Computer-Assisted Functions

for

Auditing XBRL-Related Documents

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ABSTRACT

The increasing global adoption of XBRL and its potential to replace traditional formats for business reporting raise questions about the quality of XBRL-tagged information. In this paper, we identify a set of issues and audit objectives that auditors might confront if they are asked to provide assurance procedures on the XBRL-related documents. We also address useful computer-assisted audit functions for supporting various audit tasks on XBRL instance documents and extension taxonomies and discuss how the identified audit objectives could be accomplished using these functions.

Key words: XBRL (eXtensible Business Reporting Language); Assurance; Computer-Assisted Auditing Tools for XBRL;
1. INTRODUCTION

Business information is increasingly being provided on the Internet in digital formats. XBRL (eXtensible Business Reporting Language) was developed to further enhance information communication by providing a standardized method to prepare, publish, and exchange business, and especially financial, information (Boritz and No, 2009; 2004b; Hoffman and Strand, 2001; XBRL International, 2007a). XBRL is being used, being implemented, or being pilot tested around the world for financial reporting and government e-filings as well as other uses. For instance, the Securities and Exchange Commission (SEC) in the U.S. has mandated the use of interactive data (i.e., XBRL) for the financial reporting of all U.S. public companies by December 2011 (SEC, 2008), and the Canadian Securities Administrators (CSA) have adopted a voluntary XBRL filing programs (CSA, 2007). The U.K. plans to mandate the use of XBRL for tax filings by all companies from March 2011 (XBRL Planet, 2009). The Financial Services Agency in Japan has required all public companies to submit XBRL-tagged financial statements since 2008 (Karen, 2008). China has required the use of XBRL for the full financial statements of all listed companies in quarterly, half-year, and annual reports since 2004 (SEC, 2007b) and in October 20, 2010 it announced the adoption of a general purpose taxonomy for standard business reporting. The general purpose XBRL taxonomy will be used across government agencies such as Ministry of Finance and China Security Regulatory Commission (XBRL International, 2010).

The limited guidance for and experience with the creation of XBRL documents raise questions about the quality of XBRL-tagged information, which, in turn, leads to assurance issues related to the use of XBRL (Boritz and No, 2009; 2004a; 2008; Elliott, 2002; Farewell and Pinsker, 2005; McGuire et al., 2006; Pinsker, 2003; Plumlee and Plumlee, 2008). The goals of this paper are to identify a set of specific audit objectives and related audit tasks for XBRL-
tagged information and to discuss how computer-assisted audit functions can be used to carry out those audit tasks. Those objectives and tasks could pertain to an external agreed-upon procedures engagement, an examination level attestation engagement, an internal audit program or other internal quality assurance program aimed at ensuring that the XBRL-related documents produced by the entity are reliable. The term “XBRL-related documents” refers to documents used for presenting financial information in XBRL format (i.e., instance document\(^1\) and company extension taxonomies\(^2\)).

The remainder of this paper is organized as follows. The section after this brief introduction discusses a number of issues that auditors might confront if they are asked to perform assurance procedures on XBRL-related documents. This section is followed by a discussion of audit objectives and related audit tasks for XBRL-related documents. Next, we describe useful computer-assisted audit functions and discuss how these functions can be used to address those audit objectives. Then, we describe the outcome of a preliminary evaluation by practitioners of the framework, objectives, tasks and computer-assisted tools discussed. Finally, we conclude with a summary of limitations and suggestions for future research.

2. FINANCIAL REPORTING USING XBRL AND ASSURANCE

2.1. XBRL and Financial Reporting

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\(^1\) An instance document is the financial or business information of the entity tagged with XBRL elements. An element represents a financial reporting concept, including line items in the face of the financial statements, important narrative disclosures, and rows and columns in tables.

\(^2\) A taxonomy is a dictionary linking agreed-upon financial terms used in preparing financial statements or other business reports and the corresponding XBRL elements. An XBRL taxonomy consists of taxonomy schema and linkbase. Company extension taxonomies are taxonomy elements added by a company to a standard (official) taxonomy to compensate for elements the company requires or desires to use for preparing its instance document but that are missing in the standard taxonomy.
XBRL can be used for a variety of business reporting purposes. In this paper, we focus on financial reporting. Currently, most companies first create their official financial statements using their internal financial reporting systems. Then, using a separate process, they create XBRL-related documents (i.e., instance documents and company extension taxonomies). Figure 1 depicts the current status in electronic financial and business reporting and assurance.

Companies can either create the documents in-house or outsource this process to a third party service provider (XBRL US, 2010b). Regardless of whether XBRL-related documents are produced in-house or outsourced, most companies typically use a “bolt-on” approach (Garbellotto, 2009; XBRL US, 2010b). Under a bolt-on approach (XBRL Creation Process in Figure 1), a company first maps financial facts in the official financial statements to elements in a standard XBRL taxonomy (e.g., XBRL US GAAP Taxonomy). It also determines whether there are financial facts that do not match to the elements in the standard taxonomy (Mapping). If necessary, the company extends the standard taxonomy to create extension elements (Extending). It then sets up the context information such as period and units of measure that collectively provide the basis for understanding the numeric or non-numeric data items or individual facts in the instance document. Next, each individual account value in the financial statements is tagged using a corresponding XBRL element (Tagging). After that, the company validates the instance document and company extension taxonomy against XBRL specifications and regulatory requirements (e.g., the SEC EDGAR filer manual and UK HMRC filing requirements in iXBRL).

--- Insert Figure 1 ---

3 We emphasize “currently” because eventually XBRL-related documents will be produced simultaneously with or even before the production of official financial statements or may in fact be the official financial statements.
and may render the instance document for visual examination (Reviewing). Finally, the company places the instance document and extension taxonomy on the corporate Web server and regulator sites such as EDGAR. Whenever they need to do so, users (e.g., investors, analysts, and regulators) obtain the XBRL-related documents over the Internet from the corporate Web site or other sites such as EDGAR (if they are made publicly available) and use them for their analysis. Furthermore, if they want to transform the instance documents into other formats such as a spreadsheet or database, they can do so with appropriate style sheets or other tools.

The traditional audit attests to the fairness of the presentation in accordance with GAAP of the “official” financial statements. However, at present, there is no requirement to provide independent assurance on the digital version of the official financial statements (e.g. XBRL) in any regulatory filings around the world, despite evidence of inadequacies in those “documents.” For example, Boritz and No (2008) studied XBRL filings in the SEC’s XBRL Voluntary Filing Program on EDGAR from its inception in 2005 to December 31, 2007, and found that most XBRL filings contained exceptions, inconsistencies, and errors that could limit their usefulness as data exchange mechanisms if users felt that the XBRL-related documents were not tagged properly or were otherwise lacking in quality. Debreceny, Farewell, Piechocki, Felden, and Gräning (2010) studied the first set of filings under the SEC’s mandatory XBRL filing program and also found a significant number of errors.

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4 EDGAR stands for Electronic Data Gathering, Analysis and Retrieval system.
5 For example, in the U.K., the XBRL-tagged financial statements to be submitted with tax returns are not intended for public use.
6 A style sheet is a mechanism that describes the layout or presentation to be used when displaying a document written in markup language such as XML.
7 Under the SEC’s new rule, a filer’s interactive data are subject to limited liability during the company’s first two years of required XBRL reporting. During this period, interactive data submissions will be deemed to be furnished, not filed, for the liability provisions of Security Acts and Security Exchange Act, and not subject to specified antifraud provisions if inaccurate XBRL-related documents are provided with good faith and are corrected promptly after the filer becomes aware of the failure.
Therefore, at some point, it may be desirable or necessary to perform some type of assurance procedures on the XBRL-related documents in addition to the assurance provided on the official financial statements to reassure various parties such as users, management, and audit committees and regulators that the XBRL-related documents furnished by companies are complete, accurate, valid, and consistent translations of the original paper format documents and, perhaps, that acceptable practices were followed in preparing those translations. At the 21st XBRL International conference held in October 2010 in Beijing, representatives of the Big 4 firms reported that about 10 – 15% of their clients who were required to file in the first set of mandatory XBRL filings had engaged the auditors to perform Agreed-Upon Procedures (AUPs). This number was growing as the firms moved towards the detailed tagging of footnotes.

2.2. An Assurance Framework for XBRL-Related Documents and Audit Tools

In this section, we briefly discuss audit objectives for assurance on XBRL-tagged data and computer-assisted auditing tools required to assist auditors to provide assurance on XBRL-related documents. Conventionally, when an auditor performs a substantive test, he or she gathers sufficient appropriate evidence to enable him or her to draw a conclusion whether the subject matter is presented fairly, in all material aspects, in accordance with GAAP or other suitable criteria (e.g., IFRS). An XBRL assurance engagement may be aimed at assessing whether XBRL-tagged data completely, accurately, validly, and consistently reflect the business facts in the original document and meet regulatory requirements. Since XBRL is a standardized machine-readable format, the auditor may need a tool that will enable him or her to check whether the instance document and taxonomies are valid, to evaluate whether the data contained in the instance document completely, accurately, and consistently reflect the business facts in the
corresponding official financial statements, and to verify that the instance document and company extension taxonomies comply with regulatory requirements (e.g., the SEC Rules and EDGAR filer manual) and other guidelines (e.g., XBRL US Taxonomy Preparers Guide, FRIS, and FRTA)\(^8\).

There are four profession-generated guidelines currently available that address the issues related to assurance on the XBRL-related documents: American Institute of Certified Public Accountant (AICPA) Interpretation No. 5, Public Company Accounting Oversight Board (PCAOB) Staff Q&A, Assurance Working Group (AWG) white paper, and AICPA Statement of Position 09-1. The AICPA Interpretation No. 5, Attest Engagements on Financial Information Included in XBRL Instance Documents (AICPA, 2003), addressed several considerations when an auditor is engaged to examine and report on whether an instance document accurately reflects certain client financial information. PCAOB Staff Q&A (2005) addressed attestation on the XBRL-related documents and was intended to provide guidance for auditors engaged in reporting on whether the data contained in the XBRL-related documents accurately reflect the corresponding information shown in the official EDGAR filings. The Assurance Working Group (AWG) of XBRL International has proposed an assurance framework for electronic business reporting based on ISA 3000 principles (AWG, 2006).\(^9\) The AICPA issued Statement of Position (SOP) 09-1 (AICPA, 2009). The SOP provides CPAs with guidance on performing and reporting on agreed-upon procedures engagements, performed under AT section 201, that address the

\(^8\) Financial Reporting Instance Standards (FRIS) were developed to facilitate the analysis and comparison of data in instance documents. FRIS provide a guideline for creating instance documents under XBRL Specification v2.1 (XBRL International, 2004). Financial Reporting Taxonomies Architecture (FRTA) is a set of rules and conventions which help make taxonomies more usable and efficient (XBRL International, 2006).

completeness, accuracy, or consistency of XBRL-tagged data. It also includes recommendations that assist CPAs in applying certain aspects of AT section 201 to the subject matter of XBRL.

In addition, several academic papers have addressed this topic. Plumlee and Plumlee (2008) discussed assurance issues involved in providing assurance on XBRL-tagged information. Boritz and No (2009) conducted mock assurance procedures on the XBRL-related documents of United Technologies Corporation’s 10-Q for the third quarter of 2005 and repeated on its 10-Q for the third quarter of 2008. By presenting the findings from their examination process, Boritz and No discussed issues that might need to be addressed by auditors if they were asked to provide assurance on XBRL-related documents. Srivastava and Kogan (2010) developed a conceptual framework consisting of a set of assertions determining the quality of an XBRL instance document and discussed how the framework could be used to help auditors in performing assurance procedures on XBRL instance documents.

In general, the assurance process for XBRL-related documents can be categorized into four major phases: client/engagement acceptance; planning; testing and evidence gathering; and, evaluation and reporting. In the client/engagement acceptance phase, an auditor needs to decide whether he or she can accept an assurance engagement and should agree on the terms of the engagement with the engaging party. According to the PCAOB (Q4 and Q6) and AICPA’s SOP, an auditor performing an assurance engagement involving XBRL-related documents should not only be independent but also have sufficient knowledge (e.g., regulatory requirements, XBRL specifications, and the company’s financial statements) to evaluate the completeness, accuracy, and consistency of its XBRL-tagged data. If the auditor cannot or does not wish to accept an assurance engagement, he or she could consider alternatives such as an agreed-upon procedures (AUP) engagement or consulting engagement. In the planning phase, the auditor determines the
amount and type of evidence or other effort required to allow a supportable conclusion to be drawn; for example, whether the subject matter (i.e., XBRL-related documents) is presented fairly, or in the case of AUP, whether the procedures on XBRL-tagged data as of a specified data and for a specified period have been performed in accordance with the agreement.

In the testing and evidence gathering phase, according to PCAOB (Q7) the auditor gathers sufficient appropriate evidence to enable him or her to assess whether the XBRL-tagged data comply with the appropriate XBRL specifications and taxonomies and to evaluate whether the data in the instance document reflect the same information as the corresponding official EDGAR filings. Therefore, such an engagement would involve procedures to determine whether the instance document and the extension taxonomies are in accordance with applicable regulatory requirements and XBRL specifications (i.e., compliance), whether the XBRL-tagged data in the instance document completely and accurately reflect the business facts in the official financial statements (i.e., completeness and accuracy), whether the instance document contains only valid information, not extra, unrelated information (i.e., occurrence), and whether the same rules and taxonomies, unless otherwise indicated, are applied to create the XBRL-related documents across reporting periods (i.e., consistency). In an AUP engagement or a consulting engagement, the procedures would be negotiated with the client. For example, according to the AICPA’s SOP, the agreed-upon procedures that an auditor may perform to assess completeness, accuracy, and consistency of XBRL-tagged data include identifying the taxonomies used, determining accuracy and consistency of the tagging process, evaluating the creation of extension taxonomies, assessing completeness of XBRL-tagged data and the level of granularity the entity used to tag its notes, and reviewing linkbases (i.e., labels, calculations, and presentation links).
In the final phase, evaluation and reporting, the auditor evaluates the evidence and prepares a report regarding the XBRL engagement as distinct from the accountant’s report on the traditional format financial statements.

Based on our review of the aforementioned guidelines (AICPA, 2003; 2009; AWG, 2006; PCAOB, 2005) and other literature discussing XBRL assurance issues (AICPA, 2008; Boritz and No, 2009; Plumlee and Plumlee, 2008; Srivastava and Kogan, 2010; XBRL.US, 2008), we developed the following assurance framework for XBRL-related documents.

----- Insert Figure 2 ----- 

The framework represents the necessary characteristics of auditors and seven objectives that auditors may need to address in performing assurance procedures on XBRL-related documents (i.e., instance document and extension taxonomies):

a. Internal control over the creation of XBRL-related documents:
   To determine whether the controls over the creation of the XBRL-related documents are operating effectively and efficiently

b. Compliance:
   To determine whether the XBRL-related documents are created in accordance with the relevant XBRL specifications and regulatory requirements

c. Suitability:
   To determine whether appropriate elements are used to tag the underlying business facts in the official filing and the extension taxonomies are necessary
d. Accuracy:

To determine whether the data in the instance document accurately reflect, in all material respects, all business facts presented in the source documents or files (e.g., a regulatory filing)

e. Completeness:

To determine whether all business facts in the source documents or files are completely tagged in the instance document

f. Occurrence:

To determine whether XBRL-related documents contain information that is not in the source documents or files

g. Consistency:

To determine whether the XBRL-related documents are prepared in a consistent manner

Table 2 provides a summary of these audit objectives and 20 related audit tasks. It also compares these audit tasks with the procedures described in Statement of Position (SOP) 09-1 (AICPA, 2009) and Srivastava and Kogan (2010)\(^\text{10}\).

3. COMPUTER-ASSISTED AUDIT TOOLS FOR XBRL-RELATED DOCUMENTS

3.1. Computer-Assisted Audit Functions for XBRL-Related Documents

\(^{10}\) Srivastava and Kogan (2010) introduced a similar conceptual framework presented in Table 2. Our framework differs from the framework developed by Srivastava and Kogan in two ways. First, our framework includes several additional components (e.g., internal control and consistency) that were not addressed in their framework. Second, our framework identifies the audit tasks that an auditor needs to perform to achieve the related audit objectives.
The attestation or assurance engagement on XBRL-related documents primarily focuses on the compliance of XBRL-related documents with the relevant XBRL specifications and regulatory requirements, and the effectiveness of the XBRL generating processes. An auditor may need to conduct several tasks to achieve the aforementioned seven objectives.\textsuperscript{11} In performing such tasks, the auditor would benefit from the following four computer-assisted functions designed for analyzing XBRL-related documents. The desired functionalities are summarized in Table 1.

- General functions
  Present detailed information about XBRL-related documents and provide standard functions such as search, print, help, etc.

- Validation of instance documents and company extension taxonomies:
  Check whether an instance document and company extension taxonomies comply with the relevant XBRL specifications and applicable legislative or regulatory requirements.

- Mapping/Tracing:
  Map/trace elements in the instance document to the business facts in the official financial statements.

- Rendering:

\textsuperscript{11} Srivastava and Kogan (2010) argued that several assertions addressed in their conceptual framework for providing assurance on XBRL instance documents could be easily done using computer-assisted tools. For instance, assertions regarding well-formedness, validity, and valid taxonomy extensions can be significantly simplified with validation tools.
Display instance documents to enable visual review and detailed checking of instance documents to official financial statements and vice versa.

----- Insert Table 1 ----- 

3.2. Validation

A validation tool is essential to check the XBRL-tagged data because this task is too tedious for an auditor to perform effectively manually but is essential due to the high frequency of exceptions (e.g., calculation errors) or errors (e.g., EDGAR filer validation errors) that currently exist in XBRL-related documents (Boritz and No, 2008; Debreceny et al., 2010; SEC, 2009b). A validation tool usually performs two types of validations: taxonomy validation and instance validation. Taxonomy validation is a process that analyzes a taxonomy to confirm that it complies with the requirements of the XBRL specifications. Instance validation is a process that checks whether the instance document is consistent with the XBRL specifications and extension taxonomies and complies with the applicable legislative or regulatory requirements (e.g., the EDGAR filer manual).

3.3. Mapping

A mapping tool would be useful for assessing whether the XBRL-tagged data in the instance document are a complete and accurate reflection of the business facts in the official financial statements. That is, by mapping the elements in the instance document to the business facts in the official financial statements, an auditor can determine whether all business facts in the corresponding official filing are completely tagged in the instance document and whether the data in the instance document reflect the same information as the corresponding official filing.
However, the usefulness of a mapping tool declines as the chart of accounts becomes less standardized and as the use of extension taxonomies increases. In settings like North America where a standard chart of accounts is considered to be unacceptable, companies use a wide ranging set of account names in their financial statements and extension taxonomies frequently represent a considerable number of the elements in an instance document. Thus, the accuracy of a mapping between the instance document and the official financial statements would be limited by the proportion of elements in company extension taxonomies and the level of granularity the entity uses to tag notes and MD&A (e.g., single block tag versus detailed tag). This may require the auditor to rely on a rendering tool instead of a mapping tool.

3.4. Rendering

XBRL was developed for machine-to-machine information transfer. It was not designed for direct reading by humans; thus, most people would find it difficult to review or audit XBRL code directly. A rendering tool converts XBRL code into a presentation that can be visually inspected by a human. Once an XBRL instance document is rendered, that version can be visually compared to the original source document (assuming that the original source is indeed a document and not a database or other such digital source); however, rendering does interpret metadata rather than display it directly, and important aspects for assurance may be lost or ignored.

4. AN ILLUSTRATION OF THE USE OF COMPUTER-ASSISTED AUDIT

FUNCTIONS FOR XBRL
In this section, we describe how computer-assisted audit functions can be used to carry out audit tasks to achieve key audit objectives. As summarized in Table 2, in an audit aimed at assessing whether the XBRL-tagged data in the instance document completely, accurately, and consistently reflect the business facts in the original document, the following seven major objectives are addressed: a) Internal Control, b) Compliance, c) Suitability, d) Accuracy, e) Completeness, f) Occurrence, and g) Consistency. The table describes common errors in XBRL filings associated with each of the above objectives, audit tasks that can be performed to detect those errors, and useful computer-assisted audit functions that could be used to perform those audit tasks in part or in their entirety.

4.1. Internal Control

4.1.1. Audit Task 1

The quality of XBRL-tagged data will depend on the process (i.e., internal control) used to prepare the XBRL-related documents (i.e., instance document and extension taxonomies). With respect to XBRL, internal control can be broadly defined as a process that is designed to provide reasonable assurance regarding the achievement of objectives such as effectiveness and efficiency of the XBRL generating process, quality (e.g., reliability) of XBRL-related documents, and compliance of XBRL-related documents with regulatory requirements. Providing assurance on the XBRL-related documents, therefore, needs to begin by assessing whether appropriate controls exist over the creation of the official financial statements, mapping of the business facts in those financial statements to the standard taxonomies, the creation of extension taxonomies, tagging of the financial data and other required information (e.g., company identifier information
such as company name and CIK) to create the instance documents, and the review process for XBRL-related documents. The practitioner also should determine whether there exists reliable, efficient version control and stable access to the extension taxonomies.

Currently, most employees have limited knowledge about XBRL and are inexperienced in creating an instance document and extension taxonomies. Also, there may be limited supervision of employees or outsourcers’ work and no formal review process for XBRL-tagged data. As a result, a practitioner may conclude that the company has limited internal control procedures over the preparation of XBRL-related documents and decide to perform ‘substantive’ tests to determine whether the XBRL-tagged data in the instance document are a complete, accurate, valid, and consistent translation of the client’s official regulatory filing.

Currently, the bolt-on XBRL tagging process falls outside the financial reporting process contemplated by SOX 404 internal control audits. In the future, when XBRL is embedded within the financial reporting system, the XBRL tagging process will be subject to SOX 404 internal control audits.

4.2. Compliance

According to previous studies (Boritz and No, 2008; Debreceny et al., 2010; Weirich and Harrast, 2010), common errors in XBRL creation are that companies improperly represent the relationship among elements, fail to establish mathematical relationships among elements in a calculation linkbase, and present elements in the wrong location in a presentation linkbase. Companies also fail to report required values as required by government agencies (e.g., EDGAR filer requirements) and use axis and member improperly (e.g., fail to use the pre-defined table structures included in the taxonomy). To assess the compliance of a client’s XBRL-related
documents with XBRL specifications and regulatory requirements, a practitioner may use software for part of the task and may perform part of the task manually.

4.2.1. Audit Task 2, 3, 4 & 5

First, the practitioner assesses whether the instance document and extension taxonomies comply with XBRL Specification v2.1 and other guidelines (e.g., FRIS and FRTA), and applicable legislative or regulatory requirements (e.g., the EDGAR filer manual). To perform these tasks, the practitioner may use the validation functions in an XBRL tool (e.g., Fujitsu XBRL Taxonomy Editor/Instance Creator and CoreFiling’s Touchstone). Figure 3 shows the screenshot of an XBRL tool that provides validation functions for XBRL-related documents.

Validation errors may represent inconsistencies between the instance document and suggested, but not mandatory, practices. For example, sub-totals that are in the taxonomy but not in the instance document are flagged by the software as calculation errors. The practitioner would assess these errors to determine whether they are truly errors or are a legitimate reporting choice, not a contravention of XBRL specifications.

In addition, several validation exceptions may be identified upon performing FRIS and FRTA validation tests. The existing official US GAAP taxonomies are themselves not fully FRTA compliant, and therefore companies using those taxonomies would not be completely FRTA compliant as well. FRIS is still a working draft that has not yet achieved general agreement; therefore, the exceptions identified by the validation tests may represent inconsistencies due to disagreements with standards still under development rather than errors.
Since the SEC’s rule (SEC, 2009a) does not require compliance with FRTA and FRIS, the practitioner may conclude that not being consistent with FRTA and FRIS is not a contravention of XBRL specifications. However, the inconsistencies could be communicated to client managements together with the practitioner’s recommendations for addressing them.

Using the validation function, the practitioner could also examine whether the instance document and the related taxonomies, as necessary, conform to the applicable rules suggested by regulators (i.e., the EDGAR filer manual). For instance, the SEC’s EDGAR filer manual (2010a) requires filers to tag required company information (e.g., document type, entity registrant name, CIK code, and entity public float) into instance documents. An error will be identified if the client’s instance document does not include such required company information.

Finally, the practitioner may wish to determine the quality or appropriateness of taxonomies in terms of authority, history, and purpose. For instance, companies are required to create XBRL instance documents using the most recent official XBRL taxonomy. Unfortunately, there is currently no tool that automatically performs this task. Therefore, the practitioner could use an XBRL tool (e.g., Fujitsu XBRL Instance Editor) to obtain the detailed information about taxonomies used in the instance document and then manually assess the quality or appropriateness of the taxonomies used.

4.3. Suitability

Another key audit objective is to assess whether appropriate taxonomies and elements are used to tag the underlying business facts in the official filing and that the extension taxonomies are necessary to create the instance document. Studies have shown that several common errors in

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12 The EDGAR Filer Manual - Volume II (Chapter 6) provide a guideline on the presentation, submission, and validation of XBRL filings.
XBRL creation can occur when companies map business facts in the official financial statements to elements in XBRL taxonomies (Boritz and No, 2008; Debreceny et al., 2010; SEC, 2009b; 2010b; Weirich and Harrast, 2010). Some companies have used a less appropriate standard element even though a more appropriate standard element exists. Some companies have used elements that have been removed from the taxonomy. In addition, a number of companies have used a standard element when they should create an extension element while others have created an extension element when an appropriate standard element exists. Therefore, it is important for the practitioner to determine not only the suitability of elements used to tag business facts but also the necessity of extension taxonomies.

4.3.1. Audit Task 6 & 7

To determine the suitability of elements and extension taxonomies (i.e., whether the taxonomy selected is an acknowledged or approved one, whether the extensions are appropriate, and whether the taxonomy, as extended, represents suitable and available criteria) the practitioner may need a tool that provides detailed information about taxonomies used, summarizes the structure of linkbases, presents raw XBRL codes, and offers a search mechanism that allows practitioners to search a specific element, context, label, etc. Recently developed XBRL tools usually use various colors and icons to differentiate standard taxonomies and company extension taxonomies and enable practitioners to sort elements by name, period, and segment. Hence, using such tools, the practitioner is able to identify what taxonomies (e.g., standard taxonomies with light blue and orange background colors and company extension taxonomies with light purple background color) are used to create the instance document. Figure
4.3.2. Audit Task 8

Furthermore, such tools could be used to assess the appropriateness of the elements used to tag the underlying business facts. Several XBRL tools provide the detailed information of each element used in the instance document such as context and unit information. By comparing this information with the business facts in the official financial statements, the practitioner is able to determine the appropriateness of the elements used to tag the underlying the business facts. For example, when an element (e.g., CostOfRevenue) is selected, an XBRL tool would highlight the matched element and provide the detailed information (e.g., prefix, element name, associated values, period, and labels) of the element. By comparing this information with the business facts in the official financial statements, the practitioner can assess the appropriateness of the elements (e.g., CostOfRevenue) used to tag the underlying business facts (i.e., Cost of revenue). Figure 4.b shows a screenshot of this function.

4.3.3. Audit Task 9

To verify that the company extension taxonomies have only elements that are not in the XBRL standard taxonomies, the practitioner needs to examine whether elements created in extension taxonomies to prepare the instance document are the same as or similar as elements in the standard taxonomies. Useful audit functions for this task would be mapping and official

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XBRL taxonomy viewer. Figure 5 shows the screenshot of a tool that provides these functions.

Using the mapping function, the practitioner is able to create a mapping table among business facts in the official financial statement and the XBRL-tagged data in the instance document to identify all items that do not match. For each of these non-matching items, the practitioner can then search for the element using the search function of the official XBRL taxonomy viewer to check whether a similar element exists in the standard taxonomies. These steps would be repeated for all extension elements. The practitioner then can assess whether the extension taxonomies are necessary. For instance, the mapping information showed in Figure 5 indicates that the client created an extension element (i.e., SecuritiesLendingPayable) and that the tool failed to find a corresponding standard element in the official XBRL taxonomy. Upon discussing this extension with client personnel, the practitioner may be told that there was no suitable element for this item in the standard taxonomies.

4.4. Accuracy

There are several errors that companies make with respect to the accuracy of XBRL-related documents (Bartley et al., 2010; Boritz and No, 2008; Debreceny et al., 2010; SEC, 2009b; 2010b; Weirich and Harrast, 2010; XBRL US, 2010a). The common errors include reporting incorrect negative values, inappropriate use of context references, failure to tag another required value when a value is reported, reporting a value that should be zero when another value is reported, mismatching duplicate reported values, tagging improper values (i.e., data-entry errors), and rounding error.
4.4.1. Audit Task 10 & 11

To check the accuracy of XBRL-tagged data, the practitioner first determines whether the XBRL-tagged data in the instance document accurately reflect the business facts in the original document, and also whether the data in the instance documents are matched with appropriate elements in accordance with applicable taxonomies. Currently available XBRL tools provide detailed information about each element used in the instance document, including text, line item names, associated values, dates, labels, and taxonomy information. Hence, by comparing this information with the business facts in the corresponding financial statements, the practitioner is able to determine whether the elements in the instance document accurately reflect the business facts in the original document. For instance, Figure 4.b shows detailed information about the CostOfRevenue element: prefix (us-gaap), value (6755000000), decimal (-6), period (2008-07-01 – 2008-12-31), standard label (Cost of Revenue, Total), company defined label (Cost of revenue), element type (monetary item type), balance (debit), and period type (duration). Using the information, the practitioner can check whether the client made some of the common errors in XBRL creation such as reporting incorrect negative value (by examining the balance and tagged value), tagging improper values (by comparing original value with tagged value), and inappropriate use of decimal (by checking decimal and tagged value). Furthermore, the practitioner can use the official taxonomy viewer to acquire the detailed information of an element (i.e., CostOfRevenue) such as documentation, presentation reference, and properties.

4.4.2. Audit Task 12 & 13

Rendering the instance document and checking whether it agrees with the corresponding
information in the official financial statements can be used to verify that the business facts in the corresponding official documents have not been changed, deleted, or summarized in the instance document. Figure 6.a shows the screenshot of a rendering function.

For instance, Figure 6.b shows the screenshot of a tool that enables practitioners to compare a rendered XBRL document with the corresponding official financial statements. In this example, the rendered balance sheet created based on the presentation linkbase of the client’s extension taxonomies does not show ‘Total current assets’ and ‘Total current liabilities’ whereas the official balance sheet does show them.

4.4.3. Audit Task 14

Currently, most available XBRL tools provide information about identifier, unit, precision, language, and period or duration. Using such information, the practitioner is able to determine whether the instance document has this required information.

4.5. Completeness

Studies have shown that some companies fail to completely tag all business facts in the official filings in the instance document (Bartley et al., 2010; Boritz and No, 2008; Debreceny et al., 2010; SEC, 2009b; 2010b). For instance, several companies have overlooked tagging amounts appearing parenthetically in the financial statements (e.g., the allowance for doubtful accounts and shares of stock outstanding) and reported values when the values should be zero or not disclosed (e.g., report the value of new stock issued that includes a treasury stock). Another
main audit goal is to determine that the instance document completely reflects the official financial statements.

4.5.1. Audit Task 15 & 16

A useful function for this task is one that automatically maps XBRL-tagged data in the instance document to the business facts in the official financial statements. This function allows a practitioner easily to determine whether all facts in the corresponding official documents are completely tagged in the instance document. Figure 7 shows the screenshot of the mapping function in an XBRL tool.

---- Insert Figure 7 ----

For example, the mapping information shown in Figure 7.a indicates that two financial facts (i.e., ‘short-term investments’ and ‘accounts receivable, allowance for doubtful accounts’) appeared parenthetically in the balance sheet were properly tagged in the instance document. Furthermore, the mapping information shows that ‘short-term investments’ was tagged using an extension element created by the client (i.e., SecuritiesOwnedAndLoaned) whereas ‘accounts receivable, allowance for doubtful accounts’ was tagged using a standard element (i.e., AllowanceForDoubtfulAccountsReceivableCurrent). It also shows that one financial fact (i.e., ‘total current assets’) in the official balance sheet was not tagged in the instance document.

In addition, using the detailed information about element, taxonomy, and context, the practitioner is able to determine whether the instance document contains all applicable information that is required by regulators and government agencies. For instance, Figure 7.b shows the screenshot of a tool that shows elements with ‘dei’ (Document and Entity Information)
prefix. By sorting elements used in the instance document based on the prefix, the practitioner can examine the elements with a ‘dei’ prefix to determine whether required company information (e.g., document type, entity registration name, and entity central index key) is properly tagged in the instance document.

4.6. **Occurrence**

The XBRL instance document should only contain valid information, not extra, duplicated or unrelated information that is not in the official financial statements.

4.6.1. **Audit Task 17**

To assess whether the instance document only contains information that was in the official financial statements (i.e., no unnecessary elements), the practitioner could use the mapping function to verify that there is no extra information in the instance document that is not in the official filing.

4.7. **Consistency**

A main goal of XBRL is to provide financial information users with a standardized method to exchange business information. To accomplish such goal, it is important that the XBRL-related documents should be properly managed to ensure consistency. That is, the same rules, elements, and taxonomies, unless otherwise indicated, should be applied to create the instance documents across reporting periods. The tasks that can be performed to achieve this objective are to assess whether there is consistent use of official and extension taxonomies across reporting periods, whether the same elements are used to tag the same business facts across
reporting periods, and whether the same rules are applied to create context information for the
instance documents of different reporting periods.

4.7.1. **Audit Task 18 & 19**

Unfortunately, currently available XBRL tools do not have a function that enables a
practitioner automatically to check consistency of use of elements and taxonomies across
reporting periods. Therefore, the practitioner could manually examine the XBRL-related
documents of each reporting period. First, the practitioner would obtain the detailed information
about elements and taxonomies used to create the instance documents and context information
(e.g., identifier, segment, and period) from the client’s prior period instance document. The
practitioner would then obtain the same information from the current period instance document.
Finally, information obtained from both periods would be compared. Figure 8 shows the
screenshot of a tool that provides these functions.

----- Insert Figure 8 ----- 

5. **PRELIMINARY EVALUATION OF AUDIT OBJECTIVES, AUDIT TASKS, AND
AUDIT TOOLS**

To assess the reasonableness of the audit objectives and tasks described in this paper as
well as the usefulness of the identified computer-assisted audit tools, we conducted a workshop
addressing assurance on XBRL-Related documents. A questionnaire was developed to probe
participants’ opinions regarding assurance on XBRL-Related Documents. The questionnaire
consisted of four sections. The first section was designed to gather demographic information.
The second section was developed to capture the participants’ XBRL knowledge as well as their
previous experiences with XBRL. The third section measured the participants’ opinions about
the audit objectives and audit tasks as well as their current knowledge about how to achieve them. The last section was designed to obtain the participants’ opinion about the computer assisted techniques demonstrated in the workshop with respect to its potential to assist auditors in achieving the specified audit objectives effectively and efficiently.

Participants were solicited through an emailed announcement to the members of a Chapter of ISACA in a large city in North America. A total of 19 audit professionals participated in the workshop. The majority of the participants (89.5%) were male. On average, the participants had approximately 19 years of work experience and were in their current positions for four years. They were employed in various industries: Services including consulting (35%), Finance, Insurance, and Real Estate (20%), IT (10%), Accounting firms (10%), Government (10%), Manufacturing (5%), Electric (5%), and Gas and Sanitary Service (5%). Furthermore, the majority of the participants were working in IT-related areas such as Information Systems Audit (47.4%), Information Systems Management (10.5%), and Information Systems Security (10.5%). About 46% of the participants majored in Information systems, and about 32% had an accounting major. Most of the participants had at least one professional certificate such as CISA, CA, CISSP, PMP, CISM, etc. More than two-thirds of the participants (68.4%) had an undergraduate degree, and about 16% of them had a graduate degree.

Virtually all of the respondents were experienced with computer-assisted auditing - only one participant did not have previous experience. With respect to XBRL, 15 participants (approximately 79%) had previous experience with XBRL. However, only four participants (21.1%) had prepared an XBRL document. The main challenges (or concerns) that they encountered when they prepared an XBRL document include 1) Change of the standards over the years, 2) XBRL acceptance, 3) Lack of sophisticated tools, 4) Mapping companies’ chart of
accounts into taxonomy, and 5) Technical issues. In addition, only two participants (10.5%) among them had assessed the quality of an XBRL document and did it as a research project.

Most of the participants believed that they did not have the necessary knowledge with respect to XBRL, reporting low levels of knowledge on a scale of 0-100: Company’s Financial Statement Creation Process and the Process Used to Create XBRL-Related Documents (28.68), XBRL Taxonomies and Specifications (18.68), Applicable Regulations (14.74), Evaluating Extension Taxonomies (12.63), and Regulatory Requirements in terms of Context and Formats (9.74). Similarly, the respondents believed that they did not have current knowledge about how to achieve audit objectives in connection with XBRL documents, reporting the following levels of knowledge for meeting key audit objectives: Internal Control (47.21 on a scale of 100), Compliance (30.00), Suitability (30.00), Accuracy (34.32), Completeness (28.89), Validity/Existence (30.00), and Consistency (34.84). Likewise, most participants did not have confidence in their current knowledge about how to complete the 21 XBRL-related audit tasks discussed in this paper. The highest knowledge audit task was audit task No. 13 (48.42 on a scale of 100) whereas the lowest knowledge audit task was audit task No. 5 (16.05).

The participants believed that a CAAT is needed for most of the audit tasks identified (more than 50% of the participants said ‘Yes.’) except for audit task No. 1 (33%)\textsuperscript{14}. Similarly, the participants considered that a CAAT would be the most effective and efficient technique for all the audit tasks (more than 70% of the participants said ‘Yes’ for effectiveness and efficiency) except for audit task No. 1 (44% for effectiveness and efficiency).

6. CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH PLANS

\textsuperscript{14}The auditor should evaluate whether any company extensions of the taxonomy are consistent with applicable legislative or regulatory requirements and XBRL specifications.
The increasing global adoption of XBRL and its potential to replace traditional formats for filed business documents raises questions about the “quality” of XBRL-tagged information. However, there are tools that auditors can use while they are conducting assurance procedures on the XBRL-related documents. In this paper, we discuss assurance issues for XBRL-related documents. We identified several key audit objectives and related audit tasks and described how computer-assisted auditing tools could be used to address those audit objectives.

Without the use of computer-assisted tools, performing assurance procedures on XBRL-related documents can be time consuming, tedious and error prone. With the help of CAATs auditors can efficiently and effectively assess the reliability of XBR-related documents when conducting agreed-upon procedures or examination-level attestation/assurance engagements.

A limitation of our research is that the practitioners who were involved in evaluating the framework, tasks, and tools had limited experience with XBRL. Also, the tools were somewhat limited in their ease of use for someone without training in their use. In extensions of this research, we plan to further corroborate the framework and tasks by having them reviewed by practitioners with experience in this area and training in using the tools. We also plan to investigate how auditors perform the audit tasks in an actual or simulated audit setting and how they use the computer-assisted tools described in this paper to perform the audit tasks. Among the issues of interest to us are what sequence of procedures auditors choose, what degree of manual effort still remains in connection with each task, and if sampling is used, what methodology is applied to this process.
References


XBRL Planet. XBRL United Kingdom: Jurisdiction Snapshot. XBRL Planet, 2009.

XBRL US. Avoiding Common Errors in XBRL Creation. XBRL US, Inc., 2010a.


Adapted from Boritz and No (2009) and XBRL US (2010b).

Figure 1  Electronic Financial Reporting Using XBRL and XBRL Creation Process
Figure 2  Assurance framework for XBRL-Related Documents
Using the taxonomy validation function, a practitioner can evaluate whether the company extension taxonomy complies with XBRL specification and other guideline (e.g., FRTA).

Figure 3  XBRL Tool Example: Validation Function
a) General Function I  
(Show raw XBRL codes and detailed information about elements and taxonomies)

b) General Function II  
(Present official financial statements with elements used to tag the business facts)

Both element and presentation/calculation views pane use various colors and icons to differentiate standard taxonomies and company extension taxonomies. In addition, the information view pane provides detailed information on the currently selected element such as context. Therefore, a practitioner can identify what taxonomies (i.e., standard taxonomies with purple and light blue background colors and extension taxonomies with light grey background color) are used to create the instance document. In addition, the ‘Import Tree’ tab on the information view pane provides the list of taxonomies used in the instance document.

Using the SEC Filing viewer, a practitioner can open the official filing that corresponds to the instance document. When an element (e.g., CostOfRevenue) in the element view pane is selected, the matched element is highlighted in the information view pane which provides the detailed information (e.g., prefix, element name, associated values, period, and labels) of the element. By comparing the information in the information view pane with the business facts (e.g., Cost of revenue) in the official financial statements, the auditor can assess the appropriateness of the elements (e.g., CostOfRevenue) used to tag the underlying the business facts (i.e., Cost of revenue).

Figure 4  XBRL Tool Example: General Function
The mapping viewer shows the mapping information of the selected financial statement, the instance document, and appropriate official elements using different colored backgrounds (e.g., the selected financial statement with light orange, the instance document with light blue, and appropriate official elements with light green). Using the mapping information, a practitioner can assess whether the extension taxonomies are necessary. Also, the practitioner can search specific element using the search function of the taxonomy viewer to determine whether a similar element exists in the standard taxonomies.

Figure 5  XBRL Tool Example: Mapping Function and Taxonomy Viewer
The rendering pane allows a practitioner to render the instance document. The information can then be compared with the original source to determine whether the XBRL-tagged data in the instance document agree with the corresponding content. The example illustrates a rendered balance sheet. The practitioner can then compare it with the official balance sheet and see whether the instance document is an accurate reflection of its original source. In addition, the practitioner performs further analysis by copying and pasting the rendered balance sheet into a spreadsheet (e.g., Excel).

Figure 6  XBRL Tool Example: Rendering Function
a) Mapping Function

b) General Function: Provide detailed information about elements and taxonomies

Mapping viewer shows the mapping information of the selected financial statement. Using the mapping information, a practitioner can assess to whether all business facts in the official financial statements are completely tagged in the instance document. In addition, the element and information view panes show the elements used in the instance document. When an element is selected, the detailed information of the element is shown in the information view pane, and the related XBRL tags are highlighted in the instance viewer. Using such information, the practitioner can determine whether the instance document contains all applicable information that is required by regulators and government agencies.

Figure 7  XBRL Tool Example: Mapping Function
Using the ‘Element’, ‘Context’, ‘Unit’, and ‘Import Tree’ tabs in the information view pane, a practitioner can obtain information such context information (e.g., identifier, segment, and period) and elements and taxonomies used to create the instance document. After examining the XBRL-related documents of one period (e.g., 2009-12-31 filing), the practitioner can capture the information about taxonomies and elements. Similarly, after examining the XBRL-related documents of another period (e.g., 2009-09-30 filing), the auditor can capture the information. Then, the practitioner can compare them to determine whether the instance documents are created based on the same official and extension taxonomies and whether the same rules are applied to create context information across reporting periods.

Figure 8  XBRL Tool Example: Mapping Function
<table>
<thead>
<tr>
<th>CAAT Functions</th>
<th>Function Description</th>
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</table>
| General                                            | 1. Clearly and easily display XBRL-related documents (i.e., instance documents, taxonomy schemas, and linkbases).  
2. Provide a search mechanism that enables users to search for a specific element, context, label, etc.  
3. Provide generic query and report writing capability for pulling information from instance document and taxonomies.  
4. Provide audit trails.  
5. Enable exchange of data (e.g., parsing data and test results) with other tools.                                                                                                                                                                                                                                                  |
| Validation                                         | 6. Check whether an instance document and company extension taxonomies comply with relevant specifications (e.g., XBRL Specification v2.1).  
7. Map elements in the instance document to the business facts in the official financial statements for comparing the business facts of the official financial statements with the instance document.                                                                                                                                 |
7.2. Provide automated highlighting of matching content in source document or XBRL-related documents based on manual selection and ability of software users to accept and store mappings.  
7.3. Provide tracking the manual mapping of content in source document with XBRL extension taxonomies and instance documents.                                                                                                                                                                                                 |

<table>
<thead>
<tr>
<th>CAAT Functions</th>
<th>Function Description</th>
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</table>
|                | 1. Display raw XBRL codes.  
2. Display detailed information about standard taxonomies and extension taxonomies  
3. Summarize the structure of linkbases.  
4. Show information about any customization applied (e.g., custom labels used in the presentation linkbase as opposed to the standard labels).  
5. Display all detailed information about instance documents (e.g. context and unit information).  
6. Display block-tagged data such as notes and MD&A.  
7. Display and download official and XBRL filings.  
8. Display and check reference information (e.g., FASB codification references).  
10. Navigate standard taxonomies to obtain detailed information about official elements.  
11. Generate reports (e.g., review reports and summary of taxonomies).  
12. Track tests performed.  
13. Store checklists, documentation of tests, reviewer comments, etc.  
14. Export rendered document to Excel, Word, etc.  
15. Check whether an instance document and company extension taxonomies comply with relevant specifications (e.g., XBRL Specification v2.1).  
16. Check whether an instance document and company extension taxonomies comply with regulatory requirements (e.g., the EDGAR Filer manual)  
17. Check whether an instance document and company extension taxonomies comply with other guidelines (e.g., XBRL US Taxonomy Preparers Guide, FRIS, and FRTA).  
18. Display appropriate reference information, validation criteria, rules (e.g., XBRL Specification and SEC requirements).  
19. Provide adequate messages (e.g., detailed error messages for instance and taxonomy validation tests). |
| Rendering | Render instance documents to enable visual review and detailed checking of instance documents to official financial statements. | 8.1. Enable users to generate reports based on the presentation linkbase.  
8.2. Display dimensioned data in a table-like view.  
8.3. Print all information from rendered view. |
### Table 2  Audit Objectives and Related Tasks with Common Errors, Procedures Recommended in SOP, and Useful Computer-Assisted Functions

**Internal Control:** The controls over the creation of the extension taxonomies and instance documents are operating effectively and efficiently

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<tbody>
<tr>
<td>• Propagation of errors in original records or filings.</td>
<td>1. Assess whether appropriate controls exist for the mapping of the financial statements to the taxonomies, the creation of the extension taxonomies, and tagging of the financial statements to create the instance document.</td>
<td></td>
<td></td>
<td>• Enquiry/discussion of process</td>
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<td></td>
<td>• Validation $^{6.1-6.5}$</td>
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<tr>
<td>2. Assess whether there exists reliable, efficient version control and stable access to the extension taxonomies.</td>
<td></td>
<td></td>
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<td>• Enquiry and discussion of process</td>
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**Compliance:** The XBRL-related documents are created in accordance with the XBRL specifications and regulatory requirements.

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<tr>
<td>• Improperly represent the relationship among elements (e.g., fail to establish methodical relationship among elements in a calculation linkbase and present elements in the wrong location in a presentation linkbase)$^{a,b,c}$ .</td>
<td>3. Evaluate whether the instance documents comply with the XBRL specification, appropriate XBRL taxonomies, and applicable legislative or regulatory requirements (e.g., the EDGAR filer manual).</td>
<td></td>
<td></td>
<td>• Well-Formedness</td>
</tr>
<tr>
<td>• Rounding error and inappropriate use of decimals (e.g., report two decimal values but set the decimal attribute to 0, instead of 2)$^{c,g}$ .</td>
<td>4. Assess whether company extension taxonomies are consistent with XBRL specification and applicable legislative or regulatory requirements.</td>
<td></td>
<td></td>
<td>• Validity</td>
</tr>
<tr>
<td>• Fail to adequately validate the instance document and the company extension taxonomy both manually and with validation tools.$^{b,d}$</td>
<td>5. Verify that the instance documents and extension taxonomies comply with other guidelines (e.g., FRIS and FTRA).</td>
<td></td>
<td></td>
<td>• Valid taxonomies</td>
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<tr>
<td>3. Improperly use axis and member (e.g., fail to use the pre-defined</td>
<td>6. Assess the quality or</td>
<td></td>
<td></td>
<td>• Validation $^{6.1-6.5}$</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>• Display detailed information about elements and taxonomies.$^{1.2,1.5}$</td>
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<td></td>
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<td></td>
<td>• Display official taxonomy.$^{2,1}$</td>
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<td></td>
<td></td>
<td></td>
<td>• Navigate standard taxonomies to obtain detailed information about official elements.$^{2.2}$</td>
</tr>
<tr>
<td>Table Structures Included in the Taxonomy</td>
<td>Appropriateness of the Taxonomies in Terms of Authority, History, and Purpose</td>
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**Suitability:** Appropriate taxonomies are used to tag the underlying business facts in the official filing and the extension taxonomies are necessary to create the instance documents.

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<tr>
<td>• Use elements that have been removed from the taxonomy. 7</td>
<td>7. Determine that the taxonomy selected is the most recent acknowledged or approved one. 8. Determine that the extensions are appropriate.</td>
<td>1-1. Identify which base taxonomy(ies) is (are) used and compare such referenced taxonomy(ies) to that specified in management’s assertion. 1-2. Ascertain whether the base taxonomy and linkbases referenced by the XBRL instance document, including element prefixes and related namespaces, are the most current applicable version according to the applicable relevant source specified by management, such as the XBRL U.S. Web site (or IASB Web site if IFRS is used).</td>
<td>• Proper taxonomies  • Proper extension elements</td>
<td>• Provide detailed information about elements and taxonomies. 1.2 &amp; 1.5  • Display raw XBRL codes. 1.1</td>
</tr>
<tr>
<td>• Create a new element for relatively minor addition(s) or deletion(s) to the definition of standard element. 7</td>
<td>9. Assess that suitable elements are used to tag the underlying business facts.</td>
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<tr>
<td>• Extend elements due to a context issue (e.g., an event occurred in the month of May). 7</td>
<td>2-7. Search for tags in the XBRL instance document and related files that have the same definition to identify tags that are used more than once.</td>
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<tr>
<td>• Extend elements, axis, domains or members to ensure that the XBRL instance document renders in a particular fashion. 7</td>
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<tr>
<td>• Select a less appropriate standard element when it appears a more appropriate standard element exists. a, b &amp; d</td>
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<tr>
<td>• Select a standard element when it appears a new element should have been created. 9</td>
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</table>

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1. Use elements that have been removed from the taxonomy. 7
2. Create a new element for relatively minor addition(s) or deletion(s) to the definition of standard element. 7
3. Extend elements due to a context issue (e.g., an event occurred in the month of May). 7
4. Extend elements, axis, domains or members to ensure that the XBRL instance document renders in a particular fashion. 7
5. Select a less appropriate standard element when it appears a more appropriate standard element exists. a, b & d
6. Select a standard element when it appears a new element should have been created. 9
7. Use elements that have been removed from the taxonomy. 7
8. Create a new element for relatively minor addition(s) or deletion(s) to the definition of standard element. 7
9. Extend elements due to a context issue (e.g., an event occurred in the month of May). 7
10. Extend elements, axis, domains or members to ensure that the XBRL instance document renders in a particular fashion. 7
11. Select a less appropriate standard element when it appears a more appropriate standard element exists. a, b & d
12. Select a standard element when it appears a new element should have been created. 9

---

1.2 & 1.5
1.7
1.8
43
• Create a new element when it appears an appropriate standard element exists (e.g., report “Salaries” when “SalariesAndWages” exists).\textsuperscript{a, d, e & g}

10. Verify that the extension taxonomies do not have elements that are in the standard XBRL taxonomies.

3-2. Inquire of company personnel about whether they limited the use of extensions to circumstances where an appropriate financial statement element does not exist in the base taxonomy.

3-3. For each extension element, locate and list any base taxonomy elements that are duplicative of the client’s definition in the source document.

3-4. For each extension element that contains a definition, compare the definition to the company’s accounting policies or financial statement disclosures regarding such element.

• Provide detailed information about elements and taxonomies.\textsuperscript{1.2 & 1.5}

• Navigate standard taxonomies to obtain detailed information about official elements.\textsuperscript{2.2}

• Mapping\textsuperscript{7.1 - 7.3}

**Accuracy:** The extension taxonomies and instance documents accurately reflect, in all material respects, all business facts presented in the official filing.

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<tbody>
<tr>
<td>• Report incorrect negative values.\textsuperscript{a, c, d, e, f &amp; g}</td>
<td>11. Test whether the XBRL-tagged data (i.e., text, line item names, associated values, unit, decimals, dates, and other labels) in the instance document reflect the same information as the corresponding source document (i.e., the HTML or PDF version). 12. Evaluate whether XBRL-tagged data in the instance document are matched with appropriate elements.</td>
<td>2-1. For each reporting entity, ascertain whether the same identifier and scheme are used in all contexts related to that entity. 2-2. Compare the context segments, scenarios (including dimensional information), and date(s) used for each tag to the [identify source document]. 2-3. Compare the information in each tag contained in the XBRL</td>
<td>• Element accuracy</td>
<td>• Provide detailed information about elements and taxonomies.\textsuperscript{1.2 &amp; 1.5} • Display and download official and XBRL filings.\textsuperscript{1.7}</td>
</tr>
</tbody>
</table>
in accordance with the applicable taxonomy.

instance document to the corresponding data element in the source document, including (1) attributes of element, (2) context reference (“contextRef”), (3) unit reference (“unitRef”), (4) decimals/precision, and (5) amount.

* Inappropriately use context references (e.g., roll-forward: fail to use the same instance context reference for the beginning balance as for the end of the previous period).\(^{b,d}\)

* Fail to tag another required value when another value is reported (e.g., a company failed to report impact on non-controlling interest (subsidiary) when it reported purchases of additional shares of a subsidiary).\(^f\)

* Report the value that should be zero when another value is reported (e.g., common stock and additional paid in capital: could be reported as combined amount or as separate amounts in the shareholders equity table, but not both).\(^f\)

* Duplicate reported values that do not match.\(^f\)

* Improperly tag values (i.e., data-entry errors).\(^{b,d}\)

* Rounding error and inappropriate use of decimals (e.g., report two decimal values but set the decimal attribute to 0, instead of 2).\(^{c,e}\)

* Fail to adequately review the

13. Compare the rendered instance document to the corresponding information in the official filing.

14. Verify that the business facts in the corresponding official filing have not been changed, deleted, or summarized in the instance document.

2-5. Compare line items, dates, and amounts in the source document (for example, financial statements) to a rendered version of the XBRL instance document (for example, using SEC Previewer, if applicable).

6-1. Compare labels in the label linkbase to the source document (for example, financial statements).

8-1. Compare presentation links for all elements in the presentation linkbase to the presentation order of the [identify source document (for example, financial statements)].

8-2. Compare the line item text in the rendered version of the XBRL instance document to that used in the [identify source document (for example, financial statements)] to ascertain whether the labels are the same.

* Proper linkbases (Label and label linkbase)

* Proper linkbases (Presentation and presentation linkbase)

* Rendering\(^{8.1 - 8.3}\)
rendered instance document both manually and with rendering tools.\textsuperscript{\textit{d} & \textit{g}}

15. Evaluate whether the instance document not only has required information (e.g., identifier, unit, period, language, etc.), but also appropriately tagged business facts as required by rules (e.g., tagging the detailed quantitative disclosures within the footnotes and schedules required by SEC rules).

\begin{itemize}
\item Attribute accuracy
\item Provide detailed information about elements and taxonomies.\textsuperscript{1.2 & 1.5}
\item Rendering\textsuperscript{8.1 - 8.3}
\end{itemize}

**Completeness:** All business facts in the official filings are completely tagged in the instance document.

\begin{tabular}{|c|c|c|c|c|}
\hline
\textbf{Common Errors} & \textbf{Audit Tasks} & \textbf{AICPA Statement of Position (SOP) 09-1} & \textbf{Srivastava and Kogan (2010)} & \textbf{Computer-Assisted Audit Functions*} \\
\hline
\textbullet Fail to report required values (e.g., ‘Statement Class of Stock Axis’ should be used to declare classes of stock in the financial statements and common shares outstanding in the Document and Entity Information).\textsuperscript{e & f} & 16. Assess that all business facts in the corresponding official filing are completely tagged in the instance document. & 4-1. Compare the sections of the source document that are required to be tagged (for example, financial statements) to a rendered version of the XBRL instance document. & \textbullet Completeness & \textbullet Mapping\textsuperscript{2.1 - 7.3} \\
\textbullet Neglect to tag amounts appearing parenthetically in the financial statements (e.g., the allowance for doubtful accounts and shares of stock outstanding).\textsuperscript{e & f} & 17. Assess whether the instance document contains all applicable information that is required by regulators and government agencies. & 5-1. Inquire of management about what level of granularity the entity used to tag its notes. & & \textbullet Provide detailed information about elements and taxonomies.\textsuperscript{1.2 & 1.5} \\
\hline
\end{tabular}

**Validity/Occurrence:** The instance document only contains valid information.

\begin{tabular}{|c|c|c|c|c|}
\hline
\textbf{Common Errors} & \textbf{Audit Tasks*} & \textbf{AICPA Statement of Position (SOP) 09-1} & \textbf{Srivastava and Kogan (2010)} & \textbf{Computer-Assisted Audit Functions*} \\
\hline
\textbullet Report values when the values & 18. Assess that there is no information & 2.4 Compare the units and contexts & \textbullet Existence & \textbullet Mapping\textsuperscript{2.1 - 7.3} \\
\hline
\end{tabular}

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should be zero or not disclosed (e.g., report the value of new stock issued that includes a treasury stock).¹

- Duplicate reported values that do not match. ²

in the instance document that is not in the official filing.

identified in the XBRL instance document to the underlying source document to identify duplications, as well as units and contexts that do not reflect information contained in the source document.

2-6. Search for numeric or textual data that appears more than once in the XBRL instance document and compare the elements used for such data to the source document to identify any data that has been redundantly tagged with different elements.

7.1 Compare the components of all XBRL calculations in the calculation linkbase to the corresponding components of such calculations in the source document (for example, financial statements) and ascertain whether the calculation concepts and amounts are the same (for example, same data forms the calculation). Note any calculations in the XBRL instance document that do not exist in the source document (that is, implied values or subtotals).

Common Errors: The extension taxonomies and instance documents are properly managed to ensure consistency.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>- Inappropriately use context references (e.g., roll-forward: fail to use the same instance context)</td>
<td>19. Determine whether the extension taxonomies and instance documents are created based on the</td>
<td>2-8. Obtain from management a detailed list of changes in the tags used from the prior period to</td>
<td></td>
<td>• Provide detailed information about elements and</td>
</tr>
</tbody>
</table>

## Consistency:
The extension taxonomies and instance documents are properly managed to ensure consistency.
| reference for the beginning balance as for the end of the previous period). b & d | same official and extension taxonomies, unless otherwise indicated, across reporting periods. | the current period and inquire of management about why the changes were made. Compare the tags used for current period amounts and disclosures to the tags used for the related prior period amounts and disclosures in the XBRL instance document and with those in the corresponding prior period XBRL instance document(s) [specify] and to the detailed list obtained from management. | Verify that the same elements are used to tag the same business facts across reporting periods and the same rules are applied to create context information for the instance documents of different reporting periods (e.g., the same identifier and scheme are used in all contexts). |


* The number in the Computer-Assisted Audit Functions column represents each CAAT function in Table 1.