

Standards Based Regulatory Reporting

Achieving Immediate
and Long-Term Reporting
Efficiency via XBRL and
Web Services

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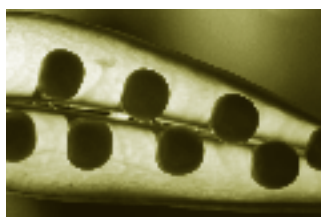
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Appendix I: Glossary

Executive summary: a better regulation strategy



Regulators everywhere face the challenges of collecting, processing and reporting information more efficiently, accurately and cost effectively. Currently exacerbating this challenge are new rules, such as

those included in the Sarbanes-Oxley Act of 2002, International Financial Reporting Standards (IFRS) and Basel II, as well as increased public demands for regulators to do more at a time when the total cost of regulation is under tight constraints. Public servants in the taxation, supervision and registration authorities of every sector—monetary policy, banking, insurance, utilities, health care, telecommunications, energy, transportation—must control the cost of compliance, improve the value of information they collect and report and manage change effectively as their responsibilities evolve over time to changing issues and mandates.

Electronic Internet filing (e-filing) is one of the tools regulators use to achieve these goals. Like any tool, it can be used well or badly. Regulatory power to compel the form and method of filing demands care and consideration of the potential to improve existing electronic filing practices or institute new ones. Alas, if only upgrading to new technology was enough to discharge this duty: a good old process plus good new technology often equals a bad new process. A particularly egregious example is the use of Internet based e-filing as a method to execute an outmoded, paper-based regulatory reporting paradigm.

In contrast, standards based reporting, by decoupling the data-standard definitions from the technology, offers regulators a way to employ e-filing to improve their entire, end-to-end regulatory reporting process. It delivers benefits to the filers by enabling greater efficiency in collecting their information, particularly as they report to multiple regulators. It benefits regulators themselves and external information users by improving the usability and comparability

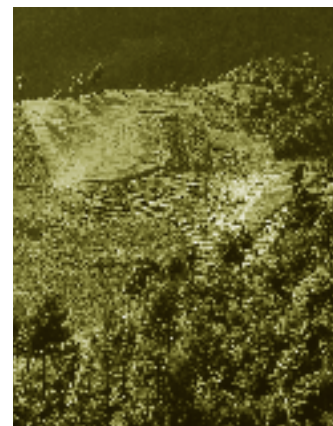
of reported information within a variety of software applications. Finally, all parties benefit from standards based reporting because it supports diversity and flexibility of technical implementations for filers with different needs and regulators whose needs change over time. To realise the potential for collaboration by these parties to achieve exceptional benefits, open, royalty-free technology standards are critical. Two key and interrelated standards that support standards based reporting are the eXtensible Business Reporting Language (XBRL) and Web services.

For anyone in the regulatory community responsible for gathering and preparing large amounts of data for analysis and decision making, standards based reporting offers substantial benefits by:

- Improving the quality, accuracy and reliability of information as it enters, is processed within and then reported by regulators
- Enhancing the breadth and depth of information that can be included in analyses and reports on a routine basis, with minimal to no added cost
- Addressing the need to find long-term solutions to pulling time and costs out of the reporting process
- Encouraging stronger ongoing communication and cooperation among members of a regulator's information supply chain through development and usage of shared information standards

In this paper, we examine the scope and sources of regulatory reporting inefficiency and explain why regulators, their constituents and the broader regulatory communities around the world are moving to standards based reporting. We will explain how XBRL and Web services standards are being developed and deployed, using examples of far-sighted regulatory projects, such as the US Federal Financial Institutions Examination Council's (FFIEC's) Central Data Repository. We also present a plan for regulators to move forward from wherever they may be on the e-filing adoption spectrum and identify essential skills, experience and approaches that they can use to be successful.

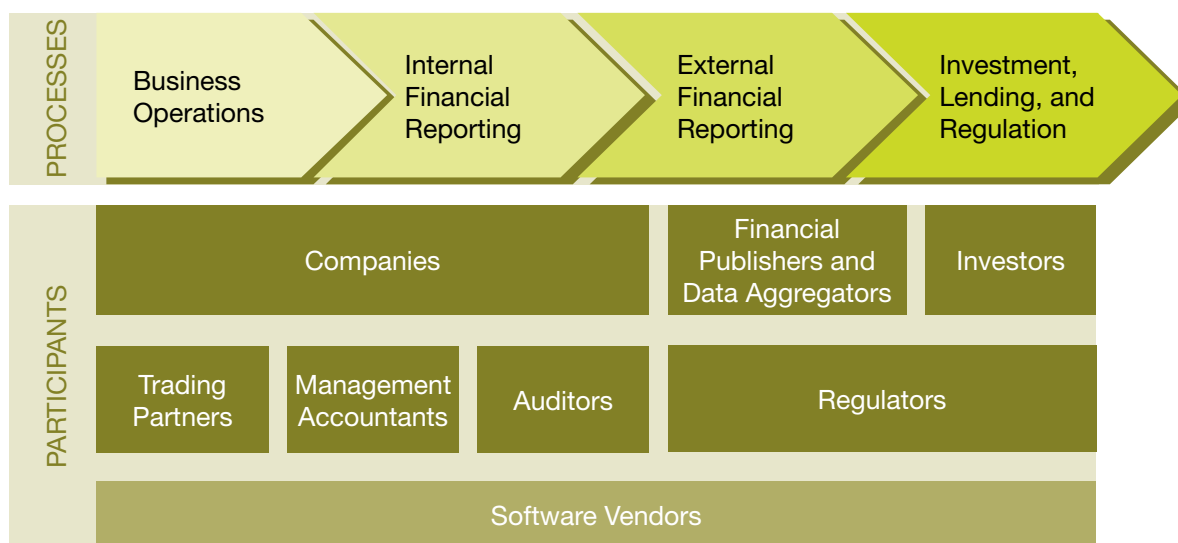
1 Understanding e-filing issues from the top down



Regulators are not information islands, isolated from entities that supply their raw data or that receive their processed data. Rather, regulators are members of a business reporting supply chain. A regulator's business reporting supply chain reaches from regulated entities' operating unit reports, through the filing process, into the regulator's own internal archives, thence out to a public that includes information aggregators, re-sellers, investors and other public and private sector stakeholders.

A business reporting supply chain consists of several stages; Figure 1 shows the supply chain that encompasses the information gathered and reported by companies.

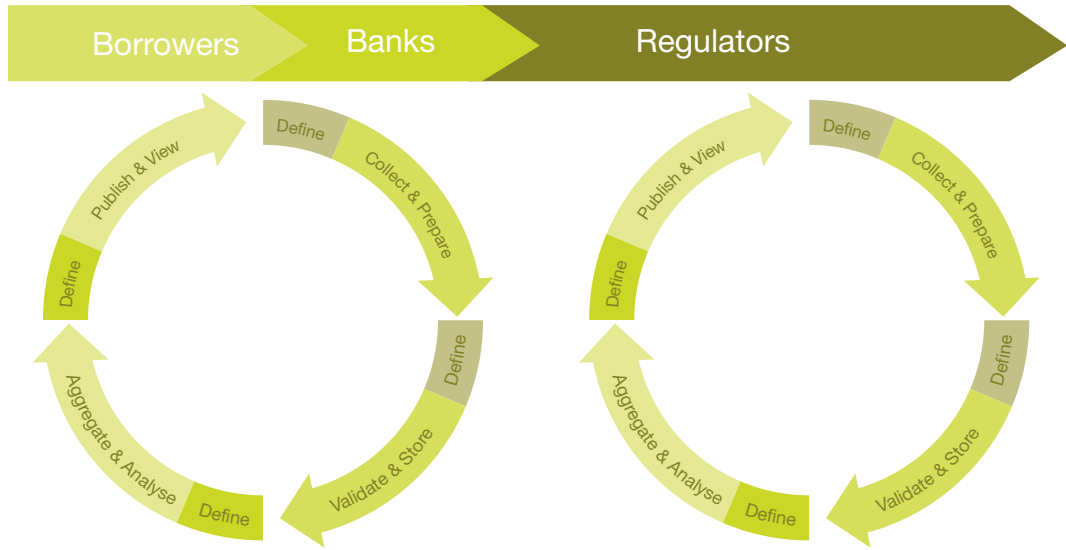
Figure 1. A business reporting supply chain



Within each stage of a business reporting supply chain, each participant executes a business reporting cycle, in which a supply-chain member (producer) reports information to other parties (consumers). Although a participant may be a producer, a business information supply chain usually requires that producers also play the role of consumers as they must gather the necessary reporting information from other sources. Figure 2 shows two examples of business reporting cycles within a banking regulation supply chain.

When the business reporting supply chain is laid out in this end-to-end fashion, it becomes apparent that there are two major sources of potential waste and error in business reporting (electronic or otherwise). First is the possibility of a silo perspective, which is the opposite mindset from the one regulators need *vis á vis* the rest of the supply chain. Second is the tendency to focus on current, rather than future, information collection, a danger clearly underscored by today's fast-evolving changes in regulatory mandates and the current inability of information supply chain members to quickly or easily adapt.

Figure 2. Business reporting cycles within each stage of the supply chain



EXAMPLE	EXAMPLE
A commercial lender preparing a quarterly filing for a bank regulator	A bank regulator processes hundreds to thousands of quarterly reports.
Collect and Prepare Manually enter and possibly correct borrowers' financial highlights (also known as "spreading"), payment histories and other data related to their credit risk.	Collect and Prepare Gather electronic forms, monitor late filers, ensure that all forms are the right version and contain necessary attachments.
Validate and Store Detect exceptions indicating possible data entry errors, such as unusual ratios or trends; correct and store the results.	Validate and Store Detect exceptions indicating possible data entry errors, such as unusual ratios or trends, contact the bank to correct the data; archive the results.
Aggregate and Analyse Generate summary reports along multiple dimensions, such as region, size, maturity and probability of default.	Aggregate and Analyse Run summary reports along multiple dimensions to highlight banks at risk.
Publish and View Re-enter necessary summary data into regulatory forms or form-driven software application.	Publish and View Once sufficient data from banks has been collected and validated, the regulator extracts public information from the summary reports and distributes it.

In Figure 2, the bank must manually re-enter its collected and analysed data to prepare a regulatory report since the formats and data standards used by the bank and regulator are not aligned. This potential waste and commensurate need for alignment exists all along the information supply chain—borrowers likewise must manually re-enter data to report information to the bank.

1.1 The regulator's role in the information chain

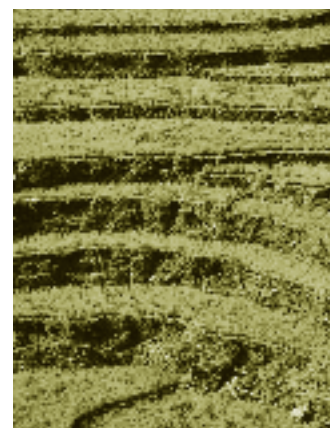
Any information consumer may suffer from a narrow, silo perspective where the only information needs considered are their own. But, regulatory power to mandate filing forms means that whatever technology they select, however they put their forms on line, whatever idiosyncratic and proprietary ways they define the data items, becomes a *de facto* standard for all the entities they regulate (information producers). If regulators' only consideration was re-engineering their own processes to meet their own needs, then choosing information-format and data standards would be an easy decision.

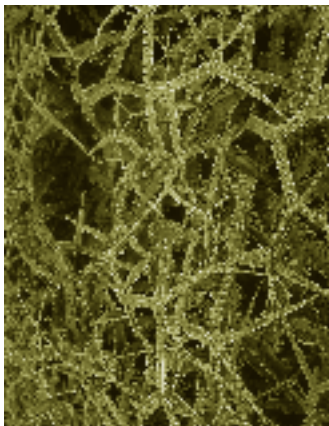
However, regulators do not operate in a vacuum. In the move to e-government around the world, a proliferation of silo-oriented, proprietary Internet information formats would impose redundant costs on members of the private sector by forcing them to accommodate numerous, mandated regulatory information standards. Multiple information formats would also make data provided by regulators to other government agencies, industry and the public as difficult to re-use for their own purposes as it is today. Therefore, the data standards they choose should be workable for both reporting entities, on the one hand, and the regulator's own information recipients, on the other.

Accurate, complete and timely information gathering, analysis and reporting is especially important as new regulations are being implemented around the world, including Sarbanes-Oxley, IFRS and Basel II. These new rules will change the content of financial reports and, by extension, will require adaptation of the already overburdened reporting systems and processes used by regulators, companies, creditors, investors and all other supply chain members. Moreover, reporting entities are not the only ones who must immediately grapple with how to apply these new reporting requirements; regulators themselves must use the new data to develop working practices that ensure continuity of oversight and, in the case of international regulations, facilitate co-ordination of cross-border interpretations.

Transparency, and therefore, trust and confidence in the new information depend on consistent application of the standards across different countries and industries. As a practical matter, the new regulations call for regulators to agree on the definitional and contextual meaning of all reporting data, whether the data predates the regulations or was created by them. This means regulatory collaboration to define data terms is a permanent effort, just as regulating is an ongoing, evolving effort.

By standardising the precise meanings of existing and new data terms in all reports, regulators can more easily access and re-use information in any report and marketplace-information consumers can understand how the new information is being reported and how to apply it in analyses. XBRL is a tool that helps regulators to standardise information definitions. The XBRL International consortium and its affiliated organisations furthermore can provide a collaborative arena in which to achieve this definitional consistency, should the regulator wish to use it in that way.





In Figure 2, the bank manually re-enters its collected and analysed data in the “Publish and View” phase in order to prepare the regulatory report because the formats and data standards used by the banks and by the regulators are not aligned. The result is wasted effort by the bank and a reporting delay to the markets by the regulator.

The potential waste and commensurate need for alignment exists all along the information supply chain. The bank also suffers as a collector of information that it receives in different forms from its various borrowers, which results in manual re-entry and adjustments, delaying analysis and decision making. As an example of a “silo approach” solution, banks could try to solve their own manual data re-entry problem by constraining the borrower’s application process and forcing them to do the manual data entry on their own, with the forms and technologies dictated to them. The problem is that this does not reduce the cost associated with data re-entry, but rather, moves it from one supply chain participant to another. In addition, the banks would be doing nothing to improve the quality of the data they receive by adding to borrowers’ manual information aggregation burdens. That would endanger the quality of the lending analysis and decision.

1.2 Adapting to ongoing changes in regulatory mandates

Regulators’ infrastructures should accommodate and be able adapt to collecting new and expanding types of information. Information consumers, such as regulators, may suffer from a static view of their information requirements. This is a particular challenge when, as is now happening to financial-markets around the world, regulators are moving toward targeting data collection, monitoring by activity rather than by entity, focusing on the information collected at the level of dynamic schedules rather than static forms and updating schedules in months rather than years.

Hence, when planning IT projects, regulators should, to an even greater extent than the private sector, strive to ensure that their infrastructure will support an environment in which the specifics of their regulatory information requirements will be in constant churn. If every new data field added causes a software rewrite, the ability to absorb new information grinds to a halt as automation gives way to re-introduction of repetitive manual tasks—hunting through pages and pages of information for specific data, “cutting and pasting” from file to file and re-keying information. Manual processes already absorb large portions of regulatory budgets without adding any value to regulatory oversight or vigilance. Software re-writes also impact filers (and, in an electronic reporting environment, the suppliers of the filers’ filing software) because change is painful, rather than having been built into the design of the e-filing system at the outset.

This status quo is not an option, especially if automated data collection systems are already in place for many supply chain members. The crux of the problem with current systems is that most use older technologies such as Electronic Data Interchange (EDI), where fixed, predetermined information-technology data structures are the rule. New reporting regimes, such as IFRS and Basel II, require more flexibility in data structure. XBRL provides solutions able to cope with these

requirements and a collaboration effort to address those needed for the future. Regulators who understand and acknowledge that information is a shared asset within a supply chain are better positioned to identify how information quality and accuracy can be improved in their own supply chains through shared information definitions. This moves regulators away from a short-term, silo perspective to a long-term, more collaborative perspective. The difference in perspective will clearly illustrate how information exchange mechanisms commonly found in supply chains fall short of enabling more, better, faster information sharing precisely because they do not address what ails the supply chain on a lasting, strategic basis.



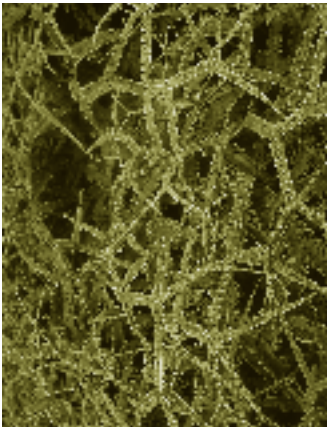
1.3 Symptoms of a sick supply chain

What are some aspects of a business reporting supply chain that would suggest it is ripe for re-examination? A first sign is when improvements emphasise standardising the technology rather than the information itself. By focusing on technology, the supply chain is subject to perpetual process disruptions and re-designs to accommodate technology changes and evolving information needs and demands. It also does nothing to ensure that supply chain members—and even operational areas within organisations—understand and use data consistently. Standardising the names by which information can be processed by all software anywhere enables near-term reporting process re-engineering and quickly accommodates new reporting requirements and information needs.

A second sign of an ailing supply chain: attempts to achieve content standardisation via open Internet information standards fall short due to limitations of the standards themselves. Not all open Internet information standards are capable of meeting the wide range of information needs that exists across an entire supply chain.

Distinguishing technology standardisation from content standardisation is vital and can be quickly understood by remembering this distinction: just because information sharing may be occurring via a standardised electronic medium does not mean there is any standardised information or “content.” The fax is an illustration of this. The fax successfully standardises medium, but content still usually has to be read by a person and manually extracted and converted in some way in order for the fax receiver to use the embedded information. Standardising the medium does not provide content standards usable throughout the supply chain. In fact, symptoms that medium standardisation is failing to promote fast, efficient and accurate information exchange across the supply chain include manual re-keying of information, or infrequent usage of the information downstream of the collection point, relative to the cost of collection.

By contrast, an example of successful content standardisation is the Universal Price Code (UPC) that appears in bar coded form on retail products and that is now a key to practically all retail operations. Many companies in the open market manufacture and sell technology devices that translate the bar code information for all kinds of uses—cash register sales, inventory tracking, customer promotion planning—in an automated manner.



Regulators should provide complete, accurate, consistent, quality, usable and timely information to consumers. However, sometimes the regulators' rules are not published or are published in difficult-to-use media and so rules are applied inconsistently by supply chain members. Focusing on medium standardisation is unlikely to fix these problems. Focusing on content standardisation through XBRL will support automation of the rules, consistent application of the rules, and allow supply chain members to check usage consistency themselves, before information is passed along to others in the supply chain. An example frequently cited by the US Federal Financial Institutions Examination Council (FFIEC) is that the current forms 031 and 041 have a 450-page manual that must be updated every time the form changes. It was not uncommon for software vendors to interpret changes differently than the way the FFIEC itself actually applied them. Symptoms of insufficiently clear and usable content standards include high error rates in submissions, poor compliance, a need for expensive expertise whenever creating the report, and inability of the regulator to investigate exceptions in a proactive fashion due to the high "noise" factor.

Besides a misdirected emphasis on medium standardisation, another prevalent "sickness" symptom is an e-filing system based on "open standards" that do not enable content to be routinely extracted and re-used elsewhere. For example, e-filing systems that allow filers to submit arbitrary HyperText Markup Language (HTML) files are, technically speaking, based on an open standard because HTML is a royalty-free standard owned by the W3C (World Wide Web Consortium). However, there is little that software can do directly with the content except to render it for a human to read or index it for full-text searching. HTML uses standards as a medium rather than as a way to make the content usable by analytical software.

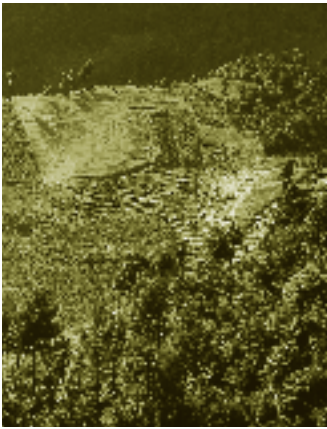
Similarly, e-filing systems that use Extensible Markup Language (XML) are also, technically speaking, based on an open standard because XML and XML Schema are royalty-free W3C owned standards. In these filing systems, XML Schemas are used to define custom standards for the individual regulator. These proprietary schemas allow the regulator to validate filers' data based on checking numerical bounds and identifying the presence or absence of data items. Unfortunately, these tests are too limited to detect data quality problems most common in regulatory settings. For that, regulators need period-to-period comparisons, consistency checks comparing a filer's content to content from other data sources, and arithmetic and logical tests that XML Schemas alone cannot enforce. XML Schema was not designed to provide the level of detail needed in data standards. Regulators therefore resort to other, non-standard ways of using data validation rules—which makes it difficult for filers to apply identical rules, especially as they are using a wide range of different filing software.

Finally, one of the most insidious symptoms of a regulatory supply chain in need of repair is the use of "modified" or "custom" versions of open standards that render them incompatible with other uses. This gives the false impression of re-usability and openness when in fact it is no better than a proprietary scheme, since software that ought to be able to be written once and used anywhere in fact would have to be modified just for that one regulator's information, putting a substantial dent in the business case for re-use.

Successfully meeting the challenges of today's filing issues depends to a great extent on a regulator's recognition of its unique position in a supply chain. Regulators are able to make determinations that will improve information timeliness and quality throughout the supply chain and help information producers and consumers adapt quickly and effectively to changing information requirements, whether they arise through legislation or mandate or in response to the supply chain's own needs.

Focusing on information standardisation and overcoming technological obstacles to achieving an environment offering faster, cheaper, more reliable information gathering, processing and sharing are prerequisite to a successful long-term solution. Standards based reporting answers these needs through open, royalty-free content standardisation, universal technological application and a mechanism for orderly transition within the regulatory information supply chain.





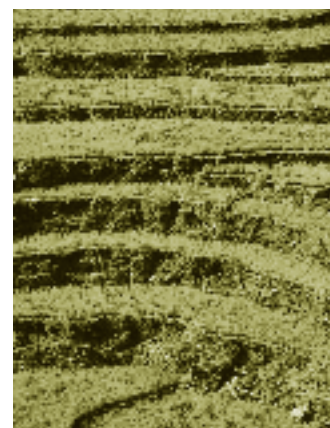
2 Achieving excellence in medium and content

Standards based reporting solutions in the regulatory information supply chain are achieved through projects that, like any other successful projects, encompass progressive stages of analysis, design, construction and deployment. These solutions use five key building blocks for transitioning to a content-driven automated information environment and attack inefficiency at its sources by:

1. **Leveraging structured filings.** The most elementary kind of structured filing is a form. The key to improving process efficiency is not so much to focus on the form layout, rather the idea is that each individual fact within the form or disclosure be identified as to its type. The more precisely each fact is identified, the more effectively the information can be used by software. For instance, a disclosure containing a list of company names in sentences of free text is less structured and, in that way, inferior to a table with one unique company identifier per row.
2. **Establishing common vocabularies.** The cost of compliance can be controlled or even reduced by relieving regulated entities of the burden of producing multiple regulatory filings that employ a combination of incompatible and incomparable data requirements and duplicate data requirements across single and multiple regulators. Standards based reporting establishes a common way of communicating the terminology of data items via agreement among regulators to use, where possible, terminology held jointly.
3. **Allowing diverse e-filing methods.** Existing e-filing software should not be replaced when it would be less disruptive to simply upgrade it for use in exchanging XBRL formatted data via Web services. In fact, in a standards based processing environment, a regulator has no need to dictate or even develop an e-filing software application for filers' use. Instead, it is more cost effective, efficient and flexible to publish XBRL and Web services interface specifications. This enables software producers, rather than regulators and selected vendors, to develop filing solutions unique to a specific regulator in the open market on a competitive basis. This approach is particularly appropriate when there is great deal of diversity among filers, as is the case, for instance, with tax filing by both large and small companies.
4. **Promoting uniform validations.** The regulator publishes, as part of the XBRL interface specifications, a set of validation formulas, instructions and other information that the filer's software can use to perform quality checks on the information in the filing before it is sent to the regulator. For the sake of both process efficiency and filer perception, it is important that the validation formulas and data-quality rules that the regulator publishes are applied identically both before and after filings are submitted.

5. **Enabling clear-cut transitions.** The transition to filings using XBRL and Web services must occur at a defined moment for all filers. The new filing method must be mandatory rather than voluntarily phased-in or made optional with other e-filing methods. The transition date also must be communicated well in advance. Planning begins with outreach, education and a collaborative approach to meeting the needs of filers, software vendors and other supply-chain stakeholders. In this way, all parties can plan for and achieve the greatest benefits from standards based reporting both for regulatory reporting purposes and for other uses within company information reporting processes.

Individually, each of these five building blocks challenges the status quo and, therefore, may seem difficult and potentially controversial to some participants in an existing business reporting supply chain. However, they collectively enable the transition from a technology inhibited information exchange environment to a standards based reporting environment, which is driven by the logic of business and regulatory needs. The goal is to enable seamless information flow from regulated entities, through regulators to audiences in other government agencies, industry and the public sector by adapting existing technologies—in all their diversity—so that they can share information with each other without manual intervention. This is accomplished through the intelligent use of open standards that are not driven by a specific vendor technology or software platform. Each of the building blocks sketched above are explained in more detail in the following sections.

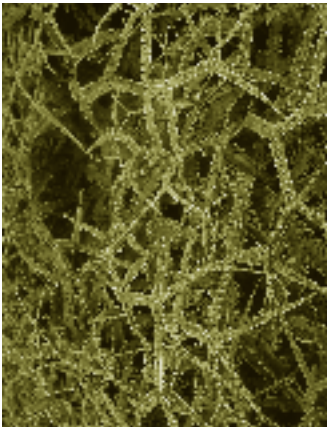


2.1 Structured filings

The way information is structured in today's largely manual regulatory-filing processes is different than that in a standards based reporting environment. Today, information is structured for humans to read, assemble, present and then use in analyses and reports. With standards based reporting, information is structured for software to read, assemble and present so humans can then use it in analysis and reports.

By making software capable of performing the non-value added, expensive manual processes used to gather and consolidate information, standards based reporting speeds the information-preparation process. In addition, increased automation reduces the high error rates associated with manual data transposition and enables resource re-deployment away from information production and assembly to value-added work in using the information for analysis and decision making.

Making software capable of understanding and processing information requires defining individual pieces of data in terms of what they mean and how they relate to other data. As any specific piece of data can have multiple relationships, the key is to define data at its most basic level, as a discrete concept, meaningful to both producer and consumer. From the basic level, data can then be classified with other data based on common relationships.



The value of clean, well structured information is clearly understood by many in the supply chain. However, this important task is often left to third party re-sellers instead of being a normal product of the reporting process. Standards based reporting enables information producers themselves to ensure the accuracy and completeness of the data they report and, at the same time, provides the means for consumers to understand and process the data as producers have tagged it.

To illustrate the importance of precise definitions, consider a regulator's consolidated report in which an anomaly is discovered. An investigation into the anomaly that can quickly and automatically drill down to the actual, individual pieces of data provided by regulated entities in their reports provides a far greater chance of uncovering the problem than an investigation that requires manual searching through the source documents or that can only go back to some earlier level of consolidation in a spreadsheet.

The goal of precisely defining data for structured regulatory filings is broader than an individual regulator creating definitions for their own forms. Many regulators use the same data as other regulators and other supply chain members. For the sake of efficiency it stands to reason that commonly used data elements be given common data definitions. The resulting sets of definitions are shared vocabularies.

2.2 Shared vocabularies—why XBRL

The e-filing platform regulators choose today directly impacts information processing and exchange efficiency across the supply chain now and in the future. In the absence of coordinated regulatory information standards, each regulatory report that filers create can be a production, or even a department, unto itself, despite the fact that identical or related information applies to multiple regulatory reports. Unless the regulatory movement to e-filing is based on collaboratively establishing data standards for common information, filer compliance costs will remain higher than necessary. Similarly, without common data standards, the cost of consuming information from regulators will also remain higher than necessary and the resulting analysis will be limited.

XBRL's value for enhancing regulatory processes (e.g., e-filing, analysis, data for policy making) cannot be explained entirely in technological terms. Software presents complications that filers may be able to overcome to a lesser or greater degree, depending upon their individual circumstances. A regulator's technology solution must be one that is aimed directly at the heart of the problem (in this case, faster, more efficient reporting) and not at issues that are minor or peripheral (such as operating system or desktop software selections.) By eliminating the problem of disparate, incompatible software through common standards all software can use, the XBRL and Web services solution puts the focus where it needs to be: on the quality, relevance and timeliness of information.

Creating those financial and regulatory reporting data standards for the XBRL and Web services enabled environment is a function of data classification. Events, properties and circumstances must each be classified and incorporated into a

comprehensible classification scheme. Absent such data classification, all the business reporting technology applied to the problem is simply “garbage in, garbage out.” Electronic filing for business reporting should focus on the essential attributes of classification schemes:

- Hierarchical, to allow classifications at multiple levels of detail
- Software-friendly and portable, for rapid dissemination and use
- Suitable for both numeric and non-numeric information
- Versioned, allowing for evolution of the scheme in a consistent way
- International and multi-lingual
- Extensible by regional or sector authorities or even by individual companies
- Equally suited to financial and non-financial performance metrics

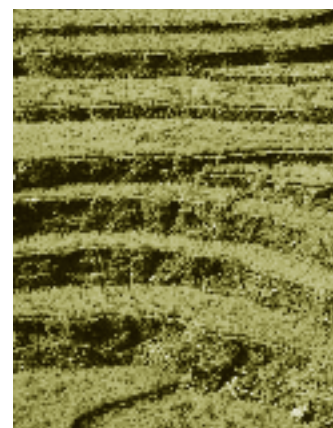
These requirements explain why XBRL is ideal for regulatory reporting as a technological solution; it is an XML Schema based language that has been significantly augmented with the idea of linkbases (leveraging XML Link or XLink) to represent additional information about individual data elements. It also provides a framework for developing base and extension taxonomies, and for establishing conventions for the representation of categories as well as performance measures and ratios that make it possible for all kinds of software to both produce and consume consistent data.

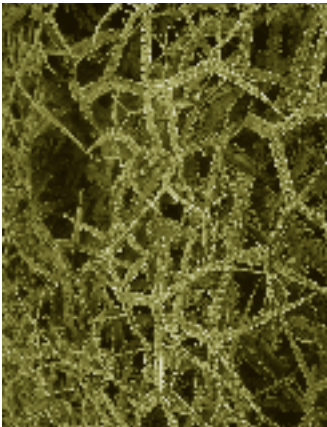
Most data collected for regulatory analysis and reporting can be made to conform to the regulator’s data standards through supplying XBRL and Web services enabled forms in which filers can enter their information. When the information enters a regulator’s systems, it already conforms to the data terms and definitions and is therefore ready for use.

To create the classifications that underlie successful transition to an XBRL and Web services enabled environment requires experienced change-management expertise that encompasses business-information knowledge and organisation, reporting-process improvement and re-design, as well as knowledge of the specific tools that will work best for an individual organisation. Proper classification is at the heart of increasing the timeliness with which regulators can ultimately provide analysis, reports and information to other government agencies, to financial-market participants and back to the community of regulated entities.

In addition to collaboratively developing data standards, regulators must be concerned with how they deliver those standards to the supply chain. The ideal platform will enable all supply chain members to accommodate and adapt to reporting and analysing new and expanding types of information with little or no changes in software, or disruption or added burden in either the filer-production or stakeholder-consumption processes.

As regulators consider the appropriate platform, a critical point to bear in mind is that tomorrow’s technology environment will likely be composed of as many or even more disparate technologies than exist today. Further, consider that every organisation, including regulators, has its own software preferences that best





enable it to achieve its goals and that those preferences change. No organisation, large or small, has a static software environment. Businesses especially have systems and software constantly entering and leaving their internal environments. With these factors as the driving force behind the platform regulators choose, the focus must be on a platform that facilitates standardising shared data definitions.

XBRL and Web services provide software-system and platform-neutral standards that enable disparate systems and software to share information directly in an automated manner, without regard to which software sends or receives the information. The standards are royalty-free and open, so they are accessible and usable by any organisation. In addition, the standards are already incorporated into, or available within, the software most businesses use, so, from a user's standpoint, XBRL and Web services are menu options, much like other, familiar menu options software packages contain.

XBRL works through taxonomies, which provide dictionary-like definitions of data terms, relevant relationships and universal rules that can be applied to any business report using those terms. A taxonomy creator makes its data terms usable by publishing the taxonomy, which enables other supply chain participants to apply the definitions to information in their own systems, using their own software tools. By applying XBRL data standards to information and utilising Web services transport and security protocols, regulators enable not just their own systems and software to share and process information—but enhance communication across the supply chain.

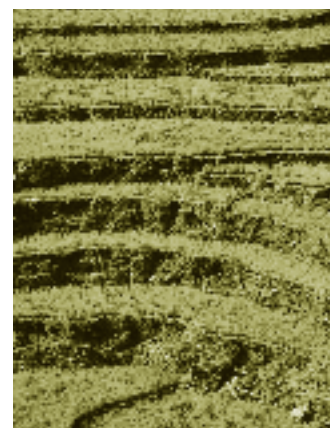
Filers can leverage and incorporate regulatory XBRL data standards into their systems and software to automate their reporting processes and improve their accuracy and completeness, while a regulator's own information constituents can use XBRL capabilities in their own software tools to quickly discover and re-use the information regulators provide.

With XBRL and Web services, there is no need for special-purpose-software or development of proprietary information standards to get information to the point at which it can be quickly accessed and used in an analytical tool. This makes organisations much less dependent upon particular third-party vendors for maintenance and adaptation as information needs evolve. Because XBRL allows disparate systems and software to communicate, it eliminates manual information gathering and consolidation and enables regulators to:

- Reduce information collection and processing costs
- Increase all participants' focus on analysing and using information
- Enhance access to information for improved risk assessments and supervision of the regulated entities
- Improve the accuracy level of information transfer from reporting-entity submissions to consolidated analyses and reports
- Decrease turnaround time for providing information to other agencies, industry and the public
- Add value by providing feedback to the regulated entities in specific, key areas, as well as to broader, market based business information supply chains

- Leverage other taxonomies to reduce the cost of managing and maintaining their own, proprietary, information standards
- Broaden dialogue with regulated entities through collaborative development of XBRL standards on an ongoing basis

With XBRL, regulators can publish information standards applicable throughout the supply chain via a platform that all supply chain members can use. This makes all parties' information production and consumption processes more automated and helps them adapt with less disruption or expense to production and consumption of new information in the future. This information-centric approach is also more consistent with the regulatory objectives focused on information analysis and policy making than today's technology-centric approach in which regulators find themselves funding development, maintenance and distribution of reporting technology.



2.3 Diverse e-filing methods—why Web services

Should regulators be in the business of choosing or providing software that regulated entities use, or establish a reporting platform that allows all supply chain participants to use the software each prefers? The former addresses a peripheral reporting issue, the means of conveying information; the latter addresses the central reporting issue, the quality of the information itself. Figure 3 illustrates that today's e-filing systems focus on the way information is exchanged, rather than on information quality, reliability and timeliness. The result is that, today, regulators are bearing increased costs and filers have less flexibility.

XBRL data standards fundamentally improve the way information is exchanged by enabling data to be unlocked from its presentation format and move selectively and directly into analytical and reporting tools as directed by individual information consumers. This requires a flexible information-exchange platform capable of transporting information that is extractable from its presentation format and also capable of moving information in any presentation format from any source to any destination. Web services are that platform. Using the Internet's most widely available open data standards and open transport and security standards, regulators promote faster, more accurate filings while allowing filers to employ their preferred e-filing methods.

Figure 4 shows how Web services enable a diversity of filing methods without impacting the information flow to regulators. Once regulators use Web services to remove limitations caused by disparate software from the filing equation, they optimise the electronic-filing environment. A variety of software programs offered by the private sector in an open market would be capable of processing reporting information, so submitting and re-using information would naturally become easier and cheaper over time.

While the savings in time and resources may be convincing enough reasons to opt for an Internet-driven standards based reporting solution using XBRL and Web services, the more profound reason is that a single-software solution may actually add to filer burdens without providing any benefit to the quality of information regulators ultimately receive. Moreover, in some cases, a single-software solution could negatively impact information quality.

Figure 5 lays out the pros and cons of different software scenarios, showing that there are complex determinations that need to be made. Ultimately, forcing a particular filing method on regulated entities is unjustifiable when the Web services alternative can be used to support all filing methods—leaving regulated entities to make software decisions for themselves.

Figure 3. BEFORE: Filer software maintained by the regulator

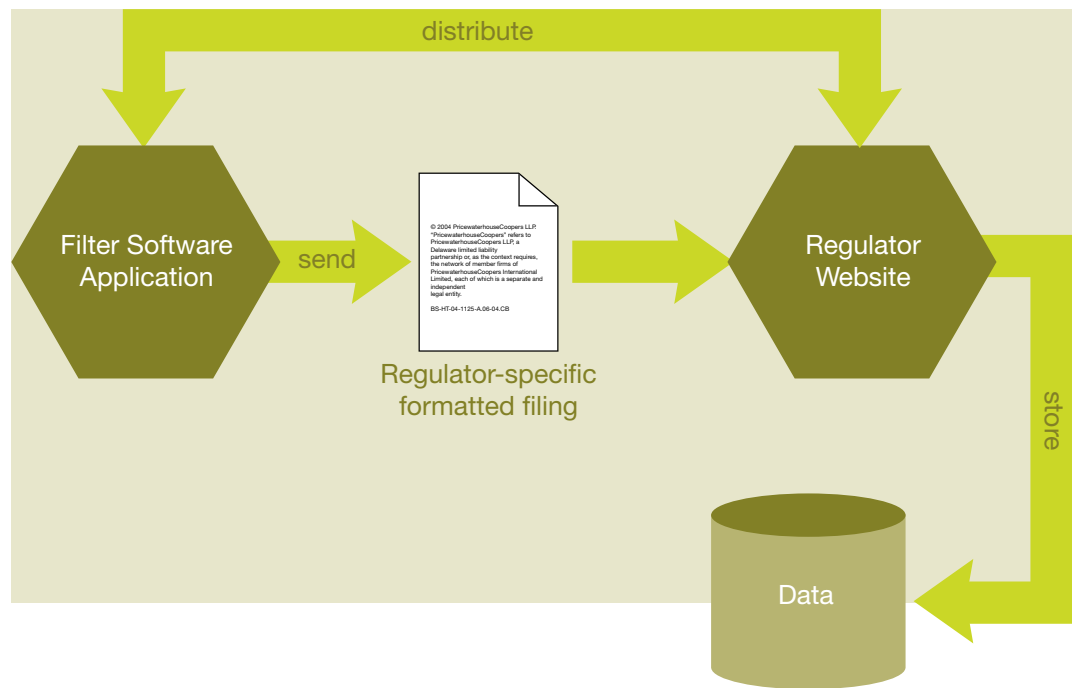


Figure 4. AFTER: Diverse e-Filing methods all using an XBRL Web service

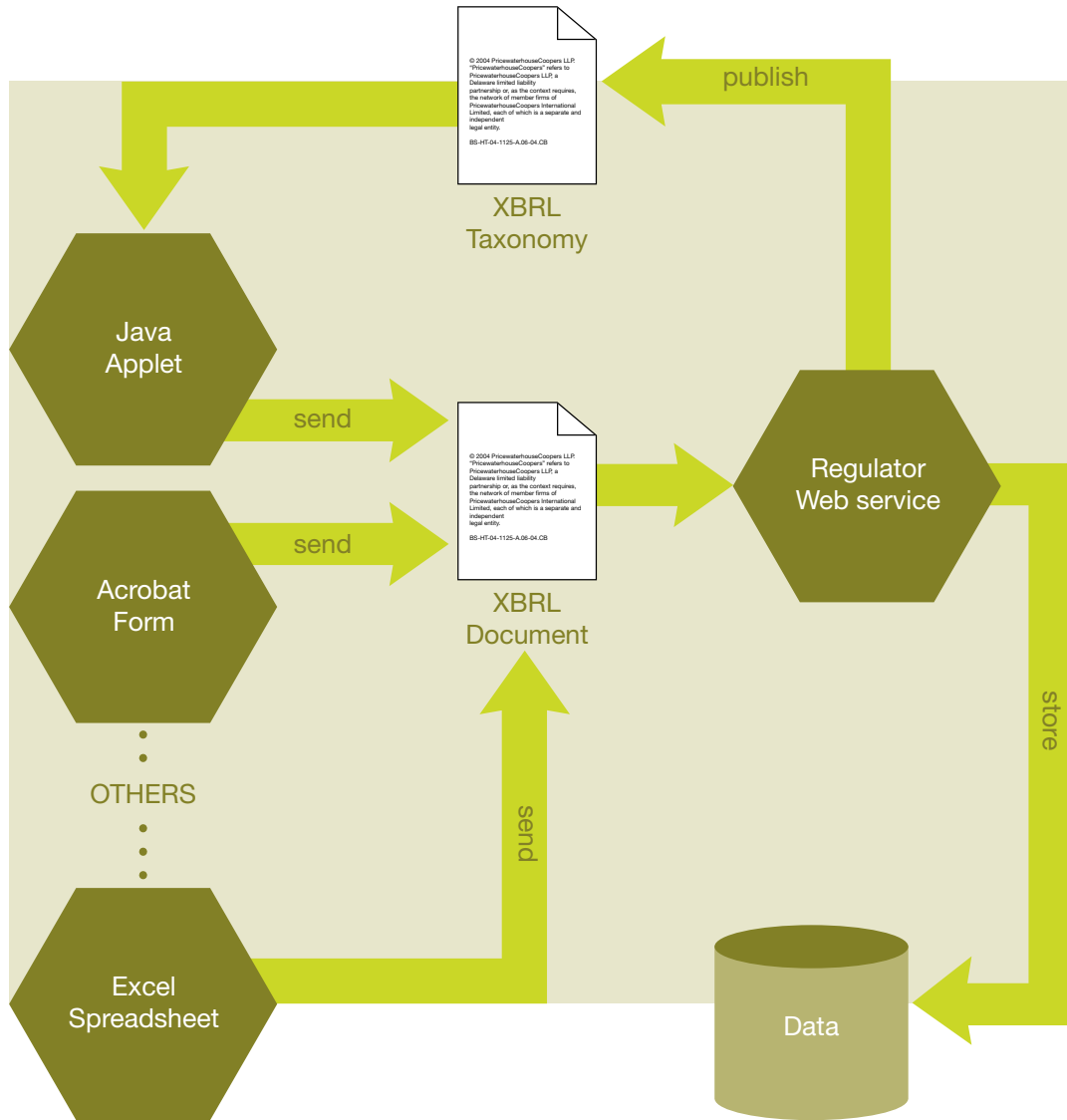


Figure 5. Some electronic filing method pros and cons

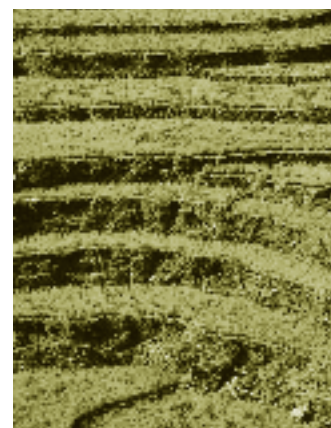
Category	Examples	Advantages	Disadvantages
Custom Executable Application	A Tax Authority distributes software on CD only used to submit tax returns from Windows	Complete control over the user interface including conditional selection of schedules, all aspects of data storage and transmission.	Regulator must take on responsibility of packaged software business; expensive, not portable, can be difficult and costly to maintain over a long period of time.
Applet	A java applet on a web page	Complete control over user interface, including storage and transmission.	Some corporate firewalls will not allow users to execute. Does not enable production benefits to regulated entities thereby placing incremental costs upon the preparers.
Web Form	A web page containing form controls and JavaScript to control behaviour	Familiar to web users.	Limited ability to control appearance and behaviour; performance suffers during peak filing periods. Does not enable production benefits to regulated entities thereby increasing preparer costs.
Paper Form Emulators	Adobe Acrobat forms	Interface is familiar to any user, even those uncomfortable with computers. Users can store partially completed forms until ready to submit.	Has limited ability to cope with narratives of different lengths or tables of unknown number of entries, like paper. Does not enable production benefits to regulated entities.
Spreadsheet	Microsoft Excel; Lotus 1-2-3	Most behaviour can be controlled including data validation and selection of different sheets (forms).	Requires user to have license; handling of large narrative sections is somewhat awkward. May be susceptible to Trojan horses. Does not enable production benefits to regulated entities.
Word Processor	Microsoft Word; Corel WordPerfect	Good at handling large and small narrative sections with formatting.	Requires user to have license. May be susceptible to Trojan horses. Does not enable production benefits to regulated entities.
Forms Player	Microsoft InfoPath, PureEdge	Most behaviour can be controlled, not as good with narrative sections.	Requires licenses; standards like XFORMS are not yet widely available.

By providing universal standards, XBRL and Web services match the solution to the problem—establishing automated data exchange and instant information re-usability across the business reporting supply chain.

The benefits to regulators are significant. E-regulation is not about turning paper reports into electronic reports, but about lowering costs and enhancing regulatory analytical and reporting capabilities. Since any software can be XBRL and Web services enabled, regulators gain instant information access and re-use upon receipt of a filer's electronic submission using their existing systems and software. There is no need to change the technology because XBRL and Web services have changed the data standards.

Recognising the need to leverage open, collaboratively developed standards like XBRL and Web services is especially important for regulators to bear in mind. First, if open standards can be used and leveraged for regulatory reporting, there is little justification for an agency to waste taxpayer money creating its own, specialised taxonomy. Second, taxonomies used by regulators will move into the information supply chain by mandate and will result in unnecessary expense for reporting entities; companies are unlikely to leverage a single agency's own taxonomy, developed for its own purposes, rather than open, collaborative standards which were developed with industry input and in response to the needs of the entire supply chain.

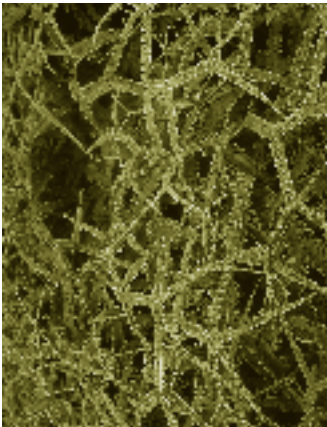
Rather than imposing a single filing process that is biased toward the regulator, XBRL and Web services are tools regulators can use to allow a diversity of filing methods. Internet protocols support a wide range of processes and, in addition, reduce costs by eliminating the need for special purpose regulatory filing software. The XBRL and Web services standards also serve as a platform for reporting process re-engineering as the information standards produce a more automated information exchange environment.



2.4 Uniform validations

Looking at today's end-to-end regulatory reporting process as it is typically executed by a given filer for a given regulator over multiple reporting periods reveals a number of potential interruptions, delays and breakdowns in the processes:

- Obtaining new versions of filing forms, modifications of instructions and other change notices;
 - Example: new filing systems sometimes require filers to register for a new identifier or authentication key.
- Satisfying newly changed information requests or policy changes;
 - Example: last year's form asked only for the number of employees as of a given date; the new form asks for full-time employees, part-time employees, and employees on leave as three separate figures, and the filer does not record its employee statistics with this degree of uniformity.
- Recalling a previously submitted report; submitting an updated report; modifying individual data items within a report;
 - Example: one of the thousand separate data items required by a complex annual filing turns out, after the filing deadline, to have had transposed digits because it was manually entered.
- Confirming acceptance or rejection of a report; obtaining a transaction history, version history; access log and detailed audit trail of reports, by organisation and/or report.
 - Example: the compliance officer must verify that the past two years of business data on record with the regulator agrees with the data as it was submitted.



Every filing process must provide some solution for each of these situations. A paper based filing process introduces delays, which dilutes the value of the data actually collected, and reduces the usability of the information by all. In the case of changing the filing forms, using paper can even cause delays measured in years. Ironically, these problems continue to exist with an “electronic” filing process if it is nothing more than a direct analogue of the paper filing process.

Key to any process improvement in any domain is improving the quality and timeliness of the inputs to each stage of the process, thereby eliminating redundancy and re-work. Whether the inputs are goods or information, the input collector must publish the most explicit instructions possible to their suppliers, with everything that they need to know, and provide visibility into the entire process. This is the foundation of “just in time” delivery in a manufacturing supply chain.

In the context of e-filings, regulators can use XML Schema, XBRL taxonomies and XBRL formulas to enhance the notion of “electronic form” with information that software can interpret. These three layers of language provide progressively greater capabilities, all relevant to electronic filing and the subsequent assessment and analytical processes as detailed below.

2.4.1.1 XML Schema-level information

XML Schema can provide information about, and enforce:

1. Primitive data types
 - Example: The value of “current assets” must be nine digits and not negative.
2. Compound data structures
 - Example: A Maturity Breakdown must contain values for Loans, Securities and for Derivatives.

2.4.1.2 XBRL taxonomy information

XBRL provides a stable and open set of conventions for structuring information not only about individual data items, time periods and entities, but also:

3. Alternative names
 - Example: “Net Income” might be termed “Net Profit or Loss” or simply “Income” in different contexts.
4. Supporting documentation
 - Example: The formal definition and instructions for reporting “Expenses incurred as a result of natural disasters” is provided in publication NCC Section 1701-D.
5. Presentation conventions
 - Example: When a list of different types of assets is shown, cash, other current assets, inventory, financial assets, and other assets should be listed in that order.

6. Summation relationships among data values:
 - Example: $\text{Assets} = \text{Current Assets} + \text{Non Current Assets}$.
7. Semantic relationships among data elements:
 - Example: On Form 42, the value of “Service Fees” is always equal to the value of “Domestic Service Fees” from Schedule B.

2.4.1.3 XBRL formula information

XBRL International is currently developing an extension that will provide additional capabilities:

8. Formulas for computing data values
 - Example: Box58 is the maximum of Box56 and 50% of Box57.
9. Co-Constraints among data values
 - Example: Box27 is “true” if and only if Box28 is the same as Box29.
10. Cross-document constraints
 - Example: Box28 must be greater than the value of Box28 on last year’s form.
11. Distinguish between “fatal” and “warning” errors
 - Example: A negative value for Receivables is technically possible, but if a negative value appears, it must be accompanied by a data item containing an explanation.

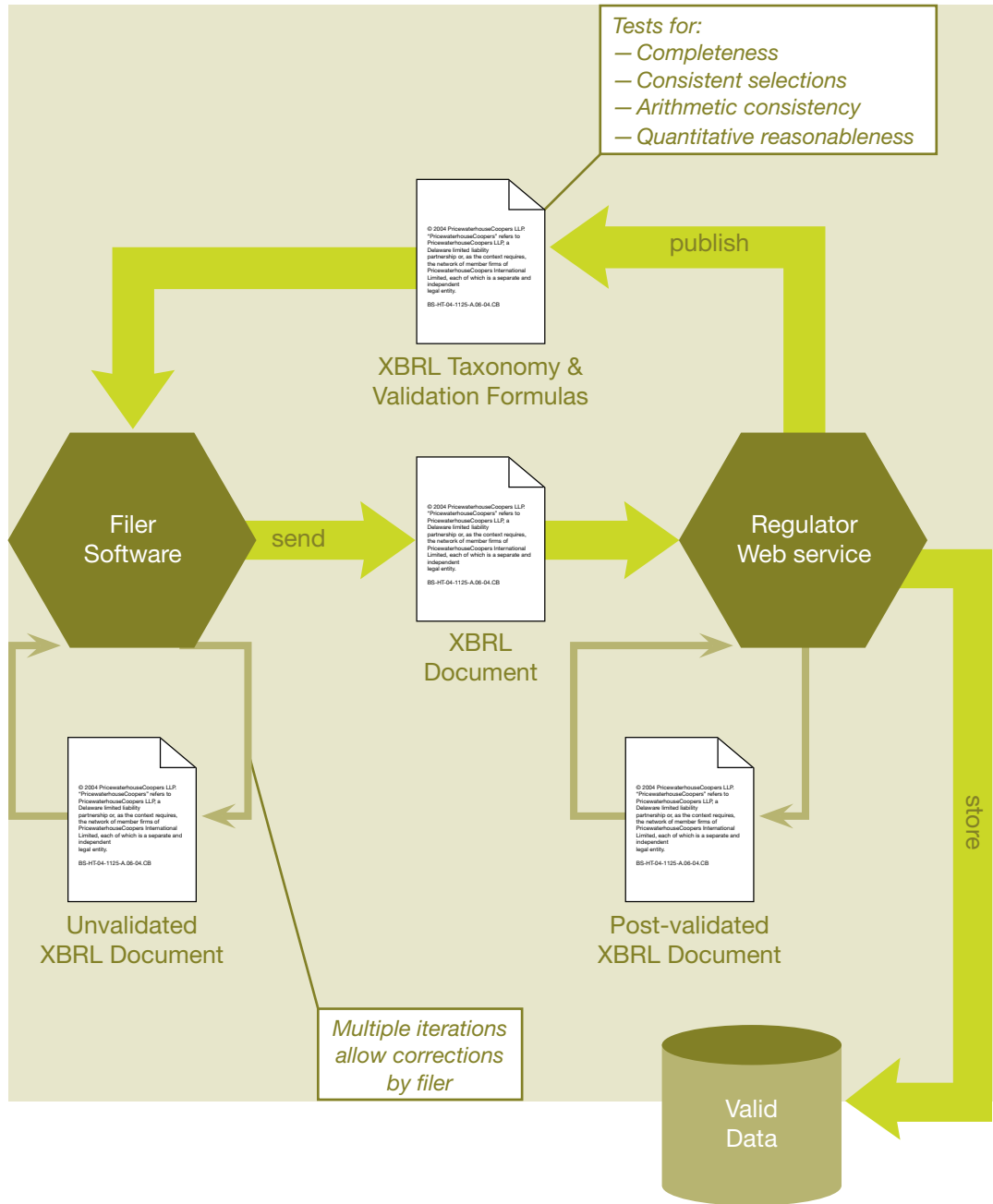


2.4.2 Uniform validation impact on filing processes

Efficient electronic filing processes depend crucially on making it as easy as possible for filers’ software to use this information—at a minimum, to verify that the filing passes all of the tests that will be applied by the regulator once the filing arrives.

Furthermore, it is critical to integrate XBRL document preparation into the normal business and compliance reporting routine. A standalone data-entry and submission environment, in which data is copied and pasted or manually converted is just as bad as, if not worse than, a paper form. A regulator with the goal of controlling the private sector’s compliance costs should provide a clear way for filers to automatically convert data into their filing format wherever possible.

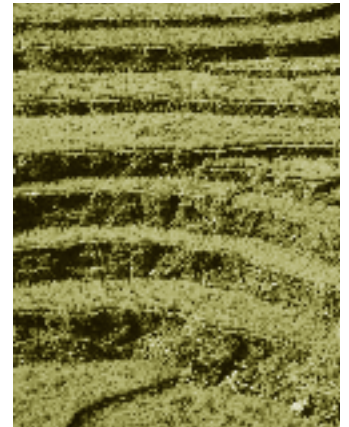
Figure 6. Validation at the core of standards based reporting



The cost-effective approach is to leverage open standards for conveying business reporting information from software application to software application. These allow filers to develop their own filing applications and the market for such software is free to operate, with different vendors adding their own value to the core functionality.

XBRL makes this possible because it provides regularity to business-reporting information. XBRL encodes this regularity in constructs, such as “facts,” “periods,” “entities,” and also in taxonomies as items, calculations, definitions and other relationships. In addition, there is regularity at a higher level as XBRL International mandates a number of practices for any taxonomy to be approved by the consortium.

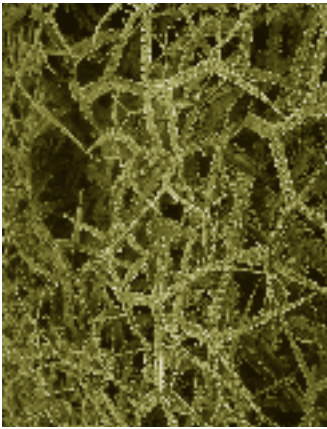
XBRL is a flexible platform that can be extended to allow regulators and other data collectors to “publish” the tests and formulas that incoming XBRL data is expected to obey. In this way, producing applications can apply those tests early and often, before ever submitting data to the regulator and thereby reduce delay, re-work and re-transmissions, and smooth and accelerate business information flow.



2.4.3 Example: XBRL formulas for the FFIEC Central Data Repository

The vision of an XBRL formula enhanced filing process is currently being executed in the US Federal Deposit Insurance Corporation (FDIC) Call Report Modernization project (Call Reports are essentially detailed balance sheets and income statements). In this broad-ranging project (which is described in more detail at <http://www.ffiec.gov/find>), the FDIC launched its first live testing in the first quarter of 2004, aiming toward having several thousand US banks required to submit their quarterly “Call Reports” starting in the fourth quarter of 2004. Subsequent planned enhancements to the FDIC’s initial XBRL deployment will encompass dozens of other electronic filings from other departments within the FFIEC, which, in addition to the FDIC, includes the Federal Reserve Board (FRB), the Office of the Controller of the Currency (OCC) and two other US Federal agencies.

The FDIC, FRB and OCC will use the FFIEC central data repository (CDR) as the system for collecting and storing quarterly Call-Report and other data about banks. The system, currently in development, will require filers to submit data as XBRL documents. The CDR performs validation of the submitted instances using “Edit” formulas that produce Boolean results for each formula that matches the data in the instance.



2.4.4 Key design principles for XBRL formulas

Designing the formulas to be used in conjunction with a streamlined business reporting process has yielded a number of insights.

- XBRL can be used to publish a “package” of form related data encompassing three distinct bodies of information:
 - (1) The underlying time-series data definitions that will be stored in a large data warehouse
 - (2) The taxonomies that represent each of the different “forms” that may be collected and
 - (3) The taxonomies that represent each of the different validity and quality tests that are applied to the data no matter which form it is reported on

This three-part organisation of the information published as part of an enhanced electronic form is crucial for the FFIEC to evolve in the future away from the concept of a “form” entirely, and instead allow banks to report only the select time-series data that are relevant to them. By reducing the importance of the form itself and focusing directly on the underlying meaning (i.e., the information), the regulator, the reporting bank and the reporting-software vendors can all more rapidly evolve and improve their part of the reporting cycle.

- To allow filers to fully validate their filings before submission, they must have access to data identical to that used by the regulator in their validation. This means that the filer’s first step should be to download from the regulator their own historical data needed on the form.

Historical data plays a vital role in error detection. Suppose a bank reports US\$1m in revenue from fees and US\$0 in revenue from brokerage, but in the next quarter reports US\$0 in fees and US\$1.1m in brokerage. It is likely, though not certain, that this is a mistake. Filing errors and the corrections made by the regulator to stored data are often a part of today’s regulatory reporting environment. Naturally, such discrepancies are unacceptable if the filer is expected to use that historical data in automated validation.

- Formulas can either determine whether a condition is satisfied (e.g., whether a deduction exceeds statutory limits) or compute a new value (e.g., “the annual total revenue is the sum of four quarters’ revenue”) and be written exclusively as expressions without conditional tests, loops, indirect references (arrays) or other programming constructs.

A large collection of simple formulas, each one being straightforward to apply to the filers’ data and each with a set of discrete results, is both modular and efficient. One formula per test is critical because each formula will be evaluated in at least two different situations: (1) when the filer enters a new value into their software and the software evaluates any associated tests; and (2) when the regulator validates the entire filing using all of the formulas. Although each individual formula must produce an identical result in the two environments, the order in which the formulas are processed can differ and must stand on its own, independent of other formulas.

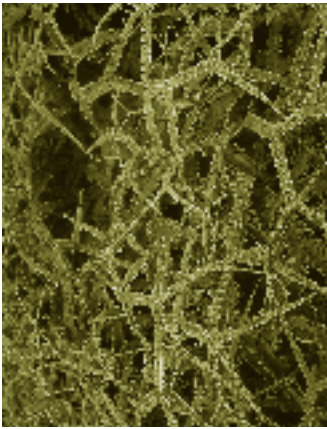
2.4.5 Example: FFIEC formula usage examples

There are generally five formula categories in the FFIEC validation set that accompanies the forms and the data series definitions in a form:

1. **Validation tests for equality and near-equality within a single time period.** The select attribute will be an expression that produces a Boolean value, with “false” indicating that the instance has failed validation and cannot be accepted at all. Math expressions are often of the form $((a + b) = (c + d))$ within some tolerance (upper bound, lower bound).
2. **Validation tests for mathematical validity across time periods.** The formula produces a Boolean value, with “false” indicating that the filing has failed validation and cannot be accepted at all. Math expressions in this case will be of the form $((ap0 + a_p1 + a_p2 + a_p3) = total)$ within some tolerance (upper bound, lower bound).
3. **Quality tests for equality and near-equality within a single time period.** The formula will contain an expression that produces a Boolean value, with “false” indicating that the filing failed to provide an explanation code for the failure of some equality test. This is mathematically similar to the first formula.
4. **Quality tests for mathematical validity across time periods.** The expression produces a Boolean value, with “false” indicating that the instance cannot be accepted because there was no explanation code provided for the failure of the test. This is mathematically similar to the second formula.
5. **General complex edits.** Some formulas are currently structured to bind a large number of variables and then sequentially test them, all in a single expression involving conditional expressions, case statements, etc. In the long run, these will be re-written as a set of individual formulas each of which only binds the needed variables.

Over time, FFIEC agencies can develop additional formulas and software will be able to use the new formulas as the agencies publish them, without the need for the software maker to intervene with an actual software upgrade for purposes of incorporating the new formulas.





2.4.6 FFIEC CDR Project collaboration

The FFIEC CDR project facilitates a collaborative environment among several stakeholders: the FDIC (lead agency on the project), other FFIEC agencies, banks represented by the American Banking Association, and individual banks and the vendors who produce Call Report software. In support of this open collaboration, supporting materials are provided that detail not only XBRL formula syntax and semantics, but also describe the methods for processing them. This documentation has been valuable to the vendors and other software developers who write applications to perform validation using these formulas. In particular, it has enabled them to write applications that will produce equivalent results to the way the CDR gateway will run the formulas to validate the instance data before it is entered into the CDR. This collaboration and communication effort is essential for meeting the filing deadlines implied by the planned launch date. It also highlights the priority placed around building adaptability of taxonomies and their associated formulas into the re-engineered processes so that subsequent flexibilities can be executed in a similar manner on a timely basis.

2.4.7 Summary

XBRL and its forthcoming extension to encompass formulas offer powerful new tools to enhance data quality throughout an information supply chain. This is a key value proposition for any large set of information providers, collectors and aggregators and is specifically relevant to regulators. XBRL offers a way for information collectors and aggregators to publish their validation criteria to the information producers, who can then enforce multiple levels of validation on their information before it is ever sent. Identical validation criteria may be applied repeatedly as data makes its way from its many origins to its many ultimate destinations.

The efficiency and effectiveness implications of this approach are being borne out in a major project at the US FFIEC, led by one of its agencies, the FDIC. Careful attention has been paid to the impact on filers of pre-validating their filings, and this awareness of the process impact has been embedded specifically into the formulas as well as into the entire open and collaborative design process.

2.5 Clear-cut transitions

Moving to an XBRL Web services automated environment involves two areas of change, one to enhance software and one to improve the activities of the people involved in analysis and reporting processes. Software enhancements concern developing and using data maps to convert existing data in all of its source locations into data that conforms to XBRL standardised terms and definitions. This enables disparate software sources, including the e-filing forms, to feed information upon publication directly into any analytical spreadsheet or any other application for immediate use.

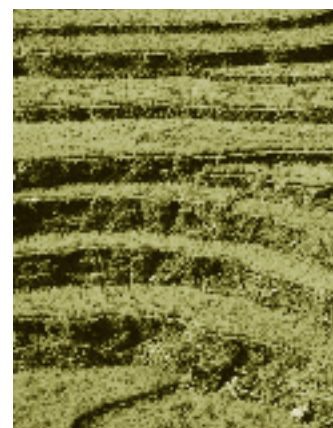
People have to change their behaviour and their use of tools in order to achieve process benefits. As automation replaces the need for manually preparing data for reporting and analysis, there will be correspondingly more time spent on analysis. The data-standards-driven automation also enables more information to be routinely incorporated into analysis, since the data enters regulatory systems from e-filing forms “live” and ready to re-use without the need for manual work.

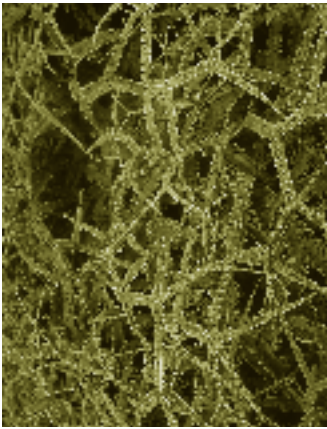
All of the parties involved in a regulatory information value chain will face changes, even if only to a small extent, and it is imperative to manage expectations and concerns to ensure a smooth transition to XBRL. Parties facing changes in a typical e-filing implementation will include:

- Service agencies, corporate secretaries, compliance officers and other filers: they will need to be trained on how to deal with validation steps during the filing process
- Company directors, accountants and auditors: for financial filings, they will benefit the most by adopting XBRL so that they can directly create, view and sign-off XBRL documents or even contribute to taxonomy building
- Information aggregators and end consumers: they will only be able to fully reap the benefits of XBRL if they understand the knowledge that the increased amount of information makes available to them
- Other regulators: achieving cost efficiencies across a number of e-filings is much easier when there is alignment of timing and expectations across different regulators and an acknowledgment of which agency will own the data definitions common to several regulators, such as the financial reporting GAAP based definitions

Changes to any established process are inevitably met with a certain resistance. Acceptance of a change in workflow can be effectively handled with greater education and awareness training of the parties involved. Fears about more structured e-filing methods can and must be addressed in the context of communicating the full scope of the difference between information from manual and automated reporting processes. In addition, the benefits to filers must be underscored, including regulatory support for filers’ preferred reporting software and e-filing methods. Training ensures that compliance officers, accountants, secretarial staff and other filers understand the concept of XBRL and creation of XBRL instance documents based on XBRL taxonomies. There are user-friendly tools available for nearly all XBRL related activities so that users never need to be conversant, with or even aware of, its technical details.

As with any process oriented change, leadership must invest effort in education and knowledge transfer. This education effort must be directed at all of the individuals involved in the regulatory process, including regulated entities’ compliance officers, product managers responsible for filing software, the data collectors and analysts within the regulator, and the external users of the data once it is published to other users. Individuals must clearly understand their personal value proposition and motivations, and how these complement the goals set by other participants. Knowledge of the process and tool enhancements must be clearly communicated and continuously reinforced so that advantages of the standards based reporting environment are fully leveraged.





Finally, to maximise the benefits to all parties, the transition to filings using XBRL and Web services must occur at a defined moment for all filers. The new filing method must be mandatory rather than voluntarily phased in or made optional with other e-filing methods. Otherwise, ambiguity, running multiple filing systems in parallel and other consequences add cost for no commensurate benefit. That said, the transition date also must be negotiated and communicated well in advance. Planning begins with outreach, education and a collaborative approach to meeting the needs of filers, software vendors and other supply-chain stakeholders. In this way, all parties can plan for and achieve the greatest benefits from standards based reporting both for regulatory reporting purposes and for other uses within company information processes.

3 Towards standards based reporting

XBRL regulatory adoption is accelerating throughout the world. These implementations are instructive for regulators whose own filing re-engineering efforts have not yet considered XBRL and Web services. In this section, we will discuss how regulators have gone about incorporating XBRL into their filing solutions, address the common questions many regulators encounter to their proposed solutions and outline an implementation plan that regulators can use as a starting point for developing a more tailored plan.

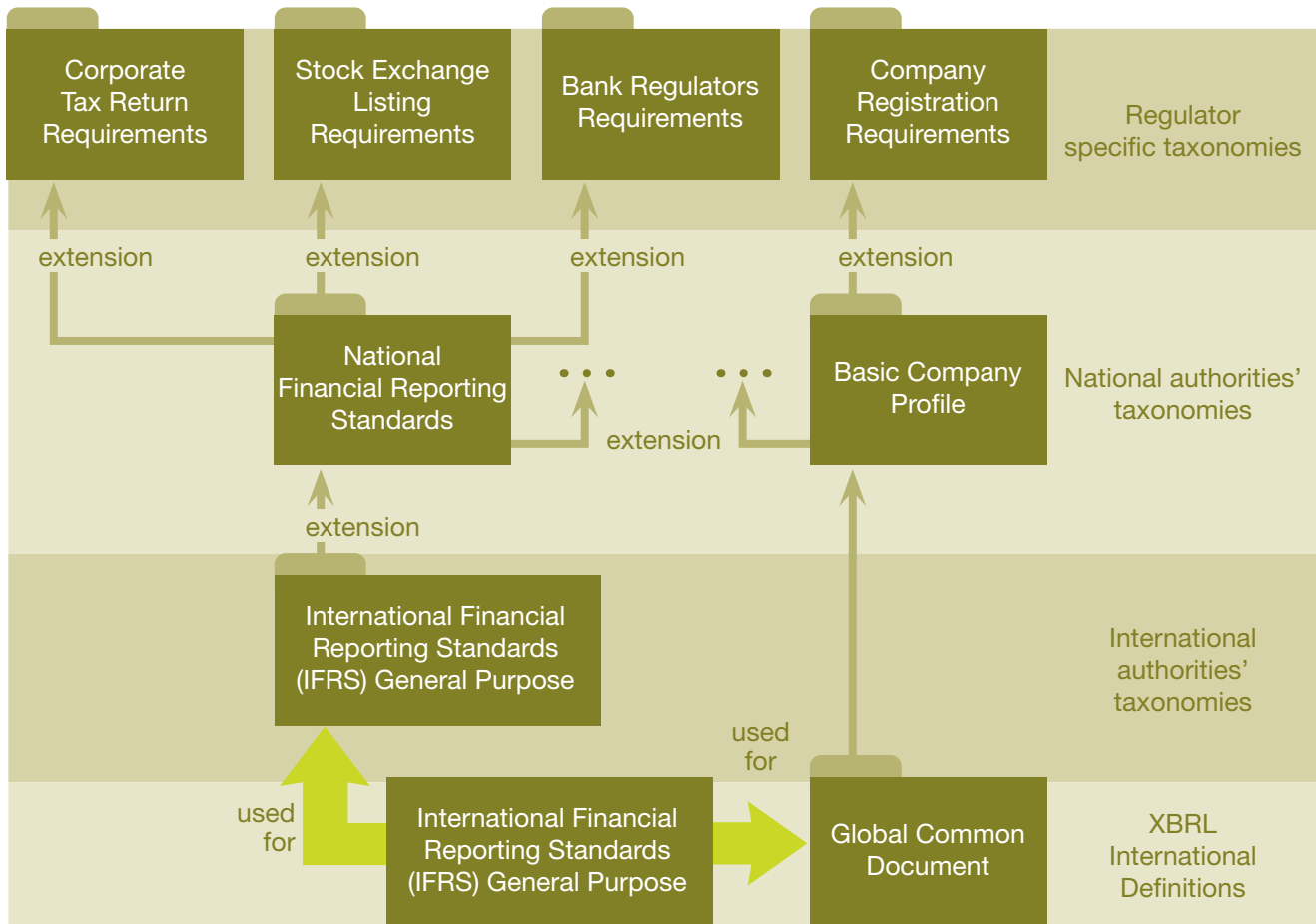


3.1 Inter-agency deployment of standards based reporting

The number of regulators around the world announcing pilot programs and deployments involving XBRL and Web services is growing rapidly. The market activity provides several deployment models to act as guides for regulators who are beginning to explore standards based reporting and the benefits and capabilities of XBRL and Web services.

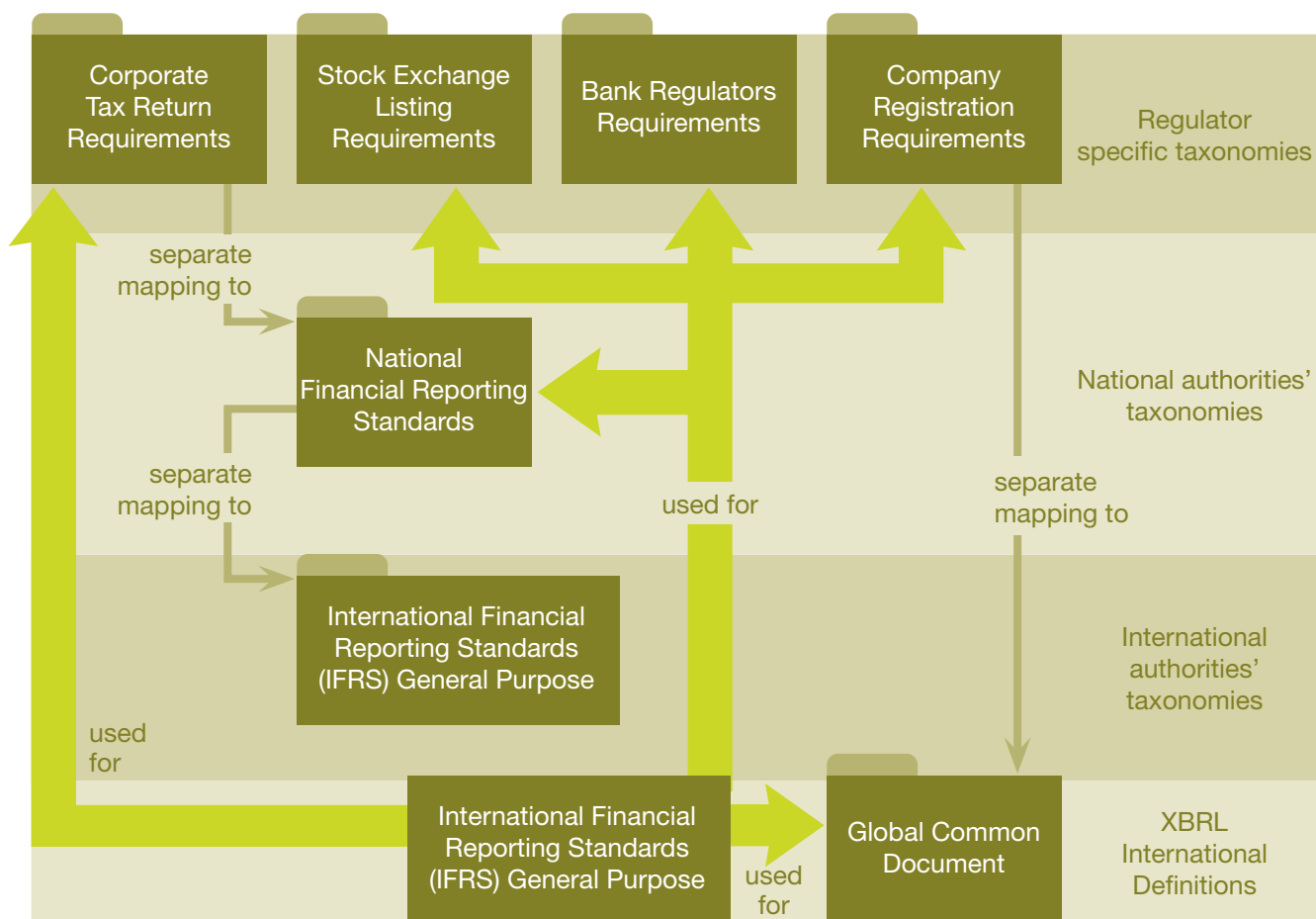
Joint Taxonomy Deployment. Related agencies may choose one agency to develop an XBRL and Web services based system and establish its viability. The intent is that more agencies can then leverage and extend the taxonomy developed, deployed and maintained by the initial regulator. The FFIEC is using this approach, with the FDIC conducting the initial pilot and deployment. The FDIC's sister agencies in the FFIEC will leverage the FDIC's XBRL Web services standards for their own information collection, processing and reporting. This approach results in the development of a base jurisdictional taxonomy, usually representing national financial or statutory reporting standards. This method also prevents standards proliferation and promotes faster, more efficient intra-agency information sharing and re-use. Figure 7 shows a sample network of taxonomy sharing that would result from this deployment model.

Figure 7. Taxonomy relationships resulting from the joint model



Parallel Taxonomy Deployment. Within any given regulatory jurisdiction, early adopting regulators can agree that while they will develop their data standards individually, they will use XBRL as a common foundation. This provides the reporting jurisdiction with robust taxonomies in key reporting areas that filers and other regulators alike can leverage to streamline their own reporting processes. Individual regulators may then choose to provide a separate mapping of selected data items to other published taxonomies. The benefits of this model include development of more than one set of data standards relevant to a jurisdiction's entire reporting supply chain, reduction of redundant definitions from different regulators and compatibility of additional standards with existing ones. Figure 8 shows a potential network of relationships among taxonomies that would be developed under this model.

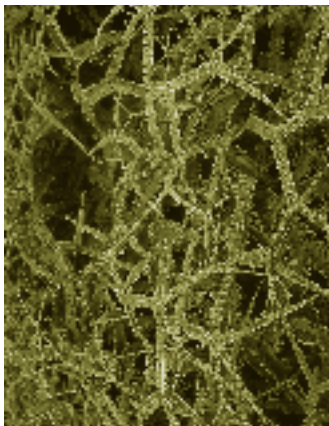
Figure 8. Taxonomy relationships resulting from the parallel model



3.2 Organising for change

In either deployment strategy, shared and interrelated taxonomies will need to be organised so that future changes may be introduced without disrupting data collectors' efforts. Three determinations are made in this part of the design stage:

1. What is the relationship between different sets of information collected, relative to the filers, regulators and other producing and consuming organisations? Different information sets should be cross referenced to the agencies that need them, so as to identify those areas that are common. In the FFIEC Central Data Repository, "reportability rules" provide this modularisation.
2. Which definitions are, by their nature, likely to be more volatile than others? The basic definitions of companies' organisations, directors, addresses, and so on are clearly more stable than accounting standards related definitions; the more stable sets of data can be partitioned into taxonomies on which more agencies can rely.



3. What is the process of collection and redistribution from filers to multiple agencies? Ideally, common information is collected only once and redistributed in a timely fashion to other agencies, within the boundaries of applicable privacy restrictions. For example, one set of regulators in Asia are collaborating so as to collect basic information from all companies using a single taxonomy and then let another agency collect the supplemental information needed for publicly listed companies using an extension taxonomy.

Taking these into consideration, a partitioning very much like those shown in Figures 7 and 8 will result. Each taxonomy may extend some other base taxonomy. Therefore, each change to a taxonomy should be evaluated as to whether it makes more sense to introduce a new “update extension” to the taxonomy and leave all other taxonomies unaffected, or to create a new version that would be selectively used by new versions of all the taxonomies (triggering a chain of updates to other taxonomies).

In general, for a purely additive change to a taxonomy, there is often no need to modify any dependent taxonomies, so that an extension makes sense; if some definitions are removed or changed, then the dependent taxonomies are more likely to be affected and therefore require new versions. For this reason, the base taxonomies most widely used should be exceptionally stable, while taxonomies that encapsulate information that is, say, relevant only to a single department or regulation can be more volatile, even changing every reporting period, as is done at the FFIEC.

3.2.1 Taxonomy modularisation and versioning

A fundamental design decision is how to modularise large taxonomies so as to satisfy multiple business requirements, particularly with respect to maintainability. Maintainability, for this purpose, includes consideration of issues relating to the correspondence of the taxonomies to existing or externally produced legislation or documentation, ownership of the various terms within the taxonomy by different organisational units, volatility of the vocabulary and supporting meta data and comprehensibility both from the point of view of domain experts and software developers.

As implied above, a sensible approach is a centralised one in which concepts having little or no volatility and broad applicability are housed in one or a few common core taxonomies. Regulatory entities and functions would be allowed to extend those taxonomies to suit their needs, within limits defined by a taxonomy architecture formulated as rules and guidelines, much like XBRL International’s own Financial Reporting Taxonomy Architecture (FRTA).

Regulatory applications of XBRL virtually without exception have, or will, require:

- Support for data collection involving different, intersecting or disjoint sets of concepts from different reporting entities
- Support for changes in these concepts and their relationships over time
- Relevance of some inter-concept relationships to some data collection functions but not others

None of FRTA's nine rules relating to organisation of taxonomies are mandatory (MUST) rules since some of them can be traded off against one another. Rather, FRTA allows for a variety of approaches and a set of guidelines indicating the principles that should be followed. The rules are presented for reference in Figure 9. A presumption of these rules is that a set of XBRL taxonomies is a unitary set of concepts that will be used *en masse*. In fact, XBRL defines the notion of a Discoverable Taxonomy Set (DTS) as a group of terms collected from various taxonomies. Any given XBRL formatted filing could, in principle, use terms from many taxonomies. Implementations using XBRL might, for efficiency or other reasons, “pre-slice” a subset of a DTS into just those concepts and links relevant to some particular need, perhaps even just at the moment of publication. While this might appear to an external user to reduce the complexity of the DTS (and therefore has some value) it nevertheless leaves the owner of the taxonomy with the task of maintaining the overall set of interrelated taxonomies and all of their terms.

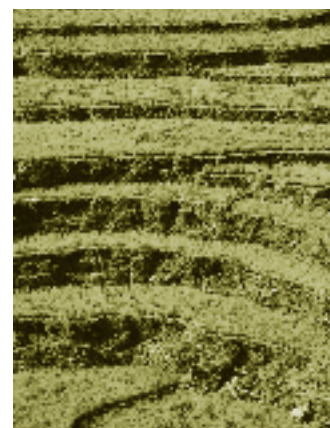
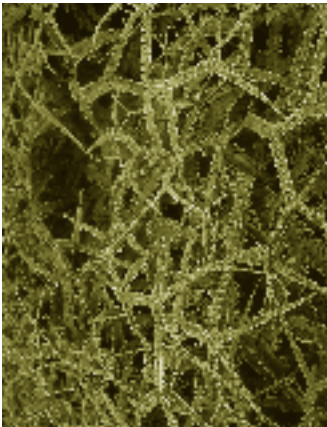


Figure 9. XBRL International taxonomy modularisation guidelines (FRTA)

Rule	Text
5.2.1.	Extension documentation MUST provide a report of concepts added.
5.2.2.	Extension documentation MUST provide a report of concepts existing in the base that are not to be used.
5.3.1.	Modules SHOULD correspond to the reporting standards and rules that they are based upon.
5.3.2.	Modules SHOULD facilitate independent development and use.
5.3.3.	Modules SHOULD be comprehensible to domain experts.
5.3.4.	Modules SHOULD allow distributed taxonomy development.
5.3.5.	Modules SHOULD ease version control.
5.3.6.	Modules SHOULD ease taxonomy extension.
5.3.7.	Modules SHOULD minimise the number of redundant concepts defined in DTS's supporting specific reporting purposes.
5.3.8.	Modules SHOULD minimise the number of files required to express taxonomy content.
5.3.9.	Modules SHOULD minimise the number of namespaces that have to be defined for XBRL concepts.



3.2.2 Prioritising the modularisation guidelines

Depending on the nature and purpose of the taxonomies, different rules have greater or lesser relevance. Taking as a prime example a financial regulator with supervisory responsibility over many different types of regulated entities, key drivers ought to include:

- Correspondence to the reporting standards and rules they are based on (FRTA 5.3.1)
- Ease of version control (change management) (FRTA 5.3.5)
- Minimisation of the number of redundant concepts (FRTA 5.3.7)

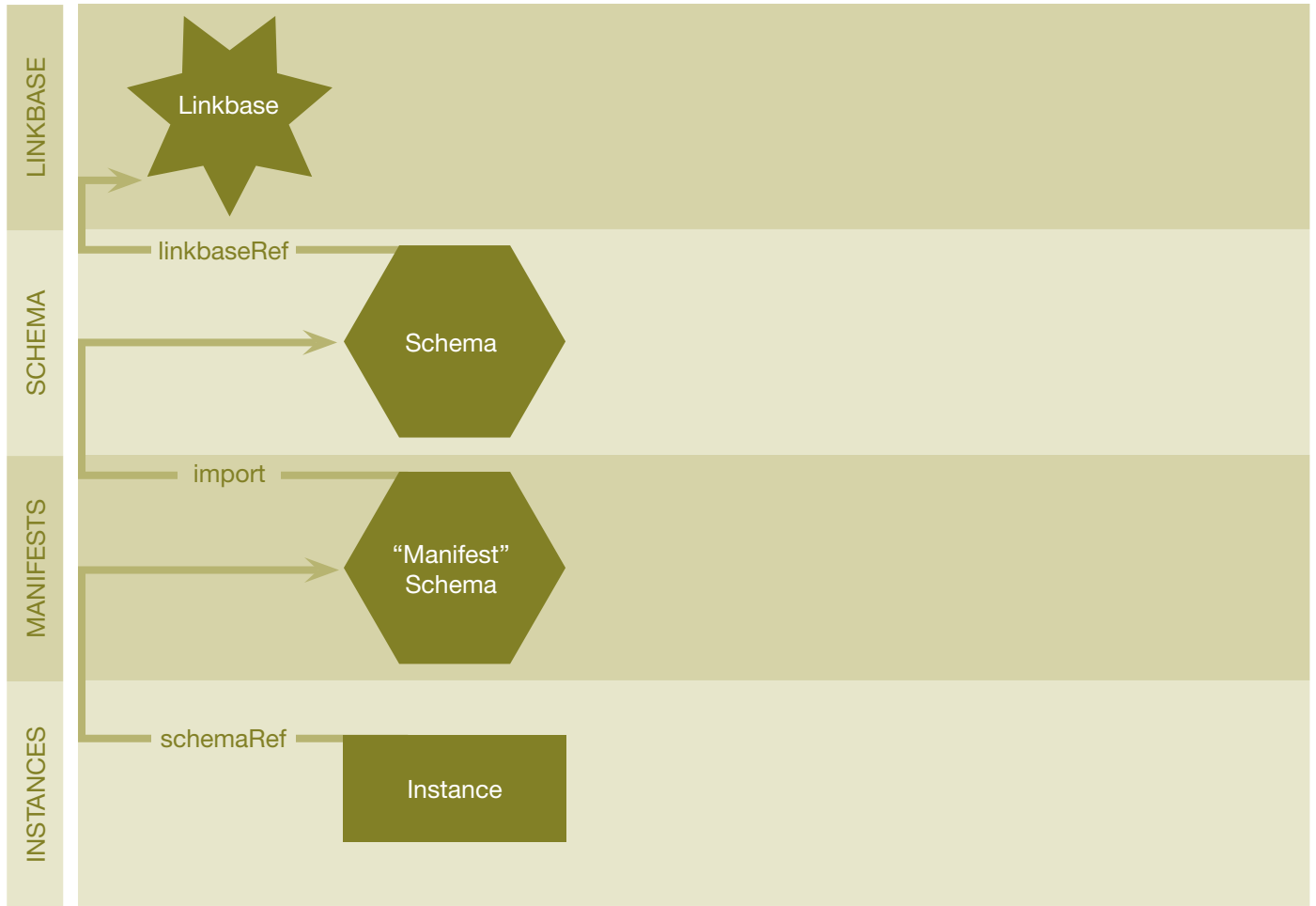
While the other features are important, these would be primary considerations for a regulator responsible for implementing changing legislative and administrative requirements while minimising the reporting burden on regulated firms. At a more granular level, there are situations arising in the construction and maintenance of taxonomies and the instance data that exist for them that are of greater or lesser interest to regulators because of their ability to compel the use of a particular taxonomy version for reporting during a period. These include:

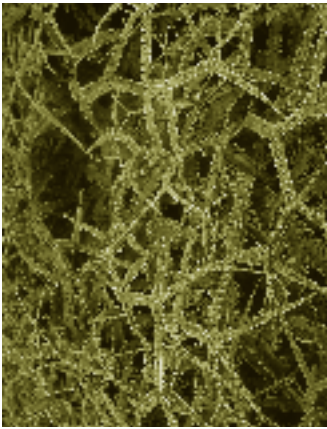
- Allowing individual regulated firms to customise the taxonomy by redefining items or relationships is unlikely to be supportable, hence taxonomy extension is not by itself an important goal
- Validating existing (historical) instance documents against newer, updated taxonomies (and updating the instances if necessary) is of interest because of the importance of trend analysis and the need to maintain, or reconstruct, historical data series
- The relative frequency of removing taxonomy items, changing items (i.e., removing the old definition and adding the new one) and adding items, will tend to be biased in favour of adding items
- Significant changes from period to period will not be in items at all, but rather, in the associated formulas—consisting of validations, quality tests and derived values

3.2.3 Conceptual model of taxonomy changes

To understand the tradeoffs between different approaches to maintenance, it is useful to consider the impact on an interrelated set of components in the “time line” that results as a set of instances, schemas and linkbases evolve over time. Figure 10 shows a basic model, in which instances generally point to a “Manifest” (header) schema whose purpose is not to define new items or tuples, but merely to collect together the necessary schemas and linkbases. While this could be done within each instance, creating a Manifest schema is more re-usable, with the Manifest being given a name such as “IFRS taxonomy with only Spanish linkbases.”

Figure 10. Conceptual model with four areas of possible change in XBRL information.





One type of change that can occur is the addition of additional linkbases. Reasons for filing instances to have need to refer to the new linkbase would include:

- Addition of a new presentation of existing data, as for example a new form or report
- Addition of new validity or quality formulas
- Addition of new documentation or links to additional reference material

This leads to the kind of extension shown in Figure 11, in which the new linkbase has no impact on existing schemas. Figure 12 shows a variation in which a new Manifest schema is added, so that many instances use an identical set of taxonomies.

Figure 13 shows one approach to making a change in an existing DTS: copy the individual components and make edits as necessary, then publish the new set. While this would appear to be a brute force approach, there are actually certain advantages that explain why something very akin to this is being used in the FFIEC CDR project:

- There is no ambiguity about whether obsolete items may still appear in instances: if their definitions are removed from the schemas, they cannot appear in valid instances
- Some aspects of linkbases can be simplified. For example, if a formula linkbase only applies to one period, the rules can be written in a more compact form and processed by a simpler engine. More generally, the point is that information usually thought of as part of the context elements, in fact becomes embedded in the taxonomy

Figure 11. Introduction of a new taxonomy linkbase without any new data elements.

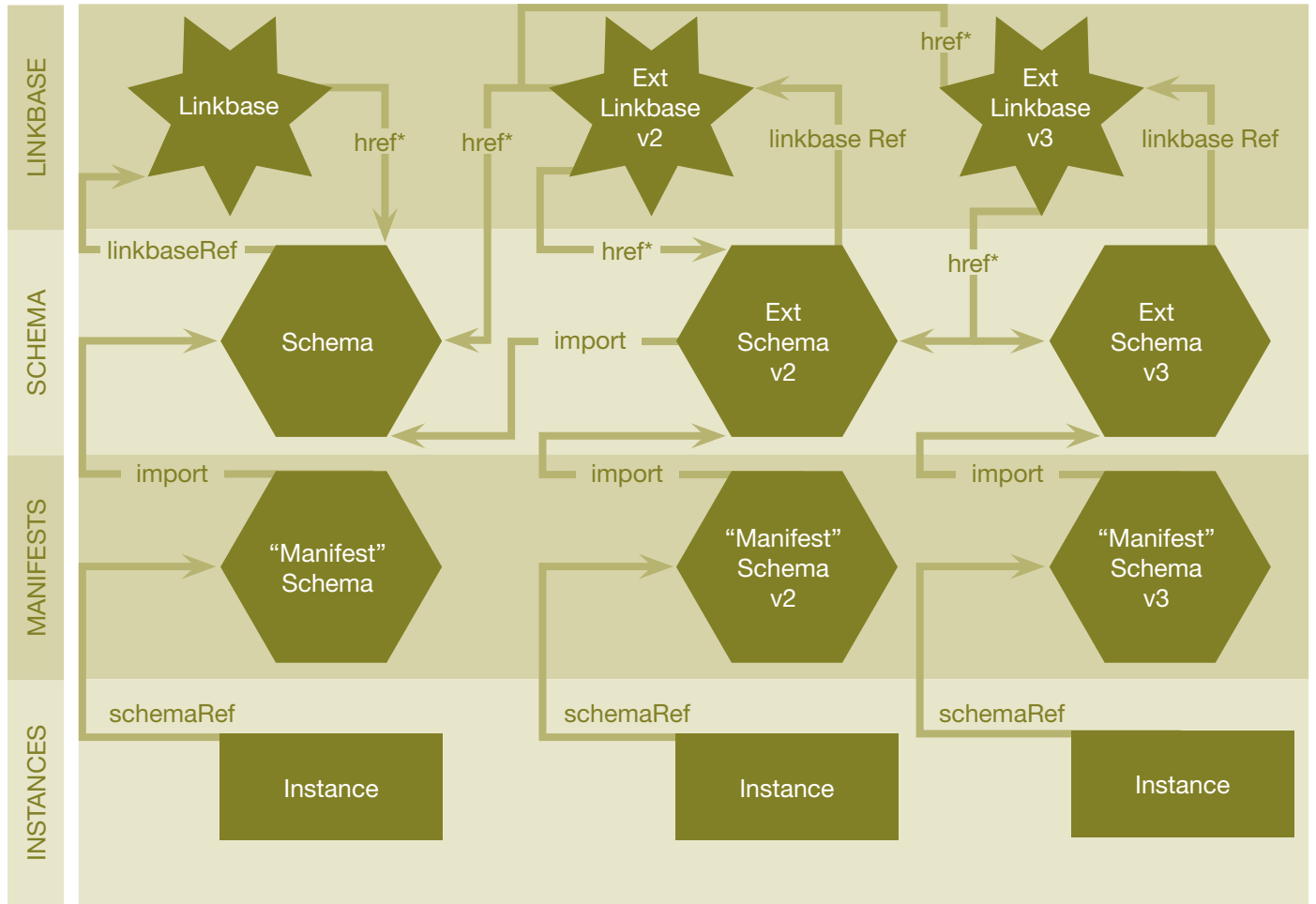


Figure 12. Introduction of a new linkbase with a Manifest schema.

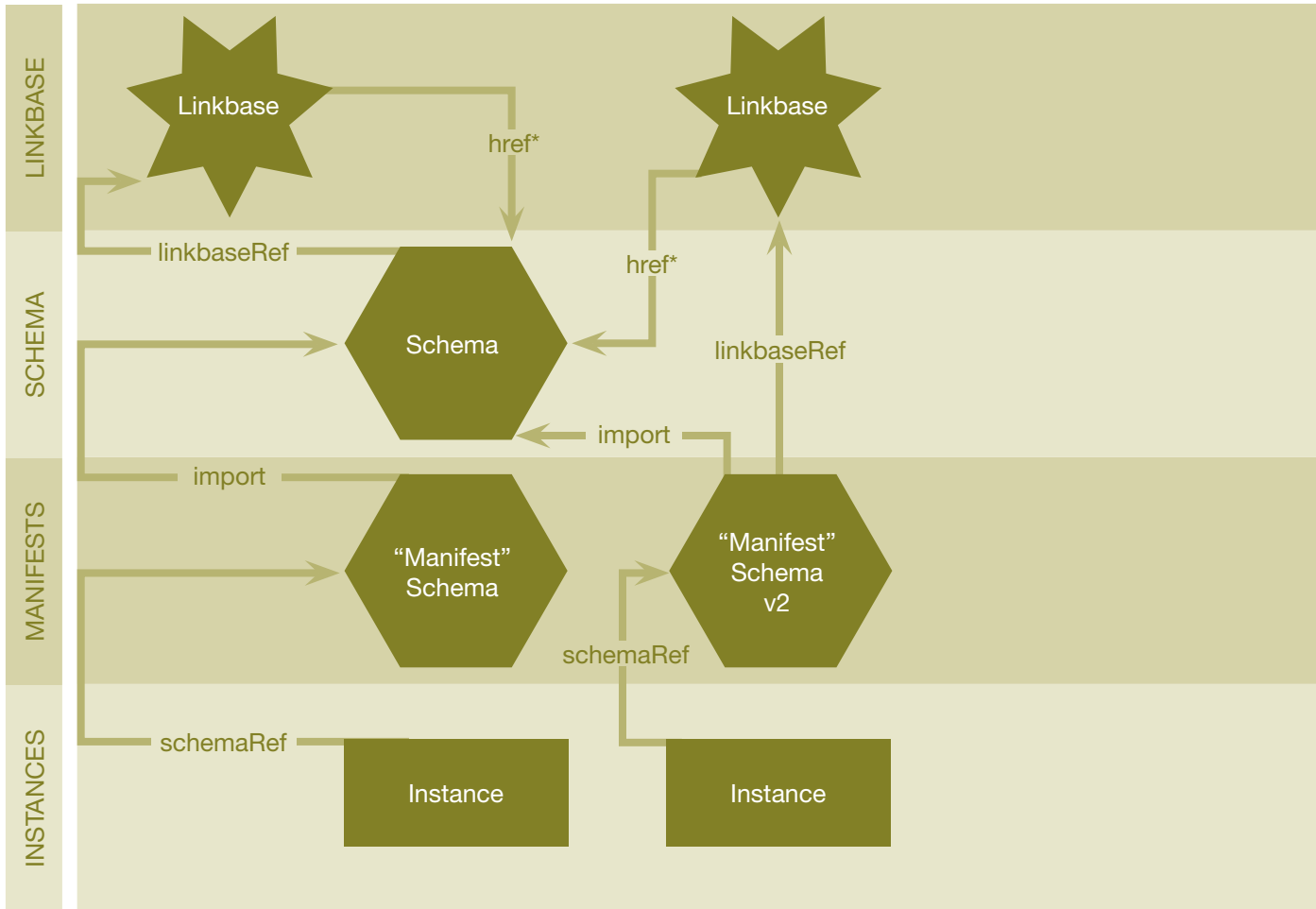


Figure 13. Making a period-specific copy of updated taxonomy components

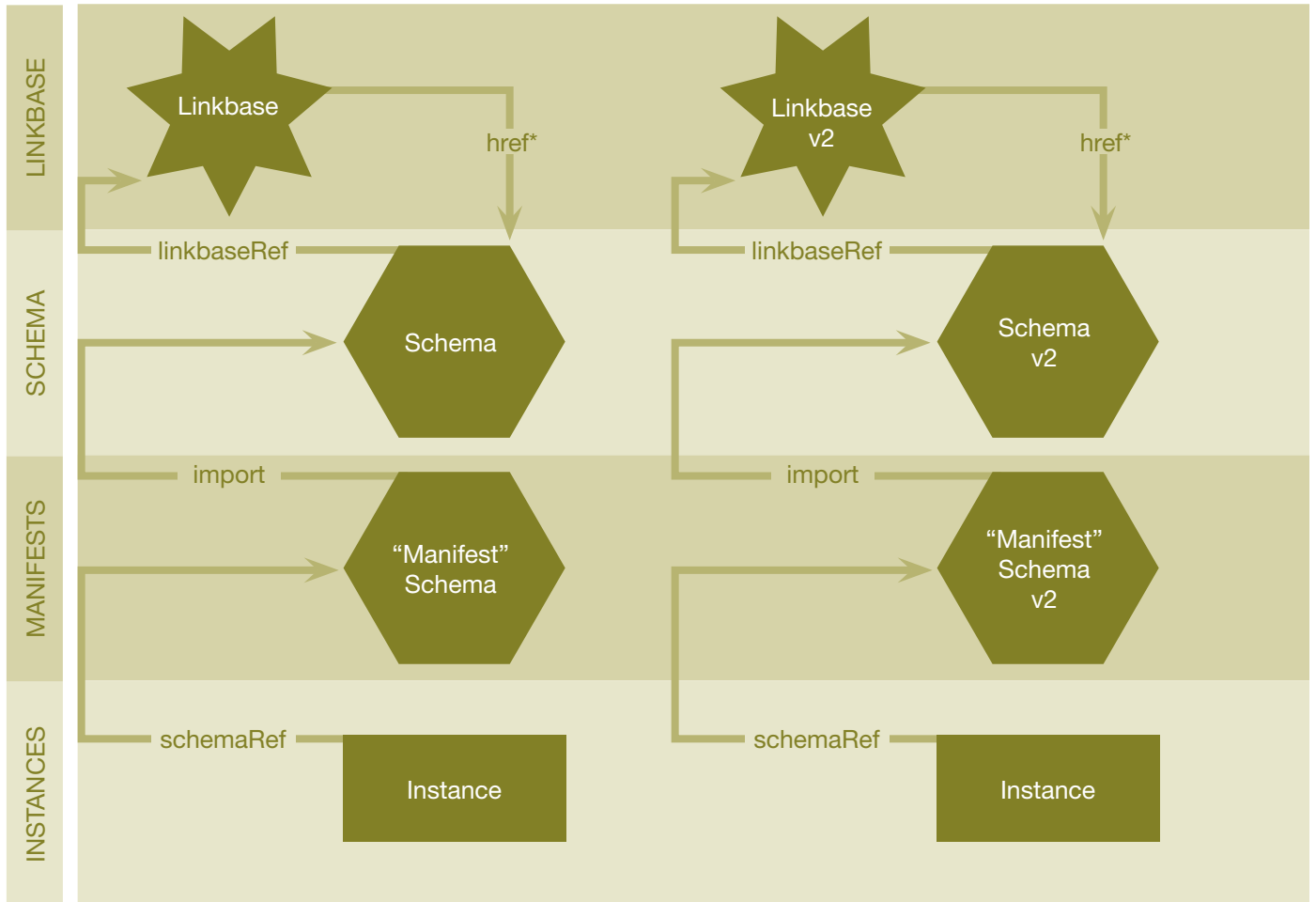
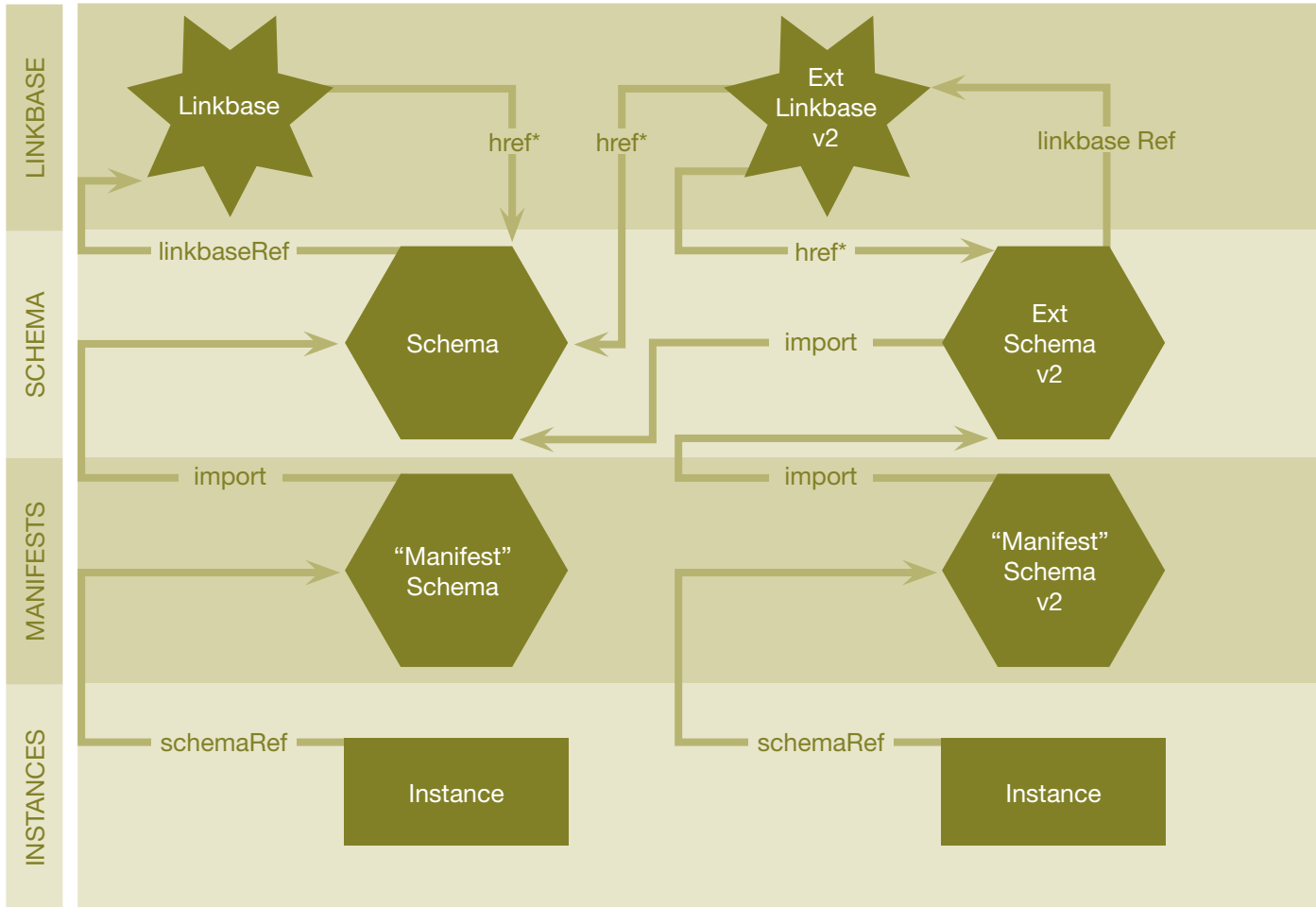


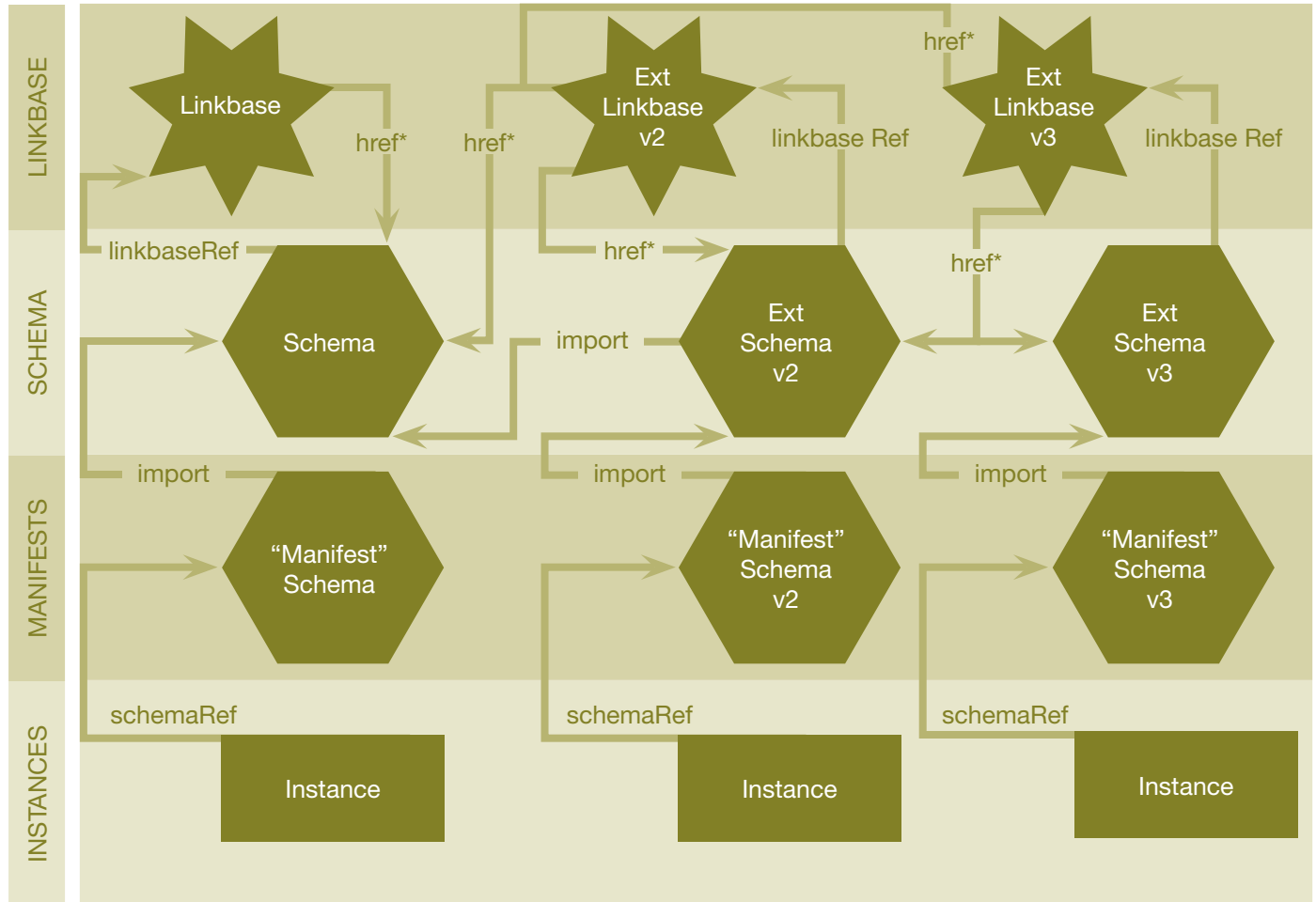
Figure 14. Making each set of changes an extension to existing components



Another approach is to use the extension mechanisms already inherent in XBRL to make each periodic or other change an extension. In Figure 14, a change in the schema—perhaps the addition of just a single element—means that the individual file components are smaller; they are depicted as such.

Ironically, this gives rise to an identical set of files as shown in Figure 13 (the periodic copy approach), hence, as far as FRTA rule 5.3.8 (minimise the number of files) is concerned, the two approaches are equivalent. Figure 15 below shows that as further extensions are added, a similar proliferation of individual files will occur as an inevitable consequence of adding new elements.

Figure 15. Another set of changes as an extension to the extensions.



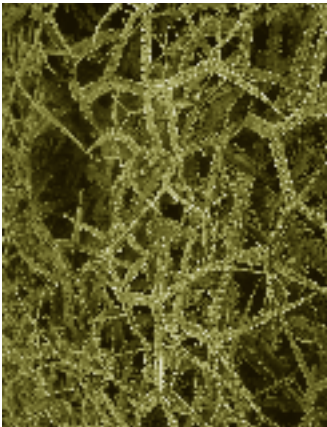
The approach of using extensions does have some advantages, and they are advantages that were previously noted to have some priority in a regulatory setting:

- Older instances can still be validated against the newer schemas; all items ever defined retain the identical namespace forever, and this could simplify the conversion of older instances to some extent.
- It is consistent with the assumption that removal of items is much rarer than the addition of elements, which is assumed to be fairly common.

Naturally, there is no reason why the approaches cannot be mixed; for example, the addition of entirely new linkbases (to represent, a “short form” presentation containing only a subset of items) can be grafted onto the extension approach, and vice versa.

Appendix I: Glossary

Term	Meaning	Learn more
ACRA	Accounting and Corporate Regulatory Authority	http://www.acra.gov.sg
CDR	Central Data Repository (Call Report Modernization Project, FFIEC)	http://www.ffiec.gov/find
FDIC	Federal Deposit Insurance Corporation (USA)	http://www.fdic.gov
FFIEC	Federal Financial Institutions Examination Council	http://www.ffiec.gov
FRTA	Financial Reporting Taxonomy Architecture Document	http://www.xbrl.org/technical/guidance/FRTA-CR2-2004-04-26.doc
FSA	Financial Services Authority (UK)	http://www.fsa.gov.uk/regulatory_reporting
HTML	Hypertext Markup Language	http://www.w3.org/html
IASB	International Accounting Standards Board	http://www.iasb.org.uk
IASCF	International Accounting Standards Committee Foundation	http://www.iascf.org.uk
SEC	Securities and Exchange Commission (USA)	http://www.sec.gov
Taxonomy	XBRL Taxonomy	http://www.xbrl.org/resourcecenter/taxonomies.asp
UPC	Universal Price Code	http://www.uc-council.org
XBRL	Extensible Business Reporting Language	http://www.xbrl.org/whatisxbrl
XII	XBRL International Incorporated, a non-profit consortium	http://www.xbrl.org/aboutus
XML	Extensible Markup Language	http://www.w3.org/xml
XML Schema	XML Schema Description Language	http://www.w3.org/schema



3.2.4 Conceptual model of modularisation at a point in time

There is a separate dimension to consider, aside from the time dimension discussed above, and that is the dimension of content. In content, modularity is illustrated at the level of a national strategy for co-ordinated data collection, as shown earlier in section 3.1. Certain taxonomy sets are regarded as core, and individual regulators' taxonomy sets are generally extensions.

3.3 Frequently asked questions

Consideration of strategic options is part of any process change. Below are some questions frequently raised about implementing standards based reporting and how XBRL and Web services provide a leverageable solution.

3.3.1 Will standards based reporting impose an undue cost burden on reporting entities, especially in jurisdictions with primarily smaller reporting entities?

No. In fact, each of the five building blocks underlying standards based reporting is oriented toward the control and reduction of overall compliance costs:

1. **Structured filings.** If a regulator requires 100 different disclosures, it is surely easier for a smaller reporting entity to complete a form presenting choices on those 100 items than it is for them to start from a blank screen. In addition, smaller organisations, like larger ones, often must collect business reporting information in a structured form anyway (see Figure 2, "Business reporting cycles within each stage of the supply chain"). There is no advantage to anyone in discarding that structure when the time comes to report it externally.
2. **Common vocabularies.** Regulated entities reporting to multiple regulators save time and effort when the terms are identical, even if one regulator requires more detailed or additional information than another. Over time, use of common vocabularies in analytical processes may actually reduce the amount of data requested. The reason is that the common vocabularies will decrease or eliminate redundant data requests. Today, many data points collected are redundant across regulators and also within existing forms promulgated by a single regulator.
3. **Diverse e-filing methods.** Diversity of e-filing methods increases choice, which, in a free market, reduces cost. Already the XBRL and Web services infrastructure is appearing in Microsoft Office and many other products that filers use routinely. Where regulators work with software vendors with niche products that are specific to their agencies' own filing requirements, there is no business reason for the vendors to raise their prices each time there is a change in reporting requirements that requires adaptations to the

software. Moreover, the initial step of incorporating XBRL into their products extends their reach within the filers' organisation because it can process other taxonomies as well. Hence, the "software cost burden" to support XBRL Web services is a hypothetical cost that has simply never yet materialised.

4. **Uniform validations.** As compared to any other filing regime, XBRL and Web services reduce the chance that incorrect data will enter the regulator's system. Data-level standards that filers can apply to the information in their own systems remove error-prone manual tasks and better insure that the data at the source is the same data incorporated into the reports and analyses to which it applies. This means filing submissions stand a better chance of being right the first time, avoiding situations in which questions are raised and corrections are required after the original filing is completed.
5. **Clear-cut transitions.** For any given entity, the timing of a change to standards based reporting is a constant; the purpose of having a crisp transition boundary is to minimise the cost of supporting multiple systems to the regulator and to any intermediate service providers that the filers depend on.

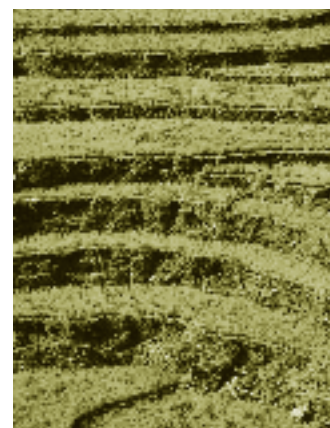
Finally, with XBRL and Web services, regulators also have the opportunity to better tailor filing methods for characteristics of filers in their particular jurisdictions. For instance, the UK Inland Revenue's XBRL corporate tax filings are oriented toward maintaining simplicity for smaller companies that have limited resources to devote to reporting.

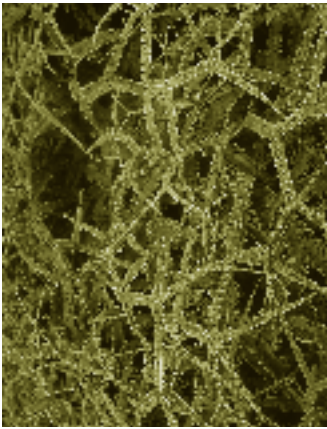
3.3.2 What incentives might be offered to encourage standards based reporting deployment with XBRL Web services?

A regulator that adopts XBRL Web services based e-filing can leverage its ability to process and analyse information more quickly as an incentive for regulated entities to choose e-filing over current reporting processes. Note that these incentives are only sensible to offer to regulated entities that have a genuine process or reporting change to make (e.g., moving from paper to electronic filing for the first time).

For example, the UK Inland Revenue is now deploying an XBRL Web services based e-filing option for businesses. While companies can continue using existing filing processes, the Inland Revenue is considering offering companies filing electronically a tighter audit window than companies that do not file electronically (six months, instead of one year).

Another encouragement for e-filing might be a commitment to provide consolidated benchmarking information back to industry, which will help filers assess, for example, where they stand in relation to others in their industry sector. Often, regulators have the data for meeting such industry information needs, but the time and cost of consolidating it manually renders the effort impractical from a timing perspective or impossible from a cost perspective.





With standards based reporting, regulators can immediately process information upon receipt, leaving more time for consolidation, whether for their own analysis and reporting, or for external benchmarking purposes. Unlike proprietary XML data standards, XBRL gives regulators flexibility to change and refine the information they collect and use making changes to the XBRL taxonomy, which can then be reflected in any and all XBRL enabled analytical or reporting software.

3.3.3 How can we ensure that taxonomies are developed in such a way that they are not unwieldy to maintain now and in the future, as new information requirements drive taxonomy expansion?

The maintenance organisation follows the information organisation as outlined earlier in section 3.2, “Organising for change.”

3.3.4 How can we prevent our deployment of standards based reporting from becoming dependent upon other organisations building an XBRL taxonomy?

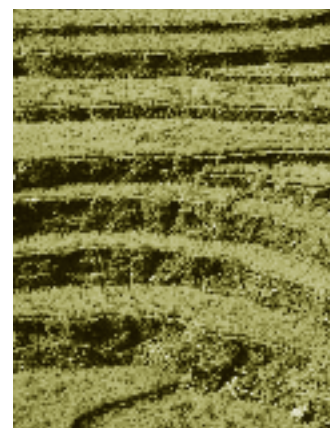
For many regulators and businesses, XBRL deployment will begin by leveraging existing, published XBRL taxonomies. This avoids having to start from scratch and relieves individual organisations from having to bear the burden of future refinements and adaptations alone.

In the simplest sense, this is a build versus buy decision of the sort made routinely in any development project: build a taxonomy and own it, or buy (or, equivalently, contribute to or invest in) the maintenance and further development of a taxonomy owned by others. As in any build versus buy decision, many factors come into play, such as the reliability of the external party’s commitments, their ability to negotiate agreements over escrowing and transfer of rights should they fail to meet their commitments, the current state of development of their taxonomy and so on. A regulator committed to a development schedule cannot be faulted for going it alone and relying on the royalty-free XBRL language itself and nothing more.

However, there are two primary reasons for regulators to leverage market oriented taxonomy development efforts: First, should a regulator choose to build a taxonomy, its value is proportional to the number and breadth of uses to which it is put. It is rational for a regulator that owns a taxonomy to license it royalty-free to encourage widespread use and maximise its value. Reaching out pro-actively to other parties who might be willing to commit both to taxonomy development and use is sensible, even if, in the end, a parallel model of development is chosen for other reasons (see Figure 8).

Second, regulators also recognise that their support for XBRL or for any given taxonomy carries considerable weight in the marketplace. This is yet another reason to reach out pro-actively to parties willing to commit to development and use, since the support of a regulator virtually guarantees success and reduces the risk perceived by such other parties. The risk to the regulator is minimal in practice.

Note that XBRL International Inc., the non-profit consortium that owns XBRL and provides it to the market via a royalty-free license agreement, has a formal process in place that allows taxonomy owners to publicise their taxonomies to others who may wish to rely on them. There are two levels at which XBRL International offers recognition: acknowledgment, which simply verifies that the taxonomy is available royalty-free and that it is technically compliant with the XBRL standard; and approval, which goes further by verifying that it is compliant with other architectural and documentation quality standards. In both cases, XBRL International monitors the availability and revisions to both kinds of taxonomies and ensures that advertised taxonomies continue to remain available.

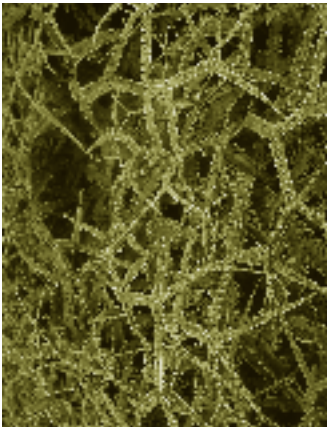


3.3.5 How can we prevent the scope of this project from growing ever wider due to involvement of several parties involved in and connected to the process that is the focus of standards based reporting?

Widening the scope of an XBRL project of course has a positive side to it: the more broadly a given regulator conceives of its information management responsibility, and the more its data collection efforts are coordinated with others, the greater the benefits to all parties. And, reporting is a pervasive environment, involving not only the single area in which the XBRL deployment is taking place, but also other areas, such as controls, analysis, risk management, business intelligence, compliance and visualisation. Of course there are limits, and project scoping is important: in other standards based reporting projects not specifically related to regulatory filings, it has been the case that projects with an initial focus on a specific reporting requirement are successful when focusing on a single output at a time.

3.3.6 Will it be difficult to build the appropriate technology infrastructure, including secure Internet gateways?

No. The software industry's broad support and adoption of XML-based standards and Web services capabilities are now available from several vendors. In fact, Web services infrastructure and powerful development tools, such as code generators, are already available from leading vendors, including Microsoft, Oracle, IBM, SAP, SoftwareAG, Sun and Novell.



3.3.7 Are regulated entities ready to use XBRL Web services enabled forms for e-filing?

Since the software industry has incorporated the XBRL and Web services standards into the current versions of their software, most filers either already have the capabilities latent in their technology environments, or the capabilities are just an upgrade away. For most software vendors, XBRL capabilities are no more than just another feature they offer their customers. So, most regulatory filers have the XBRL and Web services tools already or they have easy access to them. There are over 20 vendors now offering XBRL enabled software including Microsoft, in Word 2003, Excel 2003, Axtapa and FRx; Oracle, in Oracle Financials 11i; and SAP in mySAP Financials. A current list can be found on the XBRL International web site (www.xbrl.org).

3.3.8 Does XBRL require related regulators to collaborate on the reporting taxonomies?

No. XBRL is an information format standard that enables, rather than requires, collaboration. Taxonomy construction can be accomplished by several organisations working together or by a single organisation working on its own. Developing data standards for certain kinds of reporting must be done collaboratively from a practical standpoint. For instance, in the case of banking regulation, there are business requirements such as Basel II, that require significant collaboration; XBRL simply provides an Internet ready information format that can function as a medium and platform for collaboration on a concrete set of definitions usable by software. As in the FFIEC's case, the benefits of a common taxonomy become clear once consideration of data requirements needed to build the taxonomy shows the numerous shared data needs and business requirements across regulatory bodies.

3.3.9 Will changes to a taxonomy make obsolete or render useless XBRL instances or other taxonomies that rely on it?

As noted earlier, a key consideration in XBRL based infrastructures is the creation and publication of taxonomy versioning information. Versioning impacts the ability for older XBRL instances to be used, and impacts the ability of software vendors (particularly filing support software vendors) to economically adapt to changing taxonomies. Versioning considerations impact the way that the many components of a taxonomy will be organised, and the overall way in which they will be partitioned.

One of the key value propositions of XBRL is that it provides a standard way to represent, in a way that software can understand, the relationship between a taxonomy and extensions of that taxonomy. Although extensibility is powerful, and can be used for some types of versioning, it is not a panacea and in practical situations is usually coupled with other strategies.

3.4 Profile of a regulator implementation

Implementation of standards based reporting is an iterative four-step process:

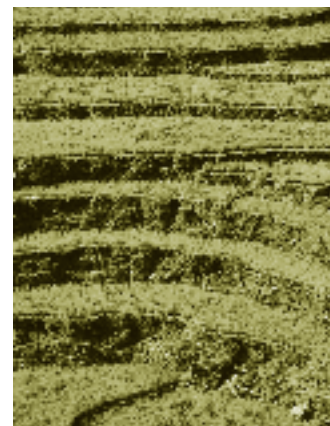
1. **Plan.** Evaluate overlap of your data collection with others'. Consider ways to add value to the process
2. **Design.** Either build a new taxonomy or build on an existing taxonomy
3. **Construct.** Start with Web services infrastructure that interfaces to legacy systems. Start with the most highly structured forms
4. **Deploy.** Your transition plan should aim to get as many filers onto the new system as possible, because that is where the benefits are

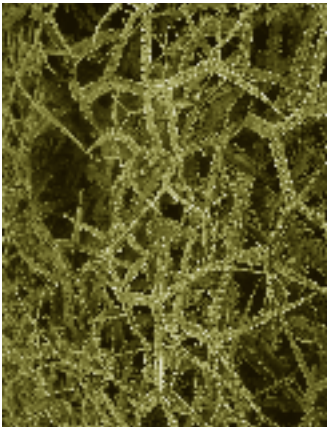
Plan. A project begins by evaluating overlapping data usage by various parts of the agency and a consideration of the ways the collection, analysis and reporting process currently used can be streamlined. Identify reports that share common data sources and evaluate the need for existing or new reports. That way, when the XBRL terms and definitions are applied to incoming data, the information can feed directly from the sources into the databases and supporting applications that will be used for consolidation and aggregation.

The critical determination in the planning stage is the way in which information will flow into reporting or analytical software via the application of XBRL data terms and definitions. This is a function of identifying desired report outputs, ideally in graphical form and not as row upon row of numbers. Examples of report output content considerations include:

- **Privacy requirements**, such as ensuring that the profitability of individual private filers cannot be inferred from aggregated outputs
- **Control requirements**, such as ensuring that a single individual cannot manipulate reports that compare and detect discrepancies in information collected in different ways
- **Timeliness requirements**, such as the need to ensure that insider stock transactions have been reported and published within 48 hours of their occurrence
- **Accuracy requirements**, such as ensuring that totals and ratios are consistent within known tolerances to allow for rounding

Determining the output will result in two key work products: the data map and test samples. A data map is a cross reference of the internal information to the terms and definitions that identify each piece of data and its relevant category. Test samples are documents showing what the actual report will contain once the terms and definitions are applied. Samples are created for each type of analysis and report in the project, along with associated timeliness, accuracy and relevant access limitations.





The next step is to “source” the inputs needed for the analyses and/or reports by identifying current and possible future internal sources and data owners in relevant divisions. The terms and definitions that apply to these detailed input sources are added to the data map; likewise, new sample inputs are added to the set of test samples.

Information entering a regulator’s systems in compliance with the data map reduces the need to collect information in a central data warehouse. The information can remain housed at its source, whether it was originally generated internally or externally, and can be used to satisfy a diverse array of disparate queries via Web services.

Finally, there should be an analysis of the impact that applying the terms and definitions will have on the way the reporting process works and the way people work. Re-engineering processes might introduce new terminology under which reports are created and may enable enhancements to the reporting or analytical processes. In addition, employees will need training to support new process and utilize the enhanced reports.

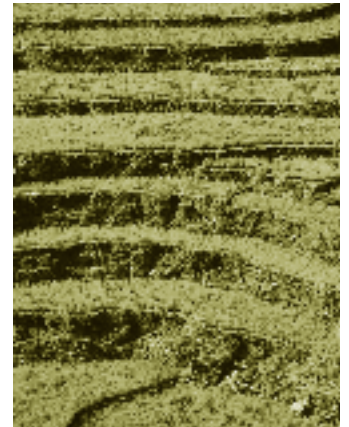
Once the analysis and report inputs are sourced and placed into sample inputs, the impact of correctly classifying information at the source is then assessed. Those who use the data for analysis and reporting, who used to have to wait for consolidated data, will now be able to access the data at earlier stages, even directly from its originating source, such as regulated entities’ e-filings. This means potential problems with data can be caught, analysed and corrected at earlier stages, before such errors impact the regulator’s analysis or reporting. Understanding this impact and setting implementation and timing expectations are important factors in managing the process changes and expectations critical for a smooth implementation.

Design. Having identified sources and needs, a key determination in this stage is whether an existing jurisdictional accounting or industry standard taxonomy would be a suitable basis for a set of common definitions for information from source e-filing forms to analytical and reporting software. If so, the regulator can avoid building a proprietary taxonomy and instead, build onto the base taxonomy by adding extensions for data and data rules that are unique to the regulator’s own information needs.

To ensure that definitions are consistent and properly applied, they must be continuously tested against sample data. Without a centralised testing mechanism, there is potential for the number of data definitions to proliferate and be either misapplied or used only for some outputs, rather than all the outputs to which they are applicable. The effect would be to create information “silos” and inaccurate analyses and reports, the very problem the regulator was seeking to correct via XBRL and Web services automation.

Construct. Construction is a bottom up process in which the foundational infrastructure of Web services that interfaces to legacy systems is developed in parallel with the development of taxonomies based on existing and legacy data.

The Web services infrastructure consists largely of web servers that expose an external, web based interface, and that internally use XML and XBRL-aware middleware to read and write legacy data, and to perform conversions, transformations, and validations on XBRL data. The middleware may or may not encompass large-scale storage of XBRL instances, but when it does, may be based either on a relational database or on an XML native database; this will depend mainly on the heterogeneity of the XBRL instances. Current generation XBRL taxonomy deployment tools have such facilities, and established XML middleware vendors are rapidly developing XBRL enabled offerings to reduce the amount of custom configuration that might be needed.

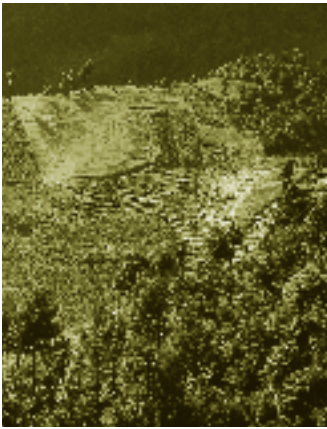


Taxonomy development begins by leveraging the data map and any data dictionaries in structured form already in use and to render as taxonomies the content of any existing regulatory forms that are structured and that contain common data elements. For example, in a companies registry with over 100 different forms for different filings, most if not all of the forms require company identification information; this would be a core taxonomy, and the early candidates for conversion to XBRL would be those which are already highly structured or mainly collect numeric or multiple-choice data points. Developing the mapping (correspondence) between existing data and XBRL taxonomy and other constructs such as XBRL units and contexts is a key step that requires domain expertise and results in facilities to automate conversion to and from XBRL.

Deploy. Your transition plan should aim to get as many filers onto the new system as possible, because that is where your savings are. As noted earlier, it is critical for a regulator to demonstrate leadership and pragmatism, and to set a clear-cut, unambiguous transition point far enough into the future to allow for the infrastructure to be thoroughly tested and all participants in the supply chain to be notified of the change. This means that deployment of the solution will proceed in stages of testing and finalisation, roughly corresponding to the layers of infrastructure needed:

- Communication and storage infrastructure consisting of secure Internet gateways, user and filer registration, and taxonomy and instance storage
- Processing of filings and related events, consisting of defined and tested protocols for publishing taxonomies and formulas, validating instances, and submitting them through the gateway for storage
- Content deployment, with finalised taxonomies, formulas, and submission of full XBRL e-filings through the gateway

Education and expectation management of all participants is needed at each stage. An effective method can be to establish open, collaborative working parties corresponding to each of the different communities of participants impacted. In a bank regulatory setting, for example, the financial institutions, filing software vendors, and agencies sharing the information all represent distinct sets of stakeholders. In an electronic filing system for financial reports or tax returns, auditors, tax consultants and other agents may play a key role distinct from any of these other communities.



4 Your way forward

No matter which stage of technology enabled process re-engineering a regulator is currently in, it is well worth considering how standards based reporting using XBRL and Web services can be incorporated into the plans.

Stage 1: No intention to streamline processes via technology? XBRL and Web services could change your mind. These open, royalty-free standards can be deployed using existing systems and software to promote automated information exchange and enable redeployment of money and resources to using information, rather than preparing it for use.

Stage 2: Committed to Internet and Extensible Markup Language (XML)? Don't make the mistake of going the proprietary route. It is not only expensive, the expense is difficult to justify compared to the royalty-free, XML based XBRL data standards which are available. In addition, proprietary standards only add to the reporting burdens of regulated entities by introducing one-off data standards and do not make reported information any easier or more valuable to information constituents in other government agencies, industry or the public.

Stage 3: Developing requirements for your e-filing system? This is a perfect time to examine ways to improve the value proposition of your e-filing system to regulated entities and promote recognition of the benefits open data standards have for the entire information supply chain.

Stage 4: Developing and deploying new systems? Even at this late stage, it is not too late to examine incorporation of XBRL into the plan. As an XML dialect, XBRL data standards can enhance infrastructure. For example, there have been several academic demonstrations in which XBRL "payload" data is communicated between parties over an ebXML transport infrastructure. An XBRL filing can also be the content of a NewsML or RIXML message, since these accommodate any valid XML payload and XBRL is valid XML.

PricewaterhouseCoopers

PricewaterhouseCoopers is a founding member of XBRL International, a consortium devoted to developing and promoting the XBRL standard. We are also at the forefront of efforts to bring XBRL into the marketplace, using our corporate-reporting expertise and commercial solutions to help organisations benefit from more reliable, accessible and reusable information. We are currently working on XBRL Web services deployments and explorations at leading companies and regulatory agencies around the world.

To learn more about XBRL and Web services, and PricewaterhouseCoopers' StraightThrough Reporting™ approach to streamlining how organisations collect, consolidate and report information to management, investors and regulators, please visit our web site at www.pwc.com/xbrl.

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