registering for the service (user registration, authentication and authorization);
- Downloading files through web services; and
- Importing XML file to corporate customers system.

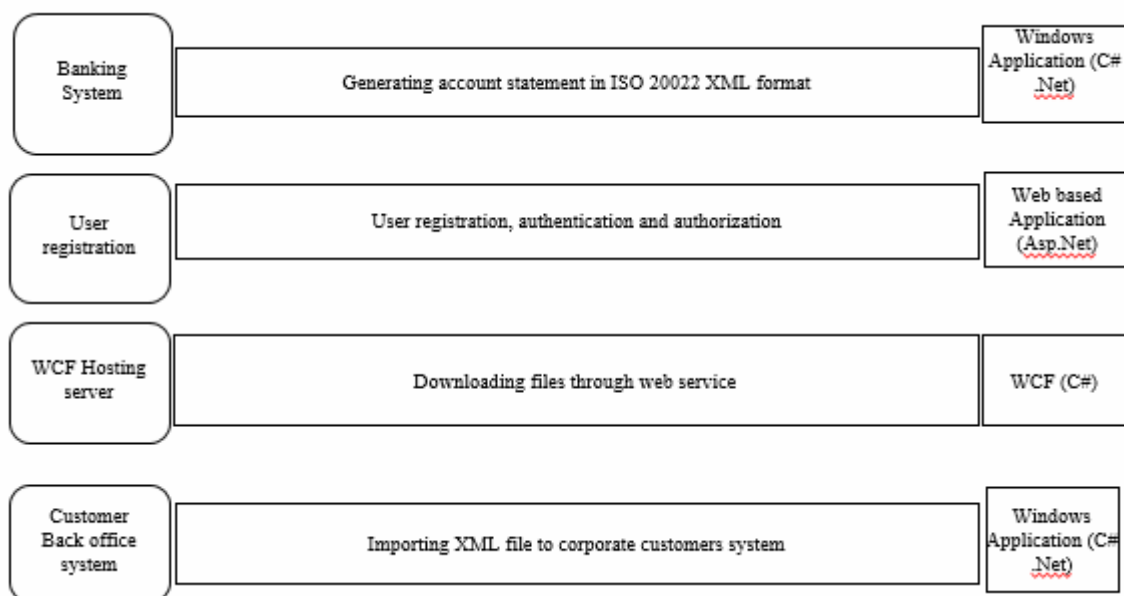


Figure 3: STP Technical Architecture

The STP application for account statement can be implemented as depicted in Figure 2 in two sites. That is, from the bank side and customer side. From customer side we need only browser and Internet connection. The customer also needs an application to convert XML files to SQL tables to achieve STP. The customer can use the XML file in his/her convenient way. From the bank side, we need web server to host WCF Service application, public IP and Internet connection. An application to convert to ISO 20022 XML is also required.

7. Conclusion and Future Work

As the financial services industry is growing more and more mature, there is an increasing need to use technologies that improve efficiency, reduce time to transact and associated costs and risks is increasing.

The day to day operations of Banks and corporate clients have been challenged due to the lack of end-to-end straight-through processing (STP). Because of this, they are forced to enter the same data, manually correct records, format, etc. Hence, standardization of messaging will cut enormous costs and risk across market via consistent approach. Important drivers pushing STP initiatives are:

- The elimination of unnecessary manual intervention reduces errors and increases efficiency, reducing operational risk.
- Financial transactions can be performed faster and lots of transactions can be processed simultaneously without quality loss.
- Changes in financial strategies can be performed faster and more accurately.
- Increased operational efficiency and time savings reduce operational cost

With the emergence of technologies such as eXtensible Markup Language (XML), Web services and SOA the task of standardization and unification of messages has become easier.

In this research attempt was made to demonstrate how global standard (ISO 20022 XML) and web Service technology can be used to achieve Straight through Processing. In Ethiopia, attempt was made to use ISO 20022 message standard in Bank to Bank message communication especially in RTGS bulk transfers. This effort should continue in large scale standardization project.

There is still much to be done to reach a consensus on how ISO 20022-based payment message standards could be used and implemented in Ethiopia. Full benefits won't be realized until there is a critical mass of banks and corporates all using the same standard and implemented in a similar fashion.

This paper underlines the benefit of using ISO 20022 in improving collaboration among stakeholders, and the National Bank of Ethiopia has to

take the initiative to run large scale adoption of the standard.

The other research area to be covered is Corporate to Bank message standards. The standard should include Customer Credit Transfer Initiation, Customer Direct Debit Initiation, and Payment Status Report.

In the future we have a plan to take part in the following two research projects:

- The National Bank of Ethiopia should launch large scale adoption of ISO 20022 in collaboration with stakeholders.
- Standardization and STP project at a national level to satisfy the needs of corporate customers shall be initiated.

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