

Why We Need Supply Chain Standardization

By Mike Willis



Mike is a retired PwC partner with public company reporting and audit experience and knowledge of relevant reporting standards, regulations and process and control considerations. He is currently the Assistant Director of the Office of Structured Disclosure at the U.S. Securities and Exchange Commission where he is responsible for leading the design and implementation of technological processes and tools to support the many structured data needs of the Commission, including the creation, implementation, and maintenance of forms and processes designed to capture structured data from SEC registrants through their filings with the Commission.

Disclaimer: The U.S. Securities and Exchange Commission (Commission or SEC), as a matter of policy, disclaims responsibility for any private publication or statement of any SEC employee or Commissioner. The views expressed herein are the author's and do not necessarily reflect the views of the Commission or of the authors' colleagues upon the staff of the Commission.

Supply chain standardization is good for you. Although this may be obvious in many physical supply chain contexts, it is useful to look at the various benefits and usages of eXtensible Business Reporting Language (XBRL), the standardized machine-readable format for the business information supply chain. In the process, we'll also examine the costs associated with those benefits and usages, and review recent SEC rulemakings that involve Inline XBRL structuring requirements for financial (and other) disclosures.

Let's begin by diving into some examples that show just how transformative supply chain standardization can be, starting with the buildout of Canadian railways in the 19th century.

At the earliest stages of Canadian railway development, some railroads used a particular gauge type known as the "provincial gauge," whereas others used a different type known as the "standard gauge." In 1873, however, all Canadian railroads were converted to the "standard gauge," literally laying the foundation for an explosion in economic growth in a vast country where growth was previously hindered by roads and waterways frozen for up to five months a year.

Another standardization example you see every day: the bar code. Before the bar code made its debut in Canadian grocery stores in 1974, Canadian department stores tried a number of different systems for tracking sales and inventories. Some used hole-punch cards, for example, while others scanned their own versions of alphanumeric codes. Shifting to a single, standardized tracking system — the Universal Product Code (aka the bar code) — drove process efficiencies for the entire supply chain and dramatically improved consumer options and buying information.



For a more recent example, consider the advent of digital video. When digital video began replacing VHS and Betamax, there was a vast array of various digital formats used (.wmf, .asf, .rm, .mov, etc.), many of which were proprietary and incompatible with one another.¹ This posed a significant challenge in sharing digital media with others — audiovisual content that was encoded in one format would often need to be converted into another format for the recipient to watch it. This all changed when the Moving Picture Experts Group (“MPEG”), an

international collaboration involving hundreds of researchers and engineers from all over the world, designated the MPEG-4 standard for audiovisual coding formats and related technology in 1998.² The adoption of this standard dramatically enhanced the reusability and flexibility of content such as digital television, animated graphics, and webpage extensions.³ Thanks to the MPEG-4 standard, no longer would a vast array of proprietary, non-interworking formats and players obstruct what we can now clearly see as a digital video revolution.⁴

In the world of modern finance, stakeholders in multiple industry sectors have leveraged the same concept of supply chain standardization to their benefit. The mortgage industry has formed the Maintenance Industry Standards Maintenance Organization (MISMO) to develop an industry-wide transparent data standard,⁵ and the insurance industry has done the same with the Association for Cooperative Operations Research and Development (ACORD).⁶ Financial institutions on the buy side and broker-dealers on the sell side use the Financial Information eXchange (FIX) communication protocol for international real-time exchange of information related to securities transactions,⁷ and Financial products Markup Language (FpML) specifically for over-the-counter derivative transactions.⁸ And, of course, businesses across the globe have leveraged the standardized XBRL to make information supply chain management better, cheaper and faster.

Standardization Produces Better Business Benefits

Simply put, standardized data enables better, cheaper and faster business outcomes. Reporting processes are vastly improved by standardizing data so that it can seamlessly flow between disparate systems. In many organizations, data is housed in disparate data storage applications. By standardizing data from the get-go, companies can use software that instantly pulls information from these disparate data sources to write automated reports.⁹ This also makes the reporting process cheaper; companies can bring filing preparation filings in-house.¹⁰ Finally, standardizing data such as key performance metrics allows a company to monitor its performance and act on it in a more agile manner.¹¹

Many people will tell you that artificial intelligence (AI) is the wave of the future, and data scientists understand that, to enable successful AI, you need to input data that is structured in a machine-readable language. You’ve likely heard of the phrase “know your consumer.” Here, the

“consumer” of information is a machine, not a person. For that machine to be able to consume information so it can perform AI tasks, the information has to be “translated” into a language it can understand, such as XBRL. So the idea that AI will somehow “replace” XBRL and render it obsolete is missing the mark; XBRL is a language that works in tandem with AI technology, enabling more effective and successful results.¹²

Let’s now dig into some of the specific benefits enabled by companies providing their disclosures in a machine-readable format such as XBRL and/or Inline XBRL. An example of actually seeing benefits is through Inline XBRL, a freely available international open standard that combines into a single document the human-readable HTML with the machine-readable XBRL. Inline XBRL reveals meta data for each of the tagged disclosures, such as whether the balance is in debit or credit, the scale of the disclosure, what tag was used, the related accounting standard for the tag and disclosure, etc. With a link to the accounting standards, filers may be enabled with a more automated approach to a disclosure checklist and can quickly observe what disclosure topics are and/or are not in the financial statements. Filers can also perform real-time risk assessments and validation checks, for example, if a value was inappropriately entered as a negative value. Further, filers can use system-to-system software to have machines, not people, submit required information to regulators.¹³

Inline XBRL also enables instant market information through the open source Inline XBRL Viewer, as it can include capabilities such as time series charting, time series benchmarking and redlining changes in the disclosures. Filers and analysts alike may find these features increasingly embedded within vendor solutions and features.



In addition, with Inline XBRL machine-readable data all types of registrant’s disclosures are accessible, even for the very smallest reporting companies. Younger, often smaller, filers benefit disproportionately from XBRL reporting. Research¹⁴ shows that firms with a relatively shorter trading age have derived more benefit from XBRL adoption than older firms have. XBRL reporting facilitates disclosure access and the market to learn about younger firms faster, therefore bolstering their ability to raise funds on the market.

Standardized disclosure can also benefit market participants by enhancing the capabilities of financial regulators. In today’s globally connected world, regulatory regimes in different jurisdictions need to harmonize their approaches to maintain effective financial oversight. For example, the current security-based swap market is global in scope, and various jurisdictions have implemented mandatory reporting rules in their own jurisdictions.¹⁵ Structuring the key data elements reported by swap market participants in a machine-readable format would help enable collaborative information sharing between regulators in multiple jurisdictions (Canadian

Securities Administrators, Commodity Futures Trading Commission, SEC, European Securities and Markets Authority, etc.).

For all the benefits it bestows, XBRL is neither expensive nor time-consuming. In 2017, the AICPA surveyed the amount paid by small companies for *fully outsourced* XBRL creating and filing solutions. According to its survey, small companies paid no more than \$5,500 per year. The median cost? \$2,500 per year.¹⁶ That's significantly less than the SEC's original cost estimate of \$27,800 per year, and as adoption levels and technological advancements keep progressing, the costs may decrease further.¹⁷

Some have questioned the benefits of machine-readable data, which could be subject to quality errors. For example, some have argued that the frequent use of custom tags defeats the idea of standardization. Custom tagging is necessary because filers could have unique transactions or disclosures that not covered by standard tags. The company-specific or custom tags provides filers with a method of directly exposing their unique disclosures to stakeholders highlighting value drivers, business segments and other areas of interest. For those concerned with ongoing growth of custom tags, the positive development is that custom tag rates in annual reports have been decreasing over the past four years, as SEC staff analyses show.¹⁸

Lastly, it is pertinent for filers to know they are responsible for reviewing the disclosures, relevant disclosure requirements and tags to ensure that they submit high-quality data within their reports.

How Machine-Readable Data is Used

So how exactly are different stakeholders using machine-readable data and realizing these benefits? With the machine-readable data, SEC staff has been able to develop analytical applications such as the Financial Statements



Query Viewer and the Corporate Issuer Risk Assessment that allow them to extract, analyze and compare the financial data across filers and industries.

The machine-readable data also allows SEC staff to identify data quality errors, reporting omissions and trending patterns more quickly and easily. Commission staff have also used the machine-readable data to assist in economic analysis for rulemakings, data analytics included in white papers and to assess different disclosure scenarios across filers.

Filers can compare their disclosures to other filers when such comparisons are helpful, such as when a significant trend or event is affecting the industry and prompting new disclosures. Filers can also use the data for risk profiling by tracking net losses and impairments taken.

Machine readable data is also used outside of the SEC. For example, when main-street investors look up a reporting entity on a financial website, the earnings data is often derived from the machine-readable data. Other federal agencies, such as the Internal Revenue Service (IRS) and the Census Bureau, have used machine-readable data in fulfilling their regulatory and administrative duties. Additionally, accounting standards bodies such as the Financial Accounting Standards Board have used the data in their assessment and development of accounting standards.

Recent Rulemakings

Canadian companies with U.S. reporting requirements should take note of two rulemakings adopted by the SEC in recent years that have incorporated structured data.

In June 2018, the Commission adopted the Inline XBRL rule, requiring filers who report in U.S. GAAP or IFRS to transition their financial statement reporting from XBRL to Inline XBRL.¹⁹ Each Canadian filer's compliance date will vary based on reporting standard and filer status — for IFRS companies, financial statements for all fiscal periods ending after June 15, 2021 are required to be provided in Inline XBRL. For U.S. GAAP companies that are accelerated filers, that phase-in date is June 15, 2020. And for U.S. GAAP companies that are large accelerated filers, the phase-in date was June 15, 2019, meaning that for those filers, all financial statements for periods that have ended since June 15 will need to be tagged in Inline XBRL, as will all subsequent financial statements.

In March 2019, the Commission adopted the FAST Act Modernization rule, requiring filers to tag cover page information (such as form type, company name, filer size, and public float) in Inline XBRL for Forms 10-K, 10-Q, 8-K, 20-F and — most relevantly for the majority of Canadian companies — 40-F. Note that many of those cover page data points were already required to be tagged in XBRL; the only thing that's changing is the transition to Inline XBRL. Compliance dates are identical to the Inline Rule dates described above and summarized in the table below.²⁰

Operating Companies	Compliance Date²⁹³
Large accelerated filers that prepare their financial statements in accordance with U.S. GAAP	Reports for fiscal periods ending on or after June 15, 2019
Accelerated filers that prepare their financial statements in accordance with U.S. GAAP	Reports for fiscal periods ending on or after June 15, 2020
All other filers	Reports for fiscal periods ending on or after June 15, 2021

Future Considerations

Here are a couple future considerations for readers to keep in mind.

If a filing has data quality errors, they may indicate to the user the potential for related process control weaknesses. In other words, data quality errors may or may not be a ‘tell’ for other related problems. Often, as in life, it is never just one problem.

The machine-readable disclosures can be subjected to freely available data quality checks to identify some of the more common data quality error types. Filers might consider asking their reporting vendor and/or software provider if such data quality checks are available for testing their draft filings prior to submission.

Analysts, researchers and others may be interested in the Financial Statement and Notes data sets that are posted on the SEC website and updated quarterly.²¹ These data sets provide the text and detailed numeric information from all financial statements and their notes and is presented without change from the "as filed" financial reports submitted by each registrant. The data is presented in a flattened format to help users analyze and compare corporate disclosure information over time and across registrants.

Please Contact Us

We welcome your comments on our rules and feedback on structuring other disclosures. You can visit www.sec.gov, click on “Regulation” on top and then select “Proposed Rules.” You will see a section to leave comments once you click on a proposed rule of interest to you. Readers should feel free to contact us via email at StructuredData@sec.gov or leave a voicemail at 202-551-5494.

OIO

Endnotes

¹ Kyle Cassidy, “Videomaker, Video formats explained.” <https://www.videomaker.com/article/c10/15362-video-formats-explained>.

-
- 2 Rob Koenen, The Moving Picture Experts Group, MPEG-4 Overview <https://mpeg.chiariglione.org/standards/mpeg-4>.
- 3 *Ibid.*
- 4 *Ibid.*
- 5 MISMO, About MISMO. <http://www.mismo.org/x140197>.
- 6 ACORD, ACORD Data Standards. <https://www.acord.org/standards-architecture/acord-data-standards>.
- 7 FIX Trading Community, What is FIX? <https://www.fixtrading.org/what-is-fix/>.
- 8 FpML, What is FpML? <https://www.fpml.org/about/what-is-fpml/>.
- 9 Mohini Singh, CFA Institute, "The Cost of Structured Data Myth vs. Reality." <https://www.cfainstitute.org/-/media/documents/survey/the-cost-of-structured-data-myth-vs-reality-august-2017.ashx>.
- 10 *Ibid.*
- 11 Ken Tysiac, "Driving Faster Decisions" (American Institute of Certified Public Accountants: *Journal of Accountancy*, April 2015. <https://www.journalofaccountancy.com/issues/2015/apr/data-driven-auditing.html>.
- 12 Pamela Pecs Cytron, *Bob's Guide*, "Why structured data is the key to AI for banks and insurers." <https://www.bobsguide.com/guide/news/2018/Mar/12/why-structured-data-is-the-key-to-ai-for-banks-and-insurers/>.
- Omar Qari, "How Structured Data Enables AI in Finance." <https://blog.abacus.com/structured-data-enables-ai-finance/>.
- Altexsoft, "Preparing Your Dataset for Machine Learning: 8 Basic Techniques That Make Your Data Better." <https://www.altexsoft.com/blog/datascience/preparing-your-dataset-for-machine-learning-8-basic-techniques-that-make-your-data-better/>.
- 13 Alisha Ukani and Nick Sinai, "Data, Not Documents: Modernizing the Regulatory State." Harvard Kennedy Center Belfer Center for Science and International Affairs. <https://www.belfercenter.org/publication/data-not-documents-modernizing-regulatory-state>.
- 14 "Effects of Information Processing Costs on Price Informativeness: Evidence from XBRL Mandate," <https://ssrn.com/abstract=3324198>.
- Are XBRL Files Being Accessed? Evidence from the SEC EDGAR Log File Dataset <https://aaajournals.org/doi/10.2308/isys-51885>.
- 15 SEC Adopting Release No. 34-78716, "Access to Data Obtained by Security-Based Swap Data Repositories" (SEC: September 2016). <https://www.sec.gov/rules/final/2016/34-78716.pdf>.
- 16 AICPA, "XBRL Costs for Small Companies Have Declined 45%," (August 2018). <https://www.aicpa.org/press/pressreleases/2018/xbrl-costs-have-declined-according-to-aicpa-study.html>.
- 17 SEC Adopting Release No. 33-9002, "Interactive Data to Improve Financial Reporting," (SEC: April 2009), p. 121. <https://www.sec.gov/rules/final/2009/33-9002.pdf>.
- 18 https://www.sec.gov/structureddata/trends_2019; https://www.sec.gov/structureddata/trends_2017; <https://www.sec.gov/structureddata/trends>.
- 19 SEC Adopting Release No. 33-10514, "Inline XBRL Filing of Tagged Data" (SEC: June. 2018). <https://www.sec.gov/rules/final/2018/33-10514.pdf>.
- 20 SEC Adopting Release No. 33-10618, "FAST Act Modernization and Simplification of Regulation S-K," (SEC: March 2019), p. 93. <https://www.sec.gov/rules/final/2019/33-10618.pdf>.
- 21 SEC Financial Statement and Notes Data Sets. <https://www.sec.gov/dera/data/financial-statement-and-notes-data-set.html>.