2.6. The Realities of Business Reporting... er... Information Exchange

XBRL isn't just about business reporting. Fundamentally, a business report's purpose is to exchange information, but you're not limited to using business reports for that exchange. The point is, you need to look at business information exchange, which business reporting is a part of.

The world that business operates in today is different than the world businesses operated in yesterday. Tomorrow's business environment will be different than today. The business-information-exchange environment is likewise different.

The creators of XBRL needed to make guesses about the future and give consideration to the past. The following sections discuss premises about the future that the XBRL creators were working under.

2.6.1. Paper has its advantages, as does digital

Paper is a convenient way to express many types of information. It's simple, it's flexible, and it's a blank slate. But paper also has its disadvantages:

- **Paper is physical.** Paper must be physically transferred from one place to another in order to be used by multiple parties. Copiers and fax machines made the process of multiple people using the same document simultaneously easier.

- **Paper is two dimensional.** Paper has only two dimensions, whereas business information can have more than two dimensions. Approaches to accommodating three dimensions — say, by repeating information and locking down specific dimensions — do work. However, as the number of dimensions increase, so do the challenges of expressing the information on this two-dimensional medium. For example, expressing sales by period, by business segment, by geographic area, by product, or by sales person is possible on paper. However, electronic pivot tables make working with the information much easier.

- **Paper is static.** After you get information on the paper, it's fixed, and you can't change it because the formatting of the information and the information itself are so tightly bound together.

- **Paper has limited richness.** You can put only certain things on paper. For example, you can't put video on paper.

Electronic "paper" formats (meaning HTML, PDF, word-processing documents, and many spreadsheets) are a little better than the "dead-tree" format of a physical piece of paper. You can create multiple copies using digital paper, and you can transfer it over the Web, but electronic paper is two-dimensional and static and has limited richness.

Why stick with paper (the dead-tree type or the electronic type) if other potentially better options are out there? What if we could have more than two dimensions to work with, and they were more dynamic and offered better richness?

New technologies help us visualize the vast quantities of information we have to work with today, quantities that will be even greater tomorrow. We have all heard the phrase "A picture is worth a thousand words." Visualizations can be worth a thousand pictures. For an example, check out the Moritz Stefaner Web site at http://moritz.stefaner.eu/projects/relatio-browser. Moritz Stefaner calls itself an "information aesthetics" company. At its Web site, you can read about a radial browser the company has created to "display complex concept network structures in a snappy and intuitive manner." Moritz Stefaner has created a demo of this browser that illustrates countries and geographical features from the CIA's The World Factbook (see Figure 2-1).
2.6.2. Information needs to be portable

To effectively reuse information, the information needs to have context. Simply exchanging data between business systems doesn't automate processes. Although the business system that generates the data understands the context of the generated information, if the receiving system doesn't understand that context, the data isn't reusable. To help drive home this point, a popular view of what is called the knowledge continuum can help you understand the differences between data, information, knowledge, and wisdom:

- **Data** is a piece or a set of measurable or observable value(s). Data is a set of raw facts, such as a list of names and associated addresses or the zip code 98406.

- **Information** is data in some context, and it's usually filtered from the complete set of all data. Information helps you understand; it informs. For example, all the customer names and addresses in your accounting system are information; the information has context because you realize that the addresses are for customers and not for suppliers.

- **Knowledge** is information that you can apply to solve a problem. For example, using the zip code of the customer addresses in your accounting system to find all the customers in a specific area provides you with knowledge.

- **Wisdom** is the application of knowledge to arrive at a decision, usually when you have multiple options. For example, using the zip code from your customer address list and knowledge of traffic patterns helps you plan where to open additional stores.

**NOTE**

What constitutes data and what constitutes information may not seem that different, but they are. Information provides context that allows one data value to be understood in the context of other data values. In data exchanges, the contextual information is stripped from the data so that a receiving system doesn't have the required context to use the information in automated computer processes. Humans are required to reconstitute the information. Again, keep in mind that we're talking about dumb computers exchanging information, not smart humans who can look at the data and properly imply certain things. In most cases, computers simply...
aren't capable of correctly implying context; they do far better if given the proper context explicitly.

NOTE

You can't realize the knowledge and wisdom until you correctly contend with data and information. More importantly, you can't just leap from data to knowledge. You have to grab hold of certain rungs as you try to climb to the higher levels. To exchange information effectively and make it portable between your business systems, you must exchange **information**, not data.

2.6.3. Syntax is not enough

Structured information has two parts: syntax and semantics. Both are important, but for different reasons:

- **Syntax**: The syntax of a language describes the valid form that information may take. For example, this valid fragment of XML

  ```xml
  <Name>John Doe</Name>
  ```

  doesn't give any indication of its significance or correct usage.

- **Semantics**: The semantics communicates the meaning of the information. For example, "the balance sheet must balance" or "Assets = Liabilities + Equity" is meaning.

Suppose that one business system sent another business system balance sheet information, and the balance sheet didn't balance. (Don't laugh: In Chapter 1, we discuss how financial institutions made 18,000 errors in their submissions to the FDIC.) For automated information exchanges to work, the meaning of the information must be correctly expressed during creation and correctly interpreted during receipt. This meaning, such as "the balance sheet must balance," is critical to creating reliable automated information exchange processes because it's the meaning that keeps garbage out of the information being exchanged.

NOTE

When we talk about structured information, we mean information structured for **meaning** like XBRL, not information structured for **presentation** like what you'd see on an HTML Web page. There is a big difference between `<bold>1000</bold>` and `<Sales>1000</Sales>` (see Chapter 21).

2.6.4. You need to be explicit

Suppose that you received a piece of paper bearing the information in Figure 2-2. Could you understand that information well enough to effectively rekey that information into, say, a spreadsheet and compare the information with the same information received from ten other companies?

**Figure 2.2. Humans can understand the organization of information in this form.**

<table>
<thead>
<tr>
<th>Example Company</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>As of December 31, (Thousands of Dollars)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2007</td>
<td>2006</td>
</tr>
<tr>
<td><strong>Breakdown of Property, Plant and Equipment, Net:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land</td>
<td>5,347</td>
<td>1,147</td>
</tr>
<tr>
<td>Buildings, Net</td>
<td>244,508</td>
<td>366,375</td>
</tr>
<tr>
<td>Furniture and Fixtures, Net</td>
<td>34,457</td>
<td>34,457</td>
</tr>
<tr>
<td>Computer Equipment, Net</td>
<td>4,189</td>
<td>5,313</td>
</tr>
<tr>
<td>Other Property, Plant and Equipment, Net</td>
<td>6,702</td>
<td>6,149</td>
</tr>
<tr>
<td>Property, Plant and Equipment, Net, Total</td>
<td>295,183</td>
<td>413,441</td>
</tr>
</tbody>
</table>
Sure, you could. You’d realize that all the information relates to the company Example Company because it says so on the top of the page. You know that you need to take the numbers and multiply them by 1,000, because it says that the report is showing the information in "thousands of dollars." You know that the two columns of numbers add up because of the single underscore above and the double underscore below the total.

A computer, on the other hand, can't read that printout and imply what a human would be able to imply. All this information must be communicated explicitly.

Seems like a lot of work, being explicit and all, and it is. But it’s more work to express the information implicitly and even more work to verify the implicit information is accurately articulated by manually adding up all the numbers printed on the piece of paper.

Why should humans do this? Besides, humans aren't very good at repetitive actions such as this task; they make mistakes. But computers are very good at doing the same repetitive thing over and over and over. They run into problems only when they run into something new that they don’t know how to handle.

Being explicit makes information actionable. You can receive information without prior knowledge of the information, without human intervention, and without custom coding of software applications and get a computer system to do the right thing with that information.

2.6.5. Specialized business systems are growing

The number of specialized business systems we use is growing. Here are a few examples:

- Databases, data warehouses, data marts, and even spreadsheets
- Business-intelligence systems
- Content-management systems
- Knowledge-management systems
- Enterprise Resource Planning (ERP) systems
- Web services interfaces to these and other systems

Because of the ubiquitous, cheap connectivity offered by the Web, more and more systems, be they your internal systems or external systems of your business partners, can and will need to be integrated. Business users need simple approaches to achieve this integration. Each report is a business user exchanging information with another business user for some purpose.

2.6.6. Keep business rules separate

*Metadata* is information that describes or classifies other information. Business rules are a type of metadata: a way of expressing semantic meaning important to understanding and getting information exchanged correctly. Another way of saying this is that business rules are a formal and implementable expression of some user requirement. Here are some examples of business rules:

- "Assets MUST equal total liabilities plus total equity."
- "If property, plant and equipment (PPE) exists on the balance sheet, then a PPE policy and a PPE disclosure MUST exist and they MUST contain..."

Today, business rules are generally stored within each individual application that makes use of those business rules, which causes two problems. First, the approach to expressing the rules is different for each system expressing the business rules. The second, related, problem is that applications that use data can’t exchange the business rules that support the data between applications because each system has its own format.

Because of this dilemma, the important business rules are stripped from information when that information is exchanged between applications. Typically, the business rules are re-created in the receiving system using some different proprietary form, which results in two versions of business rules that can wind up being different in many cases. But what if a global standard for expressing these business rules existed? You could express the rules once and then exchange them between applications along with the information being exchanged.
That's one of the things XBRL offers: a global standard for expressing business rules, separate from applications, that everyone — the creators of information, consumers of information, and all the parties in between — can use. That means users create the business rules just once, saving both the receiver and the sender time and improving the quality of the information exchange.

2.6.7. Business information exchange is a chain

Business information exchange is a chain. Most people look at business information exchange from their own perspective as one of the links in that chain. Never before has this fact been as evident as it is today with the ubiquitous connectivity offered for pennies to anyone else on the planet via the Internet. This same technology, the Web, which caused our information overload problem, will be the solution to our information overload problem.

Consider an example from the railroad industry. In the United States, during the evolution of the rail system, competing railroads used different gauges of rails as they spread all over the countryside. At first, it was done by accident because the railroads were usually so far apart and disconnected that they had no need to standardize the width of the tracks. As progress was made and tracks converged into the same cities and towns, a different reason emerged for keeping track widths different: It ensured the rail operators could force freight and passengers to shift one carrier to another.

For a while, when rail travel and transport was a novelty; people were willing to put up with the inconvenience. But as people became dependent on rails for travel and for the shipping of goods, they began to question why all this switching had to take place — especially the owners of the freight, who had to pay significant sums for the labor and time to get their goods from one carrier to the next. The desire for efficient commerce pushed the country toward a common gauge, a standard. In much the same way, commerce is pushing the need for a common approach and vocabulary for exchanging business information today.

After the standardization of the gauges, railroads still faced competition. Instead, railroads competed on the merits of their service rather than the gauge of their track. Many of the lessons from this experience remain relevant today.

Much like a materials-supply chain in manufacturing, an information-supply chain is a critical piece of logistical infrastructure enabling a far more capable organization. An information-supply chain extends upon a preexisting model in the physical world: material-supply chains. If you look at the life cycle of information across organizations, you start to see the information-supply chain. Information-supply chains are so important to understand that we devote all of Chapter 7 to explaining them in greater detail.