

1. Creation of XBRL-based Digital Financial Reports

This section shows you how you the steps used to create an XBRL-based digital financial report using a specific software application, Pesseract¹.

Many times, reports will be automatically generated from an accounting system.

Please see the document, *Method of Implementing a Standard Digital Financial Report Using the XBRL Syntax*², for a detailed explanation of a method for creating high-quality XBRL-based financial reports.

1.1. Basic Creation Strategies

There are fundamentally two basic strategies for creating an XBRL-based digital financial report: built-in and bolt-on. These two digital financial report creation strategies are explained in the short video *Digital Financial Reporting*³.

1.1.1. Built-in

When you use the “built-in” approach, XBRL is imbedded within accounting and other systems as is shown in the graphic below.



The built-in approach provides the most significant efficiency and effectiveness and long-term benefits to organizations that implement XBRL-based reporting in this

¹ Pesseract, <http://pesseract.azurewebsites.net/>

² *Method of Implementing a Standard Digital Financial Report Using the XBRL Syntax*, <http://xbrlsite.azurewebsites.net/2019/Library/MethodForImplementingStandardFinancialReportUsingXBRL.pdf>

³ YouTube, *Digital Financial Reporting*, <https://www.youtube.com/watch?v=SArROedhOjI>

manner; however currently it has significant up-front costs because accounting systems, reporting tools, audit software, and other aspects of accounting information systems have not yet provided XBRL features within their software applications.

1.1.2. Bolt-on

The second fundamental approach is the “bolt-on” approach. When this approach is used, the generation of XBRL is simply added to the end of an existing reporting system, bolting on the capabilities to output XBRL-based information.

The bolt-on approach offers no efficiency or effectiveness gains, rather the cost of creating XBRL-based reports generally increases the overall cost.

While in the short term, this option has less expensive up-front costs, over time the costs just keep getting added on and no benefits are realized.

Further, one way to bolt-on the capability to generate XBRL-based reports is to purchase software from a software vendor that offers products that allow you to generate XBRL-based reports.

Another approach that is used is to outsource the entire process, or aspects of the process, to third-party service providers such as a filing agent.

1.1.3. Other considerations

There are many things to consider when creating your strategy for XBRL-based reporting. These considerations include:

- **Net benefit over the long term:** The long-term ROI or return on investment is really the best way to measure the overall costs and benefits of your implementation strategy.
- **Short-term realities:** Although there may be a long-term net benefit theoretically, there are also short-term realities that come into play and have to be considered.
- **Total cost:** Cash flow considerations and the total cost of a system should be considered.
- **Change management capabilities:** The change management capabilities of an organization must be considered. With change comes the potential for disruption, risks, resource utilization issues, and so forth.

Over time, there is a good probability that accounting software will have the inherent ability to import and export XBRL or other format that makes integration of systems easier. The fundamental reason to implement XBRL within your systems is to make your systems better, faster, and cheaper.

1.2. Facets of XBRL that are Often Overlooked

The following is a summary of aspects related to leveraging XBRL within your organization that are often overlooked.

1.2.1. Artificial intelligence

The artificial intelligence revolution is a real thing. Just how this revolution will unfold still is as of yet to be determined. But what is very likely true is that artificial

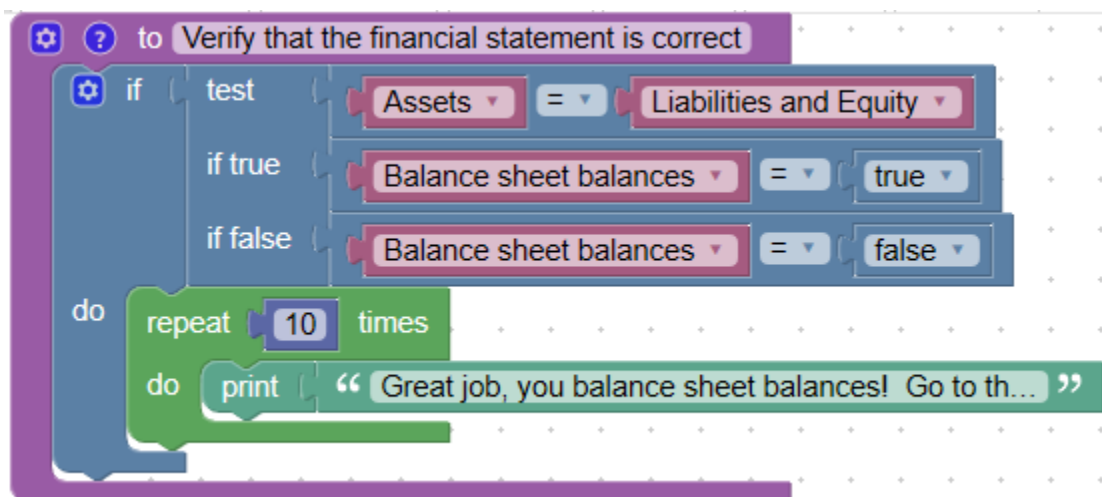
intelligence will have a significant impact on your accounting, reporting, auditing, and analysis related systems.

As we have pointed out, a paradigm shift is going to occur. The bottom line here is that software and humans will work together to perform many of the tasks that humans perform today. Think collaboration. This is very much like how a calculator is used by accountants to help you do mathematics so you don't have to perform these computations in your head.

1.2.2. Technical aspects will disappear into the background

The approach many software vendors have taken to implement software applications today for, say, creating an XBRL-based financial report expose far, far too much of the XBRL technology to the user of the software. This will not be how software works in the future.

Examples of the sorts of approaches to burying software in the background can be seen when you consider software implementations such as Blockly⁴. Consider this example below⁵:



For more information related to understanding how it is possible for the technology to disappear into the background and the capabilities that you might find in future software, please consider reading two documents. First, *Guide to Building an Expert System for Creating Financial Reports*⁶ explains how we built the Pesseract tool for creating XBRL-based financial reports. Second, the document *Putting the Expertise into an XBRL-based Knowledge Based System for Creating Financial Reports*⁷ even more details.

⁴ Google, Blockly, <https://developers.google.com/blockly/>

⁵ Click on Blocks, <https://blockly-demo.appspot.com/static/demos/code/index.html#5ge5sh>

⁶ Charles Hoffman, CPA, *Guide to Building an Expert System for Creating Financial Reports*, <http://xbrl.azurewebsites.net/2018/Library/GuideToBuildingAnExpertSystemForCreatingFinancialReports.pdf>

⁷ Charles Hoffman, CPA and Hamed Mousavi, *Putting the Expertise into an XBRL-based Knowledge Based System for Creating Financial Reports*, <http://pesseract.azurewebsites.net/PuttingTheExpertiseIntoKnowledgeBasedSystem.pdf>

1.2.3. Lean Six Sigma philosophies, principles, techniques, and methods

Because an XBRL-based digital financial report is structured information, each piece of a report is identifiable. Leveraging the ability to identify each piece of a report, patterns in the associations, structures, and assertions; and other such techniques, machine-readable metadata can be created. That machine-readable metadata enables software applications, such as artificial intelligence software applications, to interact with the report and help users perform work.

Pesseract takes advantage of these characteristics to provide some interesting capabilities to the user of the software application.

Another point of leverage is Lean Six Sigma philosophies, principles, techniques, and methods⁸.

Lean Six Sigma⁹ is a discipline that combines the problem-solving methodologies and quality enhancement techniques of Six Sigma¹⁰ with the process improvement tools and efficiency concepts of Lean Manufacturing¹¹. Born in the manufacturing sector, Lean Six Sigma works to produce products and services in a way that meets consumer demand without creating wasted time, money and resources.

Specifically, Lean is 'the purposeful elimination of wasteful activities.' It focuses on making process throughout your company faster, which effects production over a period of time. Six Sigma works to develop a measurable process that is nearly flawless in terms of defects, while improving quality and removing as much variation as possible from the system.

Lean Six Sigma is about reducing variability and increasing predictability. These are the fundamental principles of Lean Six Sigma:

- Reducing variability
- Reducing defects
- Reducing unnecessary steps
- Improving predictability

Think statistical process control, mistake proofing, near-zero defects, etc. Many of these philosophies, principles, techniques, and methods invented in the manufacturing sector are directly applicable to the "manufacture" of a financial report.

1.2.4. Logical system, expert system

As was pointed out in the document, *Special Theory of Machine-based Automated Communication of Semantic Information of Financial Statements*¹², a financial report

⁸ Comprehensive introduction to Lean Six Sigma, http://xbrlsite.azurewebsites.net/2017/IntelligentDigitalFinancialReporting/Part01_Chapter02.72_LeanSixSigma.pdf

⁹ Wikipedia, *Lean Six Sigma*, https://en.wikipedia.org/wiki/Lean_Six_Sigma

¹⁰ Wikipedia, *Six Sigma*, https://en.wikipedia.org/wiki/Six_Sigma

¹¹ Wikipedia, *Lean Manufacturing*, https://en.wikipedia.org/wiki/Lean_manufacturing

¹² Special Theory of Machine-based Automated Communication of Semantic Information of Financial Statements, <http://xbrlsite.azurewebsites.net/2019/Library/SpecialTheoryOfSemanticCommunicationOfFinancialInformation.pdf>

is a man-made logical system. Using the right techniques, that logical system can be managed using an expert system which is rules-based artificial intelligence.

When all of these ideas are combined into a system for creating a financial report and you change your way of thinking, opening the creation process to new ways, then you can see the possibilities offered by these technologies. Novel new ways that are better, faster, and cheaper than traditional approaches to creating financial reports is very possible. Pesseract takes that new approach, abandoning obsolete but more traditional approaches such as manually keying information into a Microsoft Word document which knows nothing about financial reporting.

XBRL-based digital financial reporting is only in its infancy. Software offers a bottomless pit of opportunity!

1.3. Creating Reports Using Pesseract

Next, we want to show your several specific techniques for creating an XBRL-based financial report using the functionality and features of Pesseract. Pesseract is a working proof of concept that can be downloaded¹³ and experimented with. Ultimately, think automation.

1.3.1.Import from spreadsheet or database table

One approach to creating an XBRL-based report is to simply import the information from an Excel spreadsheet or directly from a database. While this functionality does not yet exist in the Pesseract working proof of concept, the functionality can be easily explained.

When you understand XBRL-based financial reports, you will understand that every fragment of a report exists as a fact table, or fact set, within the full report. Here is an example of a fact table:

Rendering	Model Structure	Fact Table	Business Rules Structure	Business Rules Validation Results	Elements				
#	Reporting Entity	Period	Concept	Legal Entity [Axis]	Reporting Scenario [Axis]	Fact Value	Unit	Rounding	
1	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442	2020-12-31	Land	Consolidated Entity [Member]	Actual [Member]	1000	USD	0	
2	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442	2019-12-31	Land	Consolidated Entity [Member]	Actual [Member]	1000	USD	0	
3	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442	2020-12-31	Buildings, Net	Consolidated Entity [Member]	Actual [Member]	1000	USD	0	
4	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442	2019-12-31	Buildings, Net	Consolidated Entity [Member]	Actual [Member]	1000	USD	0	
5	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442	2020-12-31	Furniture and Fixtures, Net	Consolidated Entity [Member]	Actual [Member]	1000	USD	0	
6	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442	2019-12-31	Furniture and Fixtures, Net	Consolidated Entity [Member]	Actual [Member]	1000	USD	0	
7	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442	2020-12-31	Machinery, Net	Consolidated Entity [Member]	Actual [Member]	1000	USD	0	
8	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442	2019-12-31	Machinery, Net	Consolidated Entity [Member]	Actual [Member]	1000	USD	0	
9	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442	2020-12-31	Property, Plant and Equipment, Net	Consolidated Entity [Member]	Actual [Member]	4000	USD	0	
10	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442	2019-12-31	Property, Plant and Equipment, Net	Consolidated Entity [Member]	Actual [Member]	4000	USD	0	

What does that look like to you? Fairly similar to a spreadsheet, don't you think? But this spreadsheet is a bit special. This is a semantic spreadsheet¹⁴.

An XBRL-based financial report is literally a semantic spreadsheet.

1.3.2.Financial report creation wizard

One approach to creating a report is to use a financial report creation wizard¹⁵. This section will walk you through the general ideas of this wizard, the document referenced provides a step-by-step guide.

¹³ Pesseract, <http://pesseract.azurewebsites.net/>

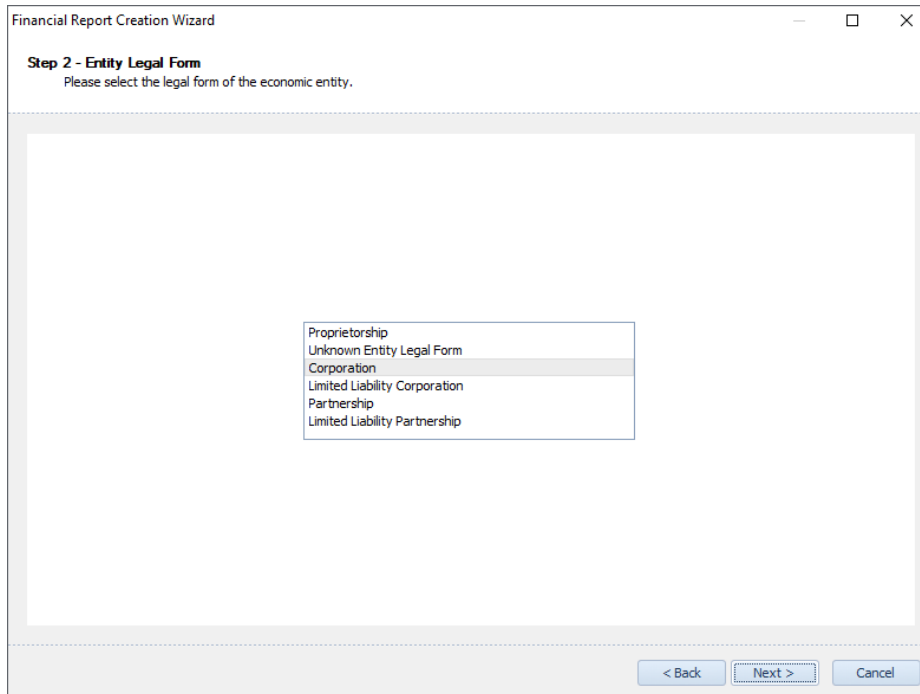
¹⁴ Understanding Cell Stores and NOLAP, the Future of the Spreadsheet, <http://xbrl.squarespace.com/journal/2014/11/14/understanding-cell-stores-and-nolap-the-future-of-the-spread.html>

Note that a financial report creation wizard is driven by metadata that is specific for each individual financial reporting scheme.

Once you select the desired financial reporting scheme, such as US GAAP or IFRS, the wizard is dynamically configured for that specific scheme.

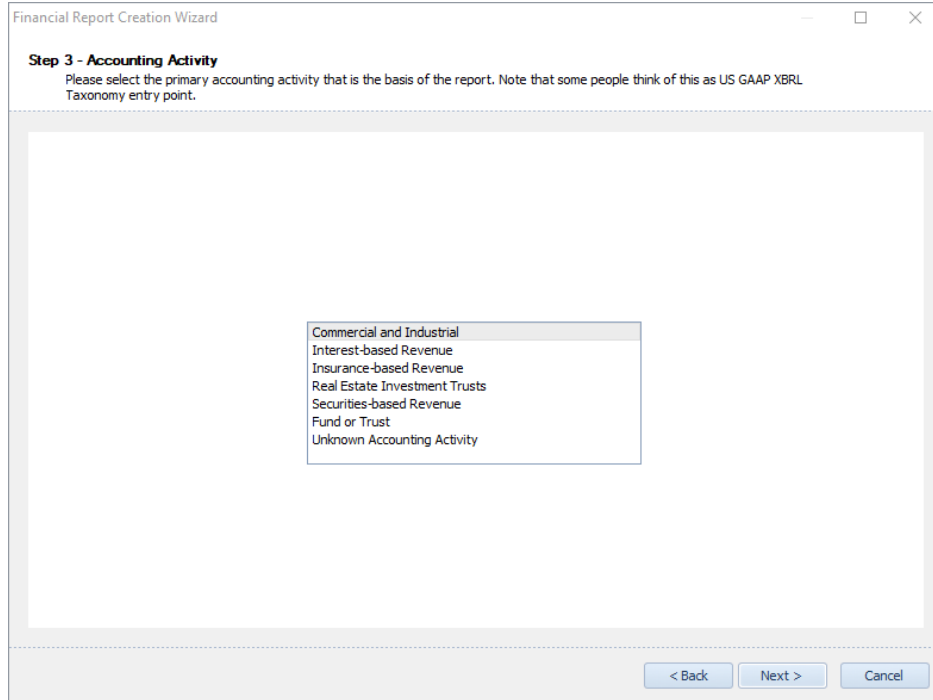
Here are examples that show you what the wizard does. Consider step 2, “**Step 2 – Entity Legal Form**” appears. This step provides the user with a list of all supported legal forms is provided.

The entity legal form information is used to limit the concepts that provided to you within the application. For example, a financial report would never be both a partnership and a corporation at the same time. If “Corporation” is selected, “Partnership” related concepts are turned off in the application.



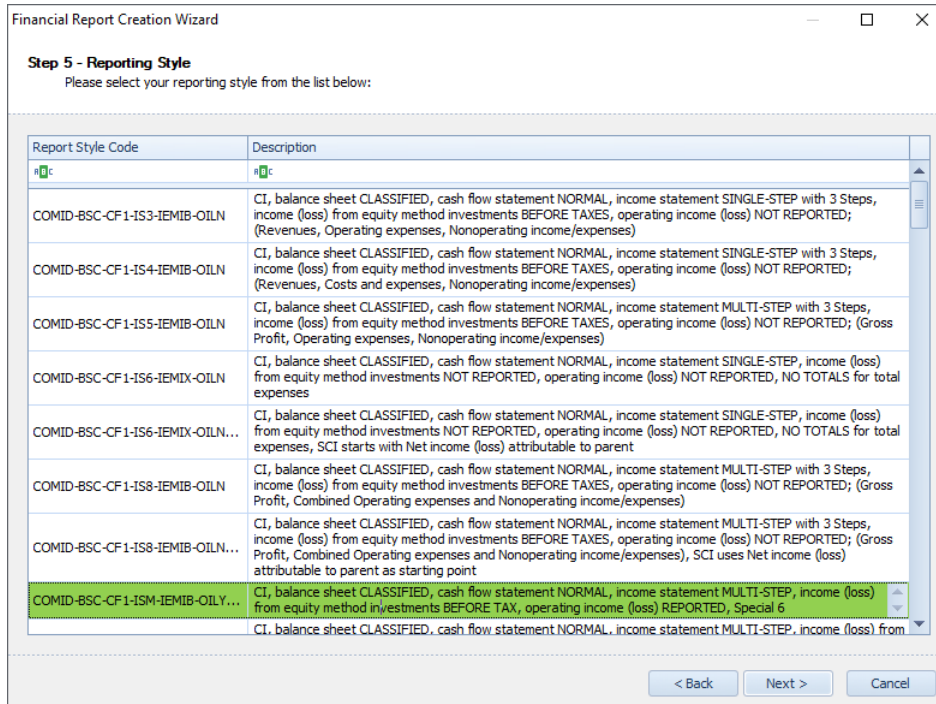
Similar to the entity legal form information, the accounting activity likewise configures that application to the needs of the user: “**Step 3 – Accounting Activity**”:

¹⁵ Financial Report Creation Wizard, <http://xbrlsite.azurewebsites.net/2018/Pesseraact/21-ReportCreationWizard.pdf>



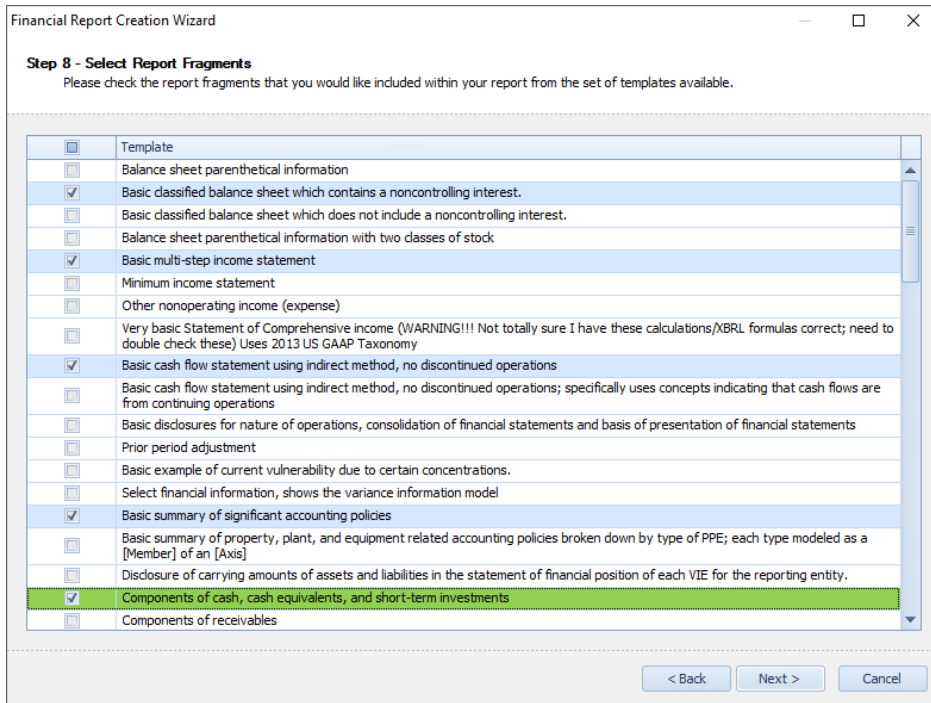
The accounting activity selects the specific entry point of the taxonomy to use. Taxonomy components that relate to entry points you do not use are turned off in the application.

Similarly, the reporting style is selected which further filters the taxonomy options required to be provided to the application user: **“Step 5 – Reporting Style”**:

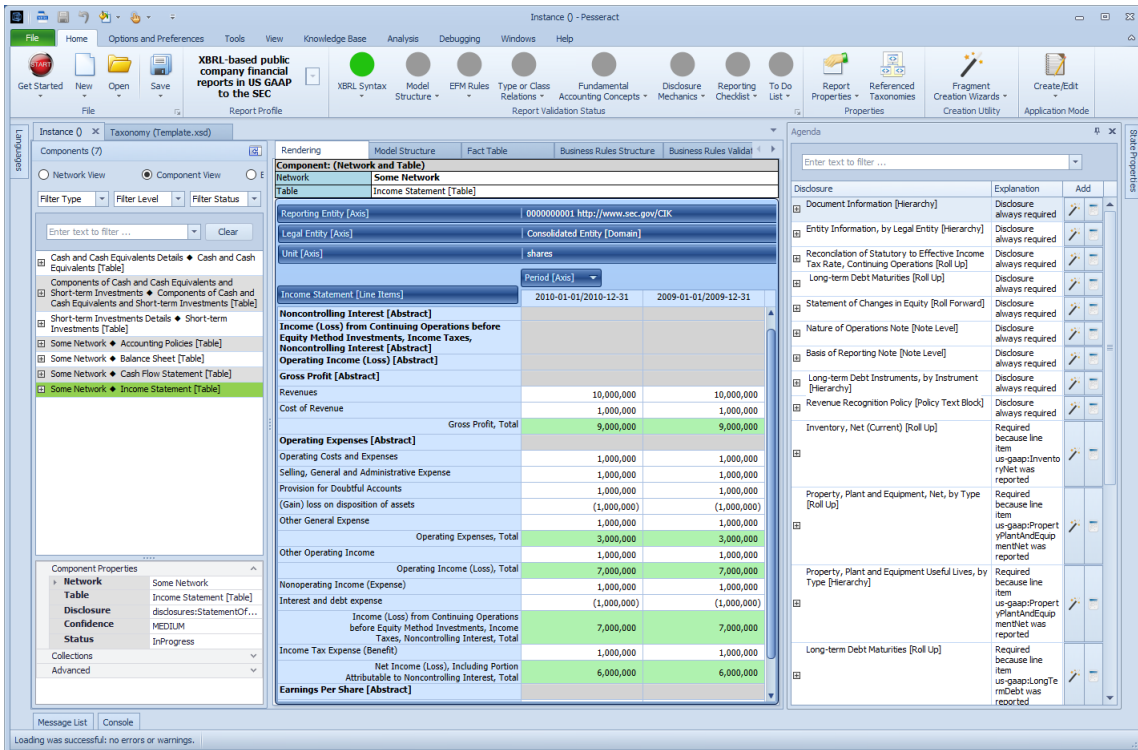


Then, a list of disclosures is provided for the application user to select from:

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Once the financial report creation wizard is completed, the user has a set of templates that serves as a framework of a report which includes both a complete information model structure, fact table with placeholder facts, all assertions are in place, and an agenda that specifies additional disclosures that must be created to satisfy statutory and regulatory reporting requirements:



There is no configuring the structure, associations, assertions, and terms that is necessary to get to this phase. Further, 100% of the report is intact. This provides a solid framework to build on and metadata necessary for the application to help the user create the next step which is to either (a) key in actual information the creator needs in the report (b) import frameworks if the information will be imported from sources that already exist, (c) help the user select additional terms from the base taxonomy that are necessary to help them complete their report.

1.3.3. Disclosure creation wizard

The disclosure creation wizard works similar to the financial report creation wizard except the disclosure creation wizard helps you create a single disclosure as opposed to creating an entire report.

More information is forthcoming for the disclosure creation wizard.

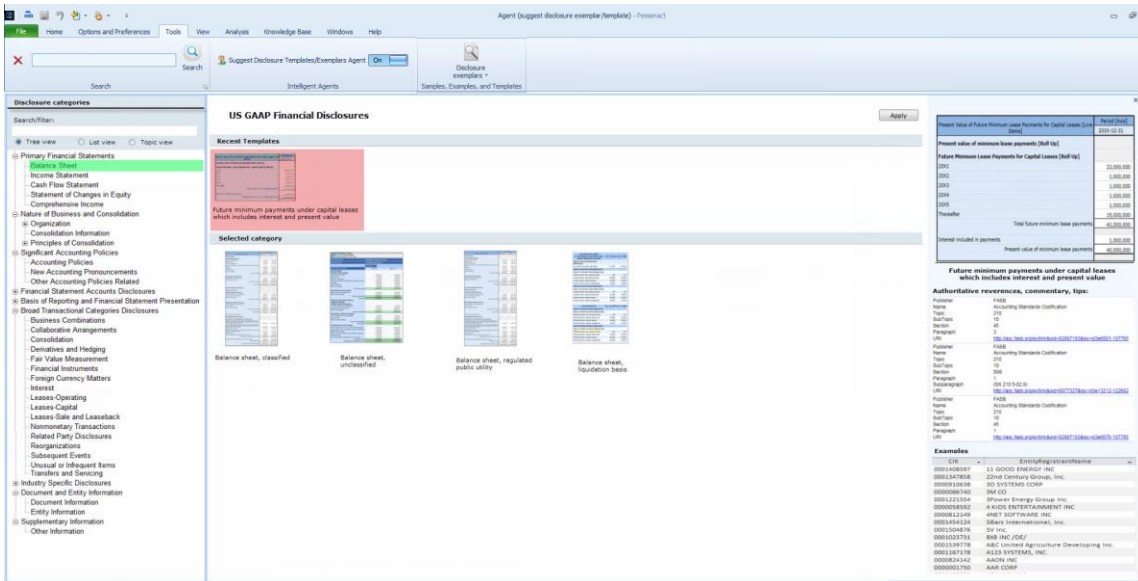
1.3.4. Templates and exemplars

A template is an example or prototype of a disclosure that you might create that has been pre-prepared and that you can simply import into the report you are creating.

An exemplar is similarly an example or prototype of a disclosure that you might create; but exemplars come from other reports that have been created.

Templates and exemplars work similarly so we will explain both in this section.

First, we want to point out the template and exemplar selection tool. It looks like this:



On the left you see a list of topics. If you select a topic, you can see all the disclosures related to the topic. If you select a disclosure, you see all the different versions of that disclosure.

In the center pane of the template and exemplar selector you see an image of each disclosure template that you might want to select. On the right, you see a list of exemplars or examples from existing XBRL-based reports that have been selected to be good examples of the disclosure you want to create.

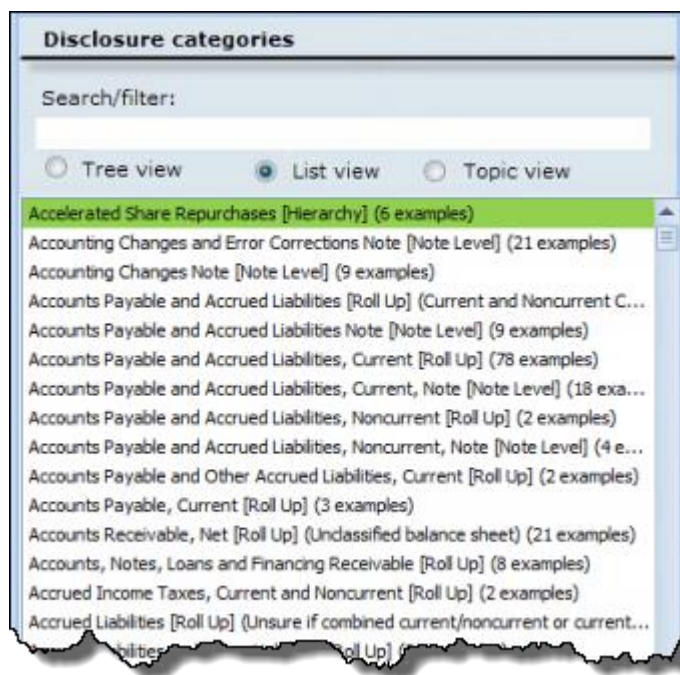
You can think of the SEC EDGAR System that is populated with thousands and thousands of free, publicly available XBRL-based reports in both US GAAP and IFRS as a huge library of disclosure templates. Each of those reports is formatted in, you guessed it, XBRL. Rather than “copying” and “pasting” an example from some other report, the template and exemplar selector provides you with an interface of filtered and curated example disclosures that are specific to the legal entity type, industry sector, and specific disclosure you might want to create.

The Template and Exemplar Selector is shown with a list of disclosures for the reporting scheme you are using, templates that are available for each disclosure, and exemplars (or examples) of existing financial reports that provide that disclosure. The template and exemplar selector allow you to find information about a disclosure you want to create and examples of that disclosure.

You can search/filter the disclosures. When you select a disclosure topic, the available templates are shown in the center of the screen with a small image. When you select the small image, a larger image is provided in the upper right corner. References are available below the image of the disclosure. At the bottom right hand side, a list of exemplars of the selected disclosure is shown.

In the Disclosure Categories you can select between the Tree view, the List view, and the Topics view. The Tree view shows a set of disclosures organized into an easy to navigate hierarchical view of the available disclosures as can be seen from the screen shot above.

You can change to a List view which shows a flat list of disclosures only, no topics are included in the list view. You can filter the list by entering text in the search/filter text box.



When you select the Topic view from the set of radio button, you enter a topic in the Search/filter box and you get a list of all the disclosures related to that topic in the list view.

When you select a disclosure, you will be provided a template for that disclosure as well as a list of a number of exemplars, or examples, for the selected disclosures:

The screenshot shows a software interface with a search bar at the top. Below it is a table of exemplars for 'Balance Sheet (38 examples)'. The table lists several companies, with 'SAFEWAY INC' highlighted in green. Below the exemplar list is a 'Rendering' section. It shows the component 'Network and Table' for Safeway Inc. and a table of financial data for the period 2013-12-28 to 2011-01-01. The table is titled 'Statement of Financial Position [Abstract]' and includes sections for 'Assets' and 'Property'.

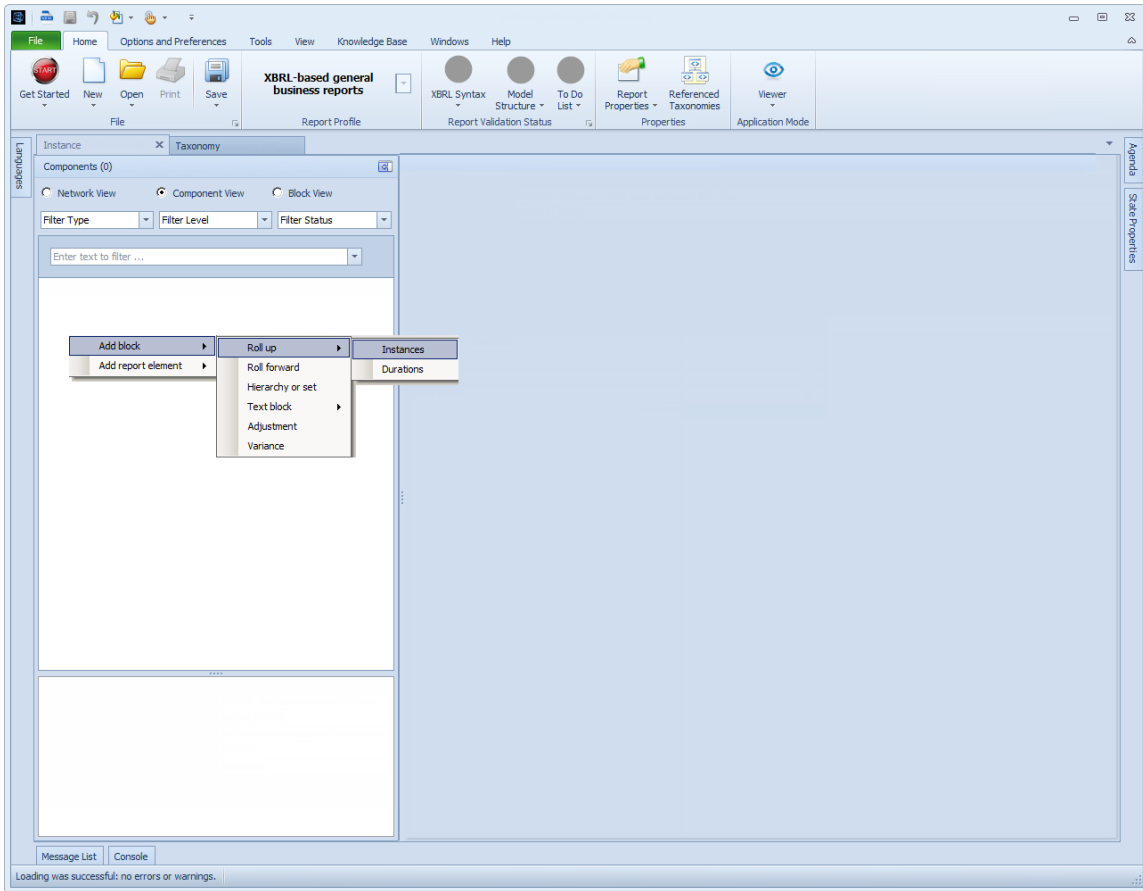
Statement of Financial Position [Abstract]	Period [Axis]			
	2013-12-28	2012-12-29	2011-12-31	2011-01-01
Statement of Financial Position [Abstract]				
Assets				
Current assets:				
Cash and equivalents	4,647,300,000	352,200,000	729,400,000	778,800,000
Receivables	1,211,400,000	909,000,000		
Merchandise inventories, net of LIFO reserve of \$58.1 and \$70.5	2,089,600,000	2,562,000,000		
Prepaid expenses and other current assets	371,500,000	344,700,000		
Assets held for sale	143,900,000	0		
Total current assets	8,463,700,000	4,167,900,000		
Property:				
Land	1,583,200,000	1,881,400,000		
Buildings	5,774,000,000	6,812,600,000		
Leasehold improvements	2,836,200,000	3,485,500,000		
Fixtures and equipment	6,979,100,000	7,958,500,000		
Property under capital leases	550,200,000	612,100,000		
Total property, gross	17,722,700,000	20,750,100,000		

You can import any exemplar into the report you are creating.

1.3.5. Manual entry

And yes, when push comes to shove, you can still enter information into a digital financial report manually.

From a completely new report, new report fragments can be created. But you don't have to go at this alone. The application is smart enough to understand that when you create a report fragment, that fragment will be a fact set that has some specific concept arrangement pattern: a roll up, a roll forward, a set, or so forth. You pick the information pattern that you want to create.

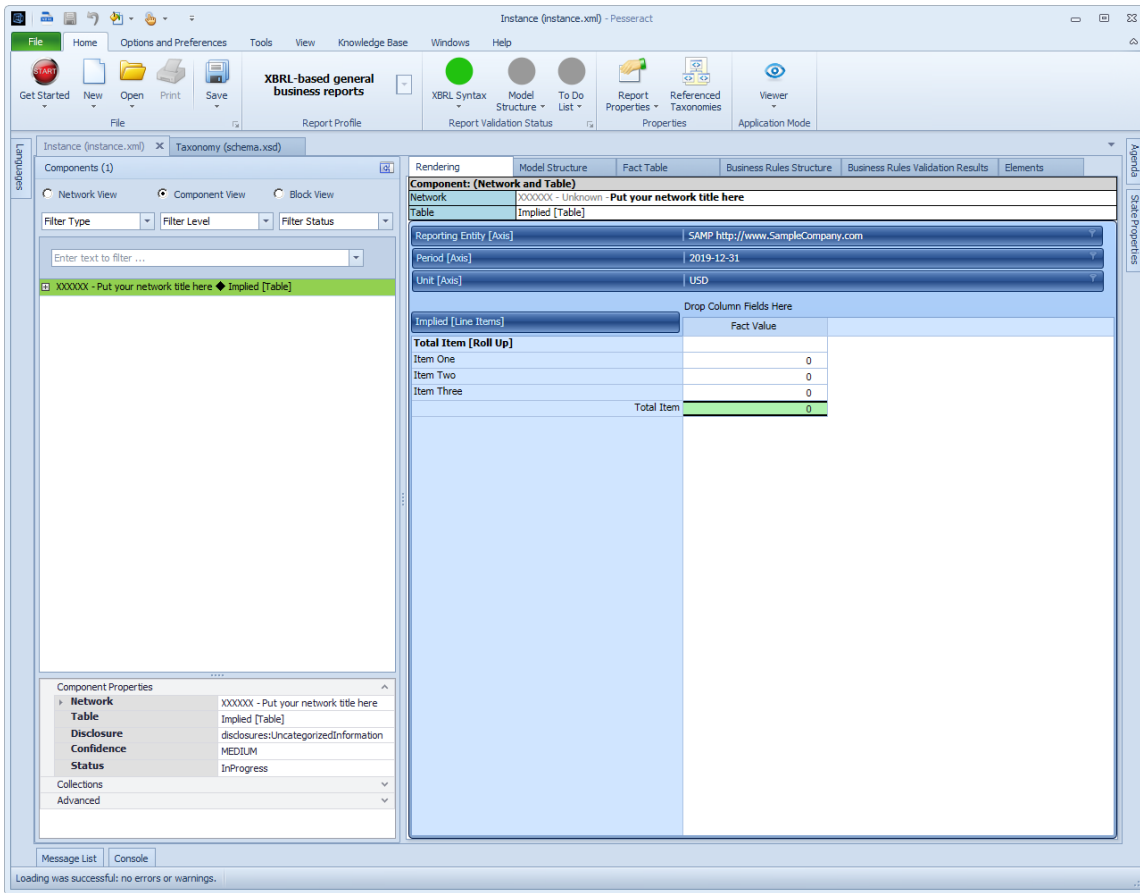


After you select the information model of the fact set that you want to create, the application uses a “jig” for that specific concept arrangement pattern to construct the framework for the piece of the report you desire to add to the report.

The report is smart enough to understand that when you create a report fragment, that fragment must be included within some network. If you had not selected a network, the application adds a network for you which you can edit.

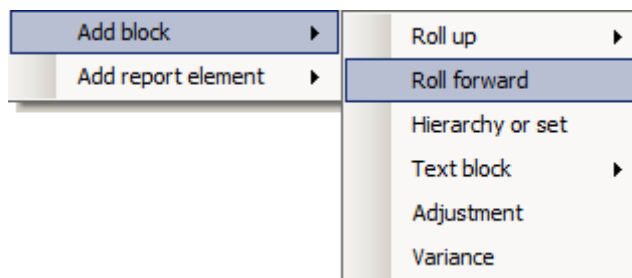
Below you see the framework of a roll up that has been added to your report:

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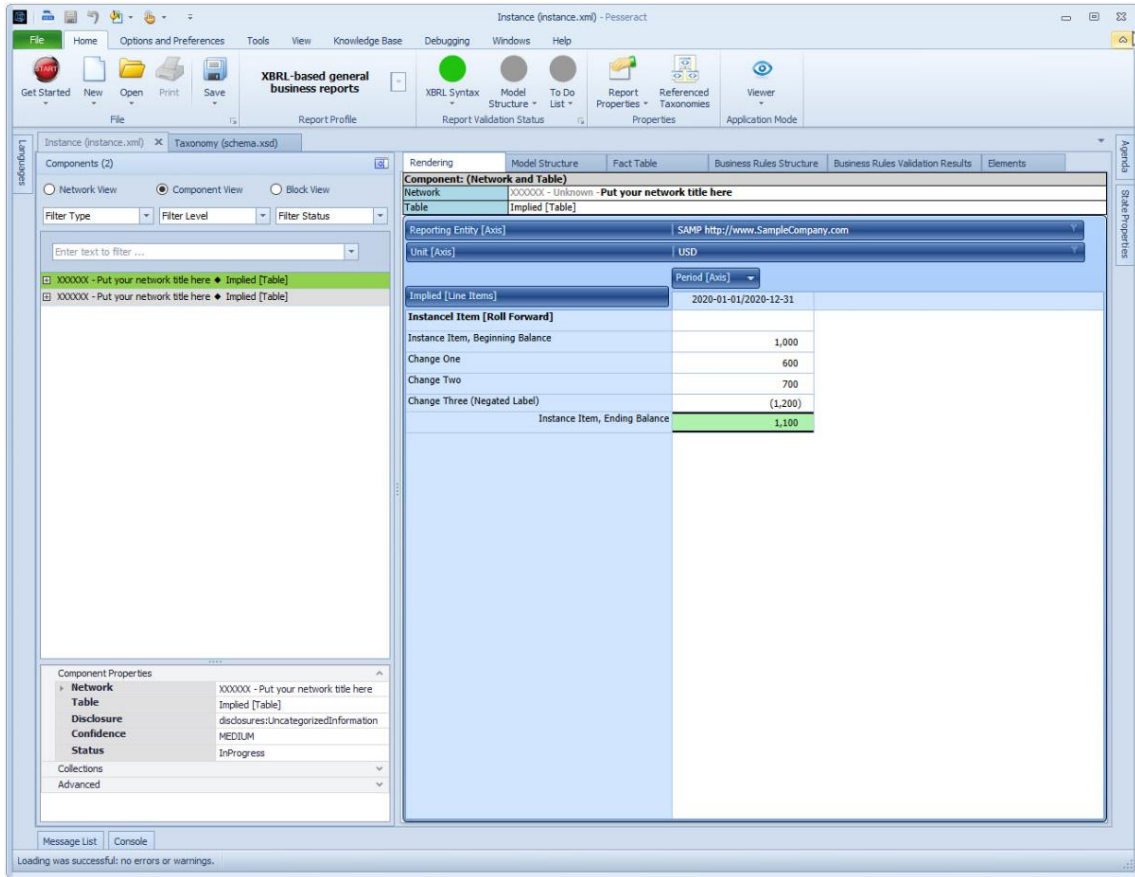


You can now edit this fragment within the provided framework. You do not need to understand anything about the XBRL technical syntax; the application understands how to create that. All you need to concern yourself with is getting the logic of the disclosure that you want to create right.

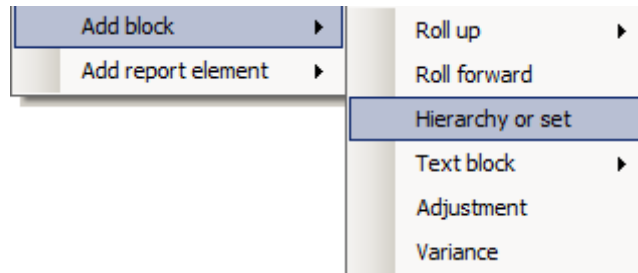
To add a second report fragment, again right click in the network list. Once again, right click within the white area that contains the list of Networks. This time select "Add block", and then "Roll forward":



This time the framework for a roll forward is provided for the user of the application. Behind the scenes, all the terms, associations, assertions, and other information was added to the structure you are creating. Again, you can edit this framework but the application will not let you "break" the framework.

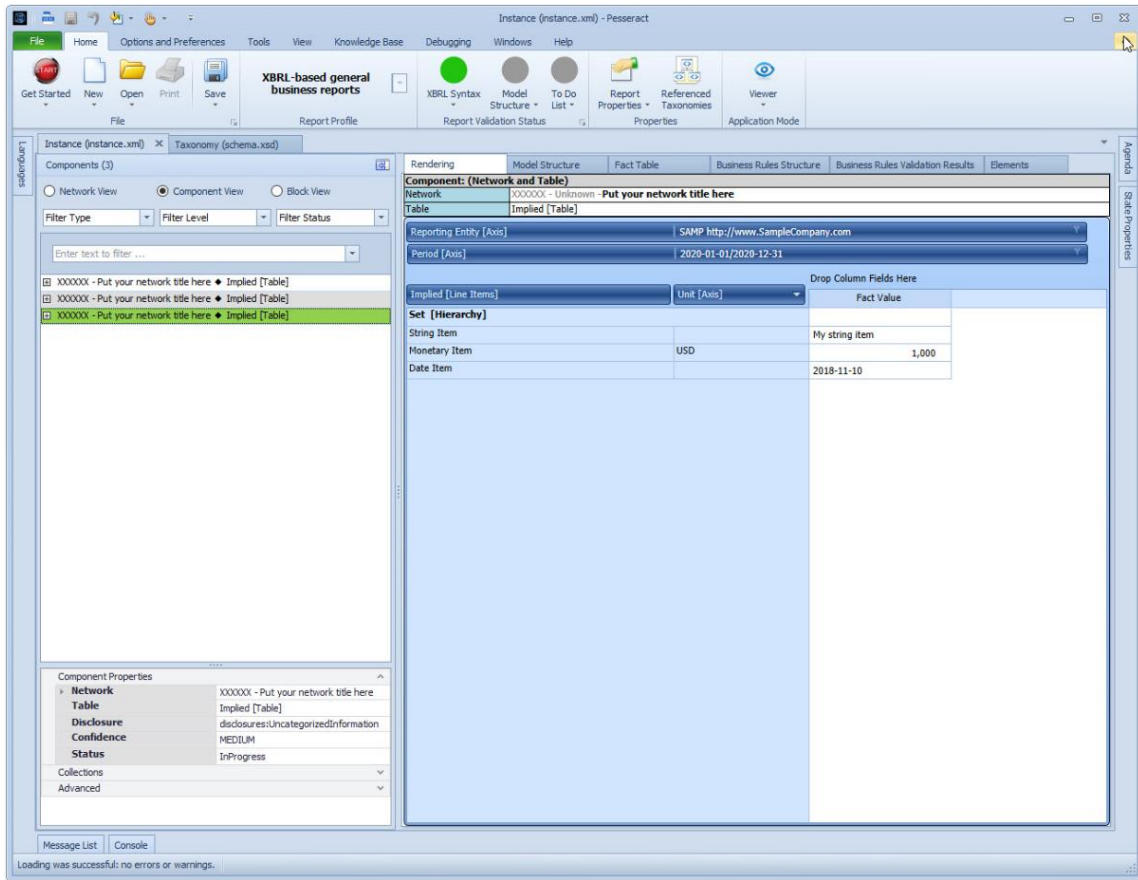


Note that a second Network which contains a roll forward has been added to the report. Once again, right click within the white area that contains the list of Networks. This time select "Add block", and then "Hierarchy or set":



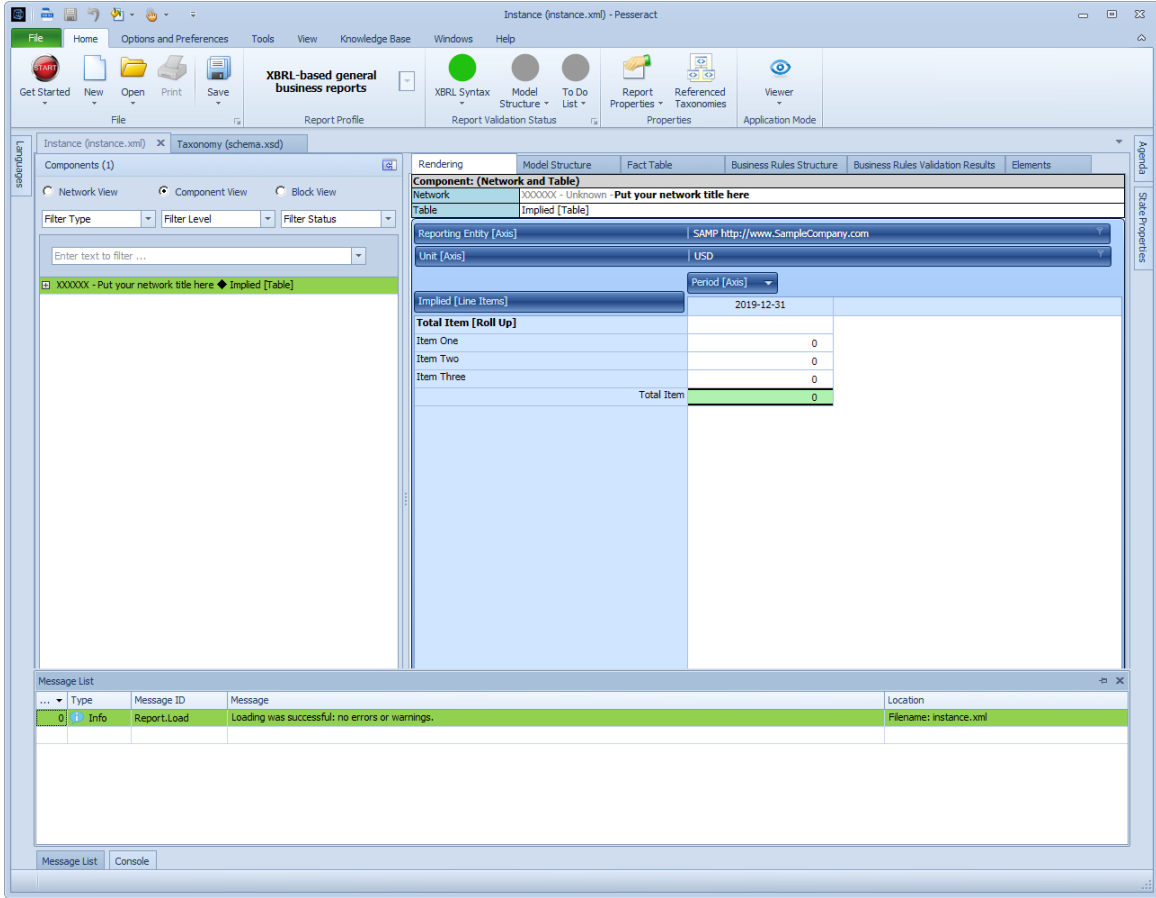
A third Network has been added to the report that contains a concept arrangement pattern of Hierarchy (or set) as can be seen in the screen shot below:

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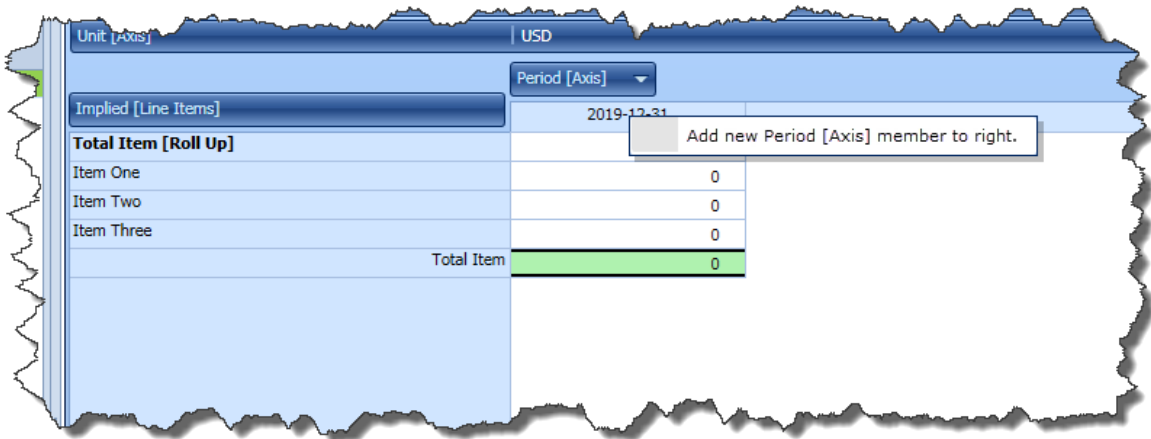


We added three separate report fragments to the report: a roll up, a roll forward, and a hierarchy or set. Now, let's go back and edit the report. Let's edit the roll up. So, select the roll up network:

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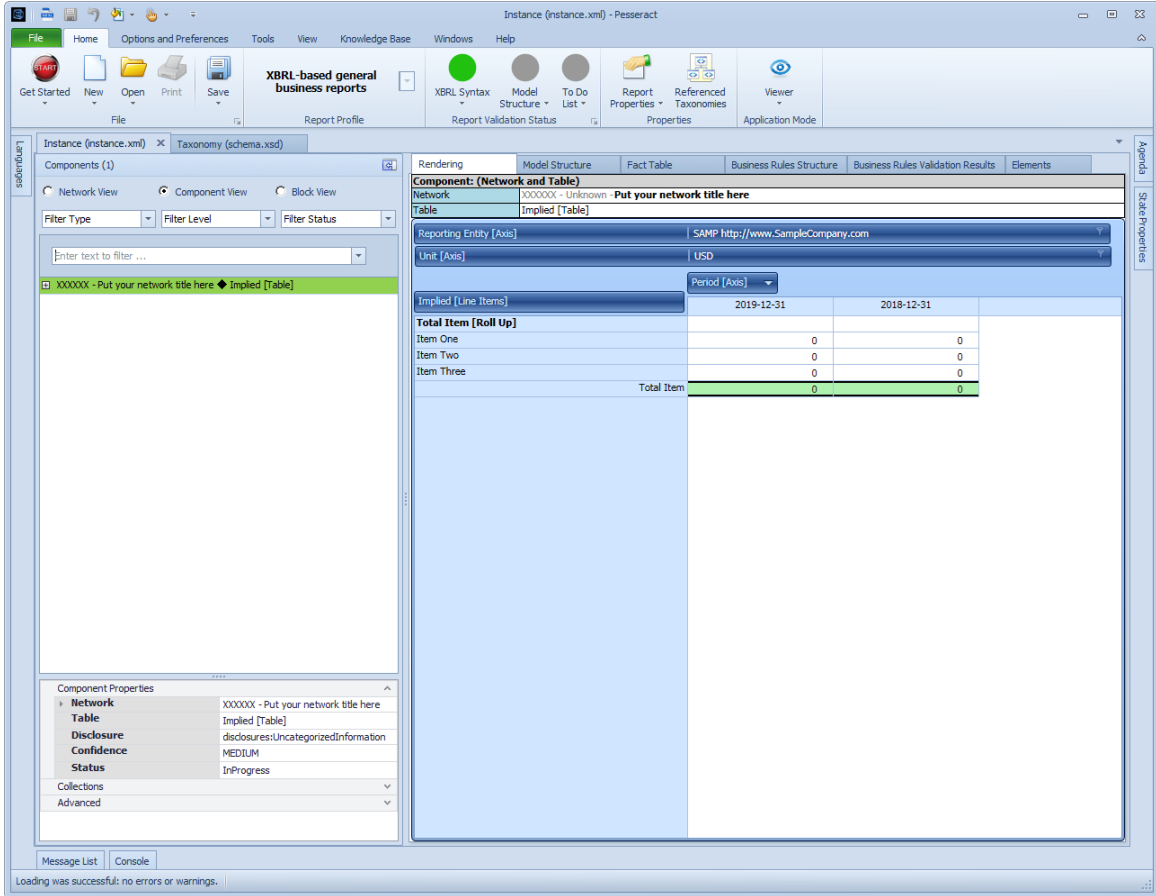


Right click over the “Period [Axis]” and a menu appears “Add new Period [Axis] member to right”. Select that menu item:



Note that a new column of facts has been added to the selected Block as can be seen in the screen shot below:

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And so, you have created the shell of an XBRL-based report without ever having to deal with the XBRL technical syntax!