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The economics of Information Technologies Standards & Recommendations The financial Services Sector Case

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This research investigates the problem of Information Technologies Standards or Recommendations from an economical point of view. In our competitive economy, most enterprises adopted standardization's processes, following recommendations of specialized Organisations such as ISO (International Organisation for Standardization), W3C (World Wide Web Consortium) and ISOC (Internet Society) in order to reassure their customers. But with the development of new and open internet standards, different enterprises from the same sector fields, decided to develop their own IT standards for their activities. So we will hypothesis that the development of a professional IT standard required a network of enterprises but also a financial support, a particular organizational form and a precise activity to describe. In order to demonstrate this hypothesis and understand how professional organise themselves for developing and financing IT standards, we will take the Financial IT Standards as an example. So after a short and general presentation of IT Standards for the financial market, based on XML technologies, we will describe how professional IT standards could be created (nearly 10 professional norms or recommendations appear in the beginning of this century). We will see why these standards are developed outside the classical circles of standardisation organisations, and what could be the "key factors of success" for the best IT standards in Finance. We will use a descriptive and analytical method, in order to evaluate the financial support and to understand these actors' strategies and the various economical models described behind. Then, we will understand why and how these standards have emerged and been developed. We will conclude this paper with a prospective view on future development of standards and recommendations.

Keywords: information technologies, financial standards, development of standards, evaluation of the economical costs of standards

Introduction

This research proposes to investigate the problem of the development of Information Technologies (IT) and Information Systems (IS) Standards and specifications from an economical point of view. With the development of new Information Technologies (IT) for improved our Information Systems (IS), such as new web technologies, new organizations of standardizations and specifications have appeared at the end of the last century. The traditional Standards Developing Organizations (*SDO*), such as ISO, the International Standardisation Organisation, seems to be outstripped by new kind of organizations such as Standards Setting Organisations (*SSO*) and Standards Professional Organisations (*SPO*) who propose specifications and recommendations. So we can see here an emergence of standards wars and memberships battle by taking the financial domain as an example.

As Stango remarks, “*the rapid pace of technological change in the last two decades has highlighted the strong link between technological standards, market performance and economic welfare*”. (2004, p.1) So each actor in this market will be interested to work and analysis this situation. Consequently most enterprises adopt standardization’s processes in our competitive economy, following recommendations of Standards Organizations, such as International Organisation for Standardization (*ISO*), the World Wide Web Consortium (*W3C*), Organisation for the Advancement of Structured Information Standards (*OASIS*) and *Internet Society (ISOC)* in order to reassure their customers.

But with the development of new and open internet standards, different enterprises from the same sector fields, decided to develop their own IT standards for their activities. So we will hypothesis that the development of a professional IT standard required a network of enterprises but also a financial support, a particular organizational form and a precise activity to describe or analyse.

In order to demonstrate this hypothesis and understand how professional organise themselves for developing and financing IT standards, we will take the Financial IT Standards as an example. As Ramello and Porrini explain, “*the central dilemma of the banking sector is stability versus competition*”. The implementation of IT standards could “*eliminate lock in mechanism in the competition between financial institutions*” (2004, p.19-20). For example a company has replaced “*60 market data flat file interfaces, with nine XML Interfaces and a further 320 applications interfaces were replaced by 75 XML equivalent*”. (Sekton, 2003)

So after a short and general presentation of IT Standards for the financial market, based on XML (eXtensible Markup Language) technologies, we will describe how professional IT standards could be created. Today nearly 10 professional norms or recommendations appear at the beginning of this century.

We will see why these standards are developed outside the classical circles of standardisation organisations, and what could be the “*key factors of success*” for the best IT standards in Finance. We will use a descriptive and analytical method in order to evaluate the financial support method and understand these actors’ strategies and the various economical models described behind. Then, we will understand why and how these standards have emerged and been developed. We will conclude this paper with a prospective view on future development of standards and recommendations.

1. The main Standardisation Organisations

Standards Organisations are “*bodies, organizations and institutions that produce, and in some cases measure, standards*” (Wikipedia, standard, 2005). These Standards Organizations are constituted at the national, transnational and international levels - e.g. AFNOR (for French Standards) and ISO (for international standards).

Following the description of Caplan (2003), we can distinguish two main Standardisation Organisations:

1. The Standards Developing Organisations (SDOs) ;
2. The Standards Setting Organisations (SSOs).

According to Caplan, a Standards Developing Organisation is “*an organisation that is an accredited representative to the International Organisation for Standardization (ISO) or the International Electrotechnical Commission: for example the American National Standards Institute (ANSI) is the sole US representative to ISO/IEC*” (2003, p.4). We can say that also the AFNOR (Association Française de Normalisation) in France and UNI (Ente Nazionale Italiano di Unificazione) are representative to the ECS (the European Committee for Standardization), was founded in 1961 by the national standards bodies in the European Economic Community and EFTA countries and to ISO. There are Standards Developing Organizations.

A Standards Setting Organisation (SSO) is an organisation which “*includes not only formal SDOs, but trade organizations, consortia, alliances and other groups that develop de jure or de facto specifications within their industries or spheres of concern*” (2003, p.4). For example W3C is a Standards Setting Organisation because it’s a private industry consortium.

1.1.1. The Standards Developing Organizations (SDOs)

ISO (International Standardization Organization) has been created in 1947 and is now a network of the national standards institutes of 151 countries. This non governmental organisation is “*the world's largest developer of standards. Although ISO's principal activity is the development of technical standards, ISO standards also have important economic and social repercussions. ISO standards make a positive difference, not just to engineers and manufacturers for whom they solve basic problems in production and distribution, but to society as a whole*”. (ISO¹).

Their standards, developed by nearly 230 specific technical committees, were used in the entire world (38 technical committees has been dissolved). For example there is a special technical committee dedicated to Information Technologies (JTC 1) or the Joint ISO/IEC Technical Committee established in 1987. JTC1 has 26 participating countries and 43 observer countries. This JTC1 technical committee has published 1807 ISO standards related to the TC and its SCs: for example, JTC1 has developed the famous Standard Generalized Markup Language (SGML, ISO 8879:1986). They also developed some important IT standard such as the ODA standard (Information technology -- Open Document Architecture (ODA) and interchange format: Introduction and general principles, ISO/IEC 8613-1:1994). Nevertheless, we can said that ISO has developed too complex information technology Standards and more particular with internet development of standards. The SGML Standard for example was too difficult to use for internet.

¹ website <http://www.iso.org/iso/en/aboutiso/introduction/index.html>

For the purpose of our study, i.e. the development of financial standards, we need to speak about the Technical Committee TC68, which is an important Committee for financial services. This Committee has developed a lot of standards for financial transaction, bank card, and International bank account number (IBAN) & International securities identification numbering system (ISIN). They have developed also a special standard for “Securities and related financial instruments -- Classification of Financial Instruments (CFI code)” (CFI, ISO 10962:2001). There are 24 participating countries and 37 observer countries.

Traditionally, the main costs are borne by the member bodies which manage the specific standards' development projects and the business organisations which provide experts to participate in the technical work. The ISO's national members pay subscriptions. The subscription paid by each member is in proportion to the country's Gross National Income and trade figures. Another source of revenue is the sale of standards. These organisations are, in effect, subsidizing the technical work by paying the travel costs of the experts and allowing them time to work on their ISO assignments.

We can speak also about the InterNational Committee for Information Technology Standards (INCITS), which is a forum of choice for information technology developers, producers and users for the creation and maintenance of formal de jure IT standards.

1.1.2. The Standards Settings Organizations (SSOs)

So as we defined above, new organisations work on the development of new internet standards such as the World Wide Web Consortium (*W3C*), the Organisation for the Advancement of Structured Information Standards (*OASIS*) which are private industry consortia and the Internet Engineering Task Force (*IETF*), a private volunteer association which depends on ISOC (*Internet Society*). These new Standards Setting Organisations have emerged and propose new recommendations especially for internet.

The Internet SOCIety (*ISOC*) is a professional membership society. This society has been created in 1992 and has now more than 100 organisations and over 20,000 individual members in over 180 countries. It addresses “*issues that confront the future of the Internet, and is the organisation home for the groups responsible for Internet infrastructure standards, including the Internet Engineering Task Force (IETF) and the Internet Architecture Board (IAB)*”. The Internet Engineering Task Force (IETF) was is “an open international community of network designers, operators, vendors and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. It is the principal body engaged in the development of new Internet Standard specifications”.

The Internet Architecture Board (*IAB*) is “*chartered by the Internet Society Trustees to provide oversight of the architecture of the Internet and its protocols. [...] The IAB provides oversight of the process used to create Internet Standards and serves as an appeal board for complaints of improper execution of the standards process*”.

The Organisation for the Advancement of Structured Information Standards (*OASIS*) is a consortium created in 1993 and has nearly 4,000 participants representing over 600 organisations and individual members in 100 countries. It's a not-for-profit, international consortium that drives the development, convergence, and adoption of XML-based e-business standards.

The World Wide Web Consortium (*W3C*) was created in 1994, with the help of Tim Berners-Lee in order to develop interoperable technologies for internet (specifications, guidelines, software, and tools) to “*lead the Web to its full potential. The specifications developed by W3C is generally open-sources and easy to implement following the guidelines*”. This international institution has over 350 Member organisations from 28 countries all over

the world, which cover wide range commercial activities. This new organisation has received a large support from the public and proposes new ways of financing. They don't sell their standards such as ISO.

1.2. Definition of standards, specifications and drafts

First of all, we would like to say that with the development of internet & new information technologies, the notion of "standard" is less well-defined and it's difficult to see the difference between different standards, emerging from different Standards Organisations, such as Standards Developing Organisations (SDOs) or Standards Setting Organisations (SSOs).

For example, SSOs use different denominations in order to be distinguished with other Standards Developing or Setting Organisations. For example W3C establishes Recommendations "*which are similar to the standards published by other organizations*".

*"A W3C Recommendation is a specification or set of guidelines that, after extensive consensus-building, has received the endorsement of W3C Members and the Director. W3C recommends the wide deployment of its Recommendations. Note: W3C Recommendations are similar to the standards published by other organizations"*².

In order to be more pragmatic, we will follow the definition of Grindley about these standards. "*standards define any common set of product features. They range from loose sets of product characteristics to precise specifications for technical interfaces*" (Grindley, 1995, p.21). For Billote (1997), standards have three main features : an informational, an legal and an economical feature.

- The information feature is "*a set of technical or intellectual knowledge coded in information*".

- The legal feature describes the rights associated to the standard. It can be private or collective. We can see the problem of patents and patent thicket, i.e. "*an overlapping set of patent rights requiring that those seeking to commercialise new technology obtain licenses from multiple patentees*" (Shapiro, 2001).

- The economical feature will consider the standard a good. But we should decide if the standard is a private or a public (or collective) good.

Moreover as Stango (2004) mentions it, standards can be in a *sponsored* or *unsponsored* mode, and "*de facto*" or "*de jure*" implemented.

- Sponsored standards "*can be used only by the holder(s) of property rights to the standard. For example, patented technologies for new standards are sponsored*". Here the development of a new standard will depend on the strategic decision of firms owning standards.

- Unsponsored standards "*can be used by anyone*". For example the number of pins used to connect two components is a simple technical specification and it's a unsponsored standard. The demand-side will play an important role in the definition and evolution of new standards. The consumer expectations and their choices of adoption is important.

- De facto standards are "*standards that achieve adoption through a standards war*". De facto standards are more often sponsored standards such as Microsoft's Windows Operating

² <http://www.w3.org/TR/>

System which is a sponsored *de facto* standards. But sometimes there are also unsponsored *de facto* standards (rpm versus zip standard in the linux world for the compression and installation files).

- *De jure* standards are “standards that emerge through industry consensus. This consensus may be informal, formally expressed through an industry standards body, or ratified by a standard organisation such as ANSI”. Here we can find more easily unsponsored standards. “*de jure standards*” are rarely sponsored standards. As Billote explains, in France, we use the term norm instead of “*de jure*” standards.

Moreover the standardisation process can be very interesting for firms, if there are “*networks effects*” in a particular market. The network effect “*are complementary relationships in value creation among adopters of a common standards*” (stango, 2004) in other words, “*wide use and adoption creates value*” (Lynch, 1999).

Classification of Standards and Norms:

Grindley (1995) distinguish two kind of standards: the quality standards “*concerned with the features of the product itself*” and compatibility standards “*concerned with the links with other products and services*” (see figure n°1).

Category	Type	Examples
Quality	Minimum attributes	Packaging, weights and measures Health and safety, trade descriptions
	Measurement and grades Public regulation	
	Product characteristic	Fashion, breakfast cereals, brands Raw materials, automobiles
Compatibility	Style and tastes	VCR tapes, software, auto parts
	Production economies	
	Complementary product	
	Complementary services	Maintenance, servicing User training, experience
	Support	Telephones, railways, LANs
	Knowledge	
	Direct Networks	

Figure 1: Types of standards

According to Gingbell (2004), standards can have positive impact on the economic ecology:

1. A standard delineates a point of homogeneity, enabling heterogeneity, change and unbridled innovation in other areas ;
2. A standard is a specification to which an artefact conforms, not an implementation ;
3. A standard is more important for how it affects the consumer than for what it offers ;
4. A standard has a community-apply it only to affect that community, and expect it only to affect that community ;
5. A standard is as strong as its enforcement mechanism, though this varies with time
6. Consumer investments are never to be undone by a standard ;
7. Innovation to the standard must come with “*skin in the game*”;
8. Innovation must be “*within chaotic range*” of the standard;
9. the lifetime of a standard is limited to the time it enables innovation in its connected areas.

1.3. Standardization's Processes

An International Standard developed by SDO, is the result of an agreement between the member bodies of ISO. It may be used as such, or may be implemented through incorporation in national standards of different countries.

International Standards are developed by ISO technical committees (TC) and subcommittees (SC) by a six steps process: Proposal stage, Preparatory stage, Committee stage, Enquiry stage, Approval stage, Publication stage

If a document with a certain degree of maturity is available at the start of a standardisation project, for example a standard developed by another organization, it is possible to omit certain stages. In the so-called "*Fast-track procedure*", a document is submitted directly for approval as a draft International Standard (DIS) to the ISO member bodies (stage 4) or, if the document has been developed by an international standardizing body recognised by the ISO Council, as a final draft International Standard (FDIS, stage 5), without passing through the previous stages. For greater detail on how an International Standard is developed, refer to the publication ISO/IEC Directives³. (see annexe n°1)

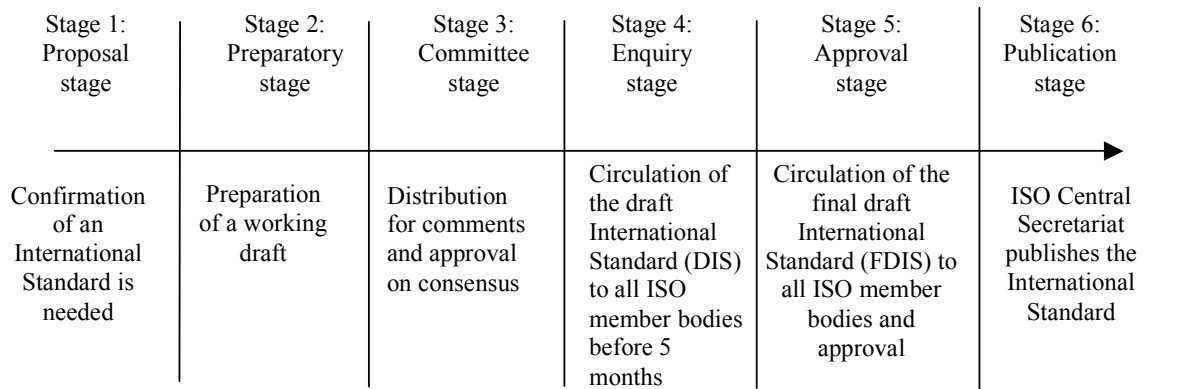


Figure 2: the ISO Standardisation's Process

The standardisation's process for SSO is based on the same principle but it's more flexible: For example, W3C has a particular Recommendation Track process⁴. W3C publishes first a "*Working Draft*" and /or a "*Working Group Note*" which represents the possible initial states of a technical report. Then this document becomes a Candidate Recommendation, after being reviewed by W3C Members, the public, and other technical organisations and then a Proposed Recommendation. Finally the "*specification or set of guidelines that, after extensive consensus-building, has received the endorsement of W3C Members and the Director.*" becomes a W3C Recommendation. "*W3C recommends the wide deployment of its Recommendations*".

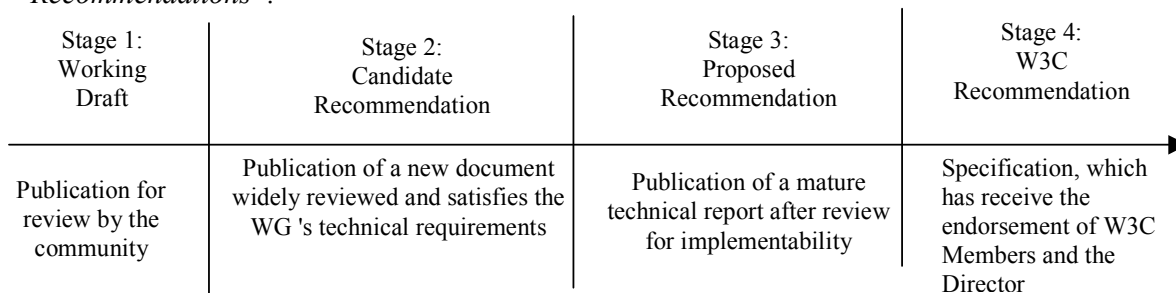


Figure 3: the W3C Standardisation's Process

³ <http://www.iso.org/iso/en/stdsdevelopment/whowhenhow/directiv.html>

⁴ <http://www.w3.org/2004/02/Process-20040205/tr.html>

2. Hypothesis and methodologies in IT Standards' Development

2.1. Main hypothesis for positioning strategies

First of all, we should recognise that different standards organisations are involved in the normalization process for Information Technologies Standards. We can distinguish three important actors: Standards Developing Organisations, Standards Settings Organisations and Standards Professional Organisations. Each actor has different goals and objectives. They will use different strategies. The importance of the standard professional organisations is important in the Information Technology World and there are numerous examples where we can find Standards Wars (Stango, 2004) and legal pursuits (Shapiro, 2000), if no cooperation between firms are possible. This competition may lead to “de facto” standards and proprietary products. But in the Financial Services Standards Cases, this simple schema is not enough explicit. There are perhaps standards wars & standards cooperation between firms, but the competition is different. It's not a competition in order to impose proprietary standards, but in order to benefit from the network externalities and the use of their own open standards. We will look more closely the problem of cooperation standards setting for financial services. And see how these open IT standards have appeared and exist nowadays.

Concerning the problematic, we will hypothesis that:

- Firstly, there are different actors (SDOs, SSOs, Firms) involved in the development of IT Standards, and that they use different strategies in order to develop IT standards on a specific market. In other word, there are different economical models & strategies which could be relevant in order to develop an IT Standard.
- Secondly, the development of a professional IT standard required a network of enterprises but also a financial support, a particular organizational form and a precise activity to describe. In other word, that there are key of “factors of success” in order to develop these standards. Networks externalities are one of theses factors but it's not the sole.

As Grindley explains, the positioning strategies can have a direct impact for the success of a company, only if his standard is accepted by the market. For this firm, “ *this is a dual decision covering (a) the leadership of the standard- whether the firm develops its own standards or adopts one from outside and (b) the access to the standard – whether the standard it supports is proprietary or open*”.

		ACCESS	
		PROPRIETARY	OPEN
LEADERSHIP	LEAD (Develop)	Sponsor / Defend	'Give away'
	FOLLOW (Adopt)	License in	Clone

Figure 4: strategic positioning decisions

So we can find in this situation four different positions:

- ✓ Sponsor/defend: the firm will “develop a proprietary standard and restrict its use by competitors, charging significant licence fees”;
- ✓ Give away: the firm encourage competitors to use an open standard developed by the firm without restrictions ;
- ✓ License in: the firm adopt a proprietary standard controlled by another (competing) firm ;
- ✓ Clone the firm adopt an open standard, without restriction.

2.2. Methodologies

Concerning these two hypotheses, we will take the financial services case as an example, we will look more closely to the XML-Based Recommendations and Standards development. We will see why these standards are developed outside the classical circles of standardisation organisations, and what could be the “key factors of success” for the best IT standards in Finance. We will use a descriptive and analytical method in order to analysis these actors’ strategies and the various economical models described behind and to evaluate the financial support. We will use the Grindley’s factors, which affect the firm’s decision in a particular case (see figure n°5 & 6).

As Grindley said, “the leadership decision depends on whether the firm is technically and financially able to develop and introduce an acceptable standard design” (1995, p.30). In choosing the best strategy for the standard, “the firm must balance the chances of it being adopted against the likely returns to the firm in each case”. For more details about the benefits and costs, see figure n°5.

	PROPRIETARY	OPEN
LEAD (Develop)	<ul style="list-style-type: none"> + protected market + High margins +high share + high licence earnings - Low chance of winning - Little external support - High cost - Small niche likely 	<ul style="list-style-type: none"> + high chance of winning + Large market + Broad external support + shared costs - Low share - Low margins - High competition - Low licence earning
FOLLOW (Adopt)	<ul style="list-style-type: none"> + Proven market + Possible alliance - Secondary position - Pay high licence fees -Emulation lag -Absorption costs 	<ul style="list-style-type: none"> + Best chance of winning + Equalized competition + Low licence fees - High competition - Undifferentiated product - Absorption costs

Figure 5: Strategic positioning: cost and benefits (Grindley, 2005, p.31)

	PROPRIETARY	OPEN
LEAD (Develop)	<ul style="list-style-type: none"> Strong propriety rights Technical leader Long time lead Strong differentiation Large resources 	<ul style="list-style-type: none"> Weak appropriability Leadership possibilities Speed essential Support needed Resources limited Proprietary threat
FOLLOW (Adopt)	<ul style="list-style-type: none"> Established standard Technical follower Late entrant Niche possible Cost competitive 	<ul style="list-style-type: none"> Dominant proprietary standard Late entrant Product differentiation Small resources Cost competitive

Figure 6: Strategic positioning: positive selection factors

Then, we will conclude this paper with prospective views on future development of standards and recommendations.

3. Economical evaluation of professional standard's development for the financial Market

3.1. New Standards Organisations with new strategies: a descriptive approach

In this research, we will consider different financial standards such as FinML, FpML, NewsML, RIXML, IRML, MDDL, FiXML, OFX. Each financial standard is specific and is built in order to respond to specific needs and use. I will present you very briefly each standard. We can indeed organize these standards differently depending on their ability to respond to certain or particular needs for example the purpose of FpML is very specific and concerns only the “*derivate or OTC (Over-the-Counter) products*” of the financial market.

OFX: transactions between financiers and customer	FiXML: professional or business relationships
MDDL: financial market data	IRML: portfolio researches
RIXML: financial researches	NewsML: financial news
FpML: derived product such as Swaps	FinML TM : financial universal language

XML allows financial establishments to create their "dictionaries of the profession", it's logical to see the development of various financial structure, according to numerous workplace. Indeed numerous financial standards have been created, you can see below:

3.1.1. Babel's myth

Despite numerous standards on Finance, it seems that financial world is easy to model. But nevertheless until this day, XML did not succeed in gathering various financial professions. From the trader to the financial councillor, there are always specific applications. However XML creates the beginning of cohesion between these ill-assorted professions and already constitutes a step forward.

Why to consider that there is a myth of a financial standard? Because until now, various standards proposed to financial institutions, technology vendors, systems integrators firms, etc., cover a large proportion of the financial field and has not been able to be used. There is a case of the standard FinXML^{TM5}, the *Digital Language for Capital Market*, launched and developed by a company, provider of Internet Technologies Solutions, which has the ambition to describe all the instruments and existing types of deals on the financial markets. Even this initiative seems utopian, because it is difficult to know if we can reduce the diversity of financial professions in one unique language. We wonder also what will be the evolution of proprietary standards in our open world. Consequently, we wonder if a initiative, such this one, could really be adopted and used widely for all financial workplace. Or if for specific tasks, in different financial field, we need different standards.

Especially this language wants to optimise the processes of treatment, information transmission and improve risks for the trading systems. So it confines to a particular domain, namely the quotation's systems. Finally, we wonder also about the origin of this myth (to see the question of the heterogeneousness of the XML with Van der Vlist, on 2001).

⁵ <http://www.finxml.org>

3.1.2. Efforts concentrated on certain particular problems

Most of these initiatives were interested especially in targeted problems. So each consortium of financial establishments develops specific standards for relatively limited projects for their work environment.

3.1.2.1. Financial software packages

XML's first interest for the financial domain is the improvement of exchanges between applications notably financial. These improvements go either towards professional software packages or towards software packages for private individuals.

- Initiative OFX (*Open Financial Exchange*) is indeed precious in order to implement a software package: it is a language intended to exchange data between the financial institutions and the private individuals. It was created by Microsoft and Intuit, both designers of famous stock-exchange and financial software packages. It concentrates on the deals of payments and the on-line financial services or for the exchange of data between applications. OFX is "very retail focused". The last version is DTD version 2.0.2.

- Initiative IFX (*Interactive Financial Exchange*) is a new standard of financial messaging protocol, built by financial industry and technology. The main goal of this standard is to connect and share financial information between internal and external applications. They want to use real business use cases and develop content that is meaningful and useful to the financial services industry and they want to create a strong, flexible, open architecture that will support extending the protocol in an efficient, interoperable manner. The last version is 1.7.

- Initiative reserved for the professionals: FIXML (*FIX Markup Language*). This initiative redefines a protocol already used in the financial environment (middle), called FIX. This standard is developed for real-time electronic exchange of securities transactions. This standard proposes to manage information between professional software packages and allows an automation of the process of information transmission and a reduction of operational risks. However it seems that FIXML is developed at the same steps that FIX, for the benefit of FIX's improvement...

- Professional initiative VRXML (*Vendor Reporting Extensible Markup Language*) normalizes the data exchanges during the invoicing, during the editorial reports and announcements and the inventories management. The initial draft was developed by the New York Stock Exchange (NYSE) and Gemini Systems to improve the quality, timeliness, and efficiency of reporting information from vendors. It was after sponsored by the FISD (*Financial Information Services Division*) of SIIA (*Software & Information Industry Association*).

3.1.2.2. The financial products

Besides the development of the previous actions, XML redefines the other professions which were little structured previously or which have supplementary necessities.

- Initiative FpML (*Financial products Markup Language*) is a language of description of by-products used on the free choice market (swaps of rate, interests or currencies, etc.). It is a specific standard for the management and the electronic treatment of the derived financial instruments. At the moment, the version 2.0 is already well formalised. The definitive version 3.0 is announced for soon. An agreement is concluded with the ISDA (the International association of the industry of by-products or "*International Swaps and Derivatives Association*").

- Initiative FundsXML works on investment fund and more particularly Luxembourgian capital. This pool regroups numerous banks, notably German banks. The

objective of this initiative, which is interesting for our study, aims to obtain information about the organization, the structures and the historic of investment fund. A not yet definitive version is proposed in downloading. This project began with the FERI company in February, 2001, or about at the same time as our search. In France, this initiative was relieved by the DIAMS project (Distribution and Integration for Asset Management Systems), created by an computer OTC software, for the actors of Asset Management.

- Initiative IndexML (*Index Markup Language*) aims to simplify the process of integration, calculation and distributions of data concerning stock-exchange indications, because the mode of calculation of these indications, the management and the variety of the existing protocols require simplifying the financial data exchange. This language addresses essentially salesmen and professional users who wish to be better informed and to decide on arbitrages. This language describes also trackers, which are very recent products. At the moment, the version of the DTD is the 2.0.

3.1.2.3. Financial studies

The other typical activities are represented as the realisation of already presented financial studies.

- Initiative RIXML (*Research Information exchanges Markup Language*) is a language of description and searches exchange. It is the language which has to improve the process of categorization, filtering, comparison and distribution of financial studies. At present this initiative proposes a version 1.0. This initiative values the number of publications, by increasing the efficiency of the distribution while avoiding rehearsal d information. It concerns brokers and assets management companies.

- Initiative IRML (*Investment Research Markup Language*) is another initiative for financial studies with the administrators of wallets. This initiative disappeared for the benefit of the initiative RIXML.

- Initiative FAML (*Financial Research Markup Language*) is, as we saw it, another initiative of formalization of financial studies. This initiative developed by First Call Corp., a Thomson Financial company, and B-Bop, a XML Platform Company, propose a special DTD available to the public, free of charge for financial research documents.

3.1.3. A reorganisation of the financial landscape

XML favours the emergence of various financial standards. Naturally all the financial activities were not yet modelled or not thought again by XML's means. Other initiatives can again find their places. Even if at present unique financial standard under XML does not still exist, an aggregation of these various extensions presented above could be envisaged. For us, one major actor of this merger could be the MDDL (*Market Data Definition Language*)⁶ initiative, according to its vocation and its development. Indeed, the MDDL is a XML language, created with the aim of collecting the various data of financial markets (the earnings of societies, the actions, the obligations, the indexes, the options, the capital, the currency, the goods and the Treasury bonds American). This standard has developed contacts with other financial associations and has long cooperation, with other standards such as twist and XBRL. But we think also that the development of new coalitions, such as the Cross-Industry Protocol Group are important in order to eliminate duplication across all of the professional and "de jure" standards.

⁶ <http://www.mddl.org>

3.2. Description of the financial support of professional IT standards' development

Membership fees are generally the only financial support for these Standards Professional Organisations (see below figure n°7):

Name of the consortium	Date	Membership	Membership fees	Cost of licensing fees
OFX Consortium	1997	Historical members: Microsoft, Intuit, Checkfree Now : 2000 institutions	Unknown	Available free of charge for implementation by financial institutions. No licensing fees
IFX forum Non profit organization	1999	Historical Members: Representatives of Integrion Financial Network's GOLD, developed by IBM and Integrion, and representatives of OFX, developed by CheckFree, Intuit and Microsoft. with BITS banks (Banking Industry Technology) Now: 33 members	- 7500 US \$ for corporate membership, voting members -4 995 US \$ for small business membership, voting members - 495 US \$ for individual membership non voting members	IFX holds all rights including copyright in and to the documentation. IFX grants you this perpetual, non exclusive license to use this documentation.
FixML	2000	Historical Member: Fix with 130 members Though buy- and sell-side firms always paid a fee, obviously the broader membership is a source of funds.	It costs \$8,000 for firms to join 1 regional committee, \$16,000 for 2, and \$24,000 for 3, etc. The global membership: \$25,000 to join three regional committees	Open and free
FinML Consortium	1999	Historical Member: Integral Corporation Now: 40 members	- Executive membership is limited to financial services institutions and technology providers. -Associate membership is open all organisations interested in using FinXML or building products and services around FinXML. - Affiliate membership is open to individuals, educational institutions and government organisations	Integral Development Corp. announced that the US Patent & Trademark Office (USPTO) has recognised its innovative technology as unique. The company has been awarded a patent for its system and method for conducting web-based financial transactions in capital markets. The patent will offer protection to Integral, its customers and their online business models in what has become a highly competitive environment. in June 1999.
FpML	2001	Historical Members: International Swaps and Derivatives Association, Inc. (ISDA) (650 members in 47 countries) & FpML.org Now: 650 participants from 47 countries	Membership fees from ISDA members : - Primary Members ; - Associate Members ; - Subscribers.	Licensors hereby grants You a world-wide, royalty-free, non-exclusive license, subject to third party intellectual property claims, to use, reproduce, modify, display, perform, and distribute the FpML Specifications (or portions thereof) with or without modifications, or as part of a Larger Work.

Figure 7: membership, license for XML Financial Standards

3.2. Estimation of the key factors of success for developing professional IT standards

We give you a general view about the standards wars and the necessity for interoperability between all these standards in the financial services nowadays:

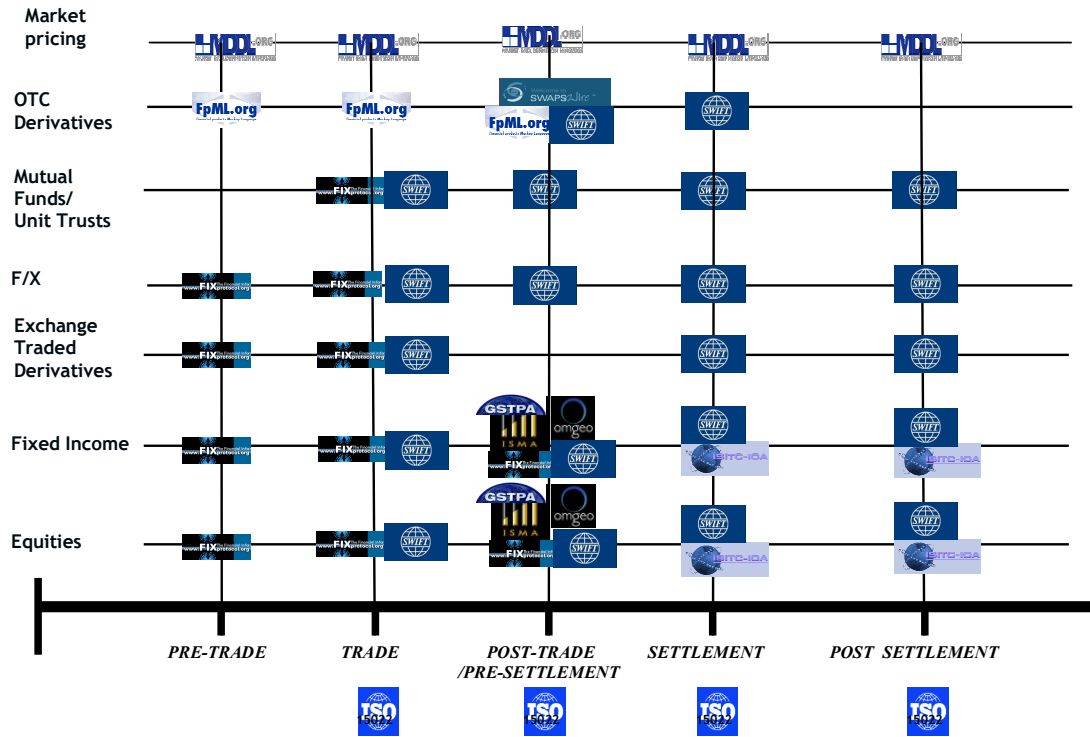


Figure 8: Partial view of Standards Landscape (developed by John Goeller and adapted, 2001)

So in order to demonstrate our main hypothesis, we will focus on the four factors of success described above concerning the development of a new IT standard:

3.2.1. An enterprises' network & the fragmentation's problem

As you can understand here in this schema (figure n°8) that financial institutions can benefit from numerous open financial standards such as the Unix Case. So the main problem with these financial standards is the fragmentation, i.e. the “*market may split into several small, poorly supported standards. Each may have just enough of a niche to survive but not enough installed base to achieve full network benefits. The market as a whole is held back by not having a single fully supported standard, or at least a few well supported ones. This is “understandardization”, in which the market would be better served with fewer standards and lower costs.*”

But in fact, we should explain first that most of companies, who initiated standard's development, are also present in other standards committees. For example, we can take the company A case's, which seems to be very symptomatic in terms of strategies (figure n°9).

	PROPRIETARY	OPEN
LEAD (Develop)	FinXML™	FpML
FOLLOW (Adopt)		

Figure 9: Different strategies for IT standards

This company A has begun as standard leader to set a new XML-based *de jure* standard, called FinXML™, in 1999, and has obtained in 2002, a patent for its system and method for conducting web-based financial transactions in capital markets recognised by the US Patent & Trademark Office (USPTO). (Integral patent #6,347,307 B1). It's not only a proprietary standard, it's better a proprietary system. This firm has developed this standard with other firms, mostly financial institutions, which can use these standards. This company A gets incomes from the membership fees, which are high for institutions. But as we mention earlier, numerous open standards for capital market have emerged during these years. So this firm A has changed his strategy. This firm participates actively to other open standards such as FpML. But it's not very easy to determine if this company has a leader role, because it's not a historical member of the standard. But due to the fragmentation's problems, the patent strategy seems not to be interesting in an open environment where network externalities are important.

3.2.2. A particular organisation form & financial support

Each Standard Professional Organisations, which develops IT Standards, uses a specific and adapted organisational form. Mainly companies are implied in a particular consortium which manages the standard design. These consortiums are generally non profit organisations, such as OFX and IFX Forum. They are based generally on different associations, such as ANNA (Association of National Numbering Agencies), BMA (Bond Markets Association), ISDA (International Swaps and Derivatives Associations), NFA (National Futures Association) or SIA (Securities Industry Association). We can add also SMPG (Securities Market Practice Group) and MISMO (Mortgage Industry Standards Maintenance Organisation) for example. Participants of these associations participate actively in order to develop these norms, but also numerous companies who pay high membership fees. Perhaps the cluster theory can help us to better understand this phenomenon.

3.2.3. The importance of a particular activity to describe and different cooperation agreement for interoperability between standards

So the problem of "*fragmentation*" tend to be limited in a particular market (such as the financial software package or information package) due to the presence of competitors in other standards committee and the will to develop strong and open standards compatible with SSO or SDO. In fact the fight of all these professional norms are to become an international standard recognised by the SDO, such as ISO. Each SPO can develop two strategies:

Firstly, the fragmentation's problem will be resolved, when SPO decide to concentrate on a specific market share. They are looking for specific market. In the mutual funds sector, the Diams Consortium or FundsXML Standards Committee (FCS) is concentrated on a national market share (French or German Market for Mutual Funds). They develop their own specifications, have good relations and tend to develop with national SDOs, some standards.

Secondly, in the financial data interchange case, companies involved in the development of finXML and FpML standards, have proposed to ask an ISO Working Group, the WG10, to take position, in order to implement a broad and industry-wide adoption.

We can also cite the development of Cross-industry protocol Group, which is a new coalition of interested parties seeking to eliminate duplication and unnecessary competition across all these standards. This coalition group together FixML, FpML, OMGEO (standard developed by Thomson Financial), RIXML, SwiftML.

These two strategies can be very helpful in avoiding the fragmentation's problem and a potential standards wars.

Conclusion

In conclusion, we can say that the financial standards case is interesting in order to understand how information technologies standards are created and how they evolved. There are very numerous financial standards and most of them are *de jure* standards. All these standards seem to reinvent the wheel, but in fact they deal with specific domains or activities.

But because of the fragmentation's risk, many companies, mainly technological vendors or financial institutions are involved in different standards professional organisations (SPOs) and use their influences in order to sign different agreements with other SPOs or SDOs, as we have seen in the mutual funds sectors and the financial data field.

Major actors of the Information technologies or solution providers are ready to propose different implementations of these emergent standards. Their strategies tend to be the first in a new market with their added value technology product. They hope that their professional standards will become official standards recognised by SDO. Some companies prefer to participate directly to these professional standards and pay important membership fees in order to be one of the leader companies, who manage the more appropriated standards. But as we demonstrated, it's not enough sometimes to implement a norm; this norm should be applied for a particular activity. This is the standards strategy for niche market. Some specifications are not always a hit.

So we have seen why these standards are developed outside the classical circles of standardisation organisations, and what could be the "*key factors of success*" for the best IT standards in Finance. In the IT standards field, the patent strategy seems not to be pay off. The added value isn't the IT standard in itself; it's most the implementation of the IT Standards in the product. So the use of "*Open IT standards*" and cooperation and financial support between a vertical network of enterprises (from the technological vendors to financial institutions), are critical for developing professional Standards in the world-wide competition between financial institutions.

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ANNEXE N°1:

We publish below a short explanation about the ISO Process (from ISO's website):

Stage 1: Proposal stage

The first step in the development of an International Standard is to confirm that a particular International Standard is needed. A new work item proposal (NP) is submitted for vote by the members of the relevant TC/SC to determine the inclusion of the work item in the programme of work. The proposal is accepted if a majority of the P-members of the TC/SC votes in favour and at least five P-members declare their commitment to participate actively in the project. At this stage a project leader responsible for the work item is normally appointed.

Stage 2: Preparatory stage

Usually, a working group of experts, the chairman (convener) of which is the project leader, is set up by the TC/SC for the preparation of a working draft. Successive working drafts may be considered until the working group is satisfied that it has developed the best technical solution to the problem being addressed. At this stage, the draft is forwarded to the working group's parent committee for the consensus-building phase.

Stage 3: Committee stage

As soon as a first committee draft is available, it is registered by the ISO Central Secretariat. It is distributed for comments and, if required, voting, by the P-members of the TC/SC. Successive committee drafts may be considered until consensus is reached on the

technical content. Once consensus has been attained, the text is finalized for submission as a draft International Standard (DIS).

Stage 4: Enquiry stage

The draft International Standard (DIS) is circulated to all ISO member bodies by the ISO Central Secretariat for voting and comments within a period of five months. It is approved for submission as a final draft International Standard (FDIS) if a two-thirds majority of the P-members of the TC/SC are in favour and not more than one-quarter of the total number of votes cast are negative. If the approval criteria are not met, the text is returned to the originating TC/SC for further study and a revised document will again be circulated for voting and comment as a draft International Standard.

Stage 5: Approval stage

The final draft International Standard (FDIS) is circulated to all ISO member bodies by the ISO Central Secretariat for a final Yes/No vote within a period of two months. If technical comments are received during this period, they are no longer considered at this stage, but registered for consideration during a future revision of the International Standard. The text is approved as an International Standard if a two-thirds majority of the P-members of the TC/SC are in favour and not more than one-quarter of the total number of votes cast are negative. If these approval criteria are not met, the standard is referred back to the originating TC/SC for reconsideration in the light of the technical reasons submitted in support of the negative votes received.

Stage 6: Publication stage

Once a final draft International Standard has been approved, only minor editorial changes, if and where necessary, are introduced into the final text. The final text is sent to the ISO Central Secretariat which publishes the International Standard.

Review of International Standards (Confirmation, Revision, Withdrawal)

All International Standards are reviewed at least once every five years by the responsible TCs/SCs. A majority of the P-members of the TC/SC decides whether an International Standard should be confirmed, revised or withdrawn.