Infosys® Finacle

Messaging standards in financial industry

Thought Paper

www.infosys.com/finacle
Universal Banking Solution | Systems Integration | Consulting | Business Process Outsourcing

Building Tomorrow's Enterprise

Messaging standards in financial industry

As the financial services industry is growing more and more mature, there is an increasing need to use technology to improve efficiency, time to transact and reduce the associated costs and risks. The days of fax messaging are a thing of the past as automation and straight through processing have become essential to outplay competition. Today, much of the information exchange between clients and counterparties is done electronically. This made it imperative to develop messaging standards that multiple institutions may follow. Several market-led initiatives to develop common standards have made substantial progress. This paper focuses on some of the popular standards existing for trading, settlement, banking etc., and finally delves on unification of standards and future trends in this area.

Why do we need standards?

Typically every bank/Financial Institution (FI) interacts with dozens of other institutions/ counterparties in their day to day transactions. The increasing risk and development cost for integration of each of these systems, has made it imperative that all institutions follow the same standard. Growing number of mergers and acquisitions have also proven that no bank can develop in silos and every system should follow certain basic standards in order to make integration easier. The following are some more challenges that lead to the development of standardized messaging in the financial industry

- **Need to reduce the time to transact:** Shorter trade – settlement cycles needed technology that would help in straight through processing. The existence of a common standard reduces the time to transact due to higher efficiencies and lower number of manual corrections.
- **Common language:** Every transaction goes through multiple parties, hence there is a need to invent a 'common language' that all players can understand irrespective of geography and region.
- **Regulatory norms:** Growing emphasis on regulatory reports (Basel II, MiFid, Sarbanes Oxley etc.) and need to reduce risks, both operational and market related has renewed the importance of a standard that would comply with the regulations.

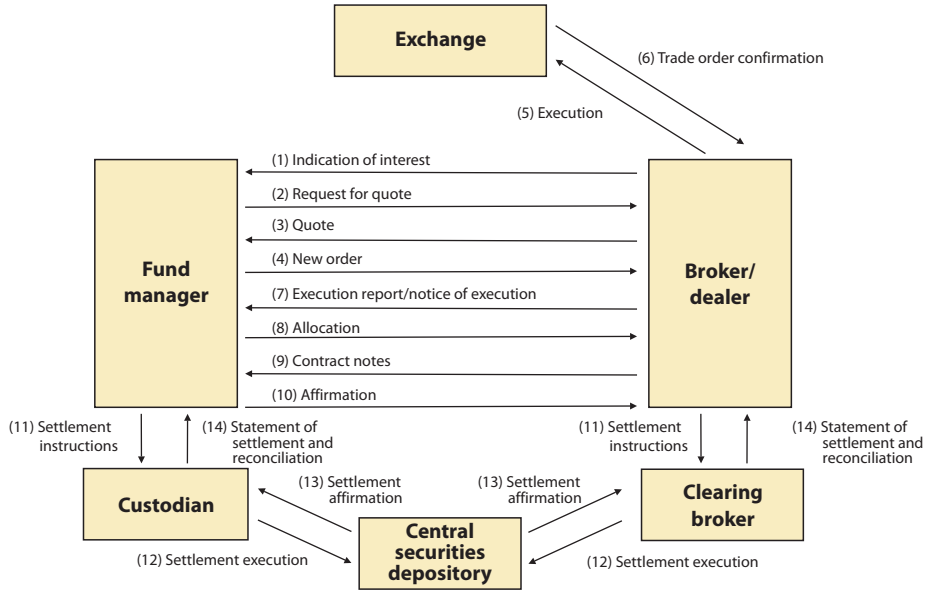
Example of message flow for a securities transaction

To understand the importance and the need to have standardized messaging, consider an example of an equity trade transaction. One single cycle of equity trade comprises of multiple messages flowing between multiple parties as described below:

1. An 'indication of interest' is sent by a broker to the fund manager
2. Fund manager requests for a quote
3. Broker sends the quote to fund manager
4. Fund manager sends a 'New Order' to broker
5. Broker routes the order to the exchange
6. Exchange sends execution details
7. Broker gets back with 'notice of execution' to fund manager
8. Fund manager provides allocation details
9. Broker sends contract notes for the same, based on allocation

10. Fund manager sends back an affirmation, in response
11. Fund manager sends settlement instructions to custodian, simultaneously broker provides instructions to clearing broker
12. Custodian and clearing broker in turn initiate settlement with depository separately
13. After matching the transactions, depository sends an affirmation to clearing member and custodian
14. While custodian sends a settlement statement to fund manager, clearing member sends it to broker

Message flows for a cash equity trade



It is evident that in a single equities transaction, six different parties are involved and about 14 different messages are exchanged between the parties. The numbers increase exponentially, when we consider multi-broker, multi-exchange, multi-region scenarios. Hence, it is imperative that the parties follow same messaging formats, in order to reduce both errors and cost of interfacing. Multiple standards emerged over the last few decades. The following section provides the details of important standards that are being used presently.

Emergence of standards

The need for standardized messaging format was felt much before the emergence of World Wide Web. The SWIFT came into existence in 1975, while its first message was sent in 1977. However, the emergence of WWW has accentuated the need for common messaging standards, as the scale and complexity of transactions increased manifold. This has resulted in the origin of FIX, Fpml and many others standards, across multiple functions and asset classes. This following section details some of the important standards, namely:

- SWIFT
- FIX
- Fpml
- XBRL

Some important standards in financial services industry

Financial Information eXchange (FIX) protocol

The Financial Information eXchange (FIX) protocol is a messaging standard developed specifically for the real-time electronic exchange of securities transactions. FIX is a public domain specification owned and maintained by FIX Protocol, Ltd.

Fix Standards are mainly used for pre trade information exchange for equities, bonds, foreign exchange, derivatives. The protocol is fast expanding to post trade communication. This standard is widely used by both the buy side (institutions) as well as the sell side (brokers/dealers) of the financial markets. Among its users are mutual funds, investment banks, brokers, stock exchanges and ECNs.

As per FIX Global Survey conducted by TowerGroup

- 75% of buy-side and 80% of sell-side firms interviewed currently use FIX for electronic trading
- Over 80% of buy-side firms and over 95% of sell-side firms surveyed currently support, or plan to support FIX for allocations
- Over three quarters of all exchanges surveyed supported a FIX interface, with the majority handling over 25% of their total trading volume via FIX

Example of a FIX message

8=FX.4.2	56=ORDERMATCH	54=1
9=144	11=1275695928511	55=IBM
35=D	21=1	59=0
34=2	38=98	60=20100604-23:58:48.551
49=CLIENT1	40=2	10=180
52=20100604-23:58:48.556	44=102.7	

Swift

SWIFT is the industry-owned cooperative, supplying secure, standardized messaging services to 7,500 financial institutions in 200 countries. The SWIFT community includes banks, broker/dealers and investment managers, as well as their market infrastructures in payments, securities, treasury and trade. The standard is exhaustively used as a back office messaging standard for settlement, corporate actions, and fund transfers.

The SWIFT messages are categorized into 10 categories based on the type of functionality that they support. SWIFT follows MT and MX standards mainly, with MT messages following. FIN syntax and MX standards following XML syntax.

Message Type	Description
MT0xx	System Messages
MT1xx	Customer Payments and Cheques
MT2xx	Financial Institution Transfers
MT3xx	Treasury Markets
MT4xx	Collection and Cash Letters
MT5xx	Securities Markets
MT6xx	Treasury Markets - Metals and Syndications
MT7xx	Documentary Credits and Guarantees
MT8xx	Travellers Cheques
MT9xx	Cash Management and Cusomer Status

MX Identifier	Description
acmt.xxx.xxx.xx	Account Management
admi.xxx.xxx.xx	Administration
camt.xxx.xxx.xx	Cash Management
defp.xxx.xxx.xx	Derivatives
pacs.xxx.xxx.xx	Payments Clearing and Settlement
pain.xxx.xxx.xx	Payments Initiation
reda.xxx.xxx.xx	Reference Data
seev.xxx.xxx.xx	Securities Events
semt.xxx.xxx.xx	Securities Management
sese.xxx.xxx.xx	Securities Settlement
setr.xxx.xxx.xx	Securities Trade
trea.xxx.xxx.xx	Treasury
tsmt.xxx.xxx.xx	Trade Services Management

Sample SWIFT MT message

```
{1:F01BANKBEBBCCIC0000000000}{2:I502BANKBEBBXCICN}{4:
:16R:GENL
:20C::SEME//ORDER 6
:23G:NEWM
:98C::PREP//20070425101030
:22F::TRTR//TRAD
:16S:GENL
:16R:ORDRDET
:22H::BUSE//SUBS
:22H::PAYM//APMT
:22F::TOOR//MAKT
:22F::TILI//GTCA
:98A::EXPI//29991231
:16R:TRADPRTY
:95Q::INVE//SMART INVESTOR
:97A::SAFE//1111
:16S:TRADPRTY
:19A::ORDR//GBP1050,
:35B:ISIN GB1234567890
:16S:ORDRDET
:16R:SETDET
:22F::SETR//TRAD
:16S:SETDET
-}
```

Financial products markup language - FpML

FpML (Financial products Markup Language) is the industry-standard protocol for electronic dealing and processing of OTC derivatives. It establishes a protocol for sharing information electronically on, and dealing in swaps, derivatives and structured products. It is based on XML (Extensible Markup Language), the standard meta-language for describing data shared between applications. All categories of privately negotiated derivatives are being incorporated into the standard. FpML is primarily used by dealers, asset managers, hedge funds, service providers and technology companies

Product coverage includes

- IRD: Interest Swaps, Swaptions, FRA's, Caps and Floors, Inflation Swaps and Bullet Payments.
- FX: Spots, Foreign Exchange Swaps, Forwards and FX Options.
- Credit: Credit Default Swaps, Credit Default Indexes, and Baskets.
- Equity: Equity Swaps, Equity Options, Variance Swaps and Total Return Swaps.
- Commodity: Commodity underlyer, Commodity Swaps, Commodity Options.

Sample message format for message confirmation in Fpml.

```
<?xml version="1.0" encoding="UTF-8" ?>
<FpML xmlns="http://www.fpml.org/2005/FpML-4-2" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.fpml.org/2005/FpML-4-
  2 ../../schema/fpml-main-4-2.xsd" xsi:type="TradeMatched" version="4-2">
- <header>
    <messageId messageIdScheme="http://www.custodian.com/coding-scheme/message-id">9287908771-55</messageId>
    <sentBy>Custodian</sentBy>
    <creationTimestamp>2004-06-23T07:10:05-07:00</creationTimestamp>
  </header>
- <tradeIdentifier>
    <partyReference href="partyA" />
    <tradeId tradeIdScheme="http://partyA.com/coding-scheme/trade-id">REPO12345</tradeId>
  </tradeIdentifier>
- <tradeIdentifier>
    <partyReference href="partyB" />
    <tradeId tradeIdScheme="http://partyB.com/coding-scheme/trade-id">REPO8979086</tradeId>
  </tradeIdentifier>
- <!--
      When there are differences that are within the margin of tolerance, they can be reported here
            if necessary, but it is not mandatory for the TradeMatched message type.
  -->
- <differences>
    <differenceType>Value</differenceType>
    <differenceSeverity>Warning</differenceSeverity>
    <element>Rate</element>
    <baseValue>0.056700001</baseValue>
    <otherValue>0.0567</otherValue>
    <message>Not significant</message>
  </differences>
- <party id="partyB">
    <partyId>BUYRGB22</partyId>
  </party>
```

eXtensible Business Reporting Language (XBRL)

XBRL (eXtensible Business Reporting Language), developed by a nonprofit consortium with over 400 members, is the global standard for digital reporting. XBRL provides a platform for communicating financial data between companies, regulators, banks and other external parties. It is a XML based open standard that allows digitization of generation, exchange and consumption of business reports, by converting all the important data into meta data, thus making the data more analyzable and reusable for the end users.

```
<?xml version="1.0" encoding="UTF-8" ?>
<!--  Generated by Fujitsu XWand B0161C   -->
- <link:linkbase xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.xbrl.org/2003/linkbase http://www.xbrl.org/2003/xbrl-linkbase-
    2003-12-31.xsd" xmlns:example9="http://www.ifrs.org/xbrl/illustrativeExamples/Example9" xmlns:ifrs="http://xbrl.iasb.org/taxonomy/2011-01-17/ifrs"
    xmlns:link="http://www.xbrl.org/2003/linkbase" xmlns:xbrli="http://www.xbrl.org/2003/instance" xmlns:xlink="http://www.w3.org/1999/xlink">
    <link:roleRef roleURI="http://www.ifrs.org/xbrl/illustrativeExamples/example9/00001" xlink:type="simple" xlink:href="example9_2011-03-25.xsd#_00001" />
  - <link:calculationLink xlink:type="extended" xlink:role="http://www.ifrs.org/xbrl/illustrativeExamples/example9/00001">
      <link:loc xlink:type="locator" xlink:href="http://xbrl.ifrs.org/taxonomy/2011-03-25/ifrs-cor_2011-03-25.xsd#ifrs_ChangesInPropertyPlantAndEquipment"
        xlink:label="loc" />
      <link:loc xlink:type="locator" xlink:href="http://xbrl.ifrs.org/taxonomy/2011-03-25/ifrs-cor_2011-03-
        25.xsd#ifrs_AdditionsOtherThanThroughBusinessCombinationsPropertyPlantAndEquipment" xlink:label="loc_2" />
      <link:calculationArc xlink:type="arc" xlink:arcrole="http://www.xbrl.org/2003/arcrole/summation-item" xlink:from="loc" xlink:to="loc_2" order="1.0" weight="1.0" />
      <link:loc xlink:type="locator" xlink:href="http://xbrl.ifrs.org/taxonomy/2011-03-25/ifrs-cor_2011-03-25.xsd#ifrs_DepreciationPropertyPlantAndEquipment"
        xlink:label="loc_3" />
      <link:calculationArc xlink:type="arc" xlink:arcrole="http://www.xbrl.org/2003/arcrole/summation-item" xlink:from="loc" xlink:to="loc_3" order="2.0" weight="-1.0" />
      <link:loc xlink:type="locator" xlink:href="http://xbrl.ifrs.org/taxonomy/2011-03-25/ifrs-cor_2011-03-25.xsd#ifrs_DisposalsPropertyPlantAndEquipment"
        xlink:label="loc_4" />
      <link:calculationArc xlink:type="arc" xlink:arcrole="http://www.xbrl.org/2003/arcrole/summation-item" xlink:from="loc" xlink:to="loc_4" order="3.0" weight="-1.0" />
      <link:loc xlink:type="locator" xlink:href="http://xbrl.ifrs.org/taxonomy/2011-03-25/ifrs-cor_2011-03-
        25.xsd#ifrs_ImpairmentLossRecognisedInProfitOrLossPropertyPlantAndEquipment" xlink:label="loc_5" />
      <link:calculationArc xlink:type="arc" xlink:arcrole="http://www.xbrl.org/2003/arcrole/summation-item" xlink:from="loc" xlink:to="loc_5" order="4.0" weight="-1.0" />
    </link:calculationLink>
  </link:linkbase>
```

More details of popular standards

While all the standards described above have wide acceptance in the industry, they only cater to specific domains. For example FIX mainly caters to pre trade transactions, while SWIFT is widely appreciated for settlement messages. FpML, on the other hand is acclaimed for messages related to OTC derivatives. Over the years, each of the standards tried to expand to other areas, though with limited success.

The following table provides mapping between functions and standards, which are operating in the particular domain.

Function	Sub Function		Equities	Bonds	Funds	Structured Products	Listed Derivatives	OTC Derivatives
Pre Trade	Indications of Interest, Trade advertisements, Quotes	FIX	•	•	•		•	
		XBRL						
		Swift						
		Fpml						
Pre Trade	Market Data/ Reference Data, Short Sale Locate	FIX	•	•	•		•	
		XBRL						
		Swift						
		Fpml						
Post Trade	Order Routing, Execution and Confirmation	FIX	•	•	•		•	
		XBRL						
		Swift						
		Fpml				•		•
Post Trade	Trade Capture, Matching	FIX	•	•	•		•	
		XBRL						
		Swift	•	•	•			
		Fpml				•		•
Post Trade	Clearing and Settlement	FIX	•	•	•		•	
		XBRL						
		Swift	•	•	•			
		Fpml				•		•
Position Management	Asset Servicing / Corporate Actions	FIX						
		XBRL	•	•	•			
		Swift						
		Fpml				•		
Position Management	Reconciliation	FIX						
		XBRL						
		Swift	•	•	•			
		Fpml						
Collateral Management	Collateral Management and Margin calls	FIX	•	•	•		•	
		XBRL						
		Swift	•	•	•		•	•
		Fpml						•
Valuation and Reporting	Tax Management, Risk Management, Reporting	FIX						
		XBRL						
		Swift	•	•	•			
		Fpml					•	•
Payments	Fund Transfers	FIX						
		XBRL						
		Swift	•	•	•		•	
		Fpml						
Regulatory Reporting	Regulatory Reporting such as Mifid etc	FIX	•	•	•		•	
		XBrl	•	•	•	•	•	•
		Swift	•	•			•	
		Fpml						

One can notice there is quite some overlapping existing between the standards. This has given rise to inefficiencies and cost issues, as financial institutions had to either adjust to limited functionality provided by a single standard, or tackle surmounting costs, resulting from adherence to multiple standards. This has given rise to the need to unify standards into one universal standard.

Unification of standards

Most financial experts began to recognize the challenges associated with using multiple standards. The realization came from the fact that no standard is perfect across all asset classes and domains. It is futile to create additional standards to represent financial transactions in a new way. The key is to have some kind of interoperability between the 'best of the breed' standards.

The advantages of having a common inter operable solution include

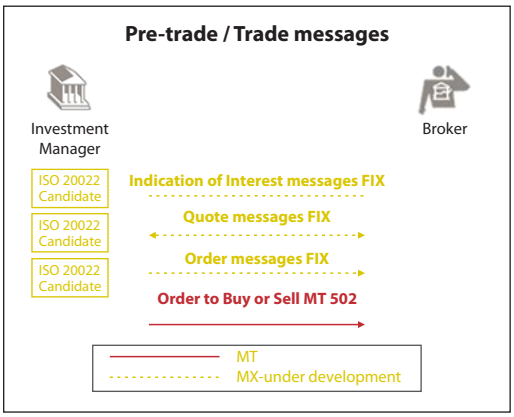
Cost effectiveness: Financial institutions can avoid excessive spending on interfacing between the standards. Instead, they may have a solution that co-exists with all standards

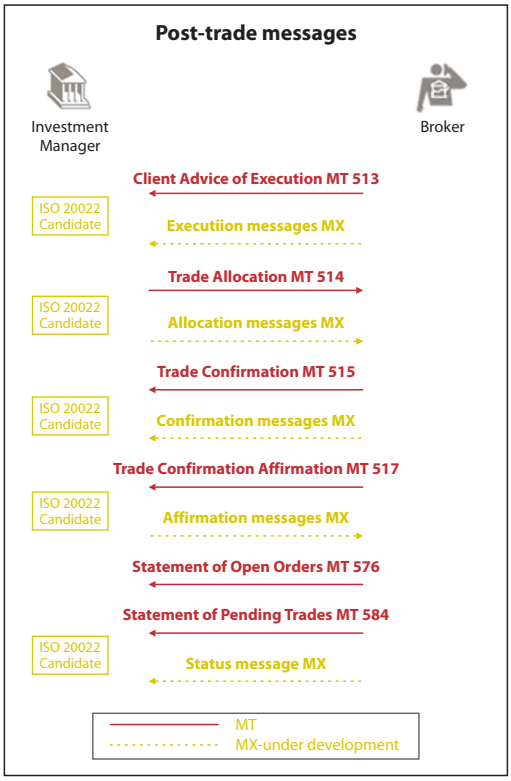
Best of breed solution: Financial institutions do not have to satisfy themselves with a standard that is superior in one domain and inferior in another. They may instead choose to follow the best standard available in each domain. For example, FIX is a de facto standard for pre-trade, while SWIFT is good in settlement domain; FpML on the other hand, is a de facto standard for OTC derivatives.

The first step towards establishing interoperability was achieved through ISO 15022 XML, which glued together pre-trade and post-trade domains of FIX and SWIFT respectively. ISO 20022 is the subsequent step towards unification of standards. This exercise involved partnership between FIX, SWIFT, FpML, OMGEO and Visa and covers wide range of domains such as payments, OTC derivatives, securities, funds, Cash Management, treasury, and cards .

Securities pre-trade, trade and post-trade in ISO 20022, using FIX and SWIFT

The following example shows the common messaging for securities transaction involving FIX and SWIFT expertise. While all the pre trade and trade related messages are exchanged using FIX, post trade messages are exchanged using SWIFT standard.





Challenges ahead

The task of unification has been successful in bringing out multiple unified messages. However, many challenges need to be addressed yet.

- There is a lot of redundancy that is built over a period of time. Multiple standards are catering to a single functionality. Getting sanity and consistency would require significant efforts and time
- Adoption of unified messaging is still Luke warm. Unless the industry accepts and propagates the advantages of the same, the future will not be assured
- The scope has to be widened further as we go along to include insurance, hedge funds, alternative investments
- Industry should be in a position to derive significant gains in terms of cost savings. This alone would ensure wider acceptance
- Many new standards are coming into existence such as SEPA. Common standard should be in a position to support such changes and new regulations. Else, after some years the institutions, will be struggling with a different set of multiple standards, which beats the purpose of having a unified standard.

Other standards

While the above standards are universally accepted standards across various geographies, multiple regional standards are in place today. Indian banks use SFMS (Structured Financial Messaging Solution) standards for all domestic fund transfers. This standard ensures faster settlement and transfer between different banks that come under RBI purview. SEPA has been witnessing growing prominence within European countries as it results in bringing cost efficiencies for transfers within Euro zone. We can expect emergence of more such standards in future. However, the standards like ISO 20022 will still coexist and remain in demand, for cross border transactions.

Conclusion

The changing paradigm involving development of a common messaging standard will have a significant impact on the way the financial transactions are done. The automation has the potential to bring about tremendous gains in terms of reduction in costs, reduction in errors occurring due to existence of multiple standards. The standards can also bring about regulatory compliance, thus reducing risks.

With the emergence of technologies such as eXtensible Markup Language (XML), task of standardization and unification of messages has become easier. Bigger players such as Oracle, Microsoft are gearing up for the challenge of unification, by developing requisite technological infrastructure. It is clear that, the coming years will witness significant changes in the way financial transactions are handled.

References

1. Demystifying standards - By SWIFT Standards in collaboration with our community
2. Microsoft Financial Services White Paper -Financial Messaging March 2005 Edition
3. FIX Message Specifications – Version 2.19
4. Article – Road to Standards Nirvana - By Martin Sexton

Srilatha Kappagantula

Lead Consultant, Finacle Consulting Team (Wealth Management), Infosys

About Finacle

Finacle from Infosys partners with banks to transform process, product and customer experience, arming them with 'accelerated innovation' that is key to building tomorrow's bank.

Infosys® Finacle | Building Tomorrow's Enterprise

For more information, contact Finacleweb@infosys.com

www.infosys.com/finacle