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INTEGRATING FINANCIAL REPORTING SYSTEMS WITH XBRL

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Abstract

To integrate financial reporting systems over the Internet and between applications, XBRL.org is developing a framework termed eXtensible Business Reporting Language (XBRL). The objective of XBRL is to create, exchange, and analyze financial reporting information throughout the financial information supply chain. XBRL is based on Extensible Markup Language (XML), the World Wide Web Consortium data standard that defines a platform-independent way to represent data and complex documents. XBRL allows the automatic exchange and reliable extraction of financial information over the Internet and among applications and hence, ensures the relevance and reliability of financial reporting. The result should lead to enhance decision-making, lower information cost, and better allocation of resources for the economy, in general.

Keywords: XBRL, XML, integration, financial reporting

Introduction

Despite of the recent demise of many dot-com companies, e-commerce is here to stay. The Internet offers firms new channels for providing goods, services, and information to consumers and business partners. E-commerce is in its infancy and its business models and standards are evolving in response to the rapidly changing business and technological environment. One major issue faced by IT departments and developers is the integration of all the Internet-based products, services and systems including financial reporting systems.

Extensible Markup Language (XML) is the World Wide Web Consortium (W3C) data standard that defines a platform-independent way to represent data and complex documents that are transmitted over the Internet and between applications. Surveys have shown that an increasing number of businesses are using XML-based applications to exchange data and information internally as well as with their business partners and customers.

The XML standard itself describes how to create the markup tags and the benefits of using them to describe data. However, individual designers must decide on how to name their tags and how to format information so that it can be processed. These descriptions form the schema of the data structure and can be shared among applications. Many industry groups have provided standard definitions or schema for detailed data, information, and business terms.

In April 2000, the American Institute of Certified Public Accountants (AICPA) and over thirty companies announced the development of an XML-based specification termed eXtensible Business Reporting Language (XBRL). The objective of XBRL is to create, exchange, and analyze business reporting information throughout the financial information supply chain. The purpose of this effort is to examine XBRL and its potential as well as to demonstrate how to generate XBRL documents. Section one of the paper briefly describes XML. Section two examines XBRL and demonstrates how an XBRL instance document is generated based XBRL taxonomy. Section three explores the potential of XBRL in financial reporting and analysis.

What is XML?

Prior to the advent of XML, the Web did not have a standard data interchange format for complex data and documents. XML is the W3C data standard that defines a platform-independent way to represent data and documents. As with HTML, data of a web page is identified using tags. HTML provides standards for data representation but not for data management. XML is

extensible in that it can be used both to display instructions and to describe the content of any file type including web pages, spreadsheets, database files, financial data and documents, and graphics.

As mentioned at the outset, the XML standard itself only describes how to create the markup tags. Individual designers have to define their tags and format information to be processed. These definitions form the schema of the data structure and can be shared among applications. An example of a schema used to describe a customer for a business entity is presented in Figure 1. This schema defines elements and their corresponding data types for customers. The element "customer" is

```
<?xml version="1.0" ?>
<Schema
  name="customer.xml" xmlns="urn:schemas-microsoft-com:xml-data"
  xmlns:dt="urn:schemas-microsoft-com:datatypes">
  <ElementType name = "customerID">
    <datatype dt:type="string" />
  </ElementType>
  <ElementType name = "customerName">
    <datatype dt:type="string" />
  </ElementType>
  <ElementType name = "address">
    <datatype dt:type="string" />
  </ElementType>
  <ElementType name = "telephone">
    <datatype dt:type="string" />
  </ElementType>
  <ElementType name = "customer">
    <element type="customerID" />
    <element type="customerName" />
    <element type="address" />
    <element type="telephone" />
  </ElementType>
</Schema>
```

Figure 1. XML Schema for Customer

composed of "customerID", "customerName", "address" and "telephone" elements. The data type for "customerName" is string. Based on the schema, an instance of a customer as shown in Figure 2 is created. The customer's ID is "1111", name is "Mary Smith", address is "1000 E. Victoria Carson CA 90747" and phone number is "310-243-3579".

```
<customer>
  <customerID> 1111 </customerID>
  <customerName> Mary Smith </customerName>
  <address> 1000 E. Victoria, Carson CA 90747 </address>
  <telephone>3102433579</telephone>
</customer>
```

Figure2. XML Structured Data for Customer

In the same way that a record structure contains fields, XML designers are free to use any XML tags that are required for their applications. If XML tags are adopted throughout an organization's intranet as well as among its trading partners, all parties involved must agree on the tag names of the schema. XML is flexible enough to be all-inclusive. However, industry groups must agree on standard definitions and schema for detailed data, information, and business terms. To date, many vertically-integrated industries have developed XML-based specifications for data exchange. Examples include FinXML for finance, adXML for advertising, cmdXML for construction, manufacturing, and distribution, and XBRL for financial reporting.

XBRL and XBRL Documents

One problem with generating financial reports on the Internet is integrating data from different financial reporting systems as well as from other data sources. Prior to XBRL, there was no generally accepted format for business reporting data. Data must be either re-entered from one application onto another application for interpretation or copied and pasted between applications. XBRL solves this problem by allowing data to be created only once and distributed throughout the financial information supply chain. The financial information supply chain consists of preparers of financial information, intermediaries in the preparation and distribution of financial information, users of financial information as well as the software vendors for the process. XBRL is still evolving and over eighty leading companies including Andersen, Deloitte & Touche, Edgar Online, Ernst & Young, Great Plain, Microsoft, and PricewaterhouseCoopers are involved in the development and promotion of XBRL. Although the AICPA first used the XML standard to create a prototype set of financial statements, XBRL.org is now in charge of the development of XBRL.

Simply stated XBRL is a framework that will allow the financial community a standards-based method to prepare, publish in a variety of formats, exchange and analyze financial reports and the information they contain. It will also permit the automatic exchange and reliable extraction of financial information among various software applications.

The main concepts in the XBRL framework are items, groups, elements, and taxonomies. An item is related to a fact that is to be reported. An XBRL item can be embedded in any document transmitted over the Internet and between applications. A group is a set of related items. A taxonomy element corresponds to an element within an XML Schema. In short, XBRL taxonomy is an XML Schema that contains accounting, financial, and business reporting extensions. An important taxonomy consists of elements that correspond to well-defined concepts in the US General Accepted Accounting Principles (GAAP) when the principles are applied to Commercial and Industrial (CI) companies. CI taxonomy is used to represent the financial statements issued by a publicly traded entity.

```
<?xml version="1.0" >
<schema xmlns="http://www.w3.org/1999/XMLSchema" xmlns:html = "http://www.w3.org/1999/xhtml"
  xmlns:xbrl="http://www.xbrl.org/core/2000-07-31/metamodel"
  targetNamespace="http://www.xbrl.org/us/gaap/ci/2000-07-31">
  <import namespace="http://www.xbrl.org/core/2000-07-31/metamodel"
schemaLocation="http://www.xbrl.org/core/2000-07-31/xbrl-meta-2000-07-31.xsd" />
  <element name="statements" type="string">
  </element>
  <element name="statements.incomeStatement" type="string">
  </element>
  <element name="operatingProfit.grossProfit" type="xbrl:monetary">
  <annotation>
  <appinfo>
  <xbrl:rollup to="incomeBeforeTaxesAcctingChangesExtraordinaryItems.operatingProfit" />
  <xbrl:label xml:lang="en">Gross Profit</xbrl:label>
  </appinfo>
  </annotation>
  </element>
  <element name="operatingProfit.operatingExpenses" type="xbrl:monetary"> </element>
  <element name="incomeFromContinuingOperations.incomeTaxes" type="xbrl:monetary"> </element>
</schema>
```

Figure 3. CI Taxonomy

```

<!-- Income Statement Report Header -->
http://www.xbrl.org/us/gaap/ci/2000-07-31/Sample/ <group type="ci:statements.incomeStatement">
  <csh:statementInformation>
    <csh:companyName>Ace Incorporated</csh:companyName>
    <csh:statementTitle>Consolidated Statement of Income</csh:statementTitle>
    <csh:columnGroups>
      <csh:columnGroup span="2">Year Ended December 31,</csh:columnGroup>
    </csh:columnGroups>
    <csh:columnHeaders>
      <csh:columnHeader width="200" />
      <csh:columnHeader width="100">2000</csh:columnHeader>
      <csh:columnHeader width="100">1999</csh:columnHeader>
    </csh:columnHeaders>
  </csh:statementInformation>
  <!-- Revenues -->
  <group type="ci:grossProfit.salesRevenueNet">
    <label href="xpointer(..)" xml:lang="en">Revenues</label>
    <item id="IS-001" period="P1Y/2000-12-31">100000</item>
    <item id="IS-002" period="P1Y/1999-12-31">84000</item>
  </group>
  <!-- Cost of Revenues -->
  <group type="ci:grossProfit.costOfGoodsAndServicesSold">
    <label href="xpointer(..)" xml:lang="en">Cost of Revenues</label>
    <item id="IS-03" period="P1Y/2000-12-31">70000</item>
    <item id="IS-04" period="P1Y/1999-12-31">56000</item>
  </group>
  <!-- Gross profit -->
  <group type="ci:operatingProfit.grossProfit">
    <label href="xpointer(..)" xml:lang="en">Gross profit</label>
    <item id="IS-05" period="P1Y/2000-12-31">30000</item>
    <item id="IS-06" period="P1Y/1999-12-31">28000</item>
  </group>
  <!-- Operating expenses -->
  <group type="ci:operatingProfit.operatingExpenses">
    <label href="xpointer(..)" xml:lang="en">Total operating expenses</label>
    <item id="IS-07" period="P1Y/2000-12-31">21000</item>
    <item id="IS-08" period="P1Y/1999-12-31">20000</item>
  </group>
  <!-- Income before income taxes -->
  <group type="ci:incomeFromContinuingOperations.incomeBeforeTaxesAcctingChangesExtraordinaryItems">
    <label href="xpointer(..)" xml:lang="en">Income before income taxes</label>
    <item id="IS-09" period="P1Y/2000-12-31">9000</item>
    <item id="IS-010" period="P1Y/1999-12-31">8000</item>
  </group>
  <group type="ci:incomeFromContinuingOperations.incomeTaxes">
    <label href="xpointer(..)" xml:lang="en">Income tax provision</label>
    <item id="IS-011" period="P1Y/2000-12-31">4000</item>
    <item id="IS-012" period="P1Y/1999-12-31">3400</item>
  </group>
  <group type="ci:incomeStatement.netIncomeAvailableToCommon">
    <label href="xpointer(..)" xml:lang="en">Net income</label>
    <item id="IS-013" period="P1Y/2000-12-31">5000</item>
    <item id="IS-014" period="P1Y/1999-12-31">4600</item>
  </group>
  <!-- Income (loss) per share -->
  <group type="ci:incomeStatement.earningsPerShareInformation">
    <csh:label>Income (loss) per share:</csh:label>
    <group type="ci:earningsPerShare.basicEarningsPerShare">
      <label href="xpointer(..)" xml:lang="en">Basic</label>
      <item id="IS-015" period="P1Y/2000-12-31" scaleFactor="0">1.00</item>
      <item id="IS-016" period="P1Y/1999-12-31" scaleFactor="0">0.92</item>
    </group>
  </group>
</group>

```

Figure 4. An XBRL Instance

XBRL has two types of documents, an XBRL instance document that contains data and XBRL taxonomy documents that contain data dictionary. XBRL taxonomy is an XML schema that defines an element that can be referenced in an XBRL instance document. Although an XBRL instance document can contain items that refer to any number of taxonomies, in this paper an XBRL instance is created using only CI taxonomy. Figure 3 gives a sample of elements from CI taxonomy. The root element of CI taxonomy is the "statements" element. Elements presented in Figure 3 include "statements", "statements.incomeStatement", "operatingProfit.grossProfit", "operatingProfit.operatingExpenses", and "incomeFromContinuingOperations.incomeTaxes" elements. Annotation tags are omitted except for the "operatingProfit.grossProfit" element. Similar to XML Schema, the data type for each element is defined. For example, the data type for "statements.incomeStatement" is a string and the data type for "operatingProfit.grossProfit" is `xbrl:monetary`, currency type for XBRL. Some elements are rolled up to other elements. For example, "operatingProfit.grossProfit" is rolled up to "incomeBeforeTaxesAcctingChangesExtraordinaryItems.operatingProfit" as stated in the annotation tags. Figure 4 presents an XBRL instance for the income statement of ACE Incorporated. CI taxonomy is used to prepare this XBRL instance.

The group type for income statement is "ci:statements.incomeStatement". Income Statement Report Header defines ACE's income statement's report headings and column headings. Then, items on the income statement in Figure 5 are presented using CI Taxonomy. For example, "ci:grossProfit.salesRevenueNet" is used for "revenues". Item ID in the Income Statement (IS) for revenues in 2000 is 01 and for revenues in 1999 is 02. Language used is English (EN). Revenues for 2000 is \$100,000 and for 1999 is \$84,000 as shown in Figure 5.

ACE Incorporated		
Consolidated Statement of Income		
	<u>Year Ended December 31</u>	
	<u>2000</u>	<u>1999</u>
Revenues	\$100,000	\$84,000
Cost of Revenues	(70,000)	(56,000)
Gross Profit	30,000	28,000
Operating Expense	(21,000)	(20,000)
Income Before Taxes	9,000	8,000
Income Tax Provision	(4,000)	(3,400)
Net Income	\$5,000	\$4,600
Income Per Share	<u>\$1.00</u>	<u>\$0.92</u>

Figure 5. Income Statement for ACE Incorporated

Potential of XBRL for the Corporate and Investment Communities

XBRL promises to provide a variety of benefits for the corporate and investment communities. XBRL has the potential to revolutionize investment analysis for investors and professionals alike by allowing easy integration of financial reporting systems. XBRL for financial statements will allow individual investors and professionals to extract data from 10K's, 8K's and 10Q's into Web-based tools that can help them analyze comparable companies. Others who will benefit from the standardization and integration that XBRL provides include preparers of statements, analysts, investors, regulators, financial publishers and aggregators, as well as independent software vendors. The AICPA has taken the lead in developing, coordinating, and promoting the use of XBRL. Being a dominant organization in financial reporting the AICPA efforts are likely to lead to rapid acceptance of XBRL by financial communities.

XBRL.org lists several specific potential XBRL applications. XBRL for Financial Statements can be used to exchange all kinds of financial information. XBRL for Taxes can be used for filing tax returns and exchange information about items on tax returns. XBRL for Regulatory Filings can be used for filings required by government and regulatory bodies. XBRL for Accounting and Business Reports, such as income statement in Figure 4, can be used to create all the reports generated by an accounting information system and make them re-usable. Finally, XBRL for Authoritative Literature can be used to describe accounting related authoritative literature published by the AICPA, FASB, and others to make using these resources easier.

Final Thoughts

According to the Financial Accounting Standards Board's Conceptual Framework the primary objective of financial reporting is decision usefulness. Financial statements and related disclosures make a difference in the decision processes of the two primary users – investors and creditors. To accomplish this objective financial reporting must possess both relevance and reliability. To be relevant financial reporting must be timely and help users make and confirm predictions. To be reliable financial reporting must be verifiable, reasonably free from bias, and faithfully represent economic events.

XBRL allows the automatic exchange and reliable extraction of financial information over the Internet and among applications, and hence, ensures the relevance and reliability of financial reporting. Therefore, XBRL makes financial reporting more decision useful for investors and creditors throughout the financial information supply chain. The result should lead to enhance decision-making, lower information cost, and better allocation of resources for the economy, in general

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