

XBRL US, Inc.

XBRL US Technology Workshop

July 28 - 30, 2009

Discussion Paper

Contents

Executive Summary	3
Real-World Applications of XBRL	4
XBRL US Update of Activities.....	4
Corporate Actions Case Study.....	8
Accounting Standards Convergence – Comparison Framework for EDINET, IFRS and US GAAP.....	13
Impact Investing and XBRL.....	17
Technical Discussions	18
Taxonomy Maintenance	18
Versioning Challenges and Possible Solutions,	21
Tagging Approaches to Developing XBRL Documents	23
Rendering.....	25
Managing Data Quality and Validation.....	27
Database and Business Intelligence	28
Contributors	31
About XBRL US.....	31

Executive Summary

Extensible Business Reporting Language (XBRL) has evolved as a worldwide technology standard supporting government reporting and securities disclosures in Europe, Asia and the United States. On July 28-30, 2009, XBRL US held its first Pacific Rim XBRL Technology Workshop to bring together XBRL and XML practitioners to brainstorm, share ideas and learn from each other about the underlying technology and process to build XBRL applications. This discussion paper outlines the case studies presented and key findings from this workshop and is the collaboration of many individuals drawn from the XBRL US membership. Major themes from the conference include:

- 1). Significant opportunities lie ahead for XBRL in non-compliance related areas such as corporate actions, social networking and social impact investing.
- 2). Continuing the dialogue surrounding the underlying technology and architecture is critical to ensure global standardization and interoperability.

Key topics covered in this outline:

- Update on projects from XBRL US
- Corporate actions initiative to develop a taxonomy and engage all representatives on the supply chain
- A comparison framework for taxonomy development for US GAAP, Japan EDINET and IFRS
- How impact investing could benefit from XBRL
- Different approaches to taxonomy support and maintenance
- Technical discussions about versioning, tagging, rendering, managing data consistency and quality and database and business intelligence

Real-World Applications of XBRL

XBRL US Update of Activities

Campbell Pryde, Chief Standards Officer, XBRL US

XBRL US GAAP Taxonomy and SEC Mandate

XBRL US analyzed XBRL-formatted financial statements for public companies that have filed to date to the SEC's EDGAR database. While there were initial concerns as to whether companies could ramp up quickly enough, XBRL US was encouraged to find that the quality of instance documents was high, with only a few calculation errors and other issues. An analysis of company extensions shows that companies did extend but not heavily, with extensions created to represent:

- Aggregations of elements not available in the taxonomy
- New elements that were more specific than what was available
- Erroneously created extensions in some cases because the preparer didn't understand that an element was already available
- Accounting changes if the 2008 taxonomy was used, which did not include new FASB pronouncements
- New FASB pronouncements that came out in the last few months, even since the 2009 taxonomy release was published

Working with FASB

FASB has been codifying the reference standards that have been created and promulgated since the 1930s. The new FASB codification has been established as the actual, authoritative standard as of July 1, 2009. XBRL US has been working closely with FASB, updating all references in the XBRL US GAAP Taxonomy to reflect the new standard. FASB completed all updates and turned them over to XBRL US. As of this writing, the codification has been released by XBRL US as an extension – 1) as a zip file available on its website, 2) uploaded to the XBRL US viewing tool and as an absolute reference. During this process, FASB also helped XBRL US double-check and add all references into the XBRL US GAAP Taxonomy.

The FASB has also added some new pronouncements in the past few months. An addendum was created for preparers that need to use these now and eventually they will be incorporated into the 2010 taxonomy for use and for public review.

The screenshot shows the SpiderMonkey application window titled "us-gaap-entryPoint-all-cod-2009-01-31.xsd". The main interface is divided into several panes:

- Concepts Pane:** Shows a hierarchy of concepts. The "Goodwill" concept is selected, and its "parent-child" relationship is displayed.
- Table Pane:** A table titled "Goodwill" with columns "Part" and "Value". It lists various presentation references and their corresponding values.

Part	Value
Presentation Reference	
ref2004:Publisher	FASB
ref2004:Name	Accounting Standards Codification
ref2004:Section	45
ref2004:Paragraph	1
codification:SubTopic	20
codification:Topic	350
codification:URI	http://asc.fasb.org/extlink&oid=6388280&loc=d3e13770-109266
Presentation Reference	
Publisher	FASB
Name	Statement of Financial Accounting Standard (FAS)
Number	142
Paragraph	43
- Web Browser Pane:** Displays the "Pre-Codification Standards" for Goodwill. It includes a "General" section with a "COMBINE SUBSECTIONS ?" button and three numbered paragraphs (45-1, 45-2, 45-3) defining the presentation of goodwill in financial statements.

Tools Available on XBRL US Web site - XBRL US GAAP Taxonomy Changes

XBRL US is developing a tool for members that reports which elements have been changed from one version of the taxonomy to the next, e.g., labels, references, definitions, etc. It also includes elements that have been removed from the taxonomy so companies can see what's been changed to improve and streamline the instance document creation process.

Tool to Check Data Consistency of XBRL Documents

Once large volumes of US GAAP data become available, it is expected that investment firms will run algorithms against multiple instance documents in an effort to identify investment opportunities, e.g., undervalued securities, companies in a growth mode, etc. If the data produced by public companies is inconsistently created, e.g., the taxonomy elements are not applied in the same way, analysts will find that they are identifying errors in the data rather than securities of interest. XBRL US has developed a tool designed to help eliminate the data errors that companies introduce upfront to limit the kind of errors that can happen downstream. This tool will validate an instance document against the latest

taxonomy to catch any errors or inconsistencies related to numerical sign, validity of tables, mutually exclusive or mutually inclusive elements and required disclosures that are missing, as well as internal consistency of the instance document.

The tool will be developed as a set of rules used in conjunction with a software tool – companies will be able to upload their instance document and take note of the taxonomy-related errors that could mean the data produced is incorrect or not consistent with their peers.

Corporate Actions Taxonomy

This taxonomy ties into the XBRL US GAAP Taxonomy and reflects corporate events that may require action by a shareholder, e.g., merger, dividend, stock split, etc. Today, the data is rekeyed by multiple players, e.g., global custodians, mutual funds, transfer agents, clearing houses, etc., and is then delivered downstream to investors. The complexity and manual nature of this process means that errors can be easily introduced and timeliness and cost are a problem.

XBRL US has created a taxonomy that covers 57 different corporate actions. It follows the ISO 20022 standard for financial transactions. The taxonomy was created using filters that are employed when a company selects the action they need – giving them just the elements they need to tag a particular kind of action. An outreach program has been kicked off, and draft taxonomy will be developed and published for public review in the first quarter of 2010. The completed taxonomy is expected to be finalized in June 2010. XBRL US will develop portals that 1) let issuers create a tagged corporate action and 2) let intermediaries convert an ISO 20022 message into XBRL.

Mortgage-Backed Securities

XBRL US created a taxonomy to reflect the details of the loans that make up the cash flow of a mortgage-backed security. It captures the details of individual loans at initiation and ongoing surveillance. Data for these securities today is non-standardized and impossible to easily analyze.

Report from XBRL US Intern Program

Presentations were made by Hiroaki Sakakibara, Fujitsu, Tadashi Shiozaki, Takara Printing, Yuta Tanaka, Fujitsu Laboratories, and Taku Hasegawa, NTT Data Corporation and Soon Kook Chang, President, JC Solution, Inc.

During the month of July 2009, XBRL US hosted five interns from Japan and Korea to share ideas and educate them on the XBRL US process for taxonomy development and maintenance. The interns came with strong technology, and in some cases, accounting backgrounds, and were assigned specific projects related to the ongoing work at XBRL US.

The first project revolved around designing a database to analyze extensions created by filers submitting XBRL-enabled financials to the SEC's EDGAR database. System requirements included: 1) reading the company extensions, and 2) categorizing the extensions including element extensions, link base extensions, industry and company. The system needed to analyze extensions statistically and would

ultimately be used by anyone needing to analyze or create taxonomy. It would provide feedback on the XBRL US GAAP Taxonomy and identify duplicate extensions across filers which would ultimately be used to improve the taxonomy.

The base system architecture included using the SEC RSS reader to download files and send them into an XBRL processing tool. The tool will identify the extensions (comparing against the taxonomy) and then analyze the extensions – categorize them, identify duplicates and provide statistical analysis, producing a report.

The design will provide:

- Element – to analyze basic element extensions
- Calculation link/presentation link – to analyze parent child relationships
- Label link – to analyze labels of extensions – companies may create extensions for elements that already exist but give the element a different label company/DTS

The project used a tool that allows users to export the taxonomy extension file. This prototype will allow companies to see what labels have been used and what extensions have been created by competitors, so that data ultimately becomes more consistent as industry “best practices” are established. The plan is to have this database ready by the end of 2009. While this will be extremely useful for preparers and for the XBRL US Project Team in revising the XBRL US GAAP Taxonomy, it could also prove very useful for the analyst community.

The second project presented an explanation document on the Corporate Actions Taxonomy, developed for the intermediate practitioner on how to use the taxonomy, covering architecture, mapping and scope.

The third project analyzed actual XBRL submissions coming in to gauge their adherence to the SEC’s EDGAR Filer Manual. Since the second quarter, large accelerated filers have begun filing in XBRL format. They are required to comply with EDGAR filing rules related to XBRL creation. Analysis shows that many filings do not complying with the EDGAR manual. XBRL US downloaded the SEC filings, validated them and then identified and summarized the errors.

Test cases analyzed were FAS 141r, 161, 163 and others which are rules that need to be followed this year. Fujitsu Xwand and CoreFiling Touchstone were used to perform the validation and the tools, in some cases, identified different errors. When validated with two different software tools, differences were found in errors identified.

Major findings:

- Only one company among ten samples passed without errors
- Some rules may be embedded in validation tools incorrectly
- The EDGAR system may truncate a submission if any rule is violated

The fourth project demonstrated the use of the XBRL formula link base to add validation to instance documents filed with the SEC.

Corporate Actions Case Study

David Hands, Director of Product Development, the Depository Trust and Clearing Corporation (DTCC), Max Mansur, Global Market Manager, Custodians and Asset Servicing SWIFT, Karla McKenna, Director, Citi, Campbell Pryde, Chief Standards Officer, XBRL US

This session described the corporate actions reporting process and explained how the use of XBRL can streamline the process, resulting in dramatic cost and time savings and reduction in the potential for error. The key question is: how can we engage the public company issuer in the process to transform paper-based documents into an electronic format to streamline the process? The organizations involved in this initiative:

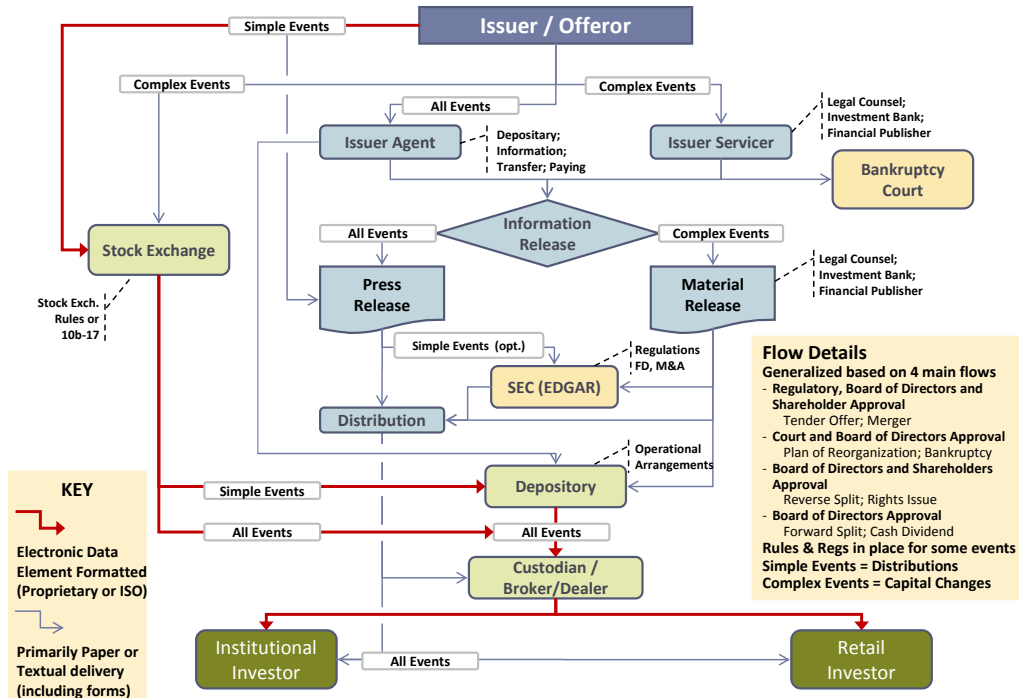
- DTCC, the US central securities depository – processed \$1.88 quadrillion in securities transactions in 2008 alone
- SWIFT – the global, member-owned cooperative that provides the communication platform for over 8,500 bank institutions in more than 200 countries
- ISO, worldwide federation of national standards bodies; ISO 20022 is a standard used for financial transactions
- XBRL US, XML standard setter for the United States

Corporate actions is information that goes from one to many, and then goes on to many others -- an activity that affects the legal or financial structure of securities issued by a public company, e.g., merger, stock dividend, etc. More complicated actions may require steps taken by a shareholder. Some of these events may require multiple messages from the issuer to communicate updated information on the action. There are mandatory and voluntary events and each event can be issued in the form of a release or a prospectus.

The flow of information from issuer to investors requires many steps. A simple event, e.g., dividend, requires information to go to the stock exchange and other parties. But more complex events require even more steps. Data goes to the depository and the exchange; the depository sends the information on to its participants, typically custodians and broker/dealers. The paper information flow must be rekeyed and translated by individuals. The current process requires many people to manually interpret the information. Everyone takes the information, checks it, and rekeys it into their databases.



Background: The Corporate Action flow in the U.S. market is complicated



DTCC

Corporate Actions: Improving Issuer-Investor Communication

DTCC Non Confidential

5

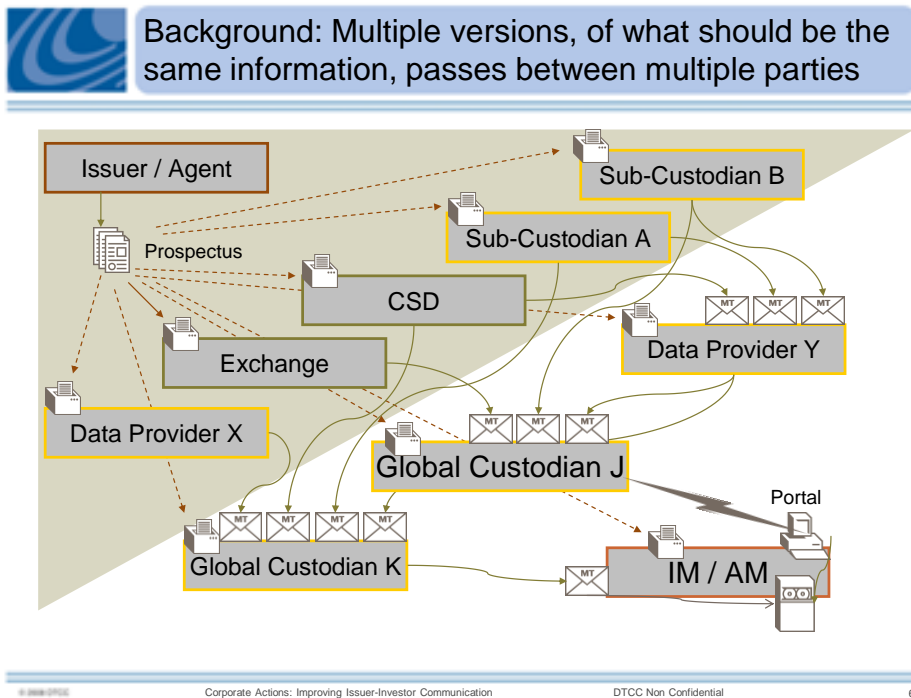
From the issuer perspective, there may be one event but that single event may require multiple messages and it is passed to and translated by multiple parties. Investment managers obtain services from multiple global custodians (such as Citi, JPMorgan, etc.). The global custodian obtains data feeds from data providers, the CSD (central securities depository), the exchange, and sub-custodians for assets held cross border, and then each of these organizations, in turn, must read the document and interpret the contents to generate the data. At each level there is a massive amount of reconciliation and “scrubbing” to derive a “golden copy” – a version that is usable as the best version of the announcement. This nets to an accumulation of repeated, and redundant, work at many levels with controls on top of controls to try to manage the monetary, reputational, and opportunity risk that is inherent in such a system. In general, the issuer is not aware of this process, and of the scale of manual effort to interpret the text based announcement.

Investors need timely and accurate information to make time-critical investment decisions. How does the current process affect investors?

- The lack of electronic dissemination introduces delays
- Lack of standardization slows down the delivery of information
- Institutional investors use multiple custodians, thus they must deal with the inevitably conflicting data

- Errors and timeliness impact investors' decision process, increasing conflict and resulting in direct losses, reputational risk, and missed opportunities

Getting the same information electronically in a standardized format would reduce costs in processing and the potential cost of an error, which can be huge. Information expands arithmetically based on the number of clients, and number of accounts serviced multiplies at each level. Each action normally produces multiple documents for the same event, e.g. release, prospectus, and SEC filings that are delivered to many different organizations. Therefore, the one action, for a widely held security, can ultimately result in millions of electronic messages with the resulting accumulation of impact.



Issuers need to get engaged in this process - they need to be aware of the impact of this process on the investment manager- how it affects the timeliness and the possibility for error that can have a significant impact on the success of that action.

Today, the time is right to evolve the process:

- With financial market turmoil, there's clear incentive to improve transparency, reduce costs
- Companies are now beginning to file in XBRL format to the SEC's EDGAR system so they are more familiar with the format and process
- The International Organisation for Standards, ISO, is releasing the XML standard messages for corporate actions processing, aligned with the established tag:value standard
- Customers are pushing to resolve corporate action problems, among the weakest areas of securities automation concurrent with the highest risk of failure

- Non US organizations (Group of 30, European Union) are also interested in improving communication between issuers and investors and are pursuing a more streamlined corporate action process.

It's becoming clear that issuers need to get this right from the start.

How ISO 20022 fits in

We need to make this happen, not just for processors but for investors as well. As standards organizations, ISO and XBRL US have a similar mindset – recognizing the value of standards. We've already begun making the link between corporate actions tags and the ISO 20022 standard components and elements. Both standards are global and are technically compatible (XML- based). It is the integration of the standards that will bring about constructive change. ISO's Technical Committee 68 (TC68) oversees standards for the financial services industry. The group is made up of financial services experts from ISO member countries and interested liaison organizations. SWIFT acts as registration authority for the ISO 20022 standard, maintains the data dictionary and repository for messages used and developed, and provides administrative support for the standard according to its structure and governance.

Within a single corporate action, there are 1) event level details, e.g., event type and CUSIP number, 2) payout level details, e.g., what you will get such as cash rate and new CUSIP, 3) option level details, available only where there are shareholder choices required.

We've established a tool that joins together the ISO and XBRL standard. The plan will introduce a unique official reference ID so that each event has its own identification number and every message related to a specific event will carry that reference ID.

XBRL US has developed a basic creation tool that will allow an issuer to tag their corporate actions document which is to be passed on to the depository. Each corporate action has a number of nested trees to describe it. For example, with a merger, there may be options as to whether the merger is paid for in cash, in options, how it's paid out, etc. There are also choices that shareholders can make when they accept a corporate action, e.g., take a dividend as cash or shares. There are also many actions where there are no options, e.g., a dividend that is set. As a result there are a lot of corporate actions, lots of choices to make. In creating the taxonomy, we could have made separate taxonomies for every corporate action resulting in about 50-60 taxonomies. But ultimately it was more efficient to create a single taxonomy that incorporates all activities. Filers then access mini entry points that help them define the corporate action they are tagging. Entry points are limited to type of security, location (country), event type, election type. Issuers select on these criteria and they are given access to a collection of terms that is a subset of the whole – they are just given the elements they need which streamline the process and reduce confusion. Once the issuer answers the questions, an instance document is created that reflects the action they need to describe.

Issuers will have the option of downloading the complete published taxonomy and tagging their document (release or prospectus) using a typical tagging tool or they can use one of the simplified

tagging tools created for this process. The prototype development was driven by the elements in the taxonomy.

To define the mapping between the XBRL elements and the ISO 20022 standard, we used a generic link base that allows users to define relationships between concepts and resources. For example, fractional security rule is a value that maps to buy up, cash in lieu, issue fraction, etc., so that every element maps to an ISO 20022 element. We have also included mapping rules that show the condition under which the mapping takes place and we have written a style sheet that performs the automatic conversion so the issuer work involved is minimized and the latest taxonomy is always pulled in.

The tool also allows the issuer to automatically validate and create an ISO 20022 message that can be transmitted over SWIFT from an XBRL instance document.

This initiative has already begun but it will develop over the next 18 months and will involve all the players in the corporate actions supply chain. The biggest challenge will be to make the case to issuers that this will be beneficial to their key audience – the investor.

Accounting Standards Convergence – Comparison Framework for EDINET, IFRS and US GAAP

Josef Macdonald, XBRL Lead, Ernst & Young Global, Makoto Koizumi, Senior Consultant, Fujitsu Research Institute, Maciej Piechocki, XBRL Technology Project Manager, IASC Foundation

ITA (International Taxonomy Architecture) is a joint initiative between the US Securities and Exchange Commission (SEC), Japan Financial Services Authority (FSA), the European Community and the International Accounting Standards Committee (IASC) to develop a comprehensive framework which will provide a basis for comparison(called the Taxonomy Comparison Framework) between the three taxonomies developed for financial statement reporting – EDINET, IFRS and US GAAP. These organizations are working to align the architectures of the three taxonomies, with a focus on four key areas: 1) architecture, 2) development approach, 3) ownership model, and 4) convergence of content – is it the same? What is the scope?

This session addressed what is meant by convergence/alignment and answer the questions: is it possible? If so, how can it be done?

The top 6 issues with alignment:

- Approach to development and common practice items
- Customization
- Patterns
- Renaming and change management
- Sign of stored value
- Guidance and support materials

Approach to development

US GAAP is a standards- driven taxonomy guided by rules promulgated by the SEC's Regulation SX and the Financial Accounting Standards Board (FASB). However, there are elements included to pick up common industry practice as well as elements required by other regulatory organizations, e.g., energy regulatory agencies – therefore, it could be considered a hybrid taxonomy. The intellectual property is owned by XBRL US but it's an open standard that can be freely used by anyone. XBRL US works closely with FASB; separately, the SEC reviews the taxonomy and a public comment period is held. The government, the standards group and XBRL US are the three players, managing a taxonomy that currently contains 17,141 elements. The purpose of the taxonomy is to help investors analyze company information, therefore our goal is to maximize comparison.

In Japan, the EDINET taxonomy has 2,500 required elements and 2,200 common practice elements, all used for primary financial statements. Companies typically use 10-15 extensions for each financial statement. The taxonomy is owned by Japan FSA (the regulator) which funded the development work. A team of vendors from XBRL Japan team built the taxonomy.

The IFRS taxonomy is owned by the IASB which had a mandate to build the taxonomy. The taxonomy is standards-only driven – there are almost no common practice items. IFRS covers the face financials and notes but it does not provide information on industry-specific disclosures or common practice items; therefore it provides a base comparison company to company for a minimal number of items. It is “farther from the market” – does not have the market coverage like the US or Japan but it does instantly reflect what is required by the IFRS accounting standard.

A new IFRS taxonomy is released every year; when released, it may include two sets of elements reflecting the old and the new standard. IFRS has 2,700 financial concepts covering face and notes. The IFRS taxonomy does not attempt to be an additional standard; the goal is to help investors but it does not add common practice items.

The Challenge with Convergence

With a different number of items in each taxonomy, convergence could be challenging but it’s important to note that the issue is the comparison of different accounting standards. Taxonomy developers work to capture the elements that are specific to each jurisdiction. XBRL makes it possible to consider how elements in different reporting standards would compare and potentially converge. Data vendors spend a lot of time working to normalize data and bring comparison – XBRL could make the process happen more easily.

With accounting standards moving towards convergence, can XBRL taxonomies also move in that direction? Some elements are beginning to converge, e.g., business combinations. To continue the convergence process requires developers of all taxonomies to maintain a dialogue so that common terms are identified and new elements are aligned where possible, e.g., if an element is being created in one taxonomy that already exists in another taxonomy, that element will be created with the same name but in a different namespace.

However, the difference is not only in the individual elements but in the architecture and ownership of the taxonomy.

Customization

When comparing the three taxonomies, several custom components were identified including arc roles and label roles – these sometimes present a risk to convergence. For example, the arc roles means application developers need to make changes to their application to adapt to each taxonomy.

Taxonomies are created at different times and incorporate architectural changes to resolve issues that arise while under development. Data types may require customization in percent, per share, domain member, area, volume, mass, energy, power, length, techblock type. For the XBRL US GAAP Taxonomy, XBRL US had to add “textblocktype” which is a string type but it allows html to be embedded so preparers can handle footnotes in block text. Regulators in other countries don’t have a need for this right now but if they do in the future, the goal is that they will use the same data type. XBRL

International has created a link role registry so all these new data types will be recorded and if a jurisdiction has need of one, they can review the registry and use what's already been implemented.

Another example of a label role added by XBRL US is a negated label which indicates that a value should be negative. The negated label allows a preparer to ensure that the rendered value is shown as a negative. For example, treasury stock appears differently, depending on the taxonomy. IFRS and XBRL US use negated labels but EDINET does not. There was pressure in Japan to ensure that the input value and visualization values would be the same which could not be accomplished with the use of negated labels.

Another architecture issue is that US GAAP and IFRS use dimensions to describe tables of data but EDINET does not.

Reference roles and functions

The IFRS taxonomy is the only one that customizes the reference roles. The IFRS team is also considering replacing the calculation link base with formulas but plans on discussing this with the US and Japan before putting it in place.

Patterns

One of the biggest differences between the IFRS and US GAAP taxonomies is in the modeling of multiple dimensions and tables. IFRS does not use dimensions for movement tables— each cell in a two dimensional table is a separate element. Without dimensions, for a table that is 20 elements X 20 elements, there are 400 separate elements – that number would be reduced dramatically if IFRS switched to dimensions.

Renaming and change management

Maintenance of the taxonomy often requires removing or replacing elements. In the US, elements that need to be removed are “deprecated” – made unavailable for use but retained in the taxonomy so creators and users can see the elements that have been deprecated for tracking purposes. Every year, XBRL US releases a new cut of the taxonomy with all changes included. IFRS currently removes elements altogether with each new release.

In the US and Japan, element names are never changed as the goal is to enable efficient time series analysis. IFRS currently does allow elements to be renamed.

Guidance and support materials

Each taxonomy has an array of guidance materials to help people produce instance documents. FRTA (Financial Reporting Taxonomies Architecture) is a set of rules developed to help guide development and maintenance, however FRTA has not been updated in many years. Developers in the US, Japan and those working with IFRS have waived many FRTA rules that no longer apply to current practice but they work together to ensure that they are waiving the same FRTA rules.

Conclusion

XBRL is a global standard that can bring greater comparability to investors, regulators, public companies and others in a marketplace with increasingly blurred borders. Harmonizing taxonomies is important to ensuring that investors have greater access to consistent, better quality data and the International Taxonomy Architecture project is designed to make that happen.

Impact Investing and XBRL

Steve Wright, Director of Innovation, Salesforce.com Foundation

To solve social issues such as climate change, the market needs to see the value that this change can bring. Social sector goals are typically thought about in terms of their costs and we need rigorous collection of data to show the costs and benefits of these initiatives.

We must overcome market structures that discourage open source data. In the social sector, we have to deal with the response to social change first, but second, we need to consider these changes as financial transactions. We need to balance the competitive environment with what are often inefficient activities in order to make a better world.

The problem we have had in the past is that we have tried to equate social impact with a dollar which doesn't work. In social impact there are different kinds of funders/investors and today's feedback loop is not very good. Most reporting is based on "did you spend my money" and the response is simply "yes, here's what I bought". What we're missing is the public and the greater insight they can provide. So how do we truly impact homelessness, hunger, disease? What else is being done?

We need to move to an environment that shows data as a cycle. Salesforce.com Foundation donates a tool they have developed into the social sector that helps to track the expenditure and the results. 5,500 foundations use this tool today.

Design of the standard used for reporting is critical. Data CAN be collected but it requires designing the data requirements, collecting the data, writing the reports and pushing that data out to a broader audience. Insight into the results can be democratized by this process. We have to show where there are successes and failures so we can cycle that back in. Often within the social sector, multiyear studies are established to try to track results but they take too long, and generally are not successful.

The social investment data environment shows the "return" on social investment against the financial return. Socially responsible investment brings in different types of investors – philanthropic (patient investors – don't expect significant returns soon), social impact (investors who just need to make marginal returns), and market (investors looking for significant, regular market returns). In a social project, you usually have a combination of these investors and need to consider how to keep all investors happy. The philanthropist wants social good so you need to give them data on the social impact this project has had.

Tools to Track Social Impact Investing

Several tools are in use today including Pulse, a portfolio management tool that measures impact investments. It tracks specific targets and how well the program has reached them. IRIS is another tool that provides impact reporting for investment standards and GRIIS offers a social impact rating system.

We need to give philanthropists and other kinds of investors more data about what their money is doing and can be doing. Once we start to pool data, we can identify popular nodes to see hubs of activity and value for funders. XBRL could provide part of the solution.

Technical Discussions

Taxonomy Maintenance

Makoto Koizumi, Senior Consultant, Fujitsu Research Institute, Phillip Engel, Director, Goffengel Consultants

A taxonomy must be continuously maintained to be of use to the creators and users of information. Markets change, industries change and these reporting changes must be applied to the taxonomy. This paper describes the process in use for the US GAAP Taxonomy and the Japan EDINET Taxonomy.

US GAAP Theory and Process

Building a taxonomy requires creating the architecture and modeling paradigms as well as content creation, documentation, education and training. The approach to maintenance must be considered during the content creation phase.

During maintenance, new content must be incorporated, comment tracking managed and documentation updated – all tasks that will be restricted to following the taxonomy architecture laid out during development. For the US GAAP project, versioning and maintenance issues became solidified in the 2009 version.

The US GAAP taxonomy is a continuous build system, with taxonomists working on it all the time to make and record changes. Tests are run against the taxonomy to check for consistency because there are so many people working on it that inconsistencies can arise. Change control is where we capture the changes needed and develop new content. In maintenance, changes impact the content all the time; the process to manage the change and the changes themselves must be documented through the change control mechanism.

The US GAAP taxonomy must be pulled into a relational database during maintenance so we can better understand what has been changed and where we stand.

Tools Needed for Maintenance

A text editor called Spider Monkey is used which allows multiuser access and stores information in a Perforce Software repository. TestTrack Pro is used to record and document every change that will be made to the taxonomy, e.g., date and timing of the change, comments about the change. SQL reporting tools are used to report on structure and content as well as applications developed in-house. Decimate is used to run a series of tests against the taxonomy to identify changes made.

Code	(T1021) ERROR: Concept Missing Definition (3.3.1)	(T1115) ERROR: Every element must have a	(T1031) ERROR: ASCII definition s (3.3.7)	(T1122) ERROR: The standard label of a concept	(T1098) WARNING: [Text Block], [Table], [Axis]	(T1126) ERROR: The documentat ion of a concept	(T1052) ERROR: All reference parts MUST be	(T1068) WARNING: [Text Block], [Table], [Axis], or	(T1001) ERROR: Abstract concepts MUST have	(T1039) WARNING: Any concept should not have	(T1094) ERROR: Statement t MUST NOT contain	(T1002) WARNING: Abstract concept should not have	(T1071) INFO: Industry associati ons
104000 - Statement - Statement of Financial Position, C	0	0	0	0	0	0	0	0	0	0	0	0	419
108000 - Statement - Statement of Financial Position, U	0	0	0	0	0	1	0	0	0	3	0	0	324
108200 - Statement - Statement of Financial Position, U	0	0	0	0	0	2	0	0	0	0	0	0	217
110000 - Statement - Statement of Financial Position, C	0	0	0	0	0	4	0	0	0	0	0	0	379
110100 - Statement - Statement of Financial Position, C	0	0	0	0	0	0	0	0	0	0	0	0	23
110200 - Statement - Statement of Financial Position, U	0	0	0	0	0	1	0	0	0	0	0	0	266
110201 - Statement - Statement of Financial Position, U	0	0	0	0	0	0	0	0	0	0	0	0	23
112000 - Statement - Statement of Financial Position, U	0	0	0	0	0	3	0	0	0	0	0	0	245
124000 - Statement - Statement of Income (Including G	0	0	0	0	0	1	0	0	0	0	0	0	556
124100 - Statement - Statement of Income (Excluding C	0	0	0	0	0	1	0	0	0	1	0	0	553
132001 - Statement - Statement of Income, Interest Bas	0	0	0	0	0	1	0	0	0	0	0	0	341
136000 - Statement - Statement of Income, Insurance B	0	0	0	0	0	0	0	0	0	0	0	0	221
140400 - Statement - Statement of Income, Securities B	0	0	0	0	0	1	0	0	0	0	0	0	238
144000 - Statement - Statement of Income, Real Estate	0	0	0	0	0	3	0	0	0	0	0	0	382
145000 - Statement - Statement of Income, Real Estate	0	0	0	0	0	1	0	0	0	0	0	0	382
148400 - Statement - Statement of Other Comprehen	0	0	0	0	0	2	0	0	0	1	0	0	186
148600 - Statement - Statement of Shareholders' Equit	0	0	0	0	0	0	0	0	0	0	0	0	203
152000 - Statement - Statement of Partners' Capital fin	0	0	0	0	0	3	0	1	0	0	0	0	110

We've created a tool called the dashboard that lets us see what changes have been made and shows if there are any errors. Errors are highlighted in color code: we can add tests into the dashboard and it reads through the taxonomy to see if that error has occurred, e.g., does the documentation or definition for each element end in a period? These tests run every time a change is input.

In the maintenance process, we focus on the biggest problems first. Decimate tracks the history of the process for each of these changes and shows the build history of what was changed.

Converting Development Work to Public

Maintenance work is automated as much as possible and we work to control the serialization of the files. We ensure that the work in progress is kept separate from the public release. This process helps us maintain consistency, eliminate double entry and solves technical problems of serialization. When we put the taxonomy out for public review, it is made available for comments which go through the change management process.

Theory and Process for Japan EDINET

The EDINET development process starts with initial development, followed by a review by the authorities (Japan's Financial Services Authority – FSA), then a public review. FSA conducts a requirements analysis, the taxonomy development team makes the changes, conducts internal testing, and then the taxonomy goes to the public review cycle. If changes are needed because of public review, the taxonomy team make the changes and performs internal testing which ensures that the taxonomy complies with:

- Business rules and requirements
- Technical specification and best practices including XBRL 2.1 and FRTA
- Team development rules – naming, style guide, and architecture guide

Elements are tested to ensure that they are 1) accurate for all concepts, attributes and relationships, 2) complete and 3) that all concepts and relationships are properly defined and that they are unique. Elements that do not meet these criteria can reduce the value and consistency of the taxonomy and resulting data.

In addition, the EDINET taxonomy follows control objectives that test that all elements are accurate and complete based on the rules, that labels are complete and valid and that references and documentation are accurate and complete. Validation testing is performed against the specification and against FRTA.

Tools Used

Many tools are used for taxonomy validation including Excel Macro, DB Checker, Fujitsu Xwand and Diff tool (to compare different versions of the taxonomy), XWand Query (query function), and Database for Group-B analysis (to analyze extension taxonomies to find out extensions which appear multiple times. These elements become a part of the EDINET taxonomy standard Group-B (common practice) elements.

Conclusion

Although taxonomies for different reporting situations may follow different approaches, proper maintenance is critical to all.

Versioning Challenges and Possible Solutions

John Turner, CEO, CoreFiling, Campbell Pryde, Chief Standards Officer, XBRL US
Maciej Piechocki, XBRL Technology Project Manager, IASC Foundation

The concept of “versions” is all about taxonomies when it comes to XBRL. Creating new versions of a taxonomy can have a profound impact on all representatives of the supply chain.

When taxonomies change, corporate filers need to consider: what changed in the accounting literature that I need to account for in preparing my document? What changed in the taxonomy and how does it impact me? How do I communicate changes in my extension taxonomy, without affecting comparability? How quickly can it be done? Regulators need to think about: Have filers updated their disclosures? How have filers altered their disclosures, given the changes that have happened? Are filers complying with current disclosure law?

Analysts need to consider: What could break in my process when a taxonomy is changed? Which companies have become more comparable? Which ones are now less comparable? Which changes impact my analytics? And which changes impact my analytics in a material fashion? The XBRL vendor needs to think about: How do I use versioning metadata? How do I present it to my users? How much can I automate without having to ask my users? How much do I have to spend to support the versioning strategies employed by taxonomists that use my tools?

The developer of the taxonomy needs to think about how to minimize change so as to not “break” anything and then, once a change is made, how best to communicate it and to who?

Three things we’re concerned about with versioning: 1) what has NOT changed, 2) what HAS changed, and 3) how and why?

Version Reporting for IFRS

The IFRS taxonomy is the only taxonomy worldwide providing versioning report according to public working draft of the specification provided by XBRL International. Changes to IFRS come from physical/structural name changes, the updating of namespaces, new technologies like XBRL dimensions, semantic changes. The IFRS taxonomy team creates two versioning reports that document changes – a “light” and a “comprehensive” report which are delivered to different stakeholders depending on their needs. The light report includes additions, deletions and renaming of elements and the comprehensive report includes all other changes made to the taxonomy.

Version Reporting for US GAAP

A versioning report is created automatically in XBRL which provides all the changes from one taxonomy to the next. Ultimately, XBRL US will report on the reason for the change and the relative importance of each change. XBRL US is also building a tool that allows users to search on specific elements and see if a change was made, what the change was and even who made the change and why.

Deprecated elements are retained in the taxonomy review tool and can be viewed with definition, label, and other attributes. Any new elements added are given a new name – they do not take the name of the element being replaced. Information about new versions are included in an online FAQ and XBRL US also provides release notes with each new release describing all changes. This is a very lengthy document so the new tool in development will streamline the process for users when they need to identify changes to the taxonomy that could affect their own tagging process.

Conclusion

Much still needs to be addressed on versioning. The XBRL International versioning working group was established and provided public working draft of versioning specification.

But all agree that the biggest issue lies on the consumption side – how analysts can deal with changes that affect time series analysis and models. For XBRL to succeed, these issues must be effectively tackled.

Tagging Approaches to Developing XBRL Documents

Ted Stavropoulos, Director of Business Development, Rivet Software

Piyush Mehta, Partner, SimpleX Data Technologies

Public companies in the SEC's XBRL mandate use the "tagging" process to transform their financial statements from Excel, Word or PDF into XBRL format. Tagging refers to identifying the elements in the taxonomy as well as the time periods, currencies and other attributes needed to accurately match up to the financial statements including the company's income statement, balance sheet, cash flow and notes to the financials.

Before beginning the tagging process, companies have to make a few choices, each with its own pros and cons. First, the company should outsource to a service provider or take the "do-it-yourself" approach?

Regardless of the method chosen to comply with the mandate, the company is responsible for the accounting representations they make, and it is imperative that they set up the review process at the right level to ensure the XBRL representation of their financial disclosure is tightly aligned with their policies. There are tools available to help with this process. The people in the review process need to understand the business and the accounting to have the greatest impact. Many factors come into play and organizations should consider these factors.

Second, should the company take a "bolt-on approach" (complete the financial statements and then begin the tagging process) or an integrated approach? Cost, time, whether it requires process re-engineering and knowledge – these are all factors that affect the choice. Merrill Corporation did a study that showed a 50/50 split behind public companies managing the process in-house versus those outsourcing. In any event, companies may consider working with other organizations that have built up a skill set and best practices to get over the initial hurdle of XBRL but over time the requirement for this outside expertise will diminish.

Tagging is just the starting point of the journey to global financial communication. While right now, the process is driven by compliance, down the road issuers will realize that XBRL can help them maintain control over how public company financials are presented and tell a better, more accurate story. The end-game is enabling better communication. Standardization helps to increase agility while driving down cost – XBRL as a standard will enable this maturity curve to happen in financial reporting as it has in many other areas like infrastructure.

Finally, what's the best way to tag? They're all right in one way or another. There is no single answer.

Approaches

- Metadata to data: applying tags to data that's already in a spreadsheet or other document. Typically a base level understanding of the taxonomies, calendars and extensions is necessary, but this process is considered the simplest method. But it is a process that must be re-executed every quarter; it does not create a repeatable template.

- Data to template: building a template that stores the metadata and then drop the financial and business data, pulled from Excel, Word or PDF, into the template. In this environment it is easier to get more people involved and to design a workflow for process.
- Automate by integrating with internal reporting: companies following this approach embed the metadata into their internal financial reporting system. Financial reports are then designed with the metadata embedded. Running the report will automatically pull in the XBRL data. As adoption of XBRL moves deeper into the company, this approach will become very valuable as organizations will be able to leverage XBRL in many ways for their own internal purposes, e.g., bringing in other types of data, running reports with metrics internally.

Conclusion

Companies have several options in the tagging process and the market will continue to evolve as XBRL becomes more widespread. Organizations need to develop a competency around the review process and find suitable tools to aid in that process. They should expect to leverage professional services for the first couple of quarters and plan to be self sufficient in the long run, invest in the review process early and maintain it over time.

Rendering

Diane Mueller, VP, XBRL Development, JustSystems, Masatomo Goto, Manager, Fujitsu, Darrell Heaps, President and CEO, Q4 Web Systems, Inc., Ted Stavropoulos, Director of Business Development, Rivet Software

How do you know what someone will see when they look at your XBRL data? Different stakeholders, e.g., analysts, preparers, regulators, have different points of view on what they want to see. Regulators want better data but also want a common view of the corporate content. They want to see the data in a format common to preparer and regulator so they can have a dialogue with the company if they need to discuss the financial statements. Analysts and other consumers of the data want to be able to extract it, view it and report it, in different views.

In the early days of XBRL, the primary concern was for machine to machine use. While that is still very important and ultimately provides some of the key benefits of XBRL, many today are also interested in the “human readable” form as well. Rendering consistency is critical to ensure that the creator and user of the information can speak intelligently to each other.

The traditional rendering approach requires an XML file that contains link bases holding labels, presentation hierarchy, calculations, references and definitions. These link bases are tied to the taxonomy, not to the individual instance (XBRL) document. They can change as the taxonomy changes or as extensions are made. Examples of rendering tools can be found from EDGAR Online, Rivet Software, Shareholder.com, 10K wizard, and even on the SEC’s website.

But there are limits to traditional rendering approaches. For example, in the UK, HMRC (Her Majesty’s Revenue and Custom) attempted to create HTML pages from the raw XBRL data using a semiautomatic style sheet in an austere format. The resulting style sheet was very large and hard to maintain.

A Solution – Inline XBRL

Because of the difficulties in establishing a common solution, the XBRL community has begun focusing on “inline XBRL”. Inline XBRL is a specification of the XBRL International Rendering Working Group which is a method of embedding XBRL into an HTML document as metadata. The data item is rendered by the browser. It allows the creator to design their own rendering and the rendered report is easily extracted and transformed. It puts the rendering back in the hands of the individual producing the application, so they can control the layout, look and feel, and branding.

If your application requires many XBRL documents using the same taxonomy you can run into scalability issues. This can be resolved by taking advantage of a rendering database.

As an example, for a balance sheet, we need to understand the context of the information. An XBRL document is missing document structure, context grouping (identification of the beginning, ending and duration), ordering of grouped contexts, the number formatting (what’s the scale, fraction), and detailed style information (fonts, borders, colors, exact size of the table).

Fujitsu has developed a rendering link base that creates inline XBRL. The link base is a relationship structure so we can create the document which holds the relationships and the containers.

On rendering, there is no “one-size fits all”. Consumers of the data should be given the options of 1) viewing the data in a consistent presentation format that is made available by the preparer, 2) getting additional information from the preparer that provides context around the data, and 3) extracting specific data items of interest to perform analysis. All three approaches can be done with the use of XBRL.

XBRL Provides an Opportunity for Better Investor Relations

At this stage, companies are simply complying with the mandate and posting the bare minimum on their websites. But studies show that 75% of professional investors use corporate websites daily or weekly, so more and more it’s becoming a growing area for investors. Investor relations (IR) professionals are beginning to understand this. Social media has changed the online experience – 67% of the global online population use social networks and blogs. The Web is even changing how companies get coverage – the financial networks and blogs are changing the way investors get information, e.g., SeekingAlpha, StockTwits, and Wikinvest. People on these networks are consumers of data – it’s becoming the next generation of analyst coverage. IR officers today see XBRL as a mandate and a compliance activity– they don’t recognize it as a strategic tool that can help them. They need to understand how XBRL can be used to create innovative tools that give investors immediate, discoverable and more shareable information. IR officers don’t understand the difference between an XBRL rendering or a hard-coded analytical report.

XBRL can help public companies get their message to their shareholders in an automated, highly functioning manner by:

- Rendering financials on the investor relations page of their websites
- Making that data interactive with charts and other forms of visualization; making it discoverable by search engines
- Giving investors the ability to download raw XBRL data to use in their own applications
- Maintaining a link to the SEC (Securities and Exchange Commission) website
- Establishing a permanent URL for XBRL data that can be used by consumers over and over
- Providing atomized content – making it possible to pull out just the pieces of information you want

Conclusion

A focus on rendering is the logical next step now that high volumes of XBRL data are becoming available through the SEC mandate. Consumers of information including analysts, portfolio managers, regulators and individual investors want to use corporate data in many different ways – XBRL gives them the tools to do that.

Managing Data Quality and Validation

John Turner, CEO, CoreFiling, Campbell Pryde, Chief Standards Officer, XBRL US

- Quality and consistency of information is critical to ensure the best possible data. In the US, XBRL data is validated and reviewed through a number of processes including:
- Financial Reporting Instance Standard (FRIS)
- Financial Reporting Taxonomy Architecture (FRTA) – guidelines for taxonomy development
- Specification validation
- The SEC maintains the EDGAR Filer Manual that includes rules designed to drive consistency

If creators of XBRL formatted documents comply with specified business rules, the resulting data will be of higher quality and much greater consistency. To make this happen, rules are needed for:

- Auditors – to build validation based on years of experience auditing financial statements
- Filing agents – need to ensure the consistency of extensions for their clients and eliminate errors to improve their service to clients
- Public companies – management might specify which tags are not used, which relationships should be maintained and want to maintain control over extensions. The ability to review and track is critical to increasing comfort level in working with XBRL data

When XBRL US builds a taxonomy, they develop models explaining how the taxonomy will appear once it's been tagged. Detailed tagging of footnotes presents further opportunity for errors to be introduced. Preparers need to know what should be tagged, what should not be tagged, what additional elements should be used if you use one tag and what elements should not be used if you use a specific tag. This would be impossible to articulate in a manual fashion through documents and guides but it does lend itself to automation.

XBRL US is in the process of developing a tool that will give preparers and those working with preparers the ability to perform checks or rules for consistency. One area of particular concern is with tables - there are over 200 tables in the US GAAP taxonomy and it is critical for preparers to know how to work with them. It's also important when working on restatements, segment reporting, notes and dimensional equivalence. Checks can be used with restatements to ensure they are done correctly. Segments are represented as tables and they can become complicated. For the downstream analyst, any of these problems can cause havoc. Any data quality error will show up quickly because investors and analysts are looking for anomalies.

Detailed tagging of the footnotes requires significant extra work so it's important that preparers are given the rules to ensure they are done correctly and consistently. For example, companies may create extensions that are already represented in the taxonomy as dimensions.

This set of "tests" is designed to improve the quality of the data. It doesn't solve the basic problem of comparability globally since there are different taxonomies around the world with different architectural structure, but it will go a long way towards making US GAAP data, both face financials and footnotes, more consistent and useable.

Database and Business Intelligence

Steve Levine, Chief Marketing Officer, UBmatrix, Ivy Li, Director of Equity Data Acquisition, Morningstar, Karen Hsu, Director Product Marketing, Informatica, Mark Drake, Manager, Product Management, Oracle

The promise of XBRL is to provide comparability across documents. Until now, the approach has been to shred data into a relational database and then pull pieces out. But the key questions at this point in the adoption cycle are: What is the impact on the consumer of XBRL data? How should XBRL data be stored and queried? This discussion paper addresses the use of XBRL in databases and in developing analytical tools and business intelligence tools.

The challenges to business intelligence fall into these areas:

- Moving from documents into data without losing metadata
- Getting access to metadata and information out of the taxonomy
- Working with one or more taxonomies that are moving targets and always changing – there are multiple taxonomies globally, all have extensions and each taxonomy has multiple versions/releases
- Managing XBRL-formatted documents - the instance document has multiple contexts, scenarios and dimensions
- Finally, scaling up performance when there are thousands to millions of instance documents that must be queried in seconds

Once the data is available, business analytics must be able to retrieve information in many different ways. Queries can be taxonomy-based or fact-based about the data included, and it could be fact-based across all documents. This is the biggest challenge because you need quick access to the taxonomy in an efficient way.

The Experience at Morningstar

Morningstar, founded in 1984, provides investment research information in 22 countries. Morningstar has an XML based data infrastructure that is platform independent, making it easy to pass information along. Morningstar is a data quality/information repository, dealing with millions of pieces of information from different entities. It's important that we be able to put data into a standard format, and then translate it into an XML format. XML is becoming more widely accepted and both XBRL and XML have given us greater accuracy, flexibility, and operational efficiency.

Morningstar's plans going forward are to expand data coverage into corporate actions and through adoption in global markets, e.g., China, Korea, Japan and other areas. Morningstar will develop XBRL related alert services and B2B data deliveries and incorporate methodologies, business rules, templates of data presentation, labeling and multiple language supports into taxonomies. Morningstar is starting to educate their mutual funds partners about XBRL and what it can do in an attempt to build a larger community.

How it works at Morningstar

SEC (Securities and Exchange Commission) EDGAR filings and native documents in PDF format serve as the raw data that is parsed into XBRL to perform alerts and search. It is normalized into a database and ultimately becomes the end product for client reporting, analysis and direct API feeds. Taxonomies that report on US GAAP, Shenzhen and Shanghai Stock exchanges and others are used extensively to create the data.

Today there's a huge amount of work that has to be done upfront to parse the data out of EDGAR filings requiring an army of people. Best practice today is 24 hour turnaround but with XBRL we can do this in seconds. As a data consumer, we have many of the same challenges that other users and creators are also facing:

- Data quality – incorrect values, formatting errors
- Differences between data in traditional text filing and XBRL filing
- Keeping up with taxonomy revisions – maintaining a consistent historical time series, changes to collection and storage system
- Handling different taxonomies from around the world – balancing the scalability and flexibility

The Experience at Informatica

Traditionally, Informatica is known for data integration, supporting many data standards and helping people untangle the information load they have into streamlined processing. Accelerating XBRL adoption will help us reduce risk.

As an example, the Shenzhen Stock Exchange was collecting a lot of data in different formats with over 20 people grabbing and posting data, resulting in numerous errors. Shenzhen had to convert the data into all the different files and formats needed by their custodians and other players. Formats used ranged from flat files to fax. We wanted to create a system for them that would take the data in, ensure data quality and then send it out in the format required.

Informatica worked with the PDF files received by the stock exchange, extracted data from it and reformatted it into XML.

Standard & Poor's also works with Informatica to analyze raw data. They had 40-80 people who analyzed raw data coming from 10,000 different formats. They were able to automate the process through a B2B data exchange.

The Experience at Oracle

Oracle's primary focus has been the issue of a regulator or analyst getting a large volume of data in XBRL format. Each player has different needs:

The regulator needs to get data, store it in a database, ensure the creators of the data are compliant and post it in a traditional relational database. They need to have access to the data without needing to write a lot of code.

For those who have to respond to the regulator, they need to track extensions, versions of extensions and be able to query the data and keep copies of their submissions for historical purposes.

The goal is to manage the entire taxonomy life cycle – from creation/validation, formula generation, analytics and querying, data integrity and management, on through to report generation and validation.

XML Db is the Oracle framework for managing XBRL data. On top of the basic XBRL, there is a database that handles instance documents and taxonomy documents. Reports need to be submitted to the repository, once there Oracle checks the integrity and consistency – they can't be deleted or destroyed. Users can review the data in XBRL and in report format and bring analytics and querying to bear over the content. The repository has: storage, ability to query and analytics. Oracle's XBRL processing framework uses a UBmatrix XBRL processing engine and UBmatrix taxonomy designer.

Conclusion

The next hurdle that will move XBRL adoption forward clearly lies in the analytics – how to perform business intelligence, how to manage a highly functioning database. Many companies have begun focusing in this area to bring XBRL to the next phase.

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About XBRL US

XBRL US is the non-profit consortium for XML business reporting standards in the United States and is a jurisdiction of XBRL International. It represents the business information supply chain, including accounting firms, software companies, financial databases, financial printers and government agencies. Its mission is to support the implementation of XML business reporting standards through the development of taxonomies relevant for use by US public and private sectors, working with a goal of interoperability between sectors, and by promoting adoption of these taxonomies through the collaboration of all business reporting supply chain participants. XBRL US has developed taxonomies to support U.S. GAAP and common reporting practices under a contract with the Securities and Exchange Commission. The XBRL US GAAP Taxonomy is available for review at <http://xbrl.us/usgaap>