XBRL

**Understanding the XML Standard for
Business Reporting and Finance**

W H I T E   P A P E R

SOFTWARE AG
THE XML COMPANY

CONTENTS

XBRL: Understanding the XML Standard for Business Reporting and Finance

This white paper provides an overview of the benefits and uses of the new XML standard for business reporting, eXtensible Business Reporting Language (XBRL). It also offers a more detailed review of the implementation and technology issues that need to be considered when structuring an XBRL strategy as well as case studies for specific industries.

The material discussed will be of particular interest to investment and finance industry professionals; government, trade and regulatory professionals; finance specialists in corporations; IT directors and software developers.

Executive Summary

Without a standard for exchanging data, the financial community has been consistently frustrated by inefficient reporting processes. Currently, financial data is passed around in a variety of non-interchangeable formats – HTML, Microsoft Excel documents, text files, and Adobe Acrobat files. While useful for editing, these formats offer no advantage over paper photocopies when it comes to sharing data between applications and users on different computing platforms. So far, attempts at integrating data for financial and business reporting applications have proven frustrating. Remarkably, 56% of integration performed in the banking industry has been accomplished by hard coding or changing actual applications rather than abiding by existing standards. Those efforts have tripled the total cost of ownership for financial software solutions.

XBRL is a widely accepted data standard that solves this dilemma and enables the exchange of uniform financial information between computer systems, software applications and people. It is based on XML (eXtensible Mar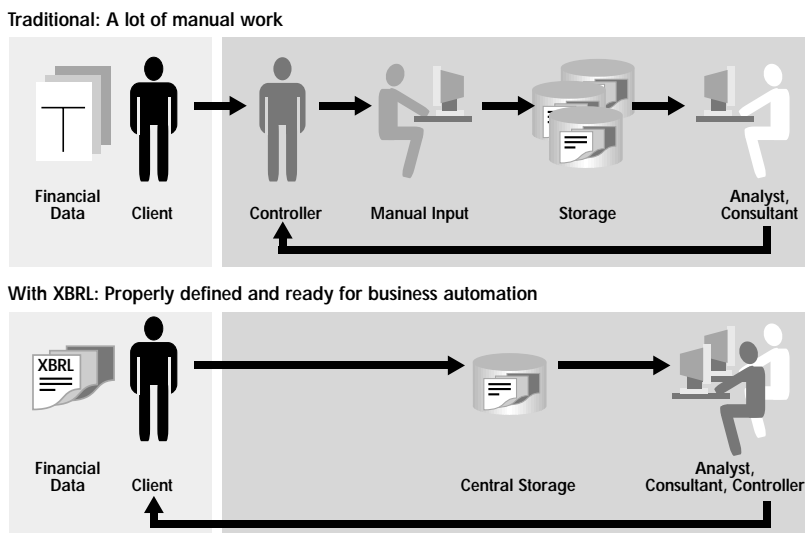kup Language) and is supported worldwide by most major accounting firms, trade organizations, software vendors, financial institutions, investors and governments.

XBRL "tags" data with standardized descriptions that enable other applications to understand the meaning and context of specific information within financial documents. The result is that data is entered cleanly once and then understood consistently and accurately thereafter. There is no need to re-key information or make guesses as to what a specific number might represent.

It sounds simple, but it represents a quantum leap for financial applications and the people who use them. The technology is ideal for Web-enabled applications and everyone who gathers financial information over the Internet.

Currently, banks, investment firms, credit companies and such regulatory bodies as governments and trade associations have the most to gain from adopting XBRL. However, any organization with financial reporting responsibilities can benefit immensely from XBRL. Specific case studies that address XBRL usage for credit risk management, internal and external reporting, portfolio support and market data providers, business intelligence tools, and Transaction Cost Analysis (TCA) are included in the latter portion of this white paper. Even though XBRL is in the early phases of adoption, the competitive advantages that come with establishing XBRL and XML capabilities are clear. The world's leading governments, financial institutions, accounting firms and corporations are already leveraging the standard to gain impressive returns on investment with both internal and external applications.

Fig. 1: The Financial Reporting Process.

Traditional: A lot of manual work

Financial Data — Client — Controller — Manual Input — Storage — Analyst, Consultant

With XBRL: Properly defined and ready for business automation

Financial Data — Client — Central Storage — Analyst, Consultant, Controller

It should also be noted that the past decade has seen a significant trend toward sophisticated business reporting. Large-, medium- and small-sized companies and organizations have been able to take advantage of low-cost computing power and software to track and analyze all kinds of business activity. Companies everywhere are beginning to understand in great detail how HR, marketing, knowledge-management systems, R&D, organizational structures and information architectures affect their business. Numerous software packages allow organizations to analyze every facet of business operations and their impacts on finance.

So, while this white paper is primarily focused on XBRL, it is important to keep the larger XML perspective in mind and understand that many applications will be using XBRL-enabled finance applications to translate indirect costs and value to the bottom line.

What is XBRL?

XBRL is a data description language that enables the exchange of understandable, uniform business information. It is based on XML and permits the automatic exchange and reliable extraction of financial information across all software formats and technologies, including the Internet (Fig. 2).

XBRL allows organizations to structure information with tags. For example, when a piece of data is tagged as "revenue," then XBRL-enabled applications know that it adheres to a strict definition of revenue and can use it accordingly. The integrity of the information is ensured by standards that have already been widely accepted. In addition, XBRL provides broader contextual information about specific data content within financial documents. For example, when a particular sum of money is specified within a report, XBRL tags may identify that data as "cash" or "accounts receivable." It can also indicate timeframes for particular pieces of information, like year-to-date sales.

With XBRL, an organization, an individual or another software application can easily generate various output formats and reports based on a single set of data.

Who benefits?

XBRL benefits all users of the financial information supply chain: public and private companies, the accounting profession, governments, regulators, analysts, the investment community, capital markets and lenders, as well as key third parties such as software developers and data aggregators.

XBRL Working Model: Dedicated "filters" supporting different processes
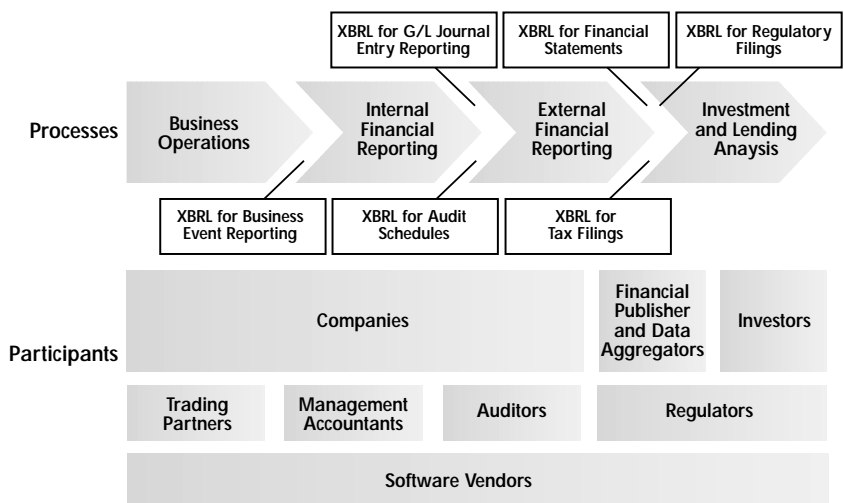
Fig. 2: The Business Information Supply Chain.

XBRL Benefits
- Creates more confidence in data through limiting the risk of erroneous data entry since all reports are automatically generated from one single information source
- Minimizes costs by allowing easier, more automatic composition and processing of reports to different clients
- Accelerates financial decision-making by institutions such as banks and rating services
- Improves the process of publishing analyst and investor reports
- Information consumers have unprecedented access, comparison and analysis capabilities

What XBRL is NOT

XBRL is not a new accounting standard, and it does not require any changes to existing accounting standards. CFOs still control disclosure, but XBRL allows more effective communication of what is disclosed and makes the information more manageable. It is not a new transaction protocol. It is merely a standard for formatting complex, structured business data like statements and general ledgers. XBRL is not a replacement for previously established data interchange standards like EDI. Rather, XBRL enhances existing standards by providing extended consistency.

What kinds of issues does XBRL seek to resolve?

The commonly practiced methods for financial reporting and analysis tend to be manual, time-consuming and costly. Without consistent naming and rigid data descriptor frameworks, the accuracy and integrity of financial information has become a serious concern. Communication with investors becomes ineffective, financial statements are created inefficiently, and reporting and analysis suffer.

BUSINESS ISSUES

From a high-level business perspective, ineffective communication with outside users creates a number of problems. Financial reports that are difficult to interpret, analyze and compare can give investors the perception of risk, for example. Investors may go elsewhere, to unreliable sources, for financial information.

Errors can occur at any step in the manual financial data aggregation process. Every time an auditor, tax preparer, regulator, analyst or investor re-enters information for his or her own purposes, the probability of error increases. Those errors can wreak havoc with the organization.

There are certainly several compelling cases for taking XBRL seriously at the C level. Automatic composition and processing of reports to different stakeholders minimizes costs significantly by eliminating time and labor spent manually entering and rechecking information. Internal information systems can be integrated more quickly and cost effectively with standardized data formats. The process of publishing analyst reports for banks and rating services is also faster and more cost effective. Thus, businesses can receive funding quickly and efficiently.

XBRL helps businesses analyze their financial results with much greater ease and efficiency. It enables businesses to concentrate on issues like forecasting and modeling rather than data entry and process tasks. From a C-level perspective, this is really what financial reporting is all

about – running a tighter ship, becoming more competitive and finding creative ways to improve business.

XBRL AND WEB SERVICES

XBRL is ideal for use in seamlessly integrated Web services. Web services are Web-based applications or software components that interact with other Web applications. Since Web services are based on the XML open standard, they can use XBRL easily. They essentially "talk" to each other, sharing data and calling routines as necessary. This means that Web services are an ideal architectural approach to automating business processes across internal or external business boundaries – by using Internet technologies.

XBRL provides efficient, validated transmission of information between Web services. Error detection, which is built into the XBRL specification, occurs at the source of the data, rather than at the receiving party. The data's accuracy and origin is traceable to one absolute point within the information chain.

Data Integration Dilemmas
- Document formats such as PDFs, Excel documents and text files are about as useful as hard copies.
- One-dimensional Web page data cannot be automatically linked to supporting details, such as journal entries.
- Spreadsheet data is often delayed, truncated and inaccurate.

XBRL Advantage
- "Live" information.
- Underlying linkages are preserved in XBRL.
- References are preserved.
- Different style sheets and "controls" can sort, expand, collapse and graph information.
- Companies classify each item to exact specifications.
- Items reach institutional investors with no delay and no conversion errors.

What Needs to Be In Place

If architected properly, XBRL platforms provide a clean middle tier where financial data can be organized and utilized by a variety of other applications. By XBRL platforms, we mean a server or database that stores and organizes XBRL-enabled information so that it can be effectively delivered to other applications and document formats. (See Figures 3 and 4 below.)

With the right architecture, a centralized XBRL repository handles information from a variety of sources

and distributes it intelligently and efficiently to applications and services that are XBRL-enabled.

The crucial success factor in any XBRL solution is the capability to convert and route financial information derived from existing systems without impacting them. Non-XBRL data needs to be converted so that XBRL-enabled applications can utilize the information. This is the layer where products like XML servers and integration solutions are important. The best solutions ensure that XBRL-tagged data is kept separate from RDBMS functionality, keeping the underlying data pristine.

Several other pieces of the puzzle need to be in place before an end-to-end XBRL solution is complete:
- Taxonomies must be developed and approved for specific industries and geopolitical areas. Countries, for instance, need to agree on accounting principles that are supported by XBRL.
- General ledger accounting software vendors need to XBRL-enable their products.
- Accounting professionals need to provide XBRL documents as part of their audit procedures.

With a general ledger application for example, the user could export data as XBRL, selecting the appropriate taxonomy according to Generally Accepted Accounting Principles, like US-GAAP, German AP, UK GAAP, IAS (International Accounting Standard) and so on. Read more about taxonomies on page 10.
Once an XBRL document exists, it can be used in any software program that supports XBRL. Between applications, this import/export function can be automated and transparent to the user.
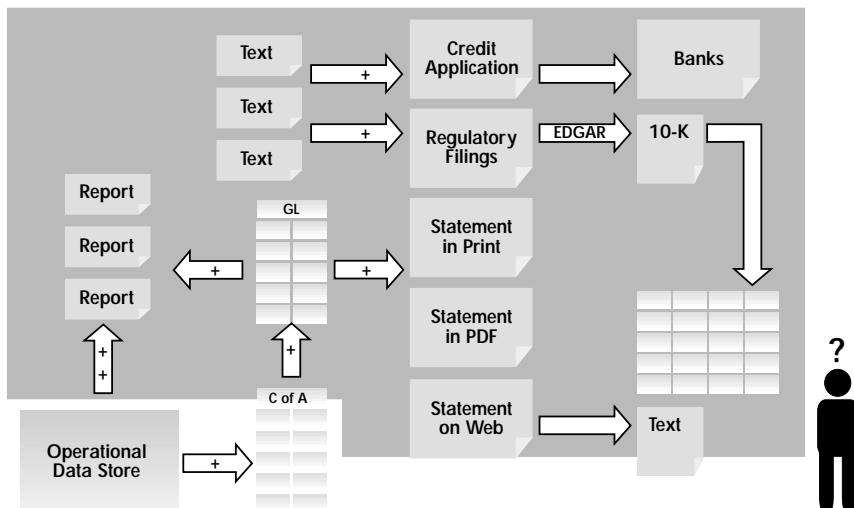
Today: Tortuous Information Supply Chain

Fig. 3: Typical, inefficient financial architecture.
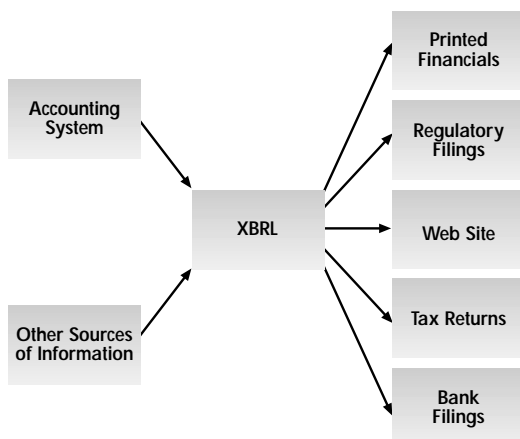
The Information Supply Chain with XBRL

Fig. 4: XBRL: handles multiple outputs from multiple data sources.

Problems that XBRL/XML solve:
- As open standards, XBRL and XML allow users to use one technology for a variety of applications without being held hostage by one software company.
- XML-coded data in search-engine databases allows users to clearly specify the exact definition and context of their terms.
- Common standards simplify application integration.
- XML automatically codes instructions for each output format (Web, CD-ROM, printer, mobile device etc.).

Uses and Applications

The primary goal of XBRL is to reduce the cost of information, accelerate its flow, increase its usefulness and globalize its form and content.

All participants within the financial supply chain can easily interpret and use XBRL documents. XBRL brings greater flexibility to investment and credit professionals working with XML-enabled applications, financial data warehouses and analytical tools. The standard lends itself to business process automation, where integrated business rules utilize the same data. Investors are able to analyze information without retyping data and compare different companies based on commonly accepted data formats. Regulators can define specific taxonomies that describe information and use standard XML and Internet technologies to receive and process that information.

By dramatically improving the speed with which data is compiled and prepared, the organizational costs required to prepare, exchange, store and publish electronic documents are greatly reduced.

Case Studies

CREDIT RISK MANAGEMENT

The banking industry has many distinct opportunities to leverage XBRL and numerous ways to gain efficiency. When processing loans, for example, banks often take 11 to 20 days before they can make an informed decision about the creditworthiness of a client. In most cases, 90 percent of their time is spent on mechanics, like verifying documents, reviewing numbers manually and double-checking work.

With XBRL, 10 percent of the time is spent on mechanics. The remaining 90 percent can be used at the bank's discretion. They can either use the new time savings as a competitive advantage by providing speedy loan approvals, or they can use the time to conduct more rigorous risk analysis. Either way, the amount of time spent on "zero-value" tasks like gathering information and keying it are eliminated.

For fast-track approvals, a small business might provide a bank with their financial information in XBRL and receive a loan approval in couple of minutes instead of a couple of weeks. A similar process would occur for credit approval and lines of credit (Fig. 5).

The use of XBRL in credit-risk-solution algorithms from noted accounting and rating companies would certainly speed processing for all kinds of credit analysis.

INTERNAL AND EXTERNAL REPORTING

Multinational corporations with hundreds of subsidiaries are another obvious beneficiary of XBRL standards. Despite the attempts of many organizations to develop "accounting manuals" and issue directives for compliance, subsidiaries inevitably deliver information in a myriad of forms and formats. Analysis applications vary from entity to entity, and even if a standard software package is used, output formats commonly vary. Massive efforts to validate, normalize, correct and consolidate information must take place before information can be reported with any clarity.

The effects of these practices spill over into the realm of external reporting. The inefficiency and inaccuracy involved in gathering financial information on a large scale inevitably spreads to every stakeholder involved.
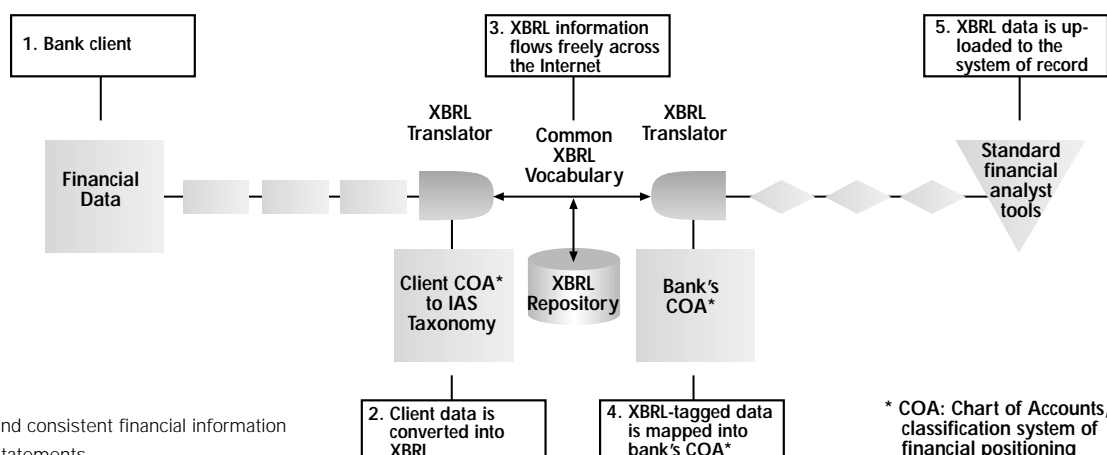
How XBRL will Work

Fig. 5: Persistent and consistent financial information for reliable statements.

The financial industry, tax agencies, national banks and governments spend an inordinate amount of time dealing with regulatory filings that have been generated from convoluted processes. Reporting forms and rules are not integrated, and data is handled manually at every stage in the process. The processes are not designed for timely, sophisticated analysis. As the reporting moves further away from the corporation, it becomes much less reliable. In the end, investors are left with suspect information and the corporation may miss the opportunity to develop capital investment in line with its performance and needs.

These problems are not relegated to large corporations, either. Government agencies and departments of all kinds run into the same situations, as do banks, investment firms and non-profit organizations.

Organizations such as governments, banks, investment firms and market data providers that depend on information feeds from corporations are in the unenviable position of receiving inaccurate information from companies. Their job begins with information that has already been through all kinds of error-prone processes.

XBRL provides for streamlined internal and external reporting processes, because the initial financial data that is passed around from application to application never changes. There is no chance for error from re-keying, and accuracy is consistently validated at every hand-off.

From an internal reporting perspective, data used in XBRL format is live and highly accurate, so reporting processes can be much less rigid. Instead of being locked into a quarterly scenario where data is compiled and verified in a mad rush at the end of the quarter, users can examine live data on a day-to-day basis and have confidence that the figures are accurate and complete.

With XBRL documents, it is also much easier to compare financial results against other data, like historical performance, competitive results and benchmarks for future goals.

BUSINESS INTELLIGENCE

Business intelligence, business performance management and decision support tools stand to gain increased usage, performance and exposure with the adoption of the XBRL standard. With live, accurate information pulsing through the veins of a company, executives and managers across the organization have extensive opportunities to examine their performance and operations. Analysis, modeling, forecasting and, of course, rapid reporting are greatly enhanced with XBRL.

PORTFOLIO SUPPORT AND MARKET DATA PROVIDERS

For all the reasons cited above, portfolio support and market data become much more accurate and much more efficiently collected. Banks are also market data providers. Many banks develop their own "ticker plants" in house, so there are ample opportunities to develop XBRL integration solutions for them.

TRANSACTION COST ANALYSIS (TCA)

Institutions that deal with massive amounts of trading volume, like banks, brokers and data providers, are constantly examining their transaction costs and searching for ways to lower them. TCA solution providers, such as some banks, offer ways to increase execution transparency, manage assets more effectively and grease the financial information supply chain.

Banks, for instance, have to deal with approximately 400 different mechanisms for completing transactions. The effort to reduce the complexity of these processes is described by the term "straight-through processing" (STP). All parties are interested in attaining STP, which is one of the inherent benefits of XML and XBRL.

Software and Financial Industry Leaders Partner to Deliver XBRL Solutions

Partnerships between technology companies and financial industry leaders have already produced viable XBRL solutions. See www.xbrl.org for a listing of partners and descriptions of their projects. The following is a short list of solutions that already exist or are in development:

- Reporting and analysis solutions for multiple organization-wide uses, as well as for investing purposes.
- Investment comparisons/investor analysis products.
- Forecasting and planning applications.
- EDGAR and other governmental filing solutions.
- Web services for a variety of applications that cater to consumers, corporations, governments and investment firms.
- Existing systems such as ERP, business intelligence, business performance management, and enterprise-wide reporting and analysis software are incorporating XBRL.

XBRL Technology Overview

The beauty of XBRL is that the technology required to XBRL-enable data resides in the middle of the IT infrastructure. Organizations still utilize their existing infrastructure, such as back-end relational databases and front-end applications like Excel. XBRL is recognized as an investment or an enhancement that provides skill protection throughout the IT organization rather than a replacement solution that requires re-engineering of systems and retraining of users.

The following overview presents the key components to successful XBRL implementations and the open source technologies that support them. Remember, XBRL is a standard, not software. So, the "technology" required to launch an XBRL initiative is composed of structured agreements and software that understands those structures.

TAXONOMIES

Taxonomies provide the rules for defining XBRL tags. Generally Accepted Accounting Principles (GAAP) is a taxonomy, for example. It defines agreements about the content and structure of various reports created and maintained by organizations such as AICPA, the International Accounting Standards Board, regulators or individual companies. Yet XBRL taxonomies do not stop there. Taxonomies can also include private company aspects that refer to and correspond to specific data structures and business rules within a singular organization. In either case, taxonomy establishes agreement between different parties within a company, industry or geographic area as to the tagging and contextual usage of specific data

items. It should be noted that the standards an organization chooses to enforce can pertain to anything. The BRL stands for Business Reporting Language, so additional measurements such as productivity, risk and spend management indicators can also be easily accounted for.

XBRL DOCUMENT

An XBRL document contains actual business reporting figures, their context and any relevant linkages. The XBRL data within these documents are defined by taxonomies. "XBRL-aware" applications can use and view the raw XML data which resides in XBRL documents.

XML SCHEMA

Even understandable application-specific tags within XML documents make sense only if they are known to all the users who are likely to need them. This is the case when user groups agree on certain document types. They can do so using DTDs (Document Type Definitions) – or XML schema definitions – document schemas that specify the valid tags and the valid structure of a document class. Even then, well-formed XML documents can still cope with unknown tags: they are automatically identified as such and left unresolved, whereby the possibility of incorrect interpretation is excluded. The architecture is thus very flexible and has been designed bearing in mind that those users and applications that have access to all information need to be served as well. And since the definitions are entered in plain text, not using cryptic control characters, XML documents remain readable by people. Regardless of the author's particular DTD or XML schema, all XML-coded documents can be processed, saved and distributed.

Error checking or validity checking is built into XML documents through their Schemas. When you send an XML document to another party or application, you also send along the document's Schema. This defines how the document will be used and interpreted.

In other words, XML Schemas define documents in a language that pertains to their particular usage. Each Schema is specific to the needs of the particular industry or usage.

XSL, XSLT, AND XPATH
The layout of an XML document is not defined in the document itself or in its Schema. It is one of the fundamental principles of XML that content should be absolutely separate from presentation. How a document is represented is defined in a stylesheet that is created with eXtensible Stylesheet Language (XSL) or possibly with Cascading Style Sheets. One document can also have several different XSL stylesheets, resulting in different document presentations. XSL likewise supports a variety of output media, such as screen display, printouts etc. In addition, XSL enables XML documents to be translated into HTML documents. Thus, terminal devices that understand HTML but not XML can be supported as well. XSL specifies how XML documents can be transformed for display.

An XML document can be transformed via multiple XSL files for display on the Web, on a mobile phone, PDA or into a format for storage. XML documents can be transformed into a variety of formats in order to be utilized by end-user applications.

These formats include HTML for use in browsers, PDF for use in Adobe Acrobat, RTF for text, SVG for rendering graphics, and so forth. XML can also be transformed into other XML documents.

An eXtensible Stylesheet Language Transformations (XSLT) file is applied to an XML document in order to transform it. An XSLT processor is also utilized. XSLT files consist of templates that specify how each node of the source XML document should appear in the destination document. XSLT is an XML-based language whose syntax and semantics are defined by a W3C specification.

XSLT uses the XML Path Language (XPath) to perform queries on an XML document in order to specify a particular part of the document.

XML ADVANTAGES OVER RELATIONAL DATA STRUCTURES
XML is designed for Internet Protocol (IP). In contrast, the binary formats and proprietary mechanisms of relational and object-oriented data prevent them from being easily accessible over the Internet. In many cases, gateway software and additional mechanisms are required to access these formats over the Internet – and it is usually through a singular transport protocol, such as HTTP only (no e-mail or FTP, for instance). However, with an XML server and the right integration tools, non-native XML data can be "staged" in a layer between the RDBMS and XML applications and services.

Established vendors such as Software AG provide native XML databases that integrate both XML and non-XML data. This provides an extensible "XML view" on all needed information, without changing the data structure (or data access layers) over and over again. In contrast, relational database vendors are developing schemas for converting data to XML within the RDBMS, a daunting task.

So, ideally, XBRL-enabled solutions will be built on an XML server platform that performs all the necessary integration, conversion, translation and routing between the database and application layers.

Software AG's Role

Software AG is one of the primary drivers of XBRL and XML technologies. We make the industry's leading XML server, Tamino, and the Software AG Suite for XBRL helps companies build XBRL solutions from existing IT investments. Hundreds of worldwide customers are already using our XML core technology to process and store XML documents.

Simply put, Software AG provides the tools and services necessary to analyze, transform, route and store XML information – the key to the entire information exchange infrastructure (Fig. 6).

The Software AG Suite for XBRL delivers the methodology and practical tools for implementing and sustaining XBRL initiatives. Project management, business and technical consulting, implementation support and tools and training are all part of the Software AG program.

Software AG's methodologies are designed to solve special issues within the financial information supply chain, like credit risk management, internal-external reporting and regulatory filings. Our solutions provide a smooth transition to native XBRL without jeopardizing or affecting current business operations. The suite for XBRL is based on W3C XML standards and offers an open framework for plugging in custom components and other third-party solutions.

Software AG's Suite for XBRL supports the automation of:

- Non-XML conversion to XML using parsers (for text, PDF, MS Word, print files, etc.)
- XML data transformation to XBRL format using XSLT
- Data extraction using adapters (RDBMS, SAP, Oracle Financials and others)
- XBRL data encryption/decryption and digital signatures using XML Signature and XML encryption technology
- Validation of XBRL using taxonomies and specific business rules
- Storage of XBRL instances and all related XML documents such as linkbases and stylesheets using Tamino XML Server

- Retrieval of XBRL instances for dynamic publishing (transforming XBRL with XSLT to other formats)
- WebDAV for collaborating on financial data
- Web services (SOAP) for front-end financial analysis (e.g., Excel) and validation of XBRL instances

A global Software AG XML/XBRL Competence Center has been established to provide state-of-the-art competence. The primary goal of the Competence Center is to transfer knowledge to participating organizations, offer support for XML/ XBRL solutions and continue to build upon the success of the standards.

XML standards have already demonstrated significant ROI for numerous technical and business applications. XBRL is simply a business extension of the XML standard. Investment returns within the financial community are already beginning to materialize from simple implementations.
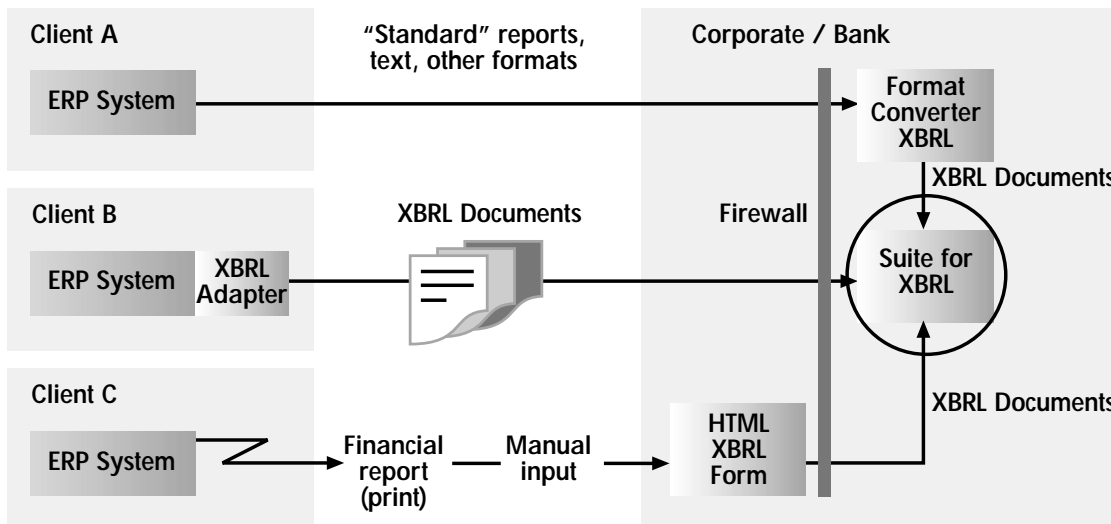

Fig. 6: An extensible architecture: all kinds of formats can be embedded into the XBRL system

Conclusion

With this analysis in mind, what is the next step for IT managers whose organizations wish to explore XBRL further? For starters, you can investigate your financial and ERP software applications to find out if they are XBRL-enabled. Also, check with vendors to see if plans are going forward for future versions that will include support for XBRL documents. Then, begin to survey internal business processes and identify which business reporting areas might benefit from XBRL. Extend the survey to include external processes and key partners, and then start to consider pilot programs for XBRL-enabling key processes within your organization.

Of course, plan on adding to your XBRL background by reading up on the latest developments. We have compiled a list of resources below.

Resource Recommendations for Further Inquiry

- www.xbrl.org
- http://web.bryant.edu/~xbrl/index.html
- www.zapthink.com
- www.softwareag.com
- http://www.microsoft.com/msft/xbrlinfo.htm
- http://www.ey.com/global/content.nsf/International/Issues_&_Perspectives_-_Web-Enabled_Business_Reporting
- www.ey.com -- Search for term "XBRL"
- www.pwcglobal.com -- Search for term "XBRL"

Additional information on Software AG's XBRL offering can be obtained at your local Software AG subsidiary or via e-mail at:
xbrl-info@softwareag.com

For more information on EntireX Integration Server:
http://www.softwareag.com/entirex

For hands-on experience:
http://www.softwareag.com/entirex/download

For more information on Tamino XML Server:
http://www.softwareag.com/tamino

Tamino Community:
http://www.softwareag.com/developer

To download the XML Starter Kit:
http://www.xmlstarterkit.com

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