



WhitePaper

Extensible Business
Reporting Language (XBRL)

An overview for technical users



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Extensible Business Reporting Language (XBRL) is an XML-based markup language for electronic transmission of business and financial data. With a new mandate from the United States Securities and Exchange Commission (SEC), and official support from European Parliament as well as the governments of Japan and China, XBRL aims to reduce costs through the elimination of time consuming and error-prone human interaction. XBRL tags increase the speed of data integration and exchange, while at the same time eliminating data redundancy and quality issues. XBRL support in Altova MissionKit® tools ([XMLSpy®](#), [MapForce®](#), and [StyleVision®](#)) gives financial institutions the ability to comply with current and future regulations using the affordable tools that they are already comfortable with.

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Executive Summary

Extensible Business Reporting Language (XBRL) is an XML-based vocabulary for electronic transmission of business and financial data. Currently in version 2.1, XBRL is an open standard that is maintained by XBRL International, a global non-profit consortium of over 550 major companies, organizations, and government agencies. XBRL International now includes 23 jurisdictions in Europe, Asia, the Middle East, North and South America, and Australia.

XBRL was developed to facilitate business intelligence (BI) automation by enabling machine-to-machine communication and data processing for financial information with an eye towards cost reduction through the elimination of time consuming and error-prone human interaction. Official support from European Parliament and a mandate from the United States Securities and Exchange Commission (SEC) has all but secured XBRL's future as the official standard for financial reporting.

Drawing upon the power and flexibility of the XML family of standards, XBRL utilizes familiar W3C specifications such as XML Namespaces, XML Schema, XPath, and XLink to offer a growing set of taxonomies for defining semantics, syntax, and relationships for single source financial reporting, helping to overcome data redundancy and quality issues in addition to offering instantaneous delivery to a variety of different output formats. XBRL incorporates these technologies to describe a taxonomy document and an instance document, which together comprise a business report.

The fact that understanding the complexities of XBRL financial reporting may seem daunting to non-technical business users may come as no surprise, but learning XBRL may also be a hurdle for many technical users (developers, software architects, IT, etc.) who may have no knowledge of the intricacies of financial reporting.

XBRL, of course, is XML, and it has taken full advantage of all of the extensibility that XML has to offer to add a sophisticated set of features for handling metadata, business rules, content validation, expressing relations, advanced computations, and dimensional data.

This whitepaper aims to educate technical users with a brief introduction to financial reporting, as well as a more technical overview of XBRL architecture, probable workflow requirements, and some ideas for seamless implementation of this very flexible and powerful standard.

Financial Reporting

In order to understand XBRL from a technical perspective, it is first important to understand the basics of financial reporting. For this paper, we will focus primarily on the International Financial Reporting Standards (IFRS), which are used in over 100 countries and territories throughout the world including the European Union, India, Hong Kong, Singapore, Russia, Australia, and the GCC¹. The IFRS are regulated and maintained by the International Accounting Standards Board (IASB) and have evolved from their original release in 1973 (as International Accounting Standards or IAS) to the latest release in 2010.

IFRS: Basic Anatomy

IFRS statements consist of five different components, which together comprise a complete set of financial reports. Together, the purpose of these statements is to disclose the financial condition, performance, and overall cash flow of an organization to government and regulatory agencies, stakeholders, the investment banking community, and other economic decision makers.

Balance Sheet

Also called a Statement of Financial Position (a moniker that the IASB officially adopted in January 2009), a Balance Sheet is an itemized summary of an organization's finances at the end of a given period, and includes Assets, Liabilities, and Ownership/Shareholder's Equity. Balance Sheet data is summarized in the following basic accounting equation:

$$\text{Assets} = \text{Liability} + \text{Equity}$$

The Balance Sheet is generally considered to be the most important piece of financial information submitted by an organization, as it is a comprehensive snapshot of a company's financial status at a specific point in time.

As with any financial disclosure, the amount and type of information reported will depend on the type of business the organization is conducting and the particular intricacies of its financial position.

¹ The United States SEC still requires registered U.S. companies to submit financial reports in accordance with US GAAP, but is working to reconcile the differences between the two taxonomies and aims to require IFRS by 2014 (foreign private issuers are currently permitted to file IFRS). *The Altova MissionKit offers full support for all XBRL base and extension taxonomies, including US GAAP and IFRS.

∴ Income Statement

Also known as a Statement of Comprehensive Income or Profit and Loss Statement (P&L), the Income Statement reports revenues earned and expenses incurred during a specific period of time, usually quarterly and at the end of each fiscal year. In contrast with the Balance Sheet, the Income Statement reports changes over time, i.e., a company's net profit or loss. The Income Statement reports net income based on the following formula:

$$\text{Net Income} = \text{Revenues} - \text{Expenses}$$

Income Statements also disclose Earnings Per Share (EPS), which calculates the earnings returned on an original investment amount by dividing the number of shares outstanding by a company's net profit.

$$\text{Earnings per Share} = \frac{\text{Profit}}{\text{Weighted Average Common Shares}}$$

∴ Cash Flow Statement

The Cash Flow Statement, or Statement of Cash Flows, gives a basis upon which to assess an organization's ability to generate cash, as well as a general overview of how cash inflows and outflows are conducted. Like the Income Statement, the Cash Flow Statement reports changes over a range of time, rather than the status at a distinct point in time.

The Cash Flow Statement is essentially reiterating and reorganizing information that is also disclosed on the Balance Sheet and Income Statement, extracting absolute cash amounts from other reported assets and revenues. Cash Flow Statements are organized under the following three main headings:

- a) Operating Cash Flows
- b) Investing Cash Flows
- c) Financing Cash Flows

Ultimately, the Cash Flow Statement depicts a net increase or decrease in cash during a period based on buying and selling activities.

⋮ Statement of Changes in Equity/Statement of Total Recognized Gains & Losses

The Statement of Changes in Equity and Statement of Total Recognized Gains and Losses (STRGL) report changes in shareholder equity at the end of a given period of time through the presentation of the following key financial data:

- a) Net profit or loss for the period
- b) An itemized list and total of equitable income and expenses
- c) Effect of changes in accounting policy and error corrections

These reports are generally accompanied by a host of other items and supporting facts, including transactions with shareholders and reconciliations of balances of retained earnings, reserves, and classes of capital.²

⋮ Notes to the Financial Statements

Notes to Financial Statements provide essential additional information to explain specific items being reported and provide a more complete assessment of financial position. The notes also include obligatory disclosures such as a statement of compliance with IFRS and details of the organizations internal accounting policies.

It is vital to keep in mind that each of the individual components introduced above are inextricably linked to each other, sometimes directly and sometimes in a more abstract manner, and together provide a complete overview of an organization's financial position and performance.

Financial reporting, though obviously important to individual organizations for record keeping purposes, is also generally a legal necessity for operating businesses. In the United States, for example, the Securities and Exchange Act of 1934 mandates that publically held companies with more than \$10 million in assets and 500 documented shareholders must file annual and periodic financial statements. Other countries have similar reporting requirements under separate legislative ordinances.

² Submitters of Statements of Changes in Equity will include this information in Notes to the Financial Statements, while submitters of Statements of Total Recognized Gains and Losses will include it in the body of the statement itself.

Standards & Data Exchange

Traditional financial reporting methodologies are structured for human consumption without the aid of advanced data exchange, integration, and analysis technologies. XBRL aims to change all this by providing a mechanism for automation to ensure seamless data exchange, credibility, and transparency – all in a normalized electronic environment.

Today, though most filings are submitted and available online, they remain constrained by static data and the lack of a standardized reporting format. A common recognition of this problem, and that mandated standardization would lead to streamlined processes and enormous cost savings, is what led to the development of XBRL. In the case of the SEC, financial disclosures are, at the time of publication of this paper, required to be submitted in unstructured HTML or ASCII via the **EDGAR** online filing system and data aggregator, which is currently undergoing a \$50 million transformation into a fully XBRL-enabled interactive system.

The advents of the Internet and globalization have essentially fast tracked a growing need for technology standards to promote data exchange and accessibility. In the realm of documentation, XML has, for many years, been at the forefront of this push, and is the language behind the development of a great many standard vocabularies that are both emerging and in use today including: OOXML, DITA, DocBook, Atom, SOAP, and Web services.

The XBRL Challenge

According to the current standard, XBRL 2.1, published by XBRL International, “XBRL consists of a core language of XML elements and attributes used in XBRL instances as well as a language used to define new elements and taxonomies of elements referred to in XBRL instances and to express constraints among the contents of elements in those XBRL instances...”³

Though XML has a powerful built-in ability to restrict document structure and syntax through the application of an XML Schema, it has no inherent capacity for validating semantics, interpreting business rules, and creating complex associations between document parts. XBRL solves these problems and brings XML squarely into the accounting domain by building upon the XML specification, adding:

³ Extensible Business Reporting Language (XBRL) 2.1

<http://www.xbrl.org/Specification/XBRL-RECOMMENDATION-2003-12-31+Corrected-Errata-2008-07-02.htm>

- Taxonomies for financial reporting
- Semantic expression
- Business rules validation
- Multi-dimensional data representation
- Normalization

The end result is a powerful and highly functional language for expressing interactive business data in a constantly evolving global setting.

⋮ Taxonomies for Financial Reporting

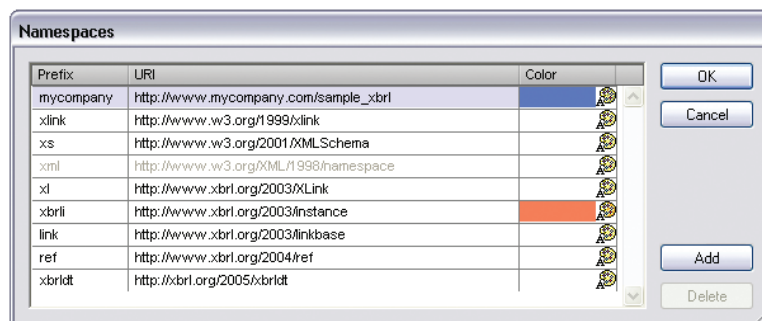
XBRL taxonomies use a combination of XML Schema and XLink to extend the base XBRL vocabulary with common “dictionaries” to fulfill individual financial disclosure requirements. Taxonomies can be created by any reporting entity and may span national jurisdictions, industries, or even individual companies. Taxonomies that have received official recognition by XBRL International are publically available in the [Financial Reporting Taxonomies](#) section of its Web site. Extending these taxonomies enables organizations to create financial statements that are valid and/or compliant without any loss to the integrity of their data.

An XBRL taxonomy document is actually a collection of files that can be broken down into two distinct parts:

- **Concepts** – are expressed in an XML Schema and define the underlying “concepts” that are being reported.
- **Relationships** – are expressed in linkbases, which are XML instance documents (.xml) that utilize the XLink specification and define the relationships between those concepts as well as the relationships between concepts and other resources.

XBRL Taxonomy Concepts

The XBRL taxonomy concept schema utilizes a standard namespaces declaration to denote the disparate XML technologies that will be used in the resulting document.



The XML vocabularies that are identified by these namespaces are:

- **XML Schema** – The XML Schema namespace is required in all XML Schema documents and refers to the syntax with which the standard is expressed. XS or XSD is often used as the namespace prefix, but a prefix is optional.
- **XBRL (xmlns: xbrli)** – This refers to the XBRL instance schema that defines a standard vocabulary that can be used across taxonomies.
- **XLink (xmlns:xlink)** – The XLink specification provides a sophisticated framework for expressing relationships between resources within XML documents.
- **XBRL linkbase (xmlns:link)** – Linkbase (or link database) refers to a document that contains collections of inbound and third-party links. This is the subset of the XLink specification that enables XBRL documents to be built from a collection of taxonomies.

The schema root also is used to define the namespace for the taxonomy that is being built, using the targetNamespace attribute, and to specify the other taxonomies that will be referenced.

An XML taxonomy concept schema is, inherently, not a standalone document. It is designed to provide a taxonomy definition to extend the basic XBRL vocabulary and can be supported by any previously published XBRL schemas. Because of this, the <import> element is a schema requirement that, at minimum, references the location of the XBRL vocabulary definition for validation purposes.

The schema goes on to define XBRL concepts as item (simple) and tuple (complex) elements that can be associated with any one of a set of commonly-used datatypes. Elements can also include two additional optional attributes: an “ID”, or unique identifier, and “balance”, which applies to financial concepts and has a value of either “credit” or “debit”.

The screenshot displays the 'ifrs-gp:AccountingPolicies' XBRL item in a software interface. The main window shows the item's properties, including its substitution group (xbrl:item) and type (xbrl:stringItemType). It lists labels in English and provides a table of references to IAS 103. A 'Details' dialog box is open, showing the item's definition in a file, its namespace, and various attributes like 'Abstract' (unchecked) and 'Nilable' (checked). The 'Children' section of the dialog shows 0 arcs, 1 label child, and 1 reference child.

Reference	ref:Name	ref:Number	ref:Paragraph
http://www.xbrl.org/2003/role/presentationRef	IAS	1	103

Details: ifrs-gp:AccountingPolicies

General

- Defined in: file:///C:/Documents and Settings/e.e
- Namespace: http://xbrl.iasb.org/int/fr/ifrs/gp/200
- Abstract:
- Nilable:
- Balance: [dropdown]
- Period Type: duration
- Subst. Group: xbrl:item
- Type: xbrl:stringItemType

Children

- Arcs: 0
- Label Children: 1
- Reference Children: 1

XBRL item

The screenshot displays the 'ifrs-gp:BusinessSegment' XBRL tuple in a software interface. The main window shows its substitution group (xbrl:tuple) and type. A 'Details' dialog box is open, showing its definition, namespace, and attributes. The 'Children' section of the dialog shows 0 arcs, 1 label child, and 1 reference child.

Details: ifrs-gp:BusinessSegment

General

- Defined in: file:///C:/Documents and Settings/e.e
- Namespace: http://xbrl.iasb.org/int/fr/ifrs/gp/200
- Abstract:
- Nilable:
- Balance: [dropdown]
- Period Type: [dropdown]
- Subst. Group: xbrl:tuple
- Type: [dropdown]

Children

- Arcs: 0
- Label Children: 1
- Reference Children: 1

XBRL tuple

XBRL Taxonomy Relationships

Relationships between the concepts, or elements, defined within an XBRL taxonomy are created using XML Linking Language (XLink), a W3C specification for creating hyperlinks within XML documents. XBRL taxonomy documents employ XLink to define relationships between concepts (via presentations, calculations, and definitions) and resources (via labels and references) in XML documents known as linkbases.

Linkbases in XBRL provide the means to define an extensible documentation architecture with data integrated from a wide variety of different sources, giving additional meaning and structure to taxonomy concepts.

XLink uses a combination of locators and connectors, or “arcs”, to first identify the concept in a taxonomy schema document, and then define its relationship to another concept or resource.

Individual XBRL structures, or instance documents are described by a Discoverable Taxonomy Set (DTS), which is a collection of the various XML Schemas and linkbases that comprise the taxonomy as a whole.

XBRL taxonomies add an additional layer on to the extensibility of XML, enabling XBRL to inherit all of the power of XML for creating additional vocabularies in a much more rigid, standardized way. This is an enormous advantage to organizations struggling to comply with an increasing number of ordinances with accurate and timely data.

⋮ Semantic Expression

Another advantage that XBRL builds onto XML is the ability to express semantic meaning. XBRL does this by fully leveraging XLink to connect XML instance documents with any number of related XML fragments at a granular level using extended links. Relationship linkbases (calculations, presentations, and definitions) establish concrete connections between item and tuple XBRL concepts, ensuring that the data reported is semantically valid.

Calculation Linkbase

Calculation linkbases relate XBRL concepts through the application of basic calculation rules (e.g., $A + B = C$). This ensures the accuracy of the many accounting equations that comprise XBRL reports and enables XBRL software to interpret these relationships correctly and automatically derive the correct values from the input data.

The screenshot shows the 'Calculation' tab in an XBRL software interface. The main window displays a tree view of calculation relationships. A 'Details' dialog box is open, showing the URI 'http://www.xbrl.org/us/fr/lr/role/...' and the number of children (1).

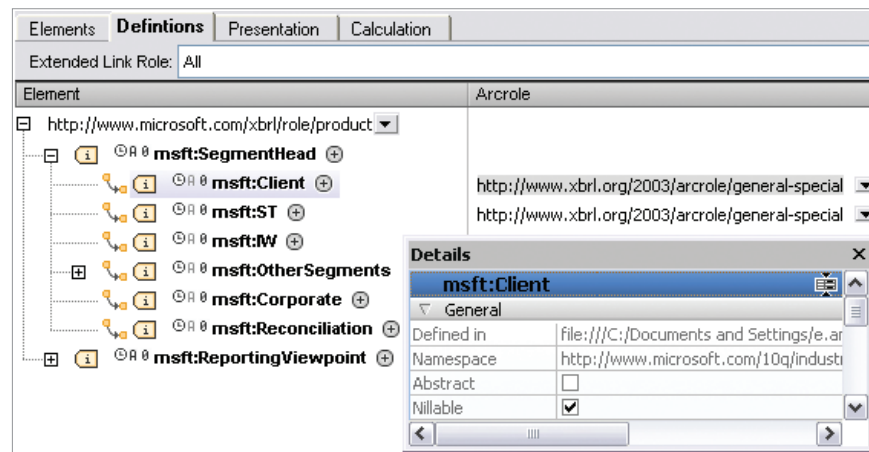
Presentation Linkbase

Presentation linkbases provide information about the structure of XBRL concepts, documenting hierarchical (parent-child and sibling) relationships between elements. This gives XBRL processing software the capacity to infer tuple definitions based on items and/or other tuple values (e.g., current assets includes cash, inventory, accounts receivable).

The screenshot shows the 'Presentation' tab in an XBRL software interface. The main window displays a tree view of presentation relationships. A 'Details' dialog box is open, showing the URI 'http://www.xbrl.org/2003/role/link' and the number of children (1).

Definition Linkbase

Definition linkbases provide taxonomy developers with the tools to define additional logical semantic relationships between concepts, such as interdependency and other associations.



⋮ Business Rules Validation

Financial reports are laden with a large number of business rules, or formulae, that are infinitely important to the accuracy and validity of the data that is being reported. These rules further express the semantic meaning of the data. One example of an intrinsic XBRL business rule is the *Assets = Liability + Equity* accounting equation from the Balance Sheet. XBRL provides 1,800 business rules that run the gamut from simple definitions, to abstract calculations, to process orientations (if/then), etc.

As we have seen above, these rules are defined in XBRL taxonomies, and XBRL software provides the means to ensure that they are being followed. In order to be effective, XBRL processors must bridge the gap between simple XML validation and XBRL validation with the ability to interpret the semantic data laid out in instance documents. Of course, because an XBRL document must conform to an XML Schema, any basic XML processor can recognize compliance to this point. However, it is the semantic meaning and business rules that give XBRL its power, and the ability to validate the accuracy of this data is of infinite importance in financial reporting and XBRL.

⋮ Multi-dimensional Data Representation

XBRL Dimensions 1.0, a modular extension to the XBRL specification, enables developers to add additional semantic meaning to XBRL taxonomies by representing multi-dimensional reports programmatically.

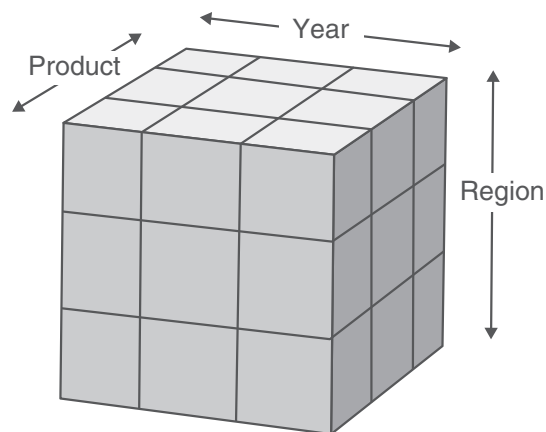
This is much more complicated than it sounds. Financial information is typically represented as structured data (e.g., in accounting software, databases, or spreadsheets) that is easily amenable to showing relationships in a multi-tiered tabular format and expresses and repurposes dimensional data (e.g., pivot tables in Microsoft Excel). For example, consider the spreadsheet data below:

Product	Region	2008	2007	2006
Apples	North America	3,416	2,995	2,255
	Europe	1,879	1,756	1,564
	Asia	4,871	4,752	4,422
Oranges	South America	2,516	2,345	2,451
	Europe	1,285	1,189	1,002
	Asia	2,399	2,230	2,166
Bananas	Australasia	1,289	1,223	1,175
	North America	5,784	5,542	5,499
	South America	2,956	2,875	2,744
	Europe	1,275	1,199	995
	Asia	3,342	1,286	2,045

The data is presented here organized by Product, but it could just as easily be organized by Region. XBRL Dimensions offers the possibility to report data in such a way that it has this kind of versatility using abstract building blocks such as hypercubes,

dimensions, domains, domain members, and primary items.

The visual representation below shows how our multidimensional spreadsheet data conforms to this model.



- **Hypercube** – is defined in the XBRL Dimensions specification as “an ordered list of dimensions, defined by a set of zero or more dimension declarations linked to the hypercube by hypercube-dimension relationships in a dimensional relationship set, and ordered according to the order of these relationships”. In plain English, a hypercube is a possible dimensional representation. For example, in our spreadsheet above, we may have two hyper-cubes, or representations of the data, “Product Name” and “Regional Location”.

- **Dimension** – is a manner in which data might be presented. For example, we have chosen to display the data above based on “Product”, but we could also have chosen to characterize it based on “Region”. Either of these are dimensions.
- **Domain** – refers to the categorization of XBRL data. In the example, both “Product” and “Region” are Domains.
- **Domain Member** – is a concept that is part of a domain. For example, “Apples” is a Domain Member in the “Product” Domain..
- **Primary Item** – is a simple concept, or item, defined in an XBRL schema that is part of a substitution group, and can therefore be represented in a multi-dimensional manner.

In his book, *Financial Reporting Using XBRL*, Charles Hoffman very concisely explains dimensional data in terms of a Microsoft® Excel® pivot table as follows:

“A hypercube is like the pivot table. The dimensions/domains are the things which are pivoted, and the primary items are the data which is being reported in the pivot table.”⁴

XBRL Dimensions enables software to consume and process dynamic associations, making automated multidimensional presentation possible for a more complete analysis.

⋮ Normalization

One of the greatest assets that XBRL brings to financial reporting is that it normalizes it through the application of a standard data format for electronic transmission. Of course, XML has a great capacity for creating industry standards and has been the language behind hundreds of commonly used vocabularies. But XBRL adds an enormous amount of functionality to XML with the addition of semantic validation through taxonomies.

In addition, normalization ensures that when data is imported into a spreadsheet, database, or any other format, it is already in the required format, and the various calculations and other relationships have been verified.

⁴ Financial Reporting Using XBRL Charles Hoffman, 2006

XBRL Instance Documents

XBRL instance documents contain the actual content that is being reported and are validated by XBRL taxonomies. They are inherently subject to the rules of the XML specification and the **XBRL instance schema** and can also be assigned any number of additional extended taxonomy documents for validation.

```
<usfr-pte:NetIncome decimals="-6" contextRef="P3MQ2FY2006" unitRef="USD">
188400000</usfr-pte:NetIncome>
<usfr-pte:NetIncome decimals="-6" contextRef="P3MQ2FY2007" unitRef="USD">
431200000</usfr-pte:NetIncome>
<usfr-pte:NetIncome decimals="-6" contextRef="P6MQ2FY2006" unitRef="USD">
214600000</usfr-pte:NetIncome>
<usfr-pte:NetIncome decimals="-6" contextRef="P6MQ2FY2007" unitRef="USD">
675200000</usfr-pte:NetIncome>
```

A snapshot of how Net Income might appear in an XBRL instance document

Instance documents contain the following general business reporting information based on the concepts defined in associated taxonomies:

- Business facts or measurements, abstract elements expressed as items and/or tuples
- Contexts, containing information about the entity being described
- Units, which specify the simple or complex numeric terms by which an item has been measured (e.g., Euros, kilograms, miles per hour)
- Footnotes, used to express irregular associations between elements

XBRL & Software Development

All of the power and functionality that XBRL brings to financial data is useless without XBRL-conformant tools to interpret and process this data. In fact, understanding the importance of tools for XBRL, the XBRL recommendation writes software vendors into its abstract:

“XBRL allows software vendors, programmers, intermediaries in the preparation and distribution process and end users who adopt it as a specification to enhance the creation, exchange, and comparison of business reporting information.”⁵

As such, XBRL development and data integration can be supported in a variety of different ways.

⁵ Extensible Business Reporting Language (XBRL) 2.1
<http://www.xbrl.org/Specification/XBRL-RECOMMENDATION-2003-12-31+Corrected-Errata-2008-07-02.htm>

The Altova MissionKit®

The Altova MissionKit suite is a set of tools designed to work together and help developers and business users master all aspects of XBRL development and data integration.

XBRL Taxonomy Creation

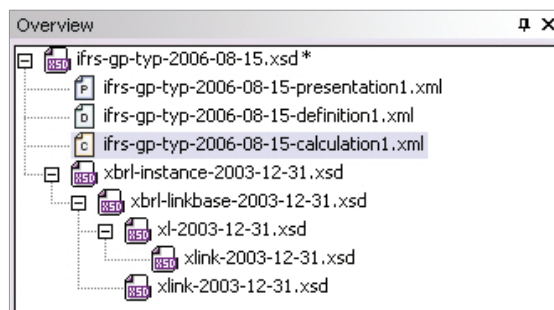
XBRL brings enormous opportunity for data integration to the financial community and provides a mechanism for creating extended taxonomies based on those that are already defined. This enables companies and other financial or government entities to build upon established XBRL frameworks without redefining their internal data infrastructure.

The [XBRL Web site](#) lists a number of public taxonomies that generally describe a particular standard or legislation. Extending these taxonomies enables organizations to create financial statements that are valid and/or compliant without any loss to the integrity of their data.

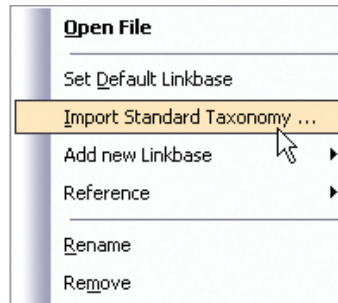
XBRL creation tools provide functionality for building XBRL taxonomies for organizations that need to augment base taxonomies (such as IFRS-GP and US-GAAP) to meet new compliance ordinances (rare) or specific internal reporting requirements. Extension taxonomies import a base taxonomy to serve as a starting point, and then can include, exclude, or change the information therein as needed to meet the reporting requirements of specific regions, jurisdictions, and/or industries, or customize the reporting to fit the particular needs of a company and their unique situation.

Altova XMLSpy®

Adding to its powerful functionality as an award-winning XML editor, XMLSpy now provides support for taxonomy creation with an integrated XBRL Taxonomy Editor.



The Taxonomy Editor adds a new XBRL view to XMLSpy, which includes an overview window where users can view their taxonomy files and easily open them for validation or editing.

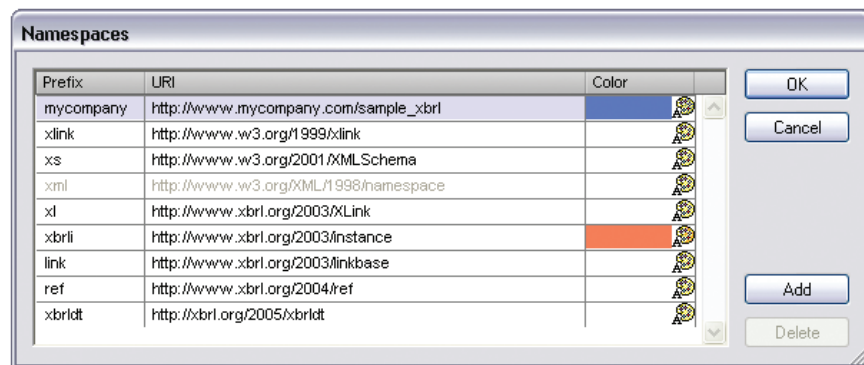


A context-sensitive right-click menu provides additional options for working with the files, including importing standard base taxonomies to extend.

The XMLSpy Taxonomy Editor gives XBRL users access the same powerful viewing and editing capabilities that are available for XML including Intelligent editing and entry helpers that guide data input based on the structural information provided in the XBRL instance and base taxonomies.

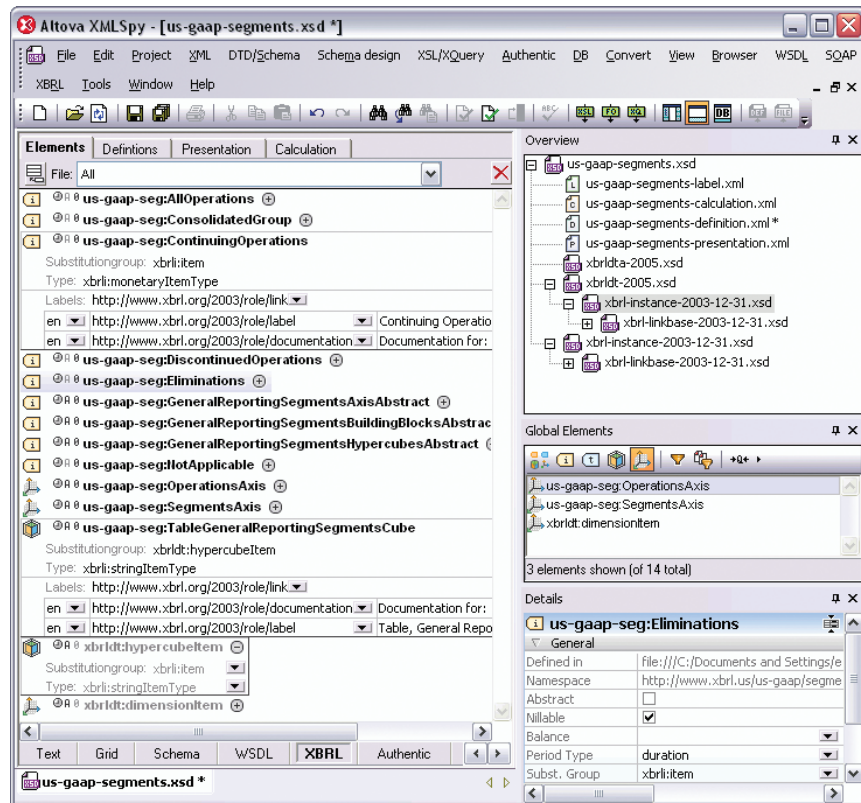
XMLSpy also includes a significant amount of XBRL-specific features that simplify the creation of complex extension taxonomies, including:

- **Namespaces dialog** – for creating and color-coding the numerous namespace references that define individual vocabularies used in XBRL documents.



- **Elements tab** – graphically displays information about taxonomy concepts including substitutionGroup, attributes, labels, and references. This gives users an overall view of the architecture of their taxonomy, incorporating the individual details from the taxonomy schema and linkbase files that give dimensionality and semantic meaning.
- **Relationships tabs** – three tabs are provided in the main window that display taxonomy relationships as defined in associated definition, presentation, and calculation linkbase files. This lets users edit concept relationships, or arcs, graphically with drag and drop functionality and entry helpers to simplify the creation complex dimensional taxonomies.

- **Details entry helper** – displays general information about selected taxonomy concepts including values for arcs, children, and their properties.



XBRL Validation

XBRL instance and taxonomy creation requires a tool that has the capacity to validate XBRL data. As noted earlier, because of the semantic meaning that XBRL adds to the XML specification, it is vital that any processing software can cater to this new functionality with an XBRL engine designed to meet these needs.

The XBRL recommendation builds a long list of features onto XML, a data format for defining markup vocabularies, and as such it is not sufficiently supported by general purpose XML tools. XBRL validation and intelligent editing requires an engine specifically built to handle advanced validation of the metadata, business rules, semantics, and the structural nuances of this complex reporting language.

⋮ Altova XMLSpy®

In addition to its powerful capabilities as a taxonomy creation and editing tool, XMLSpy can be used to validate both XBRL taxonomies and XBRL instance files to ensure truly accurate and compliant financial reporting. Standard XML editors are not sufficient for working with XBRL because they cannot process the normalization and semantic properties that XBRL adds to the XML specification. The added XBRL functionality in XMLSpy makes it the only fully featured XML editor on the market with the capacity to understand the multiple relations and content validation that makes XBRL such a powerful language for explicit and transparent financial reporting.

⋮ AltovaXML®

AltovaXML®, Altova's **free XML processor** that provides the validation component in XMLSpy, can also be used by developers as a standalone component or for integrating in enterprise XBRL reporting workflows. It also provides the validation component for all of the XML tools in the MissionKit, meaning that this capability also extends to MapForce and StyleVision.

XBRL Data Exchange/Integration

As a format for electronic transmission, XBRL data typically needs to be transformed from another storage format such as databases, Excel, accounting systems (ERP, etc.), or even XML. XBRL adoption gives companies the opportunity to introduce new efficiencies into their financial reporting workflow, preventing redundant tasks by automating data extraction and increasing accuracy through the validation of both syntax and semantics.

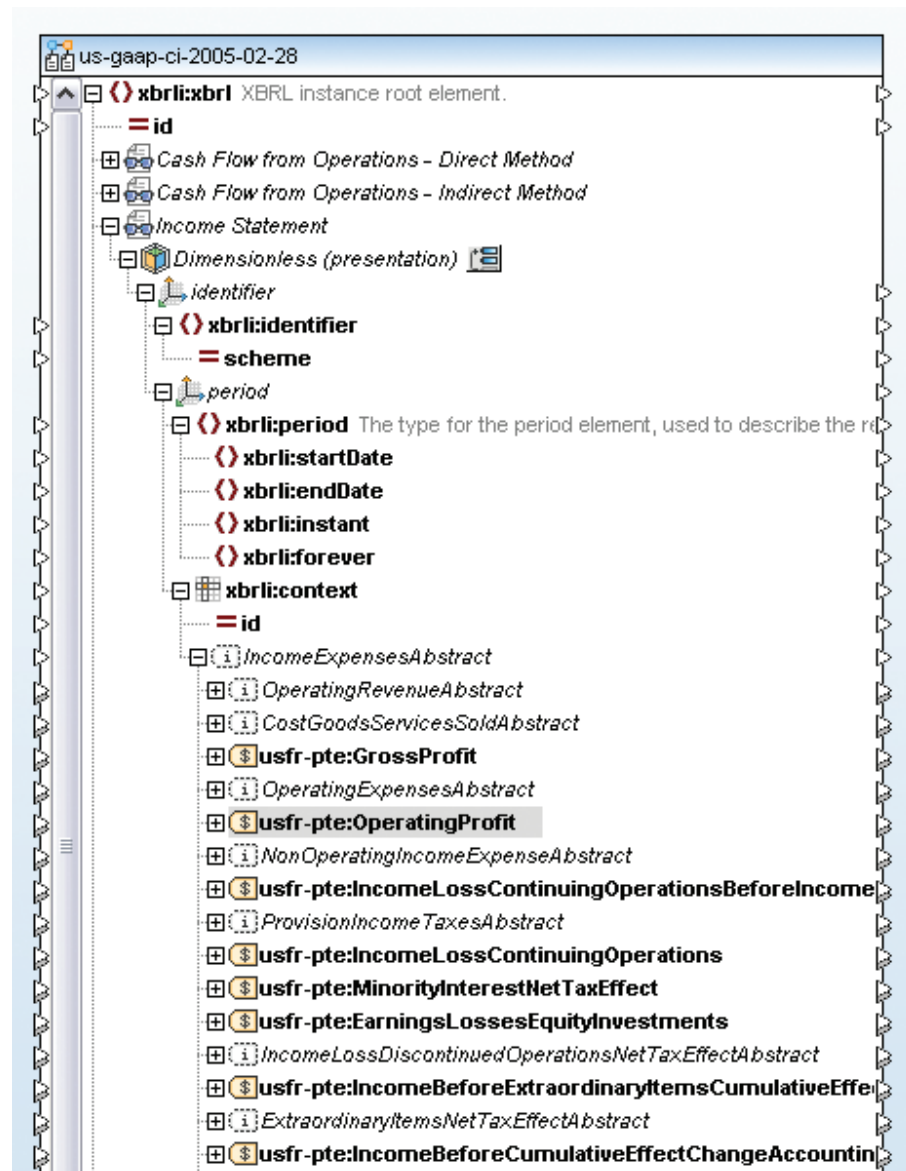
XBRL data integration tools facilitate the mapping and transformation of this data to XBRL for interactive financial reporting.

⋮ Altova MapForce®

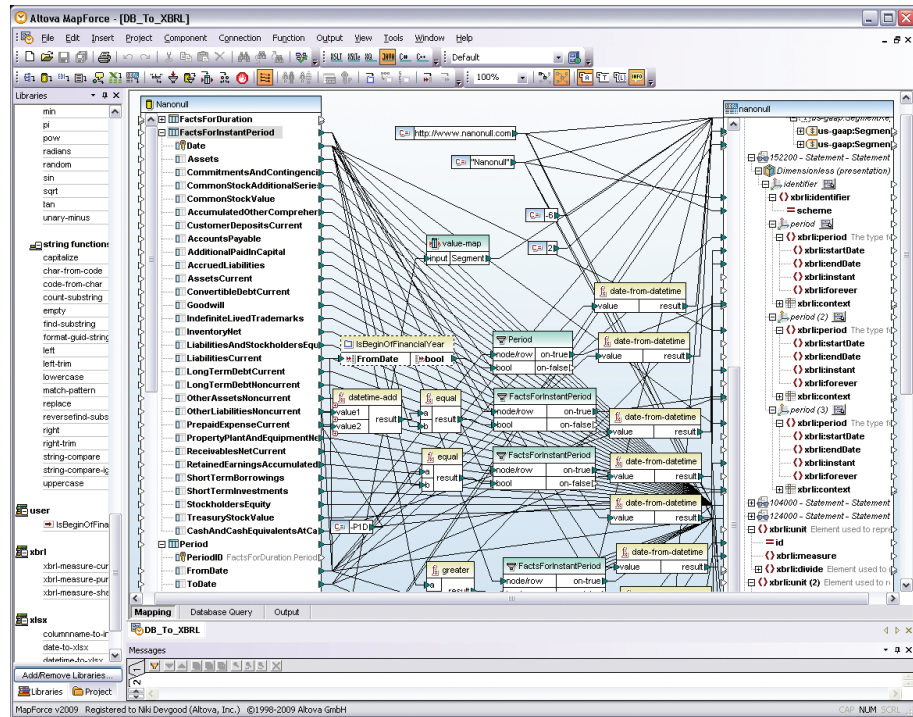
MapForce is an any-to-any graphical data mapping and integration tool with support for transforming XML, databases, flat files, EDI, Excel 2007, Web services, and now XBRL, into other data formats and/or structures. This enables XBRL users to extract data directly from backend systems and convert it into fully compliant XBRL instance documents, or transform XBRL data received for repurposing in any number of ways. These conver-

sions can be run on a one-time basis or automated through code generation in Java, C#, or C++. MapForce transformations can also be automated via the Command Line. This makes public financial data submission a repeatable and highly manageable process, allowing organizations to produce valid XBRL reports as required based on the variable data stored in accounting system fields.

XBRL taxonomies are inserted as the target or source of any mapping by referencing the taxonomy schema or an existing XBRL instance file. The XBRL component is represented in a hierarchical structure, clearly defining the root element, link roles, hypercubes, dimensions, context, concepts, and facts defined by the taxonomy.



Users can then use the graphical, drag-and-drop interface to map XBRL data to or from any other data format supported by MapForce (XML, databases, flat files, Excel 2007, Web services, and EDI).



Users can use MapForce's extensive data processing function library, value maps, filters, and constants to modify the data as needed to match the target format requirements.

In addition to giving users the ability to run one-time conversions based on graphical mapping designs, MapForce can autogenerate program code in Java, C#, or C++. This means that organizations can streamline tasks by automating their periodic financial reporting workflows. The generated code can be used to create and deploy automated transformations from accounting systems to XBRL, greatly reducing quarterly data preparation times. This enables companies to take full advantage of the efficiencies and money saving opportunities that XBRL and accounting automation provide. MapForce can also be automated through the command line.

XBRL Data Analysis

In addition to streamlining the processes behind creating financial reports and increasing data accuracy and transparency, XBRL is seen as leap forward in making financial data accessible for analysis. The meticulous tagging and preparation that goes into developing XBRL instance documents exposes it to targeted automatic extraction for analysis using standard tools like relational databases and Excel.

Altova MapForce®

Altova MapForce supports aggregating data from multiple sources, making it easy to simultaneously export data from multiple XBRL reports for analysis in any medium. Mapping data directly from its source format removes the need for re-keying and potential errors. Together, MapForce and XBRL enable the automation of the multi-dimensional financial analysis that organizations and stakeholders use to evaluate market, company, and industry performance on a regular basis.

XBRL Rendering

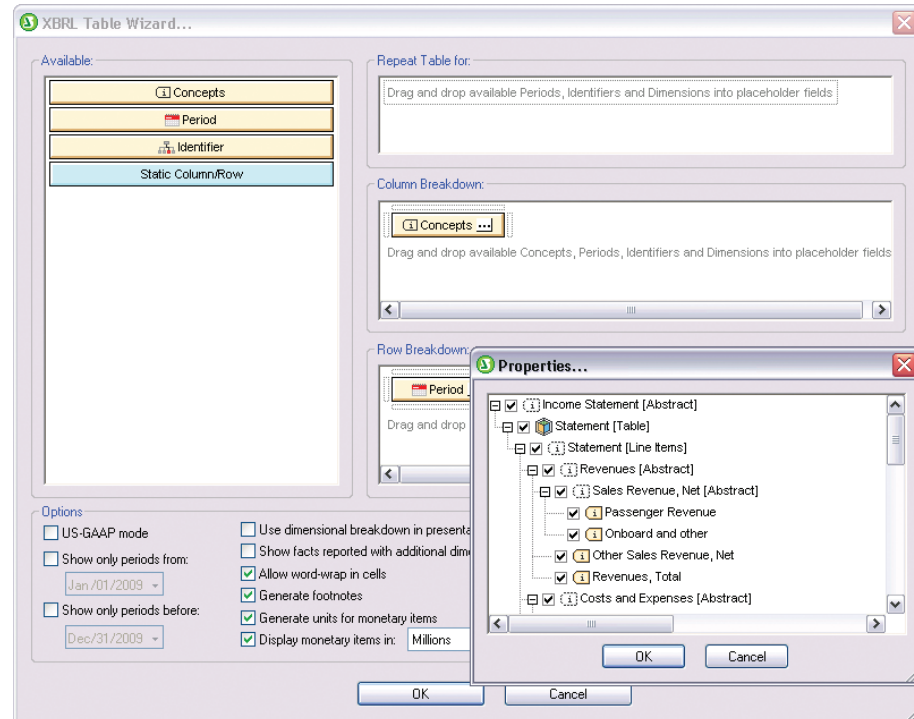
Because XBRL is based on XML, software tools have the capacity to render it in a variety of different presentation formats using XSLT stylesheets and XSL:FO. This gives organizations the ability to easily repurpose content for different audiences and display mediums without making any changes that would affect the integrity of the underlying data.

Stylesheets can be used to transform XBRL data into formats such as HTML, RTF, PDF, and Word 2007 (OOXML) for human analysis and interpretation. However, the XSL vocabulary was not created for XBRL and does not have the inherent capacity to understand the relationships that are represented in taxonomy documents. Because of this, XBRL stylesheets can be extremely complex, with separate template rules needed to represent each individual fact. Not only does this make XSL for XBRL very difficult to write by hand, it also highlights the need for an integrated XBRL processor for validating transformations.

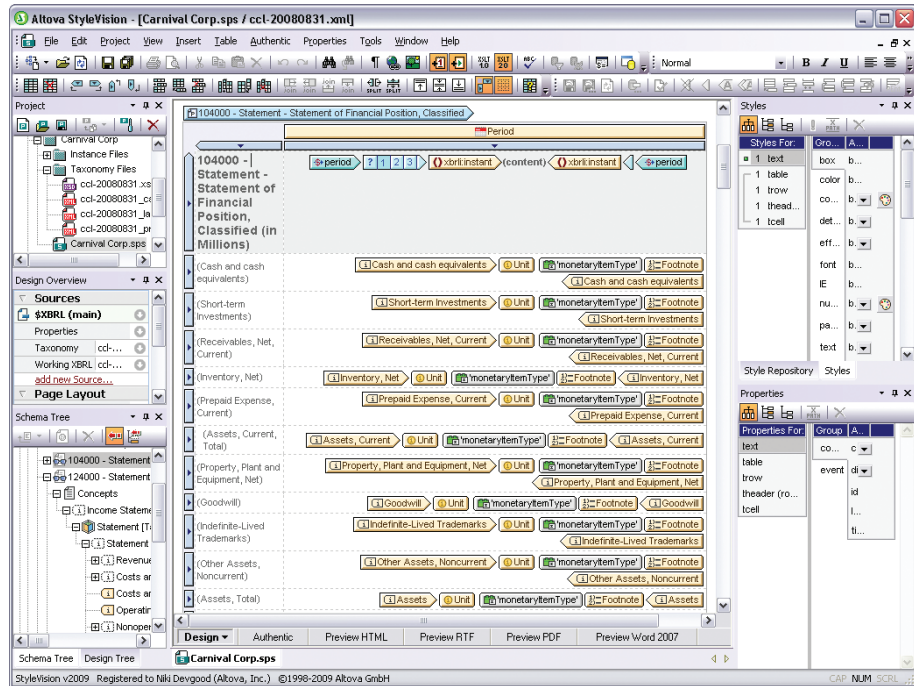
Altova StyleVision®

StyleVision is a graphical stylesheet designer and reporting tool for rendering output in HTML, RTF, PDF, and Word 2007 (OOXML) based on XML, databases, and now XBRL taxonomies.

To create a straightforward XBRL report, users simply drag and drop a taxonomy financial statement onto the design pane as an XBRL table and then use StyleVision's graphical interface to format stylesheets for simultaneous output in HTML, RTF, PDF, and Word 2007 (OOXML). The XBRL Table Wizard makes it easy to customize the table structure and specify the concepts to include in the report.



In the case of the US-GAAP taxonomy, which provides, in addition to the hierarchical organization in its presentation linkbase, some best practices information on how to structure XBRL instances, users can simply select US-GAAP mode (see above) to have StyleVision automatically output the data according to this information.



A sample XBRL instance file can be assigned to the taxonomy so that the progression of the design can be viewed on-the-fly by clicking the preview buttons at the bottom of the screen. Users can also view the corresponding XSLT 1.0, XSLT 2.0, or XSL:FO code that creates these renderings at any time.

Carnival Corp Quarterly Report

104000 - Statement - Statement of Financial Position, Classified (in Millions)	2006-11-30	2007-08-31	2007-11-30	2008-08-31
Cash and Cash Equivalents, at Carrying Value	\$ 1,163	\$ 1,412	\$ 943	\$ 792
Short-term Investments		\$ 341	\$ 17	\$ 9
Receivables, Net, Current		\$ 423	\$ 436	\$ 642
Inventory, Net		\$ 297	\$ 331	\$ 365
Prepaid Expense, Current		\$ 249	\$ 249	\$ 245
Assets, Current, Total		\$ 2,722	\$ 1,976	\$ 2,053
Property, Plant and Equipment, Net		\$ 25,134	\$ 26,639	\$ 27,735
Goodwill		\$ 3,356	\$ 3,610	\$ 3,500

Indefinite-Lived Trademarks	1	<?xml version="1.0" encoding="UTF-8"?>
Other Assets, Noncurrent	2	<!-- Designed and generated by Altova StyleVision Enterprise Edition 2009 - see http://
Assets, Total	3	<xsl:stylesheet version="2.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform" x
Short-term Borrowings	4	<xsl:output version="4.0" method="html" indent="no" encoding="UTF-8" use-charac
Long-term Debt, Current	5	<xsl:character-map name="spaces">
Convertible Debt, Current	6	<xsl:output-character character="#160;" string=" " />
Accounts Payable	7	</xsl:character-map>
Accrued Liabilities	8	<xsl:param name="SV_OutputFormat" select="HTML" />
Customer Deposits, Current	9	<xsl:variable name="XBRL" select="/" />
Liabilities, Current, Total	10	<xsl:import-schema schema-location="ccl-20080831.xsd" namespace="http://metr
Long-term Debt, Noncurrent	11	<xsl:function name="altova:distinct-nodes">
Other Liabilities, Noncurrent	12	<xsl:param name="Param1" />
Commitments and Contingencie	13	<xsl:sequence select="altovaext:distinct-nodes(\$Param1)" use-when="function
Common Stock, Value	14	<xsl:sequence select="\$Param1[fn:empty(for \$node in fn:subsequence(\$Param
Common Stock, Additional Seri	15	</xsl:function>
Additional Paid in Capital	16	<xsl:function name="altova:xbrl-footnotes">
Retained Earnings (Accumulat	17	<xsl:sequence select="altovaext:xbrl-footnotes" use-when="function-available(
Accumulated Other Compreher	18	<xsl:sequence select="()" use-when="not(function-available('altovaext:xbrl-foot
Treasury stock; 19 shares at 2	19	</xsl:function>
	20	<xsl:function name="altova:xbrl-labels">
	21	<xsl:sequence select="altovaext:xbrl-labels" use-when="function-available('ato
	22	<xsl:sequence select="()" use-when="not(function-available('altovaext:xbrl-labe
	23	</xsl:function>
	24	<xsl:variable name="altova:XBRL-xbrl-contexts" select="\$XBRL/xbrl:xbrl:cont

Partial rendering of the StyleVision XBRL design above rendered in HTML preview with the autogenerated XSLT code

The XSLT and XSL:FO-powered publishing templates autogenerated by StyleVision can be incorporated into highly automated financial reporting workflows to create a repeatable process. Because the overall structure of an organization's XBRL reports are likely to remain the same, financial statements can be automatically output in HTML, PDF, and Word at any time based on the original stylesheet design and the updated financial data. StyleVision gives XBRL users the ability to access the separation of structure and presentation that the XML specification provides.

XBRL Charting

Charts and graphs add significantly to the business intelligence and decision support potential that XBRL data inherently brings to the table.

Adding a visualization element to XBRL data makes it easier to analyze financial profitability, solvency, liquidity, and stability based on the many different dimensions already present in accounting numbers.

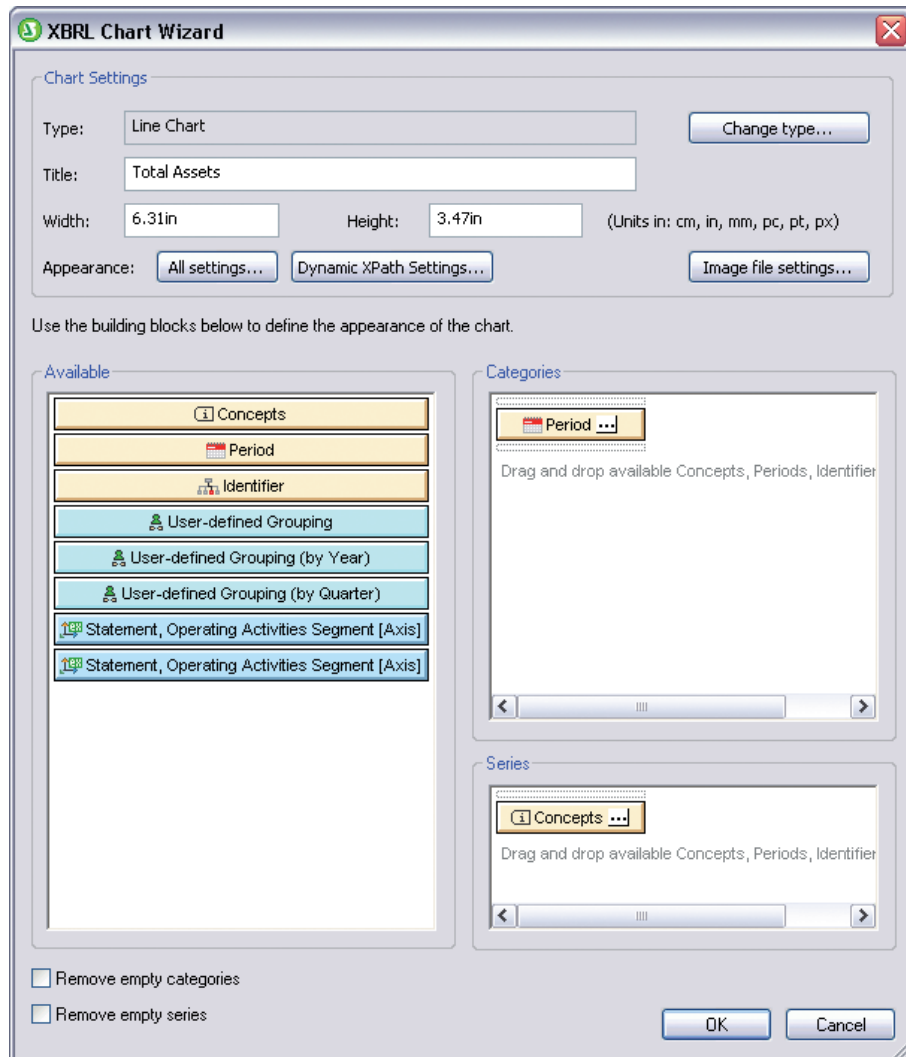
Altova StyleVision®

StyleVision supports chart generation for XBRL reports using a comprehensive wizard. This adds a visualization dimension that lends clarity and advanced presentation to financial and business data reports.

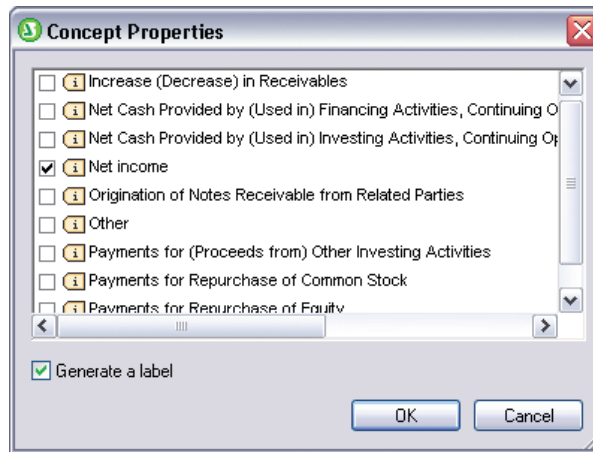
The following types of charts are available:

- 2D & 3D pie charts
- 2D & 3D bar charts
- Category line graphs
- Value line graphs
- Gauge charts

To create an XBRL chart, users simply drag a financial statement or other parent node to the StyleVision design pane and choose Create XBRL Chart to start the XBRL Chart Wizard.



Data rendered in charts is easily customized by selecting the desired category or series values (Concept and Period are default) in the properties dialogs. The screenshot below shows the Concept Properties dialog, where users select the XBRL concepts they wish to render in their charts.



The Period Properties dialog gives options on how to handle XBRL periods, which convey the relevant instant or intervals of time for XBRL reporting.

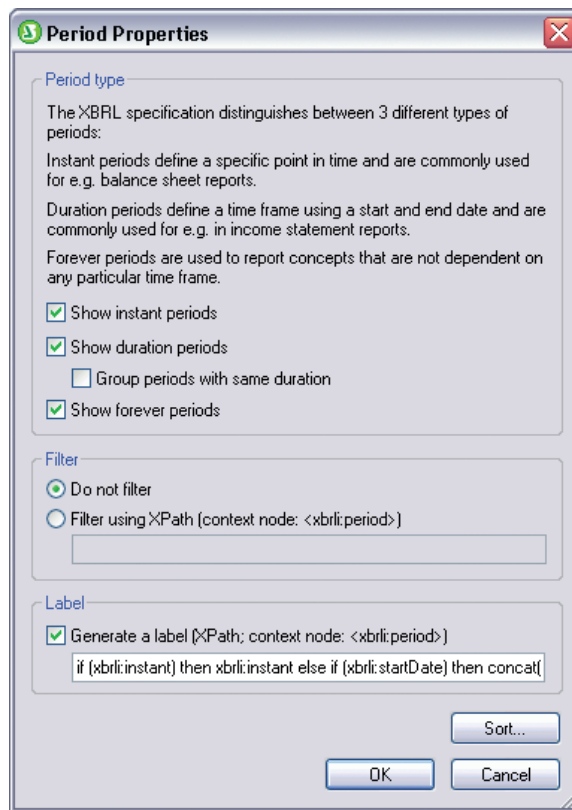
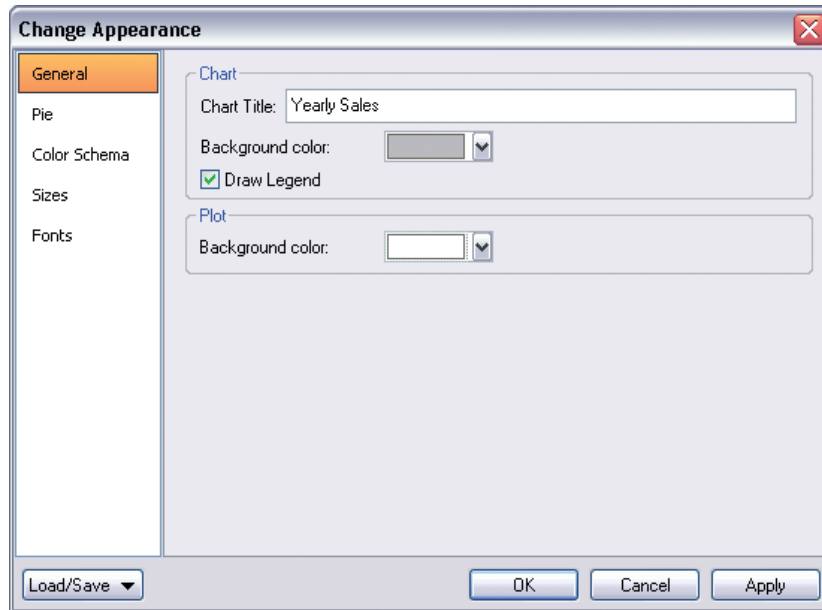


Chart styles and properties can be controlled using the All settings button in the Chart Wizard and/or by using the StyleVision entry helper windows, where chart type, background color, fonts, alignment, etc. can be selected.

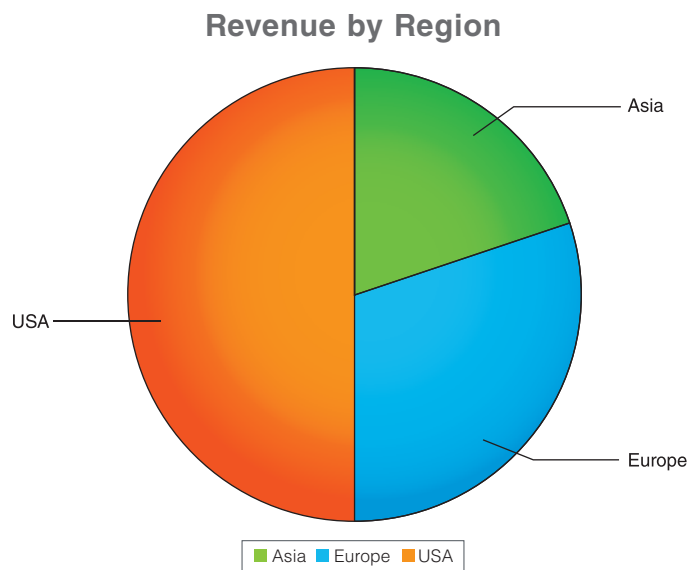


The example below shows XBRL data presented in tabular form and the same data presented as a chart in HTML. This report can also be instantly rendered in RTF, PDF, or Word 2007+ simply by clicking on the relevant output preview button.

Disclosure - Segment Revenue and Operating Income

0066091 - Disclosure - Segment Revenue and Operating Income (Monetary items shown in Millions)	+	x	x	x
	Asia	Europe	USA	
Segment Reporting Information, Revenue	\$ 1,135.4	\$ 1,701.6	\$ 2,836	

Revenue by Region (9 months ended 2008-08-31)



Conclusions

XBRL gives technical professionals across any industry enormous opportunities for creating fully scalable integrated solutions for financial reporting and analysis to make this data available in real-time to reporting entities, stockholders, trading partners, subsidiaries and parent companies, and internally within organizations.

XBRL adds a dynamic layer to business intelligence, transforming financial data into a reusable XML-based format that is readily consumed and processed by most enterprise infrastructure, making it ideal for repurposing far beyond financial statement submissions to other compliance requirements like Basel II, and beyond.

The Altova MissionKit can help companies to take full advantage of XBRL and automate the way financial data is captured, shared, reported, and analyzed. Altova has a strong history as the leading provider of XML editing and development tools, making XBRL support a logical and powerful addition to its tool suite, which is known for combining true development functionality with easy-to-use graphical interfaces.

As the XBRL standard evolves over time and expands to embrace new supporting technologies, the MissionKit tools are well positioned to meet these challenges with strong support for Service-oriented Architecture (SOA), Web services, XML document management and analysis, and the Semantic Web.

Additional Resources

- Extensible Business Reporting Language (XBRL) 2.1
<http://www.xbrl.org/Specification/XBRL-RECOMMENDATION-2003-12-31+Corrected-Errata-2008-07-02.htm>
- XBRL Dimensions 1.0
<http://www.xbrl.org/Specification/XDT-REC-2006-09-18.htm>
- XLink 1.0 <http://www.w3.org/TR/xlink/>
- XBRL Taxonomies <http://www.xbrl.org/Taxonomies/>
- XBRL Glossary <http://www.iasb.org/XBRL/Resources/Glossary.htm>
- XBRL Technical Index <http://www.xbrl.org/TechIndex/>
- Interactive Data Viewers (from the SEC) <http://www.sec.gov/xbrl>
- IFRS Taxonomy Viewers
<http://xbrl.iasb.org/xbev/viewer/presentation/index.html>
- XBRL Resources (from EDGAROnline)
<http://www.edgar-online.com/technology/xbrl.aspx>
- Sample Use Cases
<http://xbrl.squarespace.com/journal/2008/4/18/some-great-examples-of-xbrl.html>



FREE Online Training

<http://www.altova.com/aot/online-training.aspx>

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