1. Controlling Report Quality

The purpose of this section is to explain how to control the quality of an XBRL-based digital financial report. This includes understanding how to be sure such a report is a properly functioning logical system and the typical impediments that get in the way of creating reports that are consistent, precise, and complete.

This section helps you understand the impediments to creating a properly functioning XBRL-based financial report. Being conscious of the things that can go wrong helps you avoid quality issues with your XBRL-based reports. Machine readable rules are used to communicate the permissible manipulations of your report.

1.1. Computers are Dumb Beasts

If you are reading this you are likely an adult. But computers are not like adults, they are more like babies. Not children, babies. Computer have to be led by the hand and taken where you want them to go.

Rules provide a specification of the permissible manipulations of the model of a logical system. Rules prevent anarchy. Rules lead the computer by the hand, telling the computer where you need to go.

The accounting equation is a simple logical system. This section builds on a prior version[1] of the very basic "accounting equation" representation in XBRL. The point is to show the specific consequences of decisions that are made with respect to a logical system and the rules that are necessary as a result of those decisions.

You can download a zip file[2] that contains all of the XBRL examples or the human-readable representation of the example[3]. The home page for this information can be found here[4].

1.2. Simple Logical System: The Accounting Equation

The accounting equation[5] is the fundamental basis for financial accounting. By definition, every financial reporting scheme[6] has this high-level accounting equation model at its core. The accounting equation is:

"Assets = Liabilities + Equity"

The accounting equation defines three core **terms** of a financial report:

- Assets
- Liabilities
- Equity

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[1] Accounting equation, prior verion, http://xbrlsite.azurewebsites.net/2019/core/master-ae/

[2] ZIP file download, http://xbrlsite.azurewebsites.net/2020/core/master-ae/ae.zip

[3] Human readable representation, http://xbrlsite.azurewebsites.net/2020/core/master-ae/evidence-package.zip

[4] Index page, http://xbrlsite.azurewebsites.net/2020/core/master-ae/index.html

[5] Wikipedia, Accounting Equation, https://en.wikipedia.org/wiki/Accounting_equation

[6] Charles Hoffman, CPA, *Comparison of Financial Reporting Schemes High Level Concepts*, http://xbrlsite.azurewebsites.net/2018/Library/ReportingSchemes-2018-12-30.pdf

The accounting equation defines those three terms and provides the mathematical relations (**rule** or **assertion**) between the three terms:

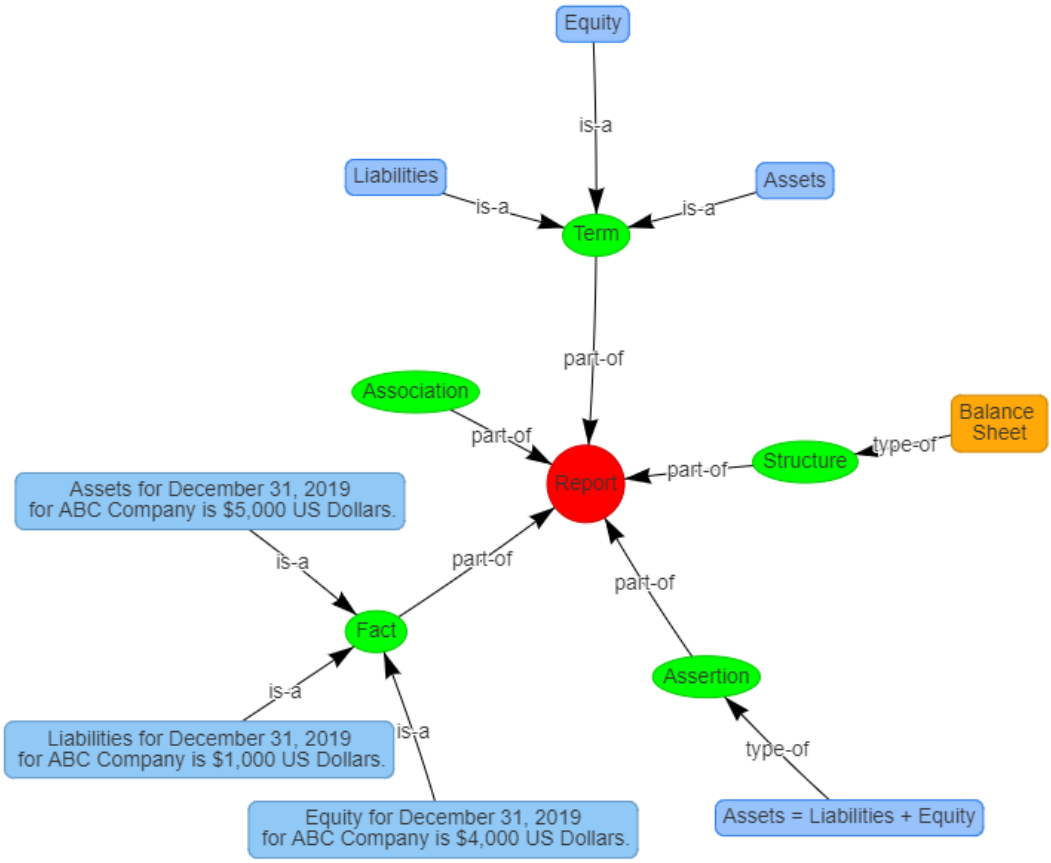
Assets = Liabilities + Equity

Depending upon how you read the definition of the accounting equation, it either explicitly says or at least implies the existence of a **structure**, the **Balance Sheet**, within which the three concepts exist. As such, the three terms, Assets, Liabilities, and Equity are **associated** with the Balance Sheet structure because they are part-of that structure.

With that information, an economic entity can create a financial statement that communicate **facts** about that economic entity. For example, the economic entity "ABC Company" might represent their assets, liabilities, and equity as of December 31, 2019:

- Assets = $5,000
- Liabilities = $1,000
- Equity = $4,000

And so, the information that has been explained above can be represented as the following set of vertices and edges using graph theory[7]:



The accounting equation is a simple man-made logical system.

[7] Wikipedia, *Graph Theory*, https://en.wikipedia.org/wiki/Graph_theory

A **logical system**[8] (logical theory) enables a community of stakeholders trying to achieve a specific goal or objective or a range of goals/objectives to agree on important common models, structures, and statements for capturing meaning or representing a shared understanding of and knowledge in some universe of discourse.

As I have explained, a logical system or logical theory is made up of a set of **models**, **structures**, **terms**, **associations**, **assertions**, and **facts**. In very simple terms,

- **Logical theory**: A logical theory is a set of *models* that are consistent with that logical theory.
- **Model**: A model is a set of *structures*. A model is a permissible interpretation of a theory.
- **Structure**: A structure is a set of *statements* which describe the structure.
- **Statement**: A statement is a proposition, claim, assertion, belief, idea, or fact about or related to the universe of discourse. There are four broad categories of statements:
    - **Terms**: Terms are statements that define ideas used by the logical theory such as the ideas "assets", "liabilities", and "equity".
    - **Associations**: Associations are statements that describe permissible interrelationships between the terms such as "assets is part-of the balance sheet" or "assets = liabilities + equity" or "an asset is a 'debit' and is 'as of' a specific point in time and is always a monetary numeric value".
    - **Assertions**: (a.k.a. rules) Assertions are statements that describe what tend to be IF…THEN…ELSE types of relationships such as "IF the economic entity is a not-for-profit THEN net assets = assets - liabilities; ELSE assets = liabilities + equity"
    - **Facts**: Facts are statements about the numbers and words that are provided by an economic entity within their financial report. For example, "assets for the consolidated legal entity Microsoft as of June 20, 2017 was $241,086,000,000 expressed in US dollars and rounded to the nearest millions of dollars.

The statements within a logical system can be **consistent** or inconsistent or can contradict one another. A logical system can have high to low **precision** and high to low **coverage**. *Precision* is a measure of how precisely the information within a logical system has been represented as contrast to reality for the universe of discourse. *Coverage* is a measure of how completely information in a logical system has been represented relative to the reality for a universe of discourse. If a logical system is consistent, has high precision, and has high coverage it is said to be a properly functioning logical system.

Finally, nothing about this logical system is a "black box". The innerworkings are logical, they are clear, and humans can understand what is being expressed because

[8] Charles Hoffman, CPA, *Explanation of a Financial Report Logical System in Simple Terms*, http://xbrl.squarespace.com/journal/2019/11/1/explanation-of-a-financial-report-logical-system-in-simple-t.html

they understand the rules of logic and they understand the terminology being used to explain the logical system. Information is knowable.

And so, if any of this is explained in machine-readable terms it must be done using auditable algorithms that are explainable to humans. Algorithms, including artificial intelligence, used by the enterprise or for accounting, reporting, auditing, and analysis needs to be explainable artificial intelligence. Explainable AI[9] (XAI) provides insight into how the software algorithms reached its conclusions, an understandable "line of reasoning" so to speak.

1.3. Accounting Equation Logical System Represented Using XBRL

The following is a summary of the model of the accounting equation logical system expressed in both machine-readable and human-readable terms.

One specific thing to note is that additional details are being added to the simple explanation provided above. For example, above we defined "Assets". But now, we define "Assets" as being a data type of "monetary", being "as of" a specific point in time (i.e. instant), and being a "Debit". Computers need this precise representation to help humans achieve what they desire to achieve from this logical system. You probably were aware that Assets is a debit and as of a point in time and is a number.

TERMS[10,11]:

Three simple terms are defined for the accounting equation logical system: Assets, Liabilities, Equity.

#	Label	Data Type	Period Type	Balance Type	Prefix	Standard label, Documentation, References, Concept name	Count
1	Assets	Monetary	As Of (instant)	Debit	ae	*Filer label:* Assets *Documentation:* *References:* Publisher: FASB; Reference Name: SFAC; Reference Information: Paragraph: 25; URIDate: 2019-10-22; URI: https://www.fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1218220132802&acceptedDisclaimer=true; Number: 6 *Name:* ae:Assets	1
2	Equity	Monetary	As Of (instant)	Credit	ae	*Filer label:* Equity *Documentation:* *References:* Publisher: FASB; Reference Name: SFAC; Reference Information: Paragraph: 49; URIDate: 2019-10-22; URI: https://www.fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1218220132802&acceptedDisclaimer=true; Number: 6 *Name:* ae:Equity	1
3	Liabilities	Monetary	As Of (instant)	Credit	ae	*Filer label:* Liabilities *Documentation:* *References:* Publisher: FASB; Reference Name: SFAC; Reference Information: Paragraph: 35; URIDate: 2019-10-22; URI: https://www.fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1218220132802&acceptedDisclaimer=true; Number: 6 *Name:* ae:Liabilities	1

STRUCTURES[12,13]

[9] ACCA, Narayanan Vaidyanathan, *Explainable AI: Putting the user at the core*, https://www.accaglobal.com/uk/en/professional-insights/technology/Explainable_AI.html

[10] Machine-readable terms, http://xbrlsite.azurewebsites.net/2020/core/master-ae/ae.xsd

[11] Human-readable terms, http://xbrlsite.azurewebsites.net/2020/core/master-ae/evidence-package/contents/ReportElements-Concepts.html

In addition to the three simple terms, one functional term is defined to represent the balance sheet structure: Balance Sheet [Hypercube]:

#	Label	Prefix	Standard label, Documentation, References, Concept name	Count
1	Balance Sheet [Hypercube]	ae	*Filer label:* Balance Sheet [Hypercube] *Documentation:* *References:* NONE *Name:* ae:BalanceSheetHypercube	1

ASSOCIATIONS[14,15]:

The association between the three terms and the balance sheet structure are provided. Some additional infrastructure report elements are provided to help organize the representation:

#	Label	Report Element Class	Period Type	Balance	Name
1	**Balance Sheet [Hypercube]**	[Table]			ae:BalanceSheetHypercube
2	**Balance Sheet [Line Items]**	[Line Items]			ae:BalanceSheetLineItems
3	*Balance Sheet [Set]*	[Abstract]			ae:BalanceSheetSet
4	Assets	[Concept] Monetary	As Of	Debit	ae:Assets
5	Liabilities	[Concept] Monetary	As Of	Credit	ae:Liabilities
6	Equity	[Concept] Monetary	As Of	Credit	ae:Equity

ASSERTIONS[16,17]:

The mathematical relationship between the terms Assets, Liabilities, and Equity are represented.

#	Label	Result	Rule
1	$Assets = ($Liabilities + $Equity) (CONSISTENCY_5)	Pass	$Assets = ($Liabilities + $Equity)

FACTS[18,19]:

We can create a set of facts to exercise the logical system. Facts representing Assets of $5,000, liabilities of $1,000, and equity of $4,000 were created.

#	Reporting Entity [Axis]	Period [Axis]	Concept	Fact Value	Unit	Rounding	Parenthetical Explanations
1	GH259400TOMPUOLS65II (http://standards.iso.org/iso/17442)	2020-12-31	Assets	5000	USD	INF	
2	GH259400TOMPUOLS65II (http://standards.iso.org/iso/17442)	2020-12-31	Liabilities	1000	USD	INF	
3	GH259400TOMPUOLS65II (http://standards.iso.org/iso/17442)	2020-12-31	Equity	4000	USD	INF	

And so, the model above is used to explain the details of the human-readable representation that is also machine-readable below in the alternative Inline XBRL format[20]:

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[12] Machine-readable structures, http://xbrlsite.azurewebsites.net/2020/core/master-ae/ae.xsd

[13] Human-readable structures, http://xbrlsite.azurewebsites.net/2020/core/master-ae/evidence-package/contents/ReportElements-Tables.html

[14] Machine-readable associations, http://xbrlsite.azurewebsites.net/2020/core/master-ae/ae-pre.xml

[15] Human-readable associations, http://xbrlsite.azurewebsites.net/2020/core/master-ae/evidence-package/contents/NetworkStructure-N0-RE6.html

[16] Machine-readable assertions, http://xbrlsite.azurewebsites.net/2020/core/master-ae/Consistency-5-Code-BS01-formula.xml

[17] Human-readable assertions, http://xbrlsite.azurewebsites.net/2020/core/master-ae/evidence-package/contents/BusinessRulesSummary.html

[18] Machine-readable facts, http://xbrlsite.azurewebsites.net/2020/core/master-ae/instance.xml

[19] Human-readable facts, http://xbrlsite.azurewebsites.net/2020/core/master-ae/evidence-package/contents/NetworkFacts-N0-RE6.html

[20] Human-readable and machine-readable facts using Inline XBRL, http://xbrlsite.azurewebsites.net/2020/core/master-ae/instance.html

Inline XBRL Business Report

Component: (Network and Table)	
Network	**01-Balance Sheet** (http://www.xbrlsite.com/ae/role/BalanceSheet)
Table	Balance Sheet [Hypercube]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	GH259400TOMPUOLS65II (http://standards.iso.org/iso/17442)

Balance Sheet [Line Items]	Period [Axis] 2020-12-31
Balance Sheet [Set]	
Assets	5,000
Liabilities	1,000
Equity	4,000

PROPERLY FUNCTIONING: CONSISTENT, PRECISE, AND COMPLETE:

The logical system can be called **properly functioning** because all of the statements within the logical system are **consistent** with one another (i.e. there are no contradictions, there are no inconsistencies), it can be established that the logical system created **precisely** reflects the reality of the logical system (we just made the numbers up for ABC Company), and a **complete** set of statements seem to be included within the logical system.

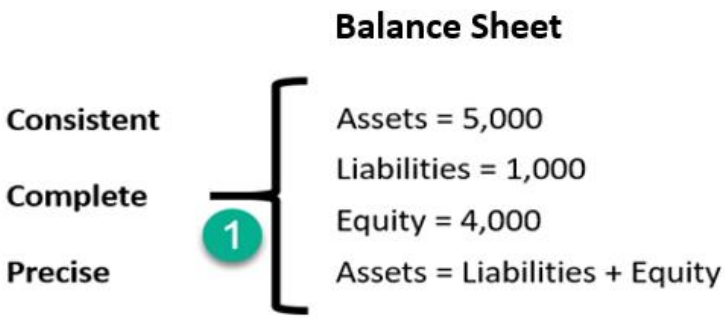
A software application can take all of the statements made within the machine-readable version of this logical system and perform work. Below you see a human-readable rendering of a Balance Sheet that was created from the XBRL-based representation of the accounting equation logical system:

Balance Sheet [Line Items]	Period [Axis] 2020-12-31
Balance Sheet [Set]	
Assets	5,000
Liabilities	1,000
Equity	4,000

Result	Rule
Pass	$Assets = $Liabilities + $Equity

The logical system of the accounting equation is therefore *consistent*, *precise*, and *complete* because all the statements are consistent with one another within the logical system, the logical system reflects the formal truths we wish to convey precisely, and a complete set of statements describe the logical system.

This graphic below shows a synopsis of the information and we can look at this synopsis and see that the logical system appears to be properly functioning because this is a relatively simple logical system:



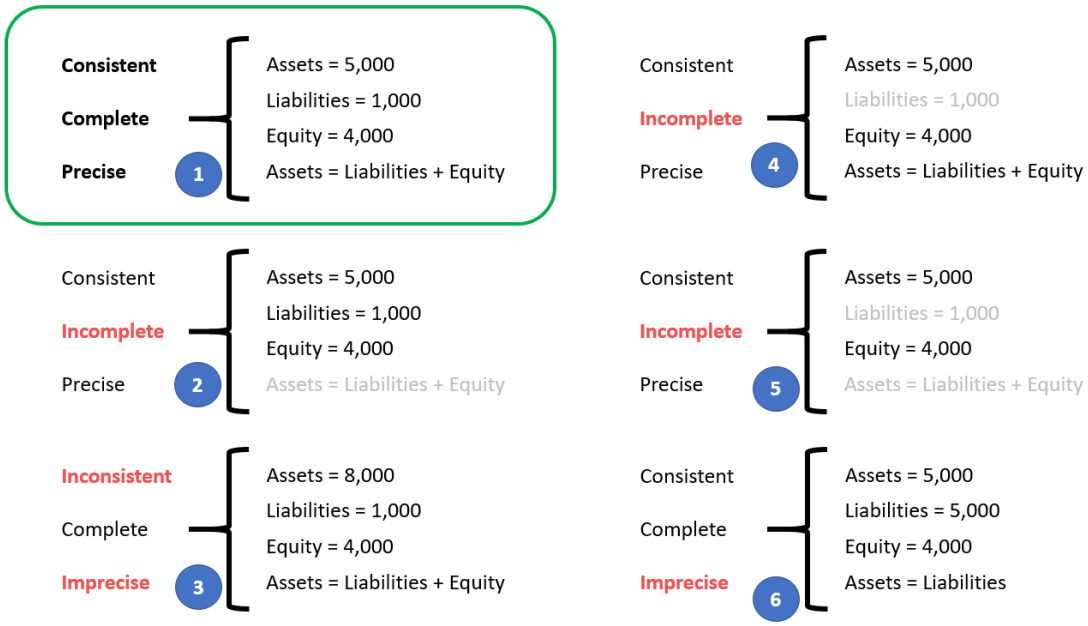
And so, above we have shown one permissible interpretation or model of the logical system that is consistent with our logical theory.

Now, we want to use this base logical system that is properly functioning to explain the sorts of things that can make the system inconsistent, incomplete, or imprecise. This will help you to better understand what is entailed in creating a properly functioning logical system.

1.4. Properly and Improperly Functioning Logical Systems

Below you can see examples of each of six possible states of the accounting equation logical system. For example, the logical system can be functioning improperly if a single statement is left out, if one statement contradicts another statement within the logical system, if a statement is imprecise with respect to reality; all of these situations impact (a) the logical system and (b) what information is necessary to include within the logical system.

Here is a graphic depicting the first 6 states including the first which is a properly functioning logical system:



In the following sections I want to make some adjustments to the logical system which make the logical system either inconsistent, incomplete, or imprecise and explain why the system is then not a properly functioning logical system. To the six examples above I will add three additional examples. I made videos that explain each of these impediments to a properly functioning logical system which you can see in this video playlist, Understanding the Financial Report Logical System[21].

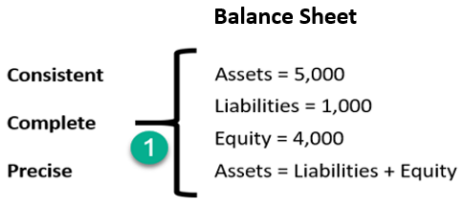
Before we get to the improperly functioning logical systems, let's take one final look at the properly functioning logical system so that you can compare and contrast the properly functioning and improperly functioning logical systems.

1.5. State 1: Properly Functioning Logical System

For completeness, I want to start by mentioning again our properly functioning logical system which is consistent, complete, and precise. It can be helpful to contrast other states to this state to understand the difference between properly functioning logical systems and improperly functioning systems.

Balance Sheet [Abstract]	Period [Axis]
	2020-12-31
Balance Sheet [Abstract]	
Assets	5,000
Liabilities	1,000
Equity	4,000

Result	Rule
Pass	$Assets = $Liabilities + $Equity



Again, this is considered a properly functioning logical system because (a) all the statements within the system are **consistent**; (b) the set of statements that describe the system is **complete**; and (c) the information conveyed by the system is **precise** in its representation of reality. Further, we are formally declaring this "reality"[22] to be our base understanding.

Also, we need to be explicit. We defined three terms "Assets", "Liabilities", and "Equity".

Now, you may know what those three terms are; but a computer does not. You have to define what you work with relative to something that you know. Imagine our system defines four terms, "fac:Assets", "fac:Liabilities", "fac:Equity", and "fac:LiabilitiesAndEquity"[23]. You understand your system but you have to map every external system into your system[24]. Your internal system understands more that the accounting equation system (i.e. you have LiabilitiesAndEquity). You have to be able to compute that value based on some other system's information[25]. It is perfectly reasonable for our system to create a concept LiabilitiesAndEquity and compute that value even though the accounting equation logical system does not have that explicit value.

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[21] Understanding the Financial Report Logical System, https://www.youtube.com/playlist?list=PLqMZRUzQ64B7EWamzDP-WaYbS_W0RL9nt

[22] YouTube, *Reality*, https://youtu.be/eq2Jw6waaCI

[23] Fundamental accounting concepts, http://xbrlsite.azurewebsites.net/2020/core/master-ae/fac.xsd

[24] Mapping from accounting equation to fundamental accounting concepts in our system, http://xbrlsite.azurewebsites.net/2020/core/master-ae/fac-mapping-definition.xml

[25] XBRL Formula to derive the value for LiabilitiesAndEquity, http://xbrlsite.azurewebsites.net/2020/core/master-ae/fac-ImputeRule-LiabilitiesAndEquity-formula.xml

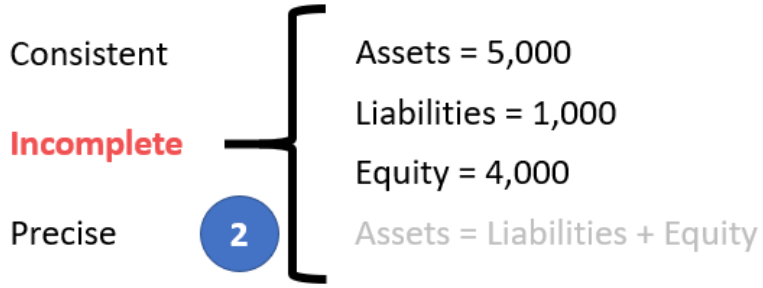
The point is that different economic entities have different models; but all models of a financial reporting scheme are reconcilable from/to one another in some manner[26].

1.6. State 2: Incomplete Coverage by Rules

The logical system #2 below is intended to show exactly the same information as our #1 properly functioning logical system, except that #2 leaves out the rule "Assets = Liabilities and Equity" which is showed as grayed out (i.e. because it is assumed to be missing from the logical system.

Coverage is a measure of how well you do or can represent a domain of information within a logical system. "Do" is about using the tools you have correctly and effectively. "Can" is about the capabilities of the tools you are using to represent the rule.

For example, if your logical system neglects to include the rule "Assets = Liabilities + Equity" or if your tools don't provide the capabilities to allow you to represent that rule; then there is the possibility that the facts being represented to be represented incorrectly and the system will not detect the inconsistency. As such, that logical system has **incomplete coverage**.

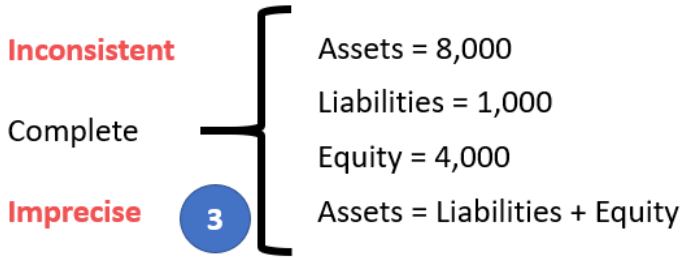


While this specific state #2 does have the Assets, Liabilities, and Equity facts consistent with the absent rule; the system is still incomplete because the coverage can be improved by adding the missing rule. If that missing rule is added, then the logical system can be considered complete again.

1.7. State 3: Inconsistent and Imprecise

All the statements in the system must be consistent for the logical system to be considered properly functioning. If statements are inconsistent, the logical system is not is not properly functioning. In this system #3, the values for Assets, Liabilities, and Equity are inconsistent with the rule "Assets = Liabilities + Equity". From looking at the information provided, it is impossible to know exactly which of the three facts are incorrect; it is only possible to understand that the statements made within the logical system is inconsistent. It could be the case that the rule is incorrect.

[26] Charles Hoffman, CPA, *Special Theory of Machine-based Automated Communication of Semantic Information of Financial Statements*, http://xbrl.squarespace.com/journal/2019/12/30/special-theory-of-machine-based-automated-communication-of-s.html

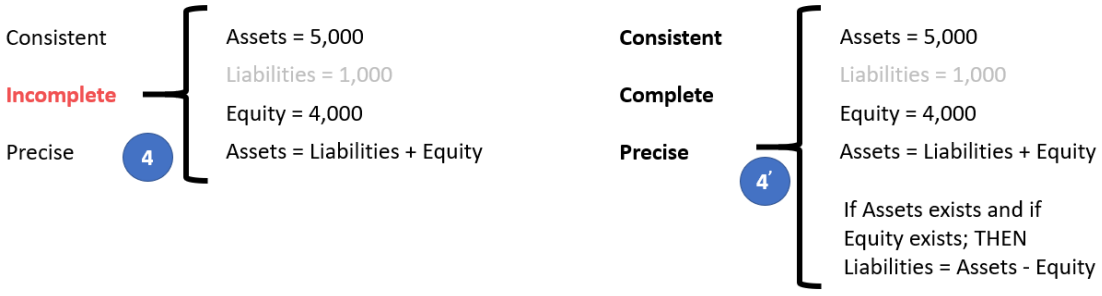


However, given that we know from state #1 that the value for Assets is 5,000 and not 8,000; the facts in this system is imprecise because the fact for Assets does not reflect reality.

1.8. State 4: Unreported Facts

In state #4, the situation is that the economic entity representing information in their report neglected to include the fact for Liabilities. Whether it is the case that a fact can, or cannot, be left unreported is a decision that can be made by the stakeholders of the system.

If it is the case that it is decided that the fact "Liabilities" can be omitted if both Assets and Equity are reported; then you must provide a rule to derive the value of Liabilities when that fact is not reported. Below you see that the system has been adjusted in state #4' to add the rule "IF Assets exists and if Equity exists; THEN Liabilities = Assets - Equity"[27].



If it were likewise true that either Assets[28] or Equity[29] could also be left unreported, similarly derivation rules could be created for each of those facts. Note that XBRL Formula chaining[30] can be used to physically derive unreported facts if any one of these three facts remain unreported. Note that it is impossible to derive missing information if any two of the facts remain unreported. Adding the derivation rule makes the system complete.

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[27] Here is the impute or derivation rule that would be added to the accounting equation logical system for this situation, http://xbrlsite.azurewebsites.net/2020/core/master-ae/ImputeRule-Key-1-Code-BS-Impute-01-formula.xml

[28] XBRL Formula rule for deriving Assets, http://xbrlsite.azurewebsites.net/2020/core/master-ae/ImputeRule-Key-3-Code-BS-Impute-03-formula.xml

[29] XBRL Formula rule for deriving Equity, http://xbrlsite.azurewebsites.net/2020/core/master-ae/ImputeRule-Key-2-Code-BS-Impute-02-formula.xml

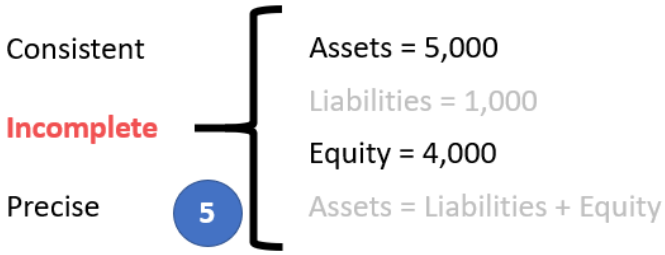
[30] Deriving Facts Using XBRL Formula Chaining (Example), http://xbrl.squarespace.com/journal/2019/4/24/deriving-information-using-xbrl-formula-chaining-example.html

Allowing certain line items of a report to go unreported specifies the need to create rules to derive missing information. Or saying this another way, omitting the possibility of unreported facts negates the need for creating derivation rules.

A second downside of allowing unreported facts is that you lose the parity check or cross check if facts can go unreported. Said another way, it would be considered best practice to not leave important high-level financial report line items to go unreported.

1.9. State 5: Incomplete

Similar to state #4, in state #5 the logical system is incomplete because both (a) the fact Liabilities is unreported and also (b) the consistency rule "Assets = Liabilities + Equity" is missing from the logical system. Because both a fact and the rule are missing from the logical system, it would be impossible to deduce the value of Liabilities in this case. There is not enough information in the logical system to allow Liabilities to be derived. At a minimum, a consistency crosscheck rule[31] plus the derivation rule to impute Liabilities[32] would be necessary.



Again, consistent with state #4; Assets and Equity would require similar rules and there is no parity check of reported information.

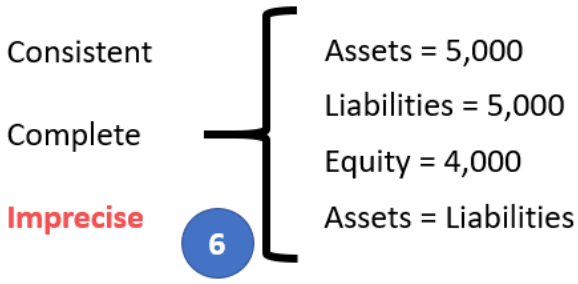
1.10. State 6: Imprecise

A logical system is a true and fair representation of some agreed upon realism. **Precision** is a measure of how precisely you do or can represent the information of a domain within a logical theory. The reality that we formalized in state #1 indicates that "Assets = Liabilities + Equity". Yet, in the state #6 example, the rule "Assets = Liabilities" was provided. Further, the values of Assets and Liabilities are, in fact, consistent with the rule that has been provided.

Remember that in state #1 we formalized our truth to be that "Assets = Liabilities + Equity". As such, this logical system can be described as being imprecise. To make this logical system precise, all that needs to be done is to fix the rule.

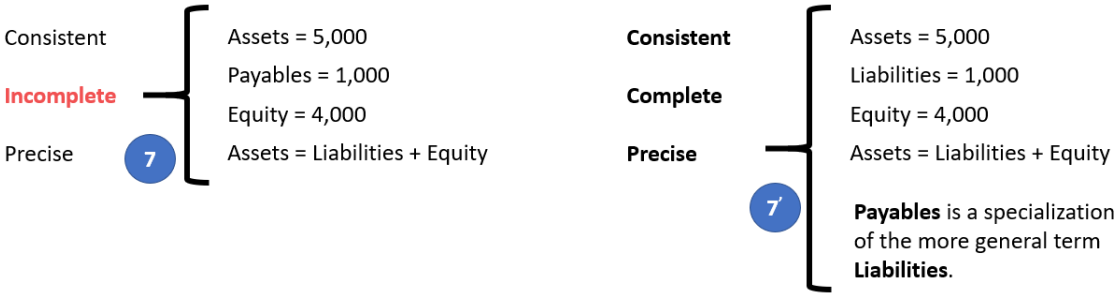
[31] XBRL Formula consistency crosscheck rule Assets = Liabilities + Equity, http://xbrlsite.azurewebsites.net/2020/core/master-ae/Consistency-5-Code-BS01-formula.xml

[32] XBRL Formula derivation rule to impute Liabilities, http://xbrlsite.azurewebsites.net/2020/core/master-ae/ImputeRule-Key-1-Code-BS-Impute-01-formula.xml



1.11. State 7: Extension Concept

In state #7 on the left, what we are trying to convey is that the economic entity reported the fact for Liabilities using the extension concept "Payables" that it had created. If a fact is represented using an extension concept created by a reporting entity; then a "general-special" or "wider-narrower" or "class-equivalentClass" association must be created to indicate to software applications of the relationship so that information can be used correctly. State #7' on the right, the rule "Payables is a specialization of the more general term Liabilities" has been added to the logical system which allows the system to operate effectively[33].



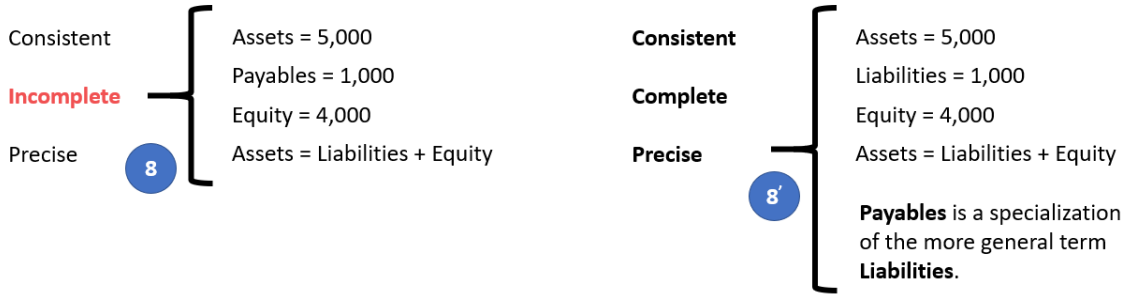
1.12. State 8: Base Taxonomy Wider/Narrower Concept Use

State #8 on the left below is similar to state #7 in that a different concept is used to report a fact; but while state #7 focuses on using an extension concept; state #8 points out that using a wider or narrower base taxonomy concept gives exactly the same result.

Now, our base state #1 does not have the concept "Payables"; but let's assume for a moment that it does have the concept "Payables". Also suppose that there was no information in the base logical system indicating the relationship between "Payables" and any other concept. If a fact is represented using a BASE TAXONOMY CONCEPT by a reporting entity; then a "general-special" or "wider-narrower" or "class-equivalentClass" association must exist in that base taxonomy to indicate that some concept is a permissible alternative for some other concept.

[33] XBRL Definition relations showing example of a mapping rule, http://xbrlsite.azurewebsites.net/2020/core/master-ae/fac-mapping-definition.xml

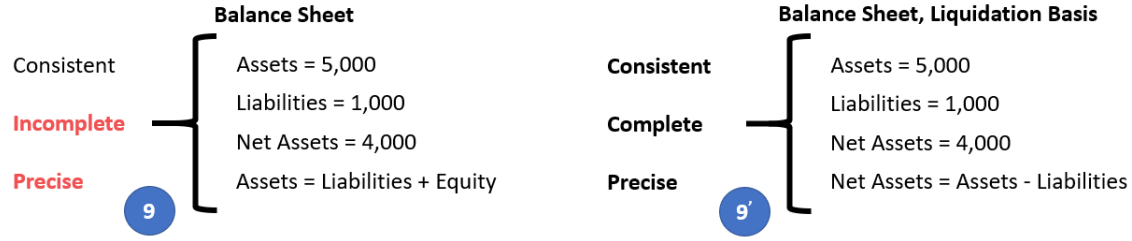
State #8′ on the right adds the rule "Payables is a specialization of the more general term Liabilities"[34].



1.13. State 9: Defining a Completely New Structure

State #9 below on the left focuses on the structure as contrast all the prior examples which focused on the terms and rules. If a new structure is created, the new structure must be referenced to the base taxonomy and the new structure needs to be explained using machine-readable rules[35]. Even base taxonomy structures need to be defined in order to be referred to[36]. When you say "Balance Sheet" you know what that means. But a machine does not know.

A base taxonomy should (a) provide all necessary structures separately, not intermingle different models in the same set of associations and (b) define what each structure must look like. Remember, computers are like babies and need to be led by the hand in order to understand the details you need them to understand.



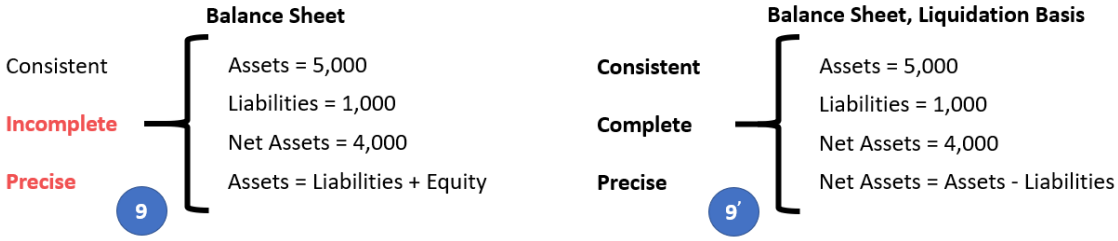
Finally, in our case we have only one disclosure, the Balance Sheet. In our case, the Balance Sheet is always required to be reported per this logical system. As such, that rule is stated in a machine-readable reporting checklist[37]. Other logical systems with more disclosures will have more rules relating to when a disclosure is required to be provided in a report.

1.14. State 10: Organizing Disclosures Using Topics

State #10 points out that while the accounting equation logical system has one structure, the balance sheet, ultimately if a complete financial reporting scheme

[34] XBRL Definition relations showing example of a mapping rule, http://xbrlsite.azurewebsites.net/2020/core/master-ae/fac-mapping-definition.xml
[35] XBRL Definition relations used to represent structure rules, http://xbrlsite.azurewebsites.net/2020/core/master-ae/dm-1355-rules-def.xml
[36] XBRL taxonomy schema used to define "Balance Sheet", http://xbrlsite.azurewebsites.net/2020/core/master-ae/disclosures.xsd
[37] XBRL Definition relations used to represent a reporting checklist or disclosure rules, http://xbrlsite.azurewebsites.net/2020/core/master-ae/reporting-checklist-rules-def.xml

were represented one might have hundreds or even thousands of disclosures. Disclosures can be organized into topics[38]. Then, rather than having one flat list of disclosures, they can be organized into a handy hierarchy[39].



1.15. More Complex Examples

While the accounting equation logical system is small, it can be used to demonstrate incredibly sophisticated functionality. To see more sophisticated examples, see my *Modern Approach to Creating Financial Reporting Scheme* examples[40] and the document *Proving Financial Reports are Properly Functioning Logical Systems*[41] which starts with the accounting equation logical system, then models the slightly larger SFAC 6 elements of a financial statement logical system, the common elements of a financial report logical system, a MINI financial reporting scheme logical system, and then contrasts that to the Microsoft 10-K financial report logical system.

What all this shows is how rules are used to specify permissible manipulations of a logical system.

1.16. XBRL Structure Validation

Finally, when representing information within XBRL presentation relations, use these rules to make sure you don't make any mistakes in your representation[42].

		Parent						
		Network	Table	Axis	Member	Line Items	Abstract	Concept
Child	Network	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL
	Table	OK	Disallowed	Disallowed	Disallowed	Disallowed	OK	Disallowed
	Axis	Disallowed	OK	Disallowed	Disallowed	Disallowed	Disallowed	Disallowed
	Member	Disallowed	Disallowed	OK	OK	Disallowed	Disallowed	Disallowed
	Line Items	Disallowed	OK	Disallowed	Disallowed	Disallowed	Disallowed	Disallowed
	Abstract	OK	Disallowed	Disallowed	Disallowed	OK	OK	Disallowed
	Concept	Disallowed	Disallowed	Disallowed	Disallowed	OK	OK	Disallowed

[38] XBRL taxonomy schema used to represent topics, http://xbrlsite.azurewebsites.net/2020/core/master-ae/topics.xsd

[39] XBRL definition relations used to create a hierarchy of disclosures, http://xbrlsite.azurewebsites.net/2020/core/master-ae/disclosures-with-topics-def.xml

[40] *Modern Approach to Creating a Financial Reporting Scheme*, http://xbrl.squarespace.com/journal/2019/12/19/modern-approach-to-creating-a-financial-reporting-scheme.html

[41] *Proving Financial Reports are Properly Functioning Logical Systems*, http://xbrlsite.azurewebsites.net/2019/Library/ProvingFinancialReportAreProperlyFuncioning.pdf

[42] XBRL definition relations to represent structure rules for report element relations, http://xbrlsite.azurewebsites.net/2020/prototype/sbrm/sbrm-structure-rules-strict-def.xml

2. Validating Report Information

This section walks you through the process of validating XBRL-based digital financial reports leveraging machine-readable rules using automated machine-based processes. We start with validating the model structure. Then we tackle the fundamental accounting concept relations. Then the disclosure mechanics. Finally, the reporting checklist.

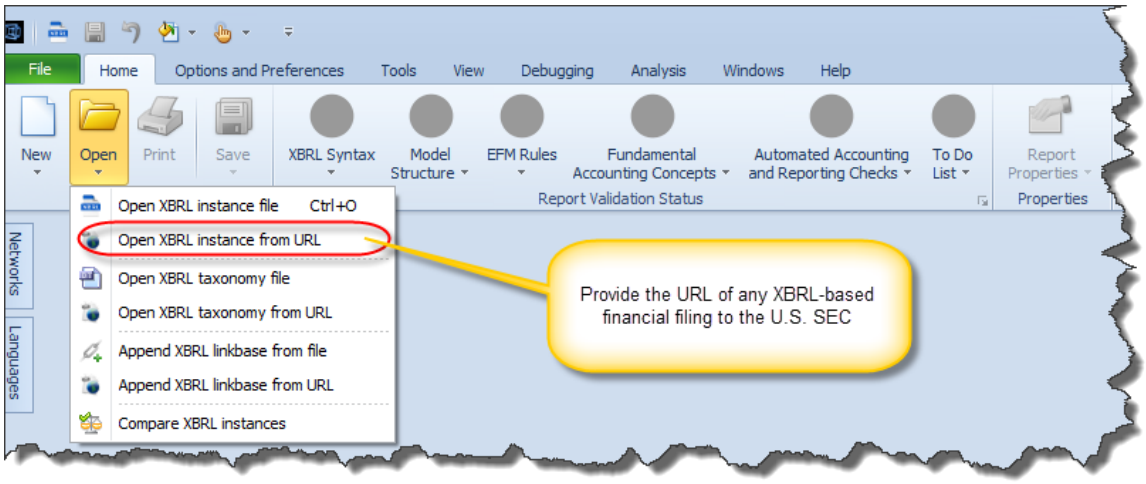
2.1. Validating Model Structure

This section walks you through validation of the model structure using the Pesseract digital financial reporting tool in the Viewer/Validation mode. This demonstration uses an XBRL-based public company financial filing which was submitted to the U.S. SEC. Local files and IFRS filings can be validated in the same manner.

2.1.1. STEP 1: Load the XBRL-based public company financial filing

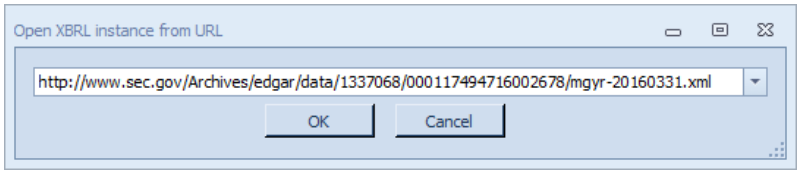
The following process can be used to load any 10-Q or 10-K XBRL-based financial report submitted by a public company to the SEC[43].

Open the Pesseract application, select "Open", and then "Open XBRL instance from URL".



In the dialog box that appears, enter the URL of the XBRL-based public company financial filing which was submitted to the SEC. For this demonstration, we will be using this XBRL-based financial filing which was made to the U.S. SEC:

http://www.sec.gov/Archives/edgar/data/1337068/000117494716002678/mgyr-20160331.xml



[43] XBRL Cloud provides the Edgar Dashboard which is an easy way to search for a financial filing for any public company for any period, https://edgardashboard.xbrlcloud.com/edgar-dashboard/

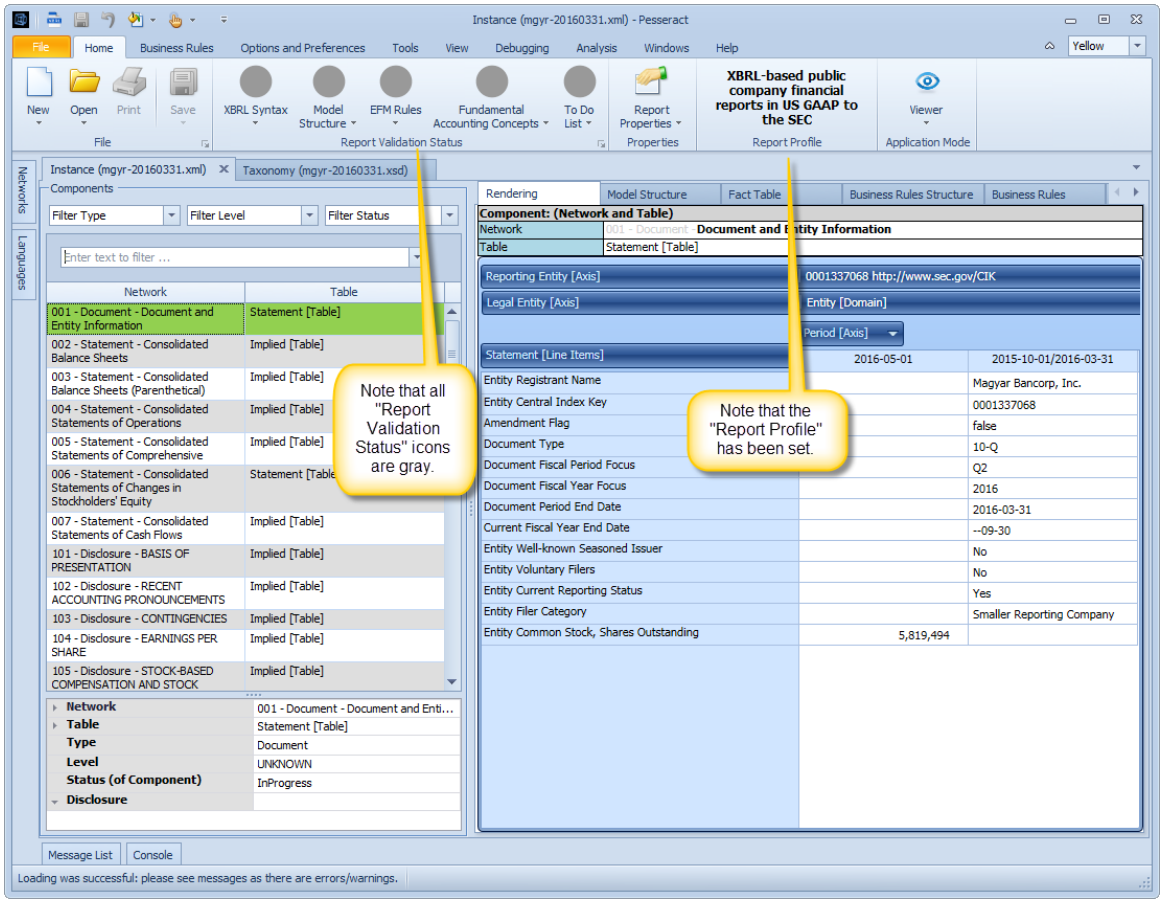
Press the OK button, then the XBRL-based document will be loaded into the application.

NOTE: *You can open a local version of an XBRL-based financial filing using the "Open XBRL instance file" option.*

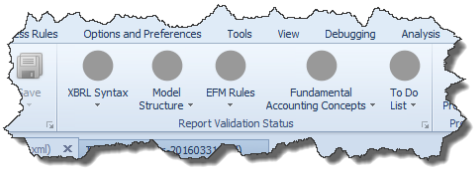
2.1.2.STEP 2: Run report model structure validation

Notice that the document has been loaded into the application. Notice the following things about the user interface:

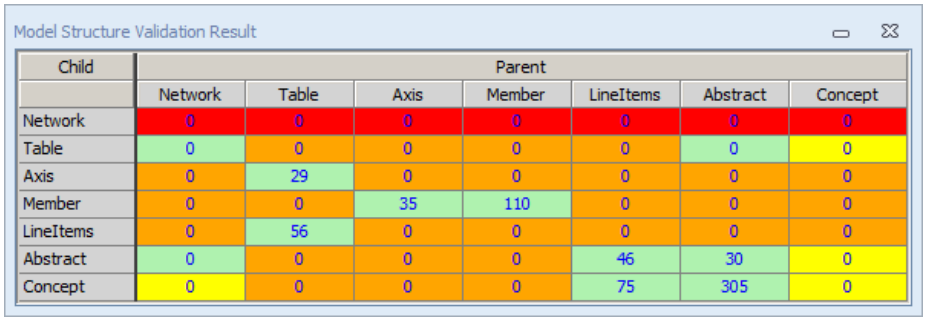
1. The "**Report Profile**" has been detected to be an "XBRL-based public company financial reports in US GAAP to the SEC".
2. The "Report Validation Status" icons are all GRAY which indicates that no validation has been performed at this point.



Now, press the "Model Structure" icon from the Report Validation Status group, then select the "Run Validation" option.

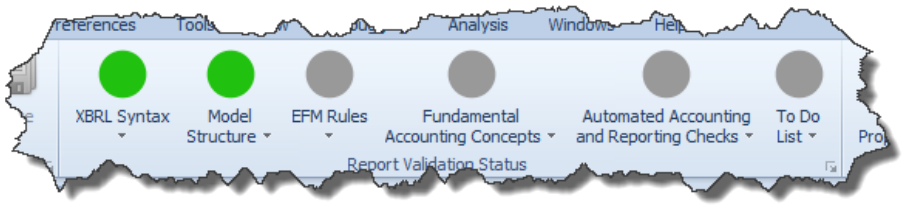


Notice that the "Model Structure Validation Results" form is shown which shows an analysis of the relations between the categories of report elements that make up the structure of the report as shown below:



Child	Parent						
	Network	Table	Axis	Member	LineItems	Abstract	Concept
Network	0	0	0	0	0	0	0
Table	0	0	0	0	0	0	0
Axis	0	29	0	0	0	0	0
Member	0	0	35	110	0	0	0
LineItems	0	56	0	0	0	0	0
Abstract	0	0	0	0	46	30	0
Concept	0	0	0	0	75	305	0

Further, the "Model Structure" Report Validation Status turns GREEN:



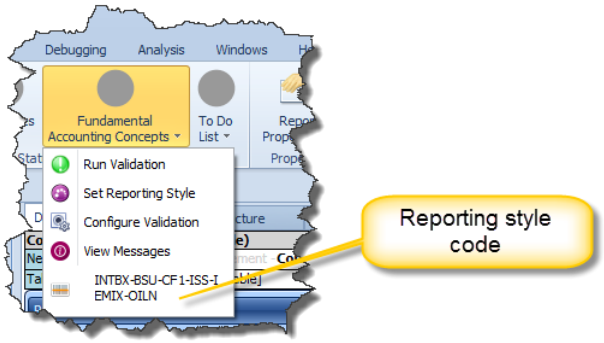
You can close the "Model Structure Validation Results" form.

2.2. Validating Fundamental Accounting Concept Relations

Next, we look at the process of validating the fundamental accounting concept relations. Recall that the fundamental accounting concept relations are the core relations of a financial report, forming the keystones of a report.

2.2.1.STEP 3: Run the fundamental accounting concept relations validation

Next, we will run the fundamental accounting concept validation (FAC). The first step in this process is to make sure the filing has the correct reporting style code assigned. For this specific filing, the reporting style code should have automatically been set to "INTBX-BSU-CF1-ISS-IEMIX-OILN". Press on the "Fundamental Accounting Concepts" icon to check this:

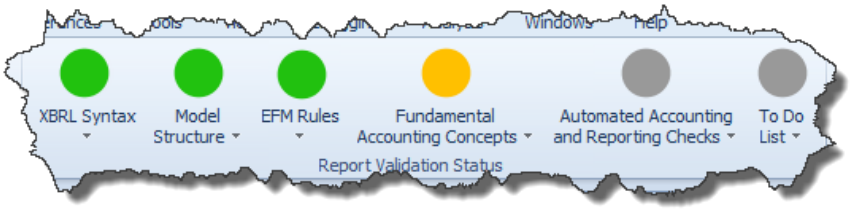


NOTE: *This code should be set. However, if it is not set; go to the "Set Reporting Style" menu item and select that style from the list and set the reporting style code to "INTBX-BSU-CF1-ISS-IEMIX-OILN".*

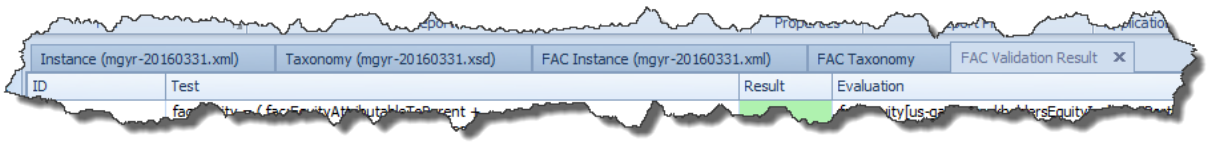
Then select the "Run validation" from the Fundamental Accounting Concepts icon to execute the validation. The following messages appear:

The messages indicate that all the fundamental accounting concept relations are valid which are indicated by the GREEN results but one is inconsistent with expectation. The inconsistent result is indicated by the ORANGE cell in the Result field.

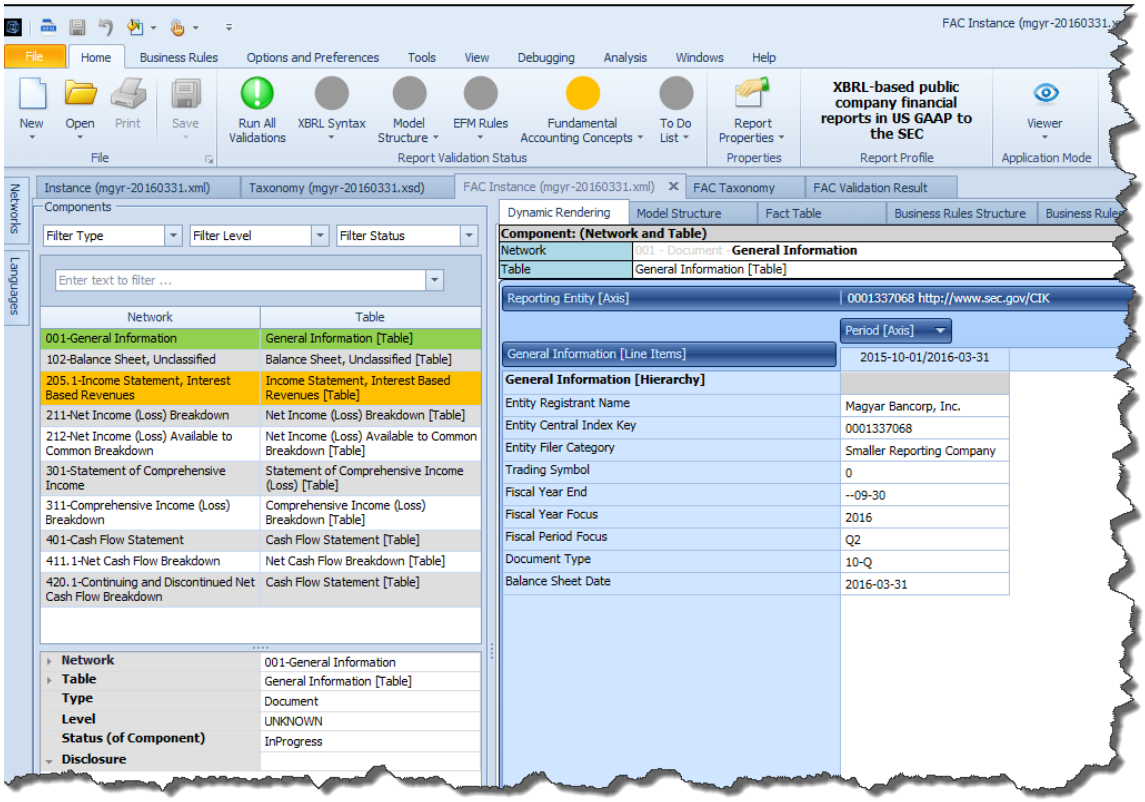
Further, notice that the "Fundamental Accounting Concept" icon turned ORANGE to indicate that an inconsistency has been detected.



Notice that two THREE additional tabs were added to the application. One is the FAC Validation Result which you were looking at above, another is the FAC Taxonomy which explains all of the FAC validation rules, and the third is the FAC instance which provides the validation result.



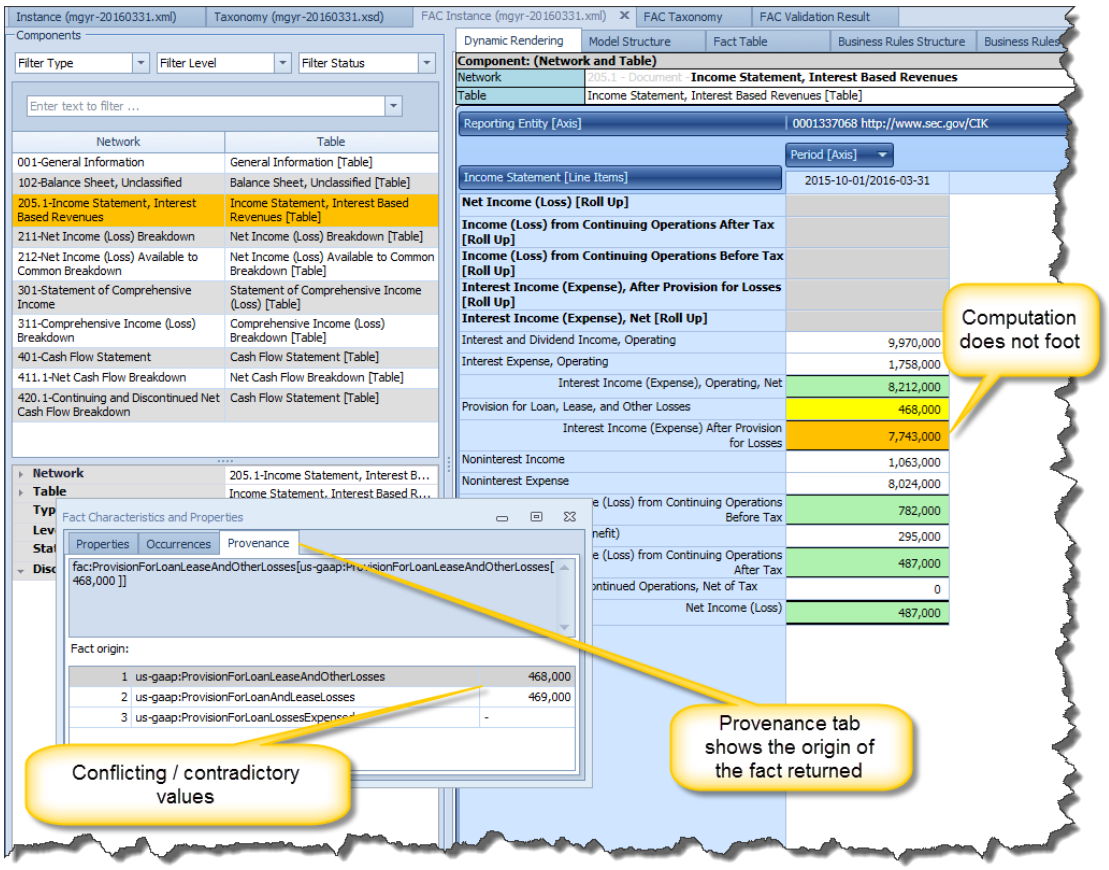
Select the "FAC Instance" tab. Notice the line Network/Table on the left that is ORANGE, indicating the location of the inconsistency:



Click on the ORANGE Network/Table and that report fragment appears in the panel on the right (see the screen shot below). You can see that the fact for the line item "Interest Income (Expense) After Provision for Loan Losses" has an ORANGE highlighting, indicating that there is some sort of inconsistency. If you get out your calculator and compute the value, you notice that the report says the value is 7,743,000 but you will likely compute the value 7,744,000. There is a $1,000 difference between what was reported and the what the computation shows.

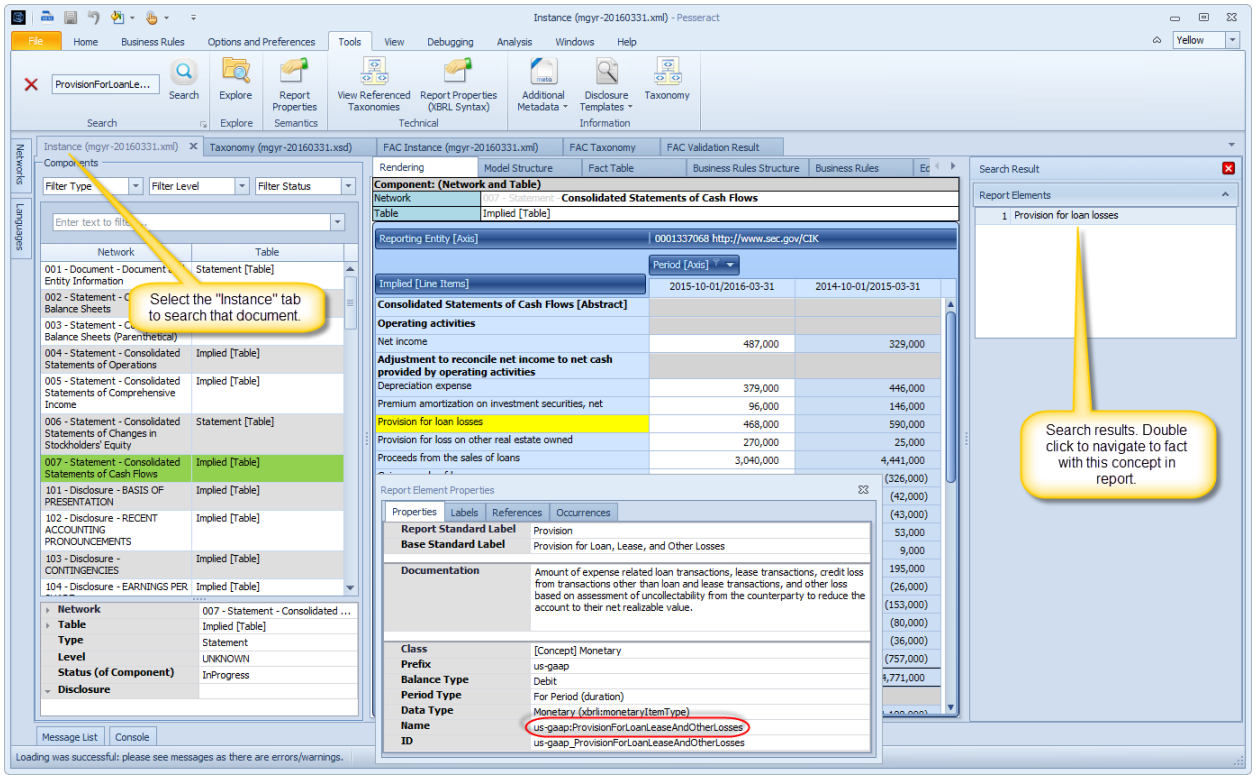
If you click on the reported fact for the line item "Provision for Loan, Lease, and Other Losses", a form will appear. Click on the "Provenance" tab and you will see that two facts were discovered in the XBRL-based financial report.

The fundamental accounting concept relations validation shows that the XBRL-based financial report contains conflicting information. Further investigation of reporting concepts will confirm this inconsistency.

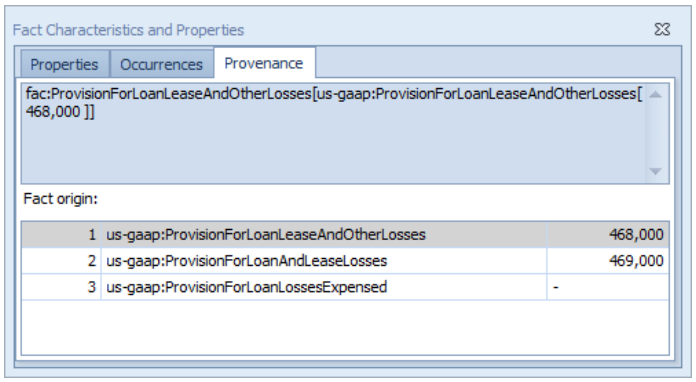


2.2.2.STEP 4: Determine if the inconsistency is an error

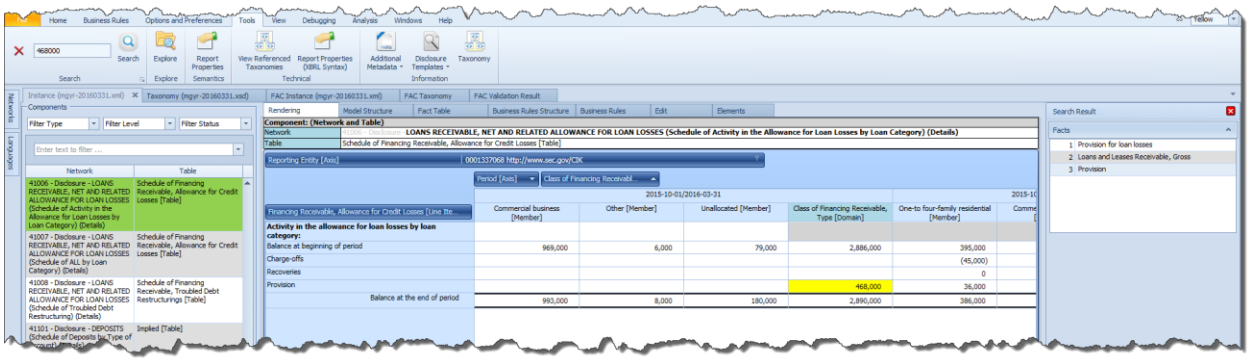
We want to find out where the concept "us-gaap:ProvisionForLoanLeaseAndOtherLosses" is being used. To do this, first, select "Instance" tab to work with that document. Next, select the "Tools" tab from the toolbar ribbon. Enter or copy/paste "ProvisionForLoanLeaseAndOtherLosses" into the "Search" tool. Press the "Search" button and the "Search Result" form appears on the right side of the screen. Click on the line item "Provision for loan losses" and you can see that this is the concept which is being picked up by the validation, that value is $468,000. If you not click on the "Statement of Operations" Network/Table, you can see that a different concept was used which has a value of $469,000 on the income statement representation.



This confirms that there is, in fact, a conflict/contradiction in the facts which have been reported.



Further, the roll forward of the provision for loan losses does not correctly foot and it uses the same concept which was reported on the income statement. You can find that disclosure by searching on the value "468000". Clear the search text box by clicking the red "X", the search results show up on the right of the application. The third fact is in the disclosure you are looking for:



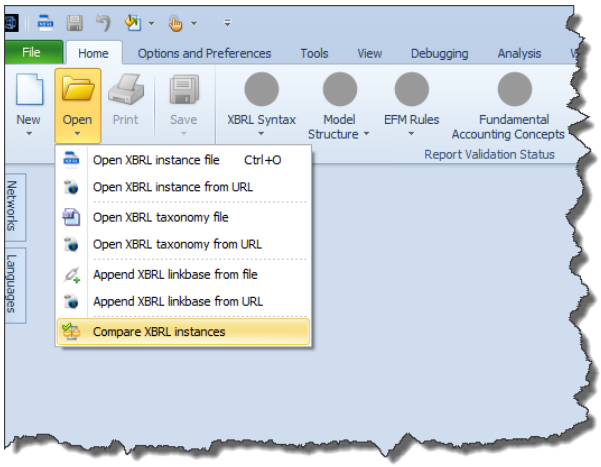
NOTE: *You have to reconfigure the disclosure by dragging the "Class of Financing Receivable Type [Axis]" to the columns.*

Because this information is contradictory, this inconsistency is confirmed to be an ERROR in the XBRL-based financial filing of this public company.

2.2.3.STEP 5: Confirming the inconsistency by comparing information across periods

To further determine if an inconsistency is an error, one can compare the information reported within one XBRL-based financial report with other reports for the same economic entity and therefore see if the inconsistency is unique to one specific period or whether the same inconsistency **exists for other periods**. To do this you use the comparison functionality of the application.

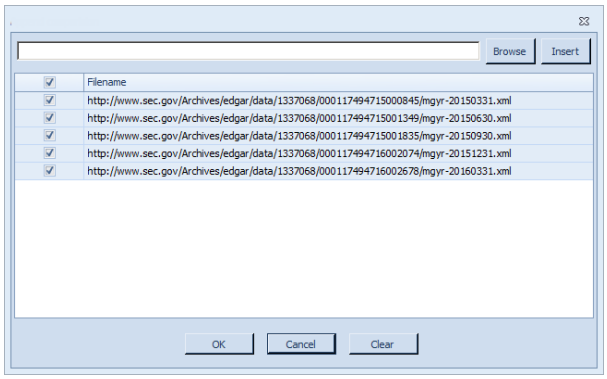
Select "Open" from the Home menu toolbar and then "Compare XBRL instances" from the menu:



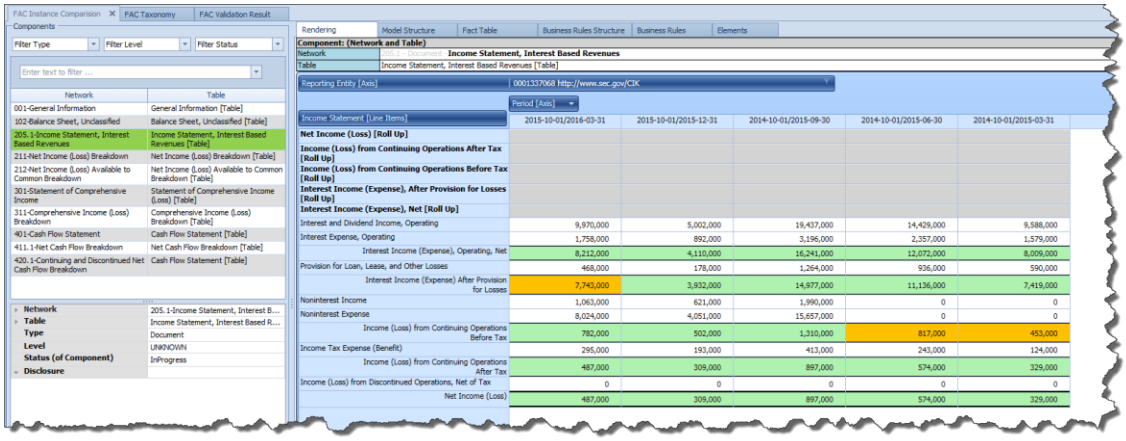
In the comparison dialog you can enter as many XBRL instances as you might want to compare. Add the following XBRL instances using that comparison dialog:

- http://www.sec.gov/Archives/edgar/data/1337068/000117494716002678/mgyr-20160331.xml
- http://www.sec.gov/Archives/edgar/data/1337068/000117494716002074/mgyr-20151231.xml
- http://www.sec.gov/Archives/edgar/data/1337068/000117494715001835/mgyr-20150930.xml
- http://www.sec.gov/Archives/edgar/data/1337068/000117494715001349/mgyr-20150630.xml
- http://www.sec.gov/Archives/edgar/data/1337068/000117494715000845/mgyr-20150331.xml

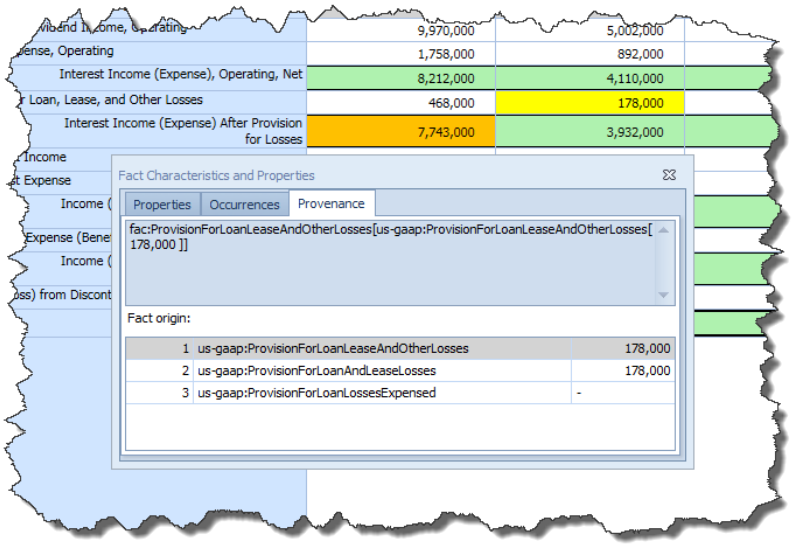
After copying and pasting these XBRL instances the comparison dialog will look like the following screen shot below.



Press the OK button and the documents will load. Select the network "205.1-Income Statement, Interest Based Revenues" and you will see a five year comparison shown side-by-side which you can use to further investigate inconsistencies:



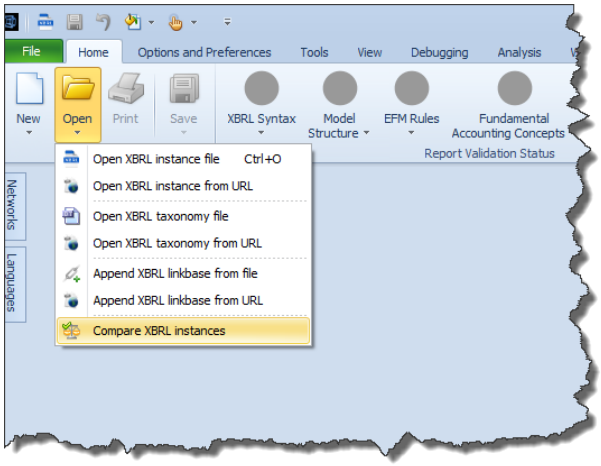
If you click on the line item "Provision for Loan, Lease, and Other Losses" for the periods that show no inconsistencies, you can see that the value for the two concepts reported always have the same value.



2.2.4.STEP 6: Confirming the inconsistency by comparing information across entities

Similar to how you compared information across periods in STEP 5, you can also compare information across reporting entities. Again, to do this you use the comparison functionality of the application.

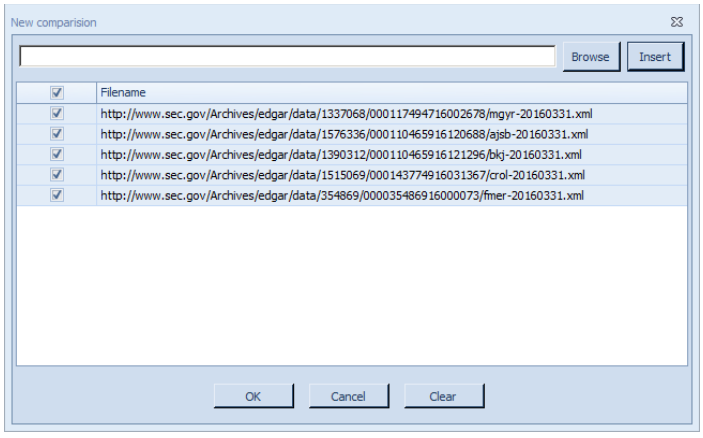
Select "Open" from the Home menu toolbar and then "Compare XBRL instances" from the menu:



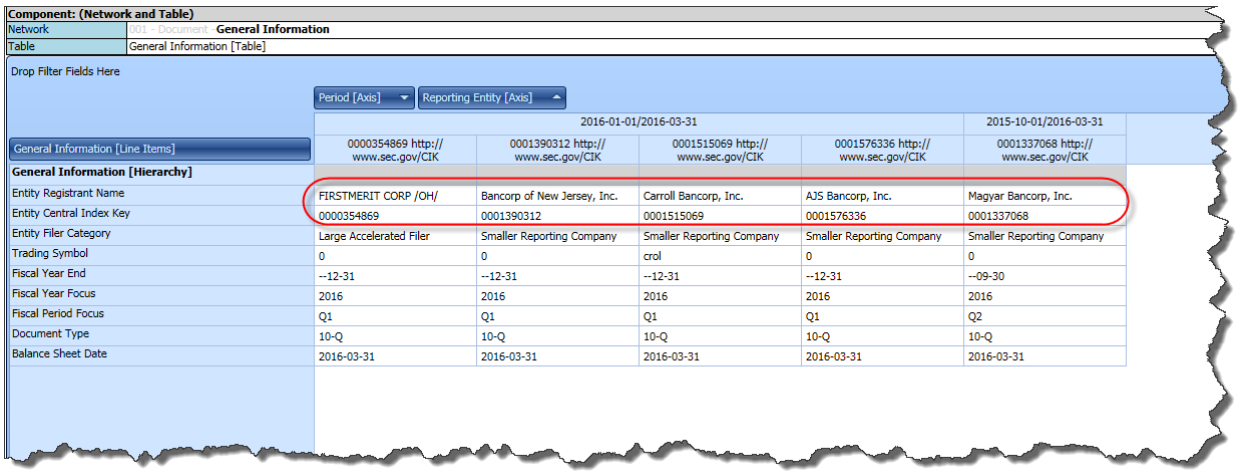
In the comparison dialog you can enter as many XBRL instances as you might want to compare. Add the following XBRL instances using that comparison dialog:

- http://www.sec.gov/Archives/edgar/data/1337068/000117494716002678/mgyr-20160331.xml
- http://www.sec.gov/Archives/edgar/data/1576336/000110465916120688/ajsb-20160331.xml
- http://www.sec.gov/Archives/edgar/data/1390312/000110465916121296/bkj-20160331.xml
- http://www.sec.gov/Archives/edgar/data/1515069/000143774916031367/crol-20160331.xml
- http://www.sec.gov/Archives/edgar/data/354869/000035486916000073/fmer-20160331.xml

After copying and pasting these XBRL instances the comparison dialog will look like the following screen shot below.



First, note that five different entities are loaded:



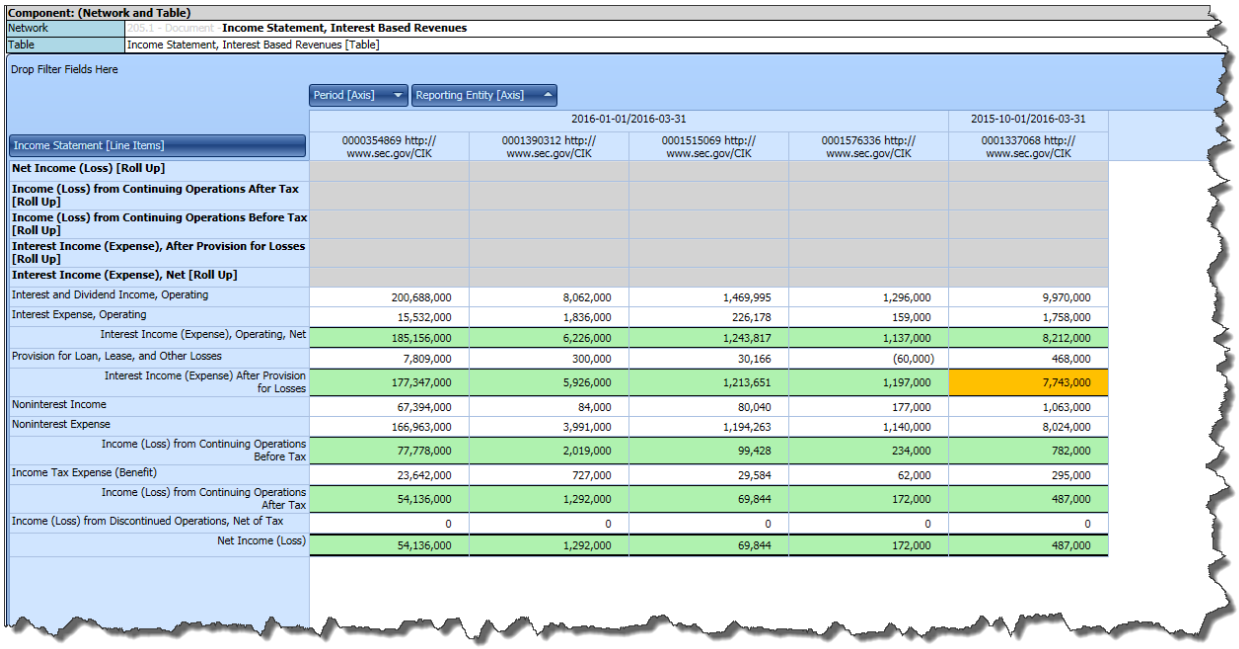
Component: (Network and Table)
Network: 001 - Document - General Information
Table: General Information [Table]

Drop Filter Fields Here

Period [Axis] | Reporting Entity [Axis]

General Information [Line Items]	2016-01-01/2016-03-31				2015-10-01/2016-03-31
	0000354869 http://www.sec.gov/CIK	0001390312 http://www.sec.gov/CIK	0001515069 http://www.sec.gov/CIK	0001576336 http://www.sec.gov/CIK	0001337068 http://www.sec.gov/CIK
General Information [Hierarchy]					
Entity Registrant Name	FIRSTMERIT CORP /OH/	Bancorp of New Jersey, Inc.	Carroll Bancorp, Inc.	AJS Bancorp, Inc.	Magyar Bancorp, Inc.
Entity Central Index Key	0000354869	0001390312	0001515069	0001576336	0001337068
Entity Filer Category	Large Accelerated Filer	Smaller Reporting Company	Smaller Reporting Company	Smaller Reporting Company	Smaller Reporting Company
Trading Symbol	0	0	crol	0	0
Fiscal Year End	--12-31	--12-31	--12-31	--12-31	--09-30
Fiscal Year Focus	2016	2016	2016	2016	2016
Fiscal Period Focus	Q1	Q1	Q1	Q1	Q2
Document Type	10-Q	10-Q	10-Q	10-Q	10-Q
Balance Sheet Date	2016-03-31	2016-03-31	2016-03-31	2016-03-31	2016-03-31

Second, notice that of the five economic entities, only one has an inconsistency:



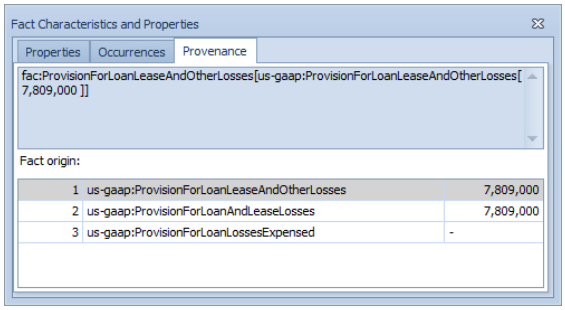
Component: (Network and Table)
Network: 205.1 - Document - Income Statement, Interest Based Revenues
Table: Income Statement, Interest Based Revenues [Table]

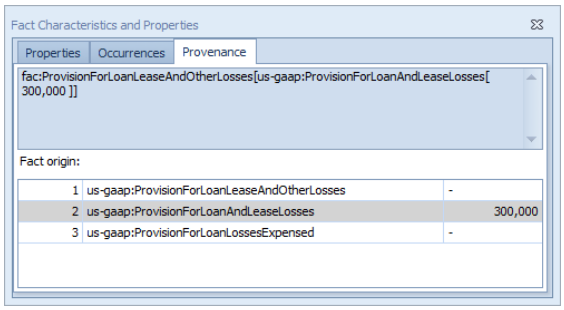
Drop Filter Fields Here

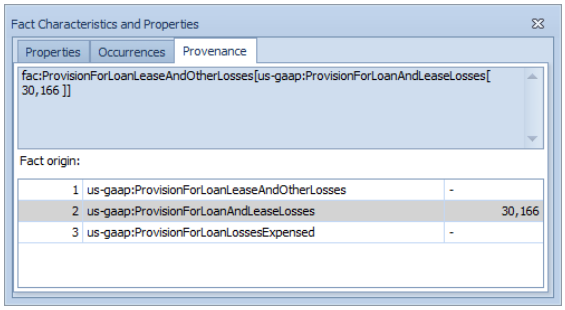
Period [Axis] | Reporting Entity [Axis]

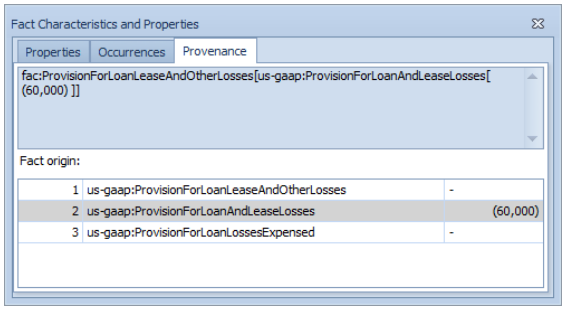
Income Statement [Line Items]	2016-01-01/2016-03-31				2015-10-01/2016-03-31
	0000354869 http://www.sec.gov/CIK	0001390312 http://www.sec.gov/CIK	0001515069 http://www.sec.gov/CIK	0001576336 http://www.sec.gov/CIK	0001337068 http://www.sec.gov/CIK
Net Income (Loss) [Roll Up]					
Income (Loss) from Continuing Operations After Tax [Roll Up]					
Income (Loss) from Continuing Operations Before Tax [Roll Up]					
Interest Income (Expense), After Provision for Losses [Roll Up]					
Interest Income (Expense), Net [Roll Up]					
Interest and Dividend Income, Operating	200,688,000	8,062,000	1,469,995	1,296,000	9,970,000
Interest Expense, Operating	15,532,000	1,836,000	226,178	159,000	1,758,000
Interest Income (Expense), Operating, Net	185,156,000	6,226,000	1,243,817	1,137,000	8,212,000
Provision for Loan, Lease, and Other Losses	7,809,000	300,000	30,166	(60,000)	468,000
Interest Income (Expense) After Provision for Losses	177,347,000	5,926,000	1,213,651	1,197,000	7,743,000
Noninterest Income	67,394,000	84,000	80,040	177,000	1,063,000
Noninterest Expense	166,963,000	3,991,000	1,194,263	1,140,000	8,024,000
Income (Loss) from Continuing Operations Before Tax	77,778,000	2,019,000	99,428	234,000	782,000
Income Tax Expense (Benefit)	23,642,000	727,000	29,584	62,000	295,000
Income (Loss) from Continuing Operations After Tax	54,136,000	1,292,000	69,844	172,000	487,000
Income (Loss) from Discontinued Operations, Net of Tax	0	0	0	0	0
Net Income (Loss)	54,136,000	1,292,000	69,844	172,000	487,000

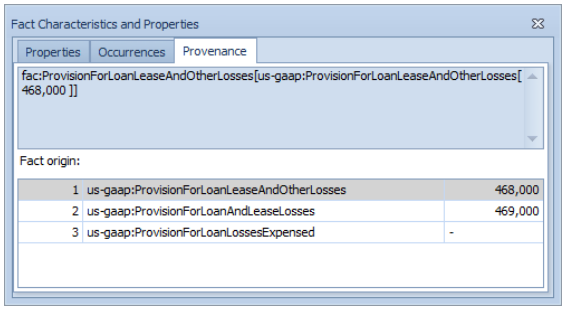
By examining which concepts were used to report the line item by each economic entity you can determine what might be correct and what might be incorrect. In the five different screen shots below for each of the five economic entities; notice that only one economic entity, the one with the inconsistency, reports more than one of the three probable fact values or if they do report more than one then the fact values of the two different facts are the SAME value. This information itself is not an indication as to whether this is an error or not. It is just information. But when you dig deeper and see how the economic entities are using the second concept you can determine if the use of the two concepts is consistent with the rules of logic.











2.2.5.STEP 6: Run the period comparison using SECXBRL.info

You can get a similar set of comparison information using SECXBRL.info using this URL.

Period comparison:

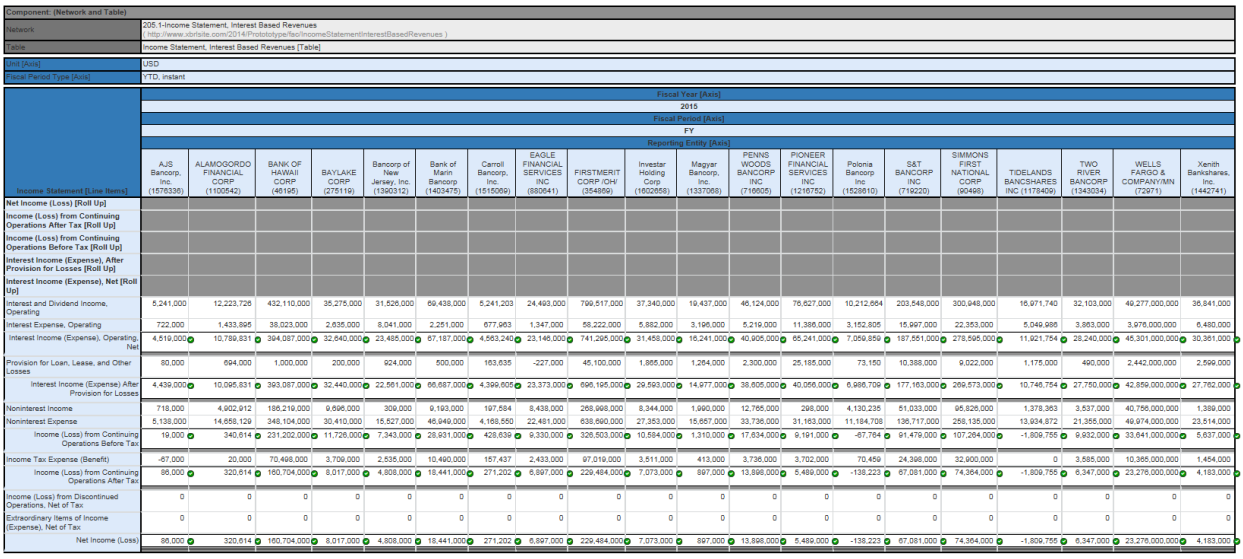
http://secxbrl.28.io/v1/_queries/public/api/spreadsheet-for-report.jq?token=c3049752-4d35-43da-82a2-f89f1b06f7a4&report=IncomeStatementInterestBasedRevenues&cik=0001337068&fiscalYear=2012&fiscalYear=2013&fiscalYear=2014&fiscalYear=2015&fiscalYear=2016&fiscalPeriod=ALL&validate=true&format=html

Component: (Network and Table)																		
Network	205.1-Income Statement, Interest Based Revenues (http://www.xbrlsite.com/2014/Protototype/fac/IncomeStatementInterestBasedRevenues)																	
Table	Income Statement, Interest Based Revenues [Table]																	
Unit [Axis]	USD																	
Fiscal Period Type [Axis]	YTD, instant																	
	Fiscal Year [Axis]																	
	2012				2013				2014				2015				2016	
	Fiscal Period [Axis]				Fiscal Period [Axis]				Fiscal Period [Axis]				Fiscal Period [Axis]				Fiscal Period [Axis]	
	Q1	Q2	Q3	FY	Q1	Q2	Q3	FY	Q1	Q2	Q3	FY	Q1	Q2	Q3	FY	Q1	Q2
	Reporting Entity [Axis]	Reporting Entity [Axis]	Reporting Entity [Axis]	Reporting Entity [Axis]	Reporting Entity [Axis]	Reporting Entity [Axis]	Reporting Entity [Axis]	Reporting Entity [Axis]	Reporting Entity [Axis]	Reporting Entity [Axis]	Reporting Entity [Axis]	Reporting Entity [Axis]	Reporting Entity [Axis]	Reporting Entity [Axis]	Reporting Entity [Axis]	Reporting Entity [Axis]	Reporting Entity [Axis]	Reporting Entity [Axis]
Income Statement [Line Items]	Magyar Bancorp, Inc. (1337068)	Magyar Bancorp, Inc. (1337068)	Magyar Bancorp, Inc. (1337068)	Magyar Bancorp, Inc. (1337068)	Magyar Bancorp, Inc. (1337068)	Magyar Bancorp, Inc. (1337068)	Magyar Bancorp, Inc. (1337068)	Magyar Bancorp, Inc. (1337068)	Magyar Bancorp, Inc. (1337068)	Magyar Bancorp, Inc. (1337068)	Magyar Bancorp, Inc. (1337068)	Magyar Bancorp, Inc. (1337068)	Magyar Bancorp, Inc. (1337068)	Magyar Bancorp, Inc. (1337068)	Magyar Bancorp, Inc. (1337068)	Magyar Bancorp, Inc. (1337068)	Magyar Bancorp, Inc. (1337068)	Magyar Bancorp, Inc. (1337068)
Net Income (Loss) [Roll Up]																		
Income (Loss) from Continuing Operations After Tax [Roll Up]																		
Income (Loss) from Continuing Operations Before Tax [Roll Up]																		
Interest Income (Expense), After Provision for Losses [Roll Up]																		
Interest Income (Expense), Net [Roll Up]																		
Interest and Dividend Income, Operating	5,272,000	10,514,000	15,684,000	20,805,000	4,954,000	9,838,000	14,796,000	19,674,000	4,973,000	9,782,000	14,641,000	19,530,000	4,812,000	9,588,000	14,429,000	19,437,000	[illegible]02,000	9,970,000
Interest Expense, Operating	1,606,000	3,119,000	4,553,000	5,809,000	1,174,000	2,298,000	3,376,000	4,352,000	925,000	1,789,000	2,641,000	3,460,000	821,000	1,579,000	2,357,000	3,196,000	8[illegible]000	1,758,000
Interest Income (Expense), Operating, Net	3,666,000	7,395,000	11,131,000	14,996,000	3,780,000	7,540,000	11,420,000	15,322,000	4,048,000	7,993,000	12,000,000	16,070,000	3,991,000	8,009,000	12,072,000	16,241,000	4,11[illegible]00	8,212,000
Provision for Loan, Lease, and Other Losses	370,000	693,000	1,033,000	1,461,000	441,000	1,441,000	1,695,000	2,111,000	359,000	740,000	1,082,000	1,387,000	420,000	590,000	936,000	1,264,000	178,000	468,000
Interest Income (Expense) After Provision for Losses	3,296,000	6,702,000	10,098,000	13,535,000	3,339,000	6,099,000	9,725,000	13,211,000	3,689,000	7,253,000	10,918,000	14,683,000	3,571,000	7,419,000	11,136,000	14,977,000	3,932,000	7,743,000
Noninterest Income	0	0	0	0	0	0	0	0	0	0	0	1,437,000	562,000	1,016,000	0	1,990,000	621,000	1,063,000
Noninterest Expense	0	0	0	0	0	0	0	0	0	0	0	15,361,000	3,877,000	7,982,000	0	15,657,000	4,051,000	8,024,000
Income (Loss) from Continuing Operations Before Tax	38,000	5,000	248,000	630,000	414,000	-206,000	66,000	283,000	174,000	222,000	488,000	759,000	256,000	453,000	817,000	1,310,000	502,000	782,000
Income Tax Expense (Benefit)	7,000	-35,000	34,000	121,000	132,000	-145,000	-67,000	21,000	41,000	29,000	106,000	185,000	74,000	124,000	243,000	413,000	193,000	295,000
Income (Loss) from Continuing Operations After Tax	31,000	40,000	214,000	509,000	282,000	-61,000	133,000	262,000	133,000	193,000	382,000	574,000	182,000	329,000	574,000	897,000	309,000	487,000
Income (Loss) from Discontinued Operations, Net of Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Extraordinary Items of Income (Expense), Net of Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Income (Loss)	31,000	40,000	214,000	509,000	282,000	-61,000	133,000	262,000	133,000	193,000	382,000	574,000	182,000	329,000	574,000	897,000	309,000	487,000

Same issue shown by 28msec

Entity comparison:

http://secxbrl.28.io/v1/_queries/public/api/spreadsheet-for-report.jq?token=c3049752-4d35-43da-82a2-f89f1b06f7a4&report=IncomeStatementInterestBasedRevenues&fiscalYear=2015&fiscalPeriod=FY&validate=true&format-indent=yes&labels=false&format=html&cik=0001337068&cik=0001576336&cik=0001390312&cik=0001515069&cik=0000880641&cik=0000354869&cik=0001602658&cik=0000716605&cik=0001216752&cik=0001216752&cik=0000090498&cik=0000719220&cik=0001178409&cik=0001343034&cik=0001442741&cik=0001528610&cik=0001100542&cik=0000046195&cik=0001403475&cik=0000275119&cik=0000072971



Component: (Network and Table)	
Network	205.1-Income Statement, Interest Based Revenues (http://www.xbrlsite.com/2014/Prototype/fac/IncomeStatementInterestBasedRevenues)
Table	Income Statement, Interest Based Revenues [Table]
Unit [Axis]	USD
Fiscal Period Type [Axis]	YTD, instant

	Fiscal Year [Axis]																			
	2015																			
	Fiscal Period [Axis]																			
	FY																			
	Reporting Entity [Axis]																			
Income Statement [Line Items]	AJS Bancorp, Inc. (1576336)	ALAMOGORDO FINANCIAL CORP (1100542)	BANK OF HAWAII CORP (46195)	BAYLAKE CORP (275119)	Bancorp of New Jersey, Inc. (1390312)	Bank of Marin Bancorp (1403475)	Carroll Bancorp, Inc. (1515099)	EAGLE FINANCIAL SERVICES INC (880641)	FIRSTMERIT CORP /OH/ (354989)	Investar Holding Corp (1602656)	Magyar Bancorp, Inc. (1337068)	PENNS WOODS BANCORP INC (716605)	PIONEER FINANCIAL SERVICES INC (1216752)	Polonia Bancorp Inc (1529810)	S&T BANCORP INC (719220)	SIMMONS FIRST NATIONAL CORP (90498)	TIDELANDS BANCSHARES INC (1176409)	TWO RIVER BANCORP (1343034)	WELLS FARGO & COMPANY/MN (72971)	Xenith Bankshares, Inc. (1442741)
Net Income (Loss) [Roll Up]																				
Income (Loss) from Continuing Operations After Tax [Roll Up]																				
Income (Loss) from Continuing Operations Before Tax [Roll Up]																				
Interest Income (Expense), After Provision for Losses [Roll Up]																				
Interest Income (Expense), Net [Roll Up]																				
Interest and Dividend Income, Operating	5,241,000	12,223,726	432,110,000	35,275,000	31,526,000	69,438,000	5,241,203	24,493,000	799,517,000	37,340,000	19,437,000	46,124,000	76,627,000	10,212,664	203,548,000	300,948,000	16,971,740	32,103,000	49,277,000,000	36,841,000
Interest Expense, Operating	722,000	1,433,895	38,023,000	2,635,000	8,041,000	2,251,000	677,963	1,347,000	58,222,000	5,882,000	3,196,000	5,219,000	11,386,000	3,152,805	15,997,000	22,353,000	5,049,986	3,863,000	3,976,000,000	6,480,000
Interest Income (Expense), Operating, Net	4,519,000	10,789,831	394,087,000	32,640,000	23,485,000	67,187,000	4,563,240	23,146,000	741,295,000	31,458,000	16,241,000	40,905,000	65,241,000	7,059,859	187,551,000	278,595,000	11,921,754	28,240,000	45,301,000,000	30,361,000
Provision for Loan, Lease, and Other Losses	80,000	694,000	1,000,000	200,000	924,000	500,000	163,635	-227,000	45,100,000	1,865,000	1,264,000	2,300,000	25,185,000	73,150	10,388,000	9,022,000	1,175,000	490,000	2,442,000,000	2,599,000
Interest Income (Expense) After Provision for Losses	4,439,000	10,095,831	393,087,000	32,440,000	22,561,000	66,687,000	4,399,605	23,373,000	696,195,000	29,593,000	14,977,000	38,605,000	40,056,000	6,986,709	177,163,000	269,573,000	10,746,754	27,750,000	42,859,000,000	27,762,000
Noninterest Income	718,000	4,902,912	186,219,000	9,696,000	309,000	9,193,000	197,584	8,438,000	268,968,000	8,344,000	1,990,000	12,765,000	298,000	4,130,235	51,033,000	95,826,000	1,378,363	3,537,000	40,756,000,000	1,389,000
Noninterest Expense	5,138,000	14,658,129	348,104,000	30,410,000	15,827,000	46,949,000	4,168,550	22,481,000	638,690,000	27,353,000	15,657,000	33,736,000	31,163,000	11,184,708	136,717,000	258,135,000	13,934,872	21,355,000	49,974,000,000	23,514,000
Income (Loss) from Continuing Operations Before Tax	19,000	340,614	231,202,000	11,726,000	7,343,000	28,931,000	428,639	9,330,000	326,503,000	10,584,000	1,310,000	17,634,000	9,191,000	-67,764	91,479,000	107,264,000	-1,809,755	9,932,000	33,641,000,000	5,637,000
Income Tax Expense (Benefit)	-67,000	20,000	70,498,000	3,709,000	2,535,000	10,490,000	157,437	2,433,000	97,019,000	3,511,000	413,000	3,736,000	3,702,000	70,459	24,398,000	32,900,000	0	3,585,000	10,365,000,000	1,454,000
Income (Loss) from Continuing Operations After Tax	86,000	320,614	160,704,000	8,017,000	4,808,000	18,441,000	271,202	6,897,000	229,484,000	7,073,000	897,000	13,898,000	5,489,000	-138,223	67,081,000	74,364,000	-1,809,755	6,347,000	23,276,000,000	4,183,000
Income (Loss) from Discontinued Operations, Net of Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Extraordinary Items of Income (Expense), Net of Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Income (Loss)	86,000	320,614	160,704,000	8,017,000	4,808,000	18,441,000	271,202	6,897,000	229,484,000	7,073,000	897,000	13,898,000	5,489,000	-138,223	67,081,000	74,364,000	-1,809,755	6,347,000	23,276,000,000	4,183,000

2.3. Validating Disclosure Mechanics

This section walks you through an overview of the validation of the disclosure mechanics and reporting checklist rules using the Pesseract digital financial reporting tool in the Viewer/Validation mode. This demonstration uses an XBRL-based public company financial filing which was submitted to the U.S. SEC and the XASB prototype financial reporting scheme. Local files, IFRS filings, and the financial reports of other financial reporting schemes[44] can also validated in the same manner.

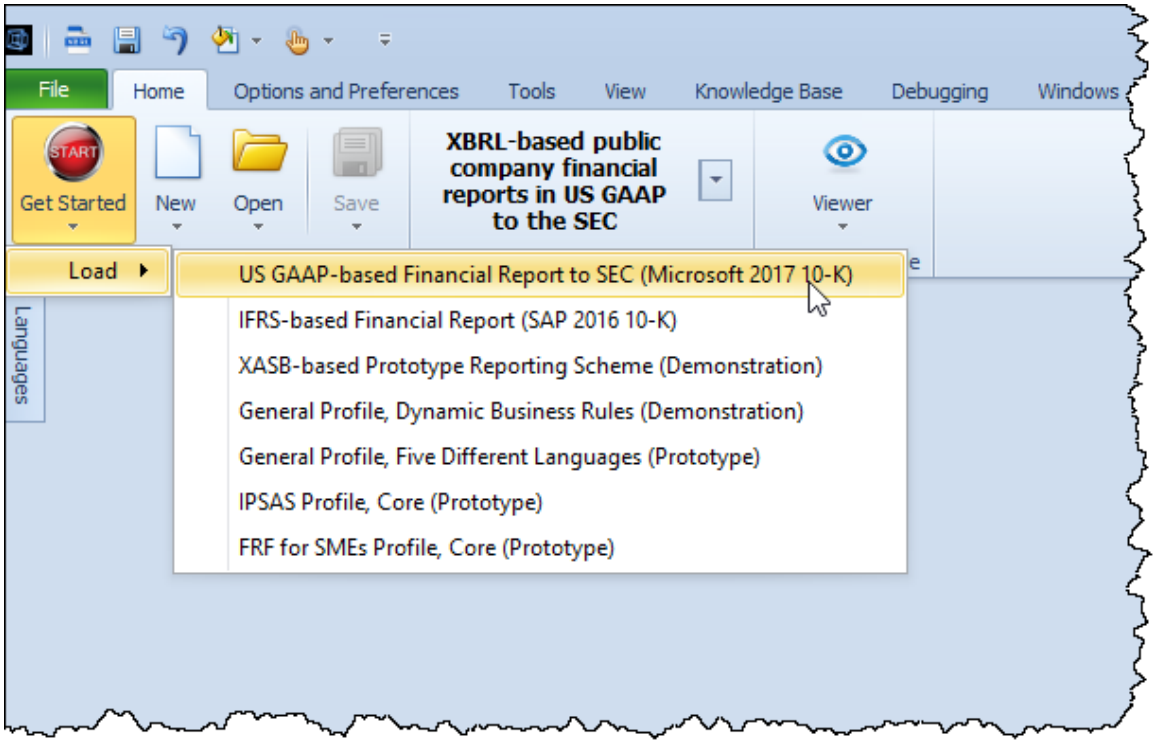
2.3.1.STEP 1: Load the XBRL-based public company financial filing

The following process can be used to load any 10-Q or 10-K XBRL-based financial report submitted by a public company to the SEC[45]. We will show the validation of the Microsoft 2017 10-K report that is included within Pesseract as an example financial report.

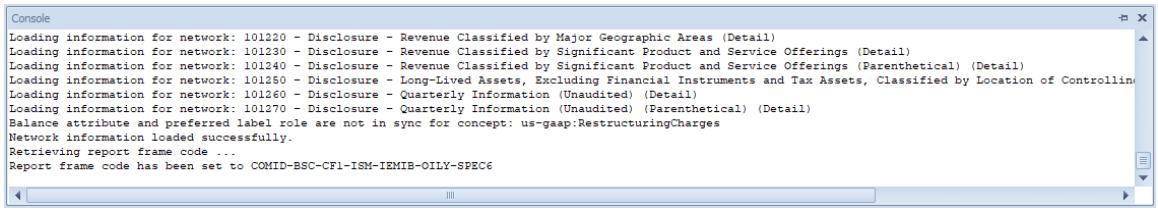
First, start Pesseract and press the "Get Started", and then "Load", and then select the first option that is show below to get the Microsoft 10-K:

[44] Modern Approach to Creating a Financial Reporting Scheme, http://xbrl.squarespace.com/journal/2019/12/19/modern-approach-to-creating-a-financial-reporting-scheme.html

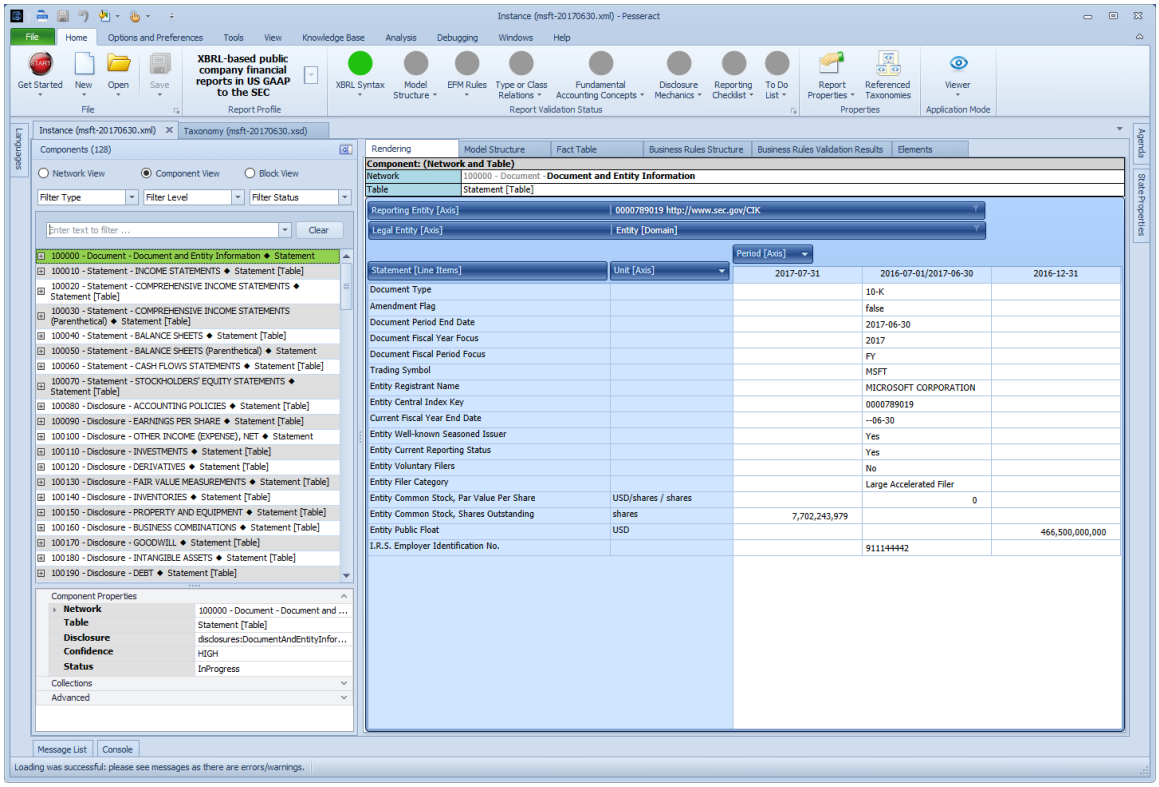
[45] XBRL Cloud provides the Edgar Dashboard which is an easy way to search for a financial filing for any public company for any period, https://edgardashboard.xbrlcloud.com/edgar-dashboard/



You will see information scrolling through the console pane at the bottom of the application:



After a few minutes, the Microsoft 10-K will load into the application:

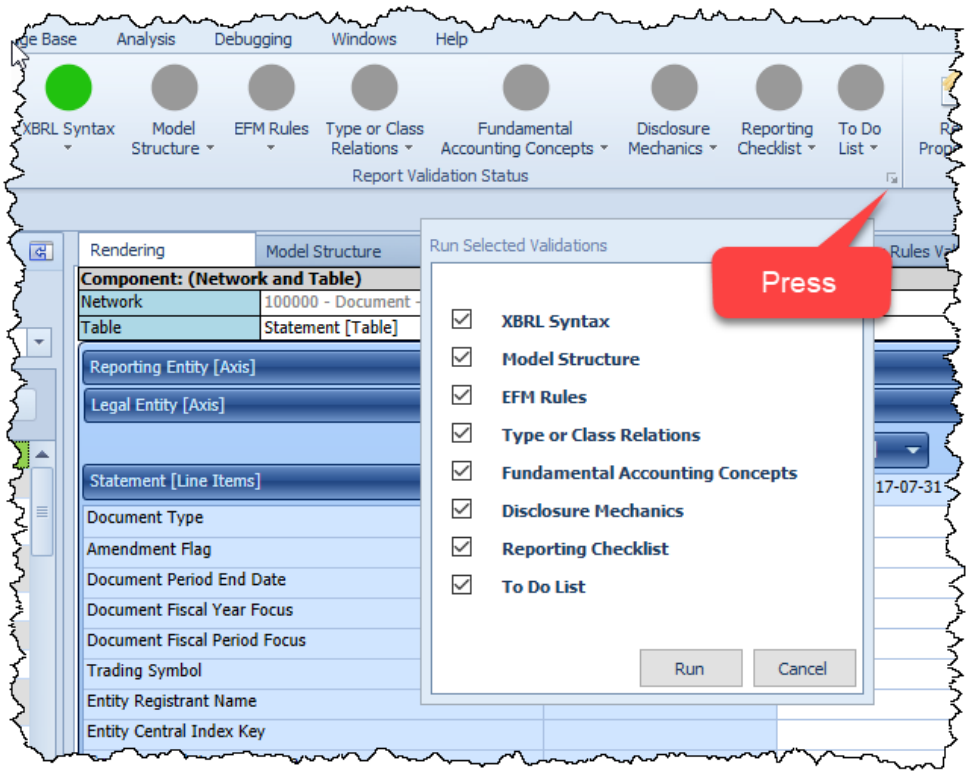


2.3.2.STEP 2: Run Validations, Disclosure Mechanics Validation Results

We are focusing on the disclosure mechanics validation and the reporting checklist validation. However, because it is easier to simply run all the validation that is what we will do.

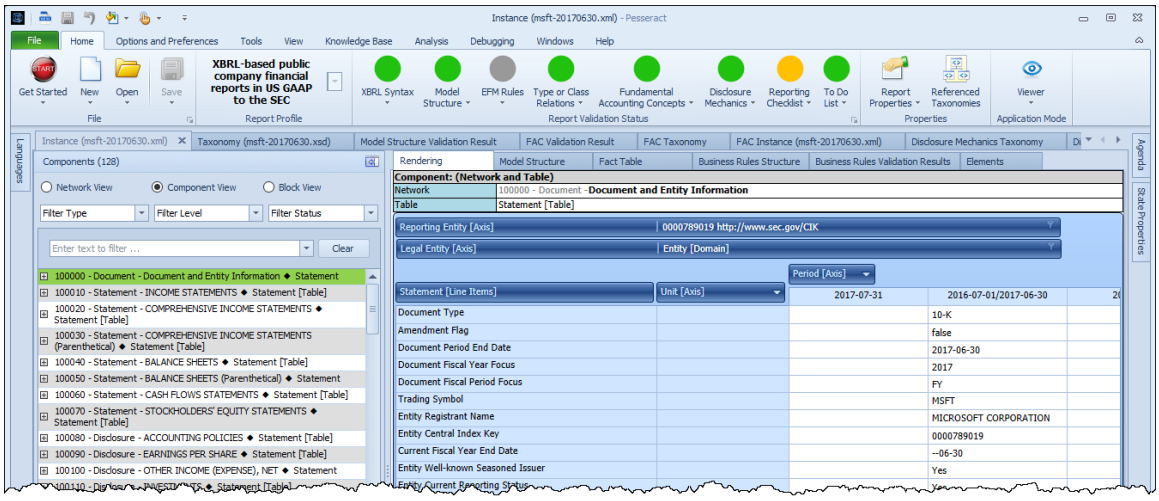
On the menu ribbon, in the "Report Validation Status" group, press the icon in the lower right hand corner with the arrow.

Upon pressing the icon, the "Run Selected Validations" form will open as shown below with all of the validation options selected.



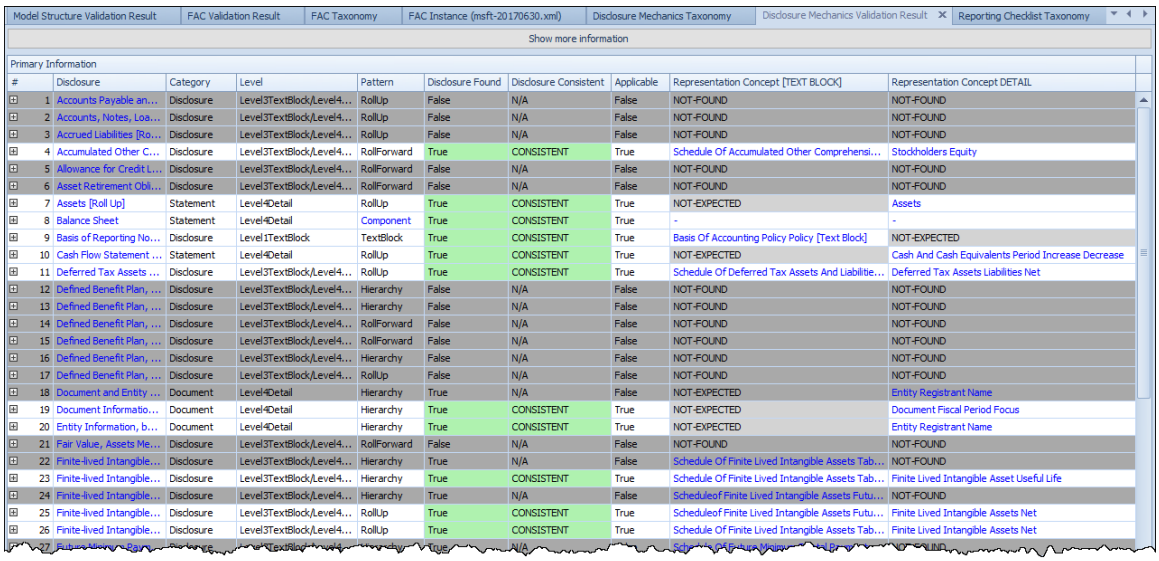
Simply press the "Run" button and the validation process will begin.

After a few moments, you will notice that the icons in the "Report Validation Status" group will change color and that several additional documents will open in the application:



The "EFM Rules" icon remains gray because the Pesseract application does not support EFM validation at this time. All the other validation icons turn green with the exception of the "Reporting Checklist" icon which turns orange.

Select the "Disclosure Mechanics Validation Result" window which was created when the validation was run. This is what you will see:



Model Structure Validation Result | FAC Validation Result | FAC Taxonomy | FAC Instance (msft-20170630.xml) | Disclosure Mechanics Taxonomy | Disclosure Mechanics Validation Result | Reporting Checklist Taxonomy

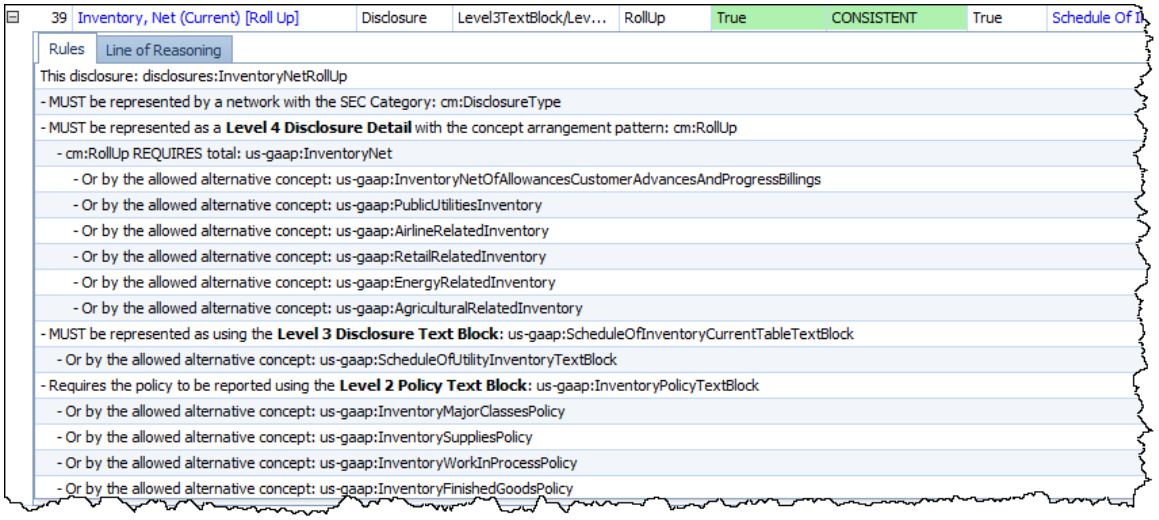
Show more information

Primary Information

#	Disclosure	Category	Level	Pattern	Disclosure Found	Disclosure Consistent	Applicable	Representation Concept [TEXT BLOCK]	Representation Concept DETAIL
1	Accounts Payable an...	Disclosure	Level3TextBlock/Level4...	RollUp	False	N/A	False	NOT-FOUND	NOT-FOUND
2	Accounts, Notes, Loa...	Disclosure	Level3TextBlock/Level4...	RollUp	False	N/A	False	NOT-FOUND	NOT-FOUND
3	Accrued Liabilities [Ro...	Disclosure	Level3TextBlock/Level4...	RollUp	False	N/A	False	NOT-FOUND	NOT-FOUND
4	Accumulated Other C...	Disclosure	Level3TextBlock/Level4...	RollForward	True	CONSISTENT	True	Schedule Of Accumulated Other Comprehensi...	Stockholders Equity
5	Allowance for Credit L...	Disclosure	Level3TextBlock/Level4...	RollForward	False	N/A	False	NOT-FOUND	NOT-FOUND
6	Asset Retirement Obli...	Disclosure	Level3TextBlock/Level4...	RollForward	False	N/A	False	NOT-FOUND	NOT-FOUND
7	Assets [Roll Up]	Statement	Level4Detail	RollUp	True	CONSISTENT	True	NOT-EXPECTED	Assets
8	Balance Sheet	Statement	Level4Detail	Component	True	CONSISTENT	True	-	-
9	Basis of Reporting No...	Disclosure	Level1TextBlock	TextBlock	True	CONSISTENT	True	Basis Of Accounting Policy Policy [Text Block]	NOT-EXPECTED
10	Cash Flow Statement ...	Statement	Level4Detail	RollUp	True	CONSISTENT	True	NOT-EXPECTED	Cash And Cash Equivalents Period Increase Decrease
11	Deferred Tax Assets ...	Disclosure	Level3TextBlock/Level4...	RollUp	True	CONSISTENT	True	Schedule Of Deferred Tax Assets And Liabilitie...	Deferred Tax Assets Liabilities Net
12	Defined Benefit Plan, ...	Disclosure	Level3TextBlock/Level4...	Hierarchy	False	N/A	False	NOT-FOUND	NOT-FOUND
13	Defined Benefit Plan, ...	Disclosure	Level3TextBlock/Level4...	Hierarchy	False	N/A	False	NOT-FOUND	NOT-FOUND
14	Defined Benefit Plan, ...	Disclosure	Level3TextBlock/Level4...	RollForward	False	N/A	False	NOT-FOUND	NOT-FOUND
15	Defined Benefit Plan, ...	Disclosure	Level3TextBlock/Level4...	RollForward	False	N/A	False	NOT-FOUND	NOT-FOUND
16	Defined Benefit Plan, ...	Disclosure	Level3TextBlock/Level4...	Hierarchy	False	N/A	False	NOT-FOUND	NOT-FOUND
17	Defined Benefit Plan, ...	Disclosure	Level3TextBlock/Level4...	RollUp	False	N/A	False	NOT-FOUND	NOT-FOUND
18	Document and Entity ...	Document	Level4Detail	Hierarchy	True	N/A	False	NOT-EXPECTED	Entity Registrant Name
19	Document Informatio...	Document	Level4Detail	Hierarchy	True	CONSISTENT	True	NOT-EXPECTED	Document Fiscal Period Focus
20	Entity Information, b...	Document	Level4Detail	Hierarchy	True	CONSISTENT	True	NOT-EXPECTED	Entity Registrant Name
21	Fair Value, Assets Me...	Disclosure	Level3TextBlock/Level4...	RollForward	False	N/A	False	NOT-FOUND	NOT-FOUND
22	Finite-lived Intangible...	Disclosure	Level3TextBlock/Level4...	Hierarchy	True	N/A	False	Schedule Of Finite Lived Intangible Assets Tab...	NOT-FOUND
23	Finite-lived Intangible...	Disclosure	Level3TextBlock/Level4...	Hierarchy	True	CONSISTENT	True	Schedule Of Finite Lived Intangible Assets Tab...	Finite Lived Intangible Asset Useful Life
24	Finite-lived Intangible...	Disclosure	Level3TextBlock/Level4...	Hierarchy	True	N/A	False	Scheduleof Finite Lived Intangible Assets Futu...	NOT-FOUND
25	Finite-lived Intangible...	Disclosure	Level3TextBlock/Level4...	RollUp	True	CONSISTENT	True	Scheduleof Finite Lived Intangible Assets Futu...	Finite Lived Intangible Assets Net
26	Finite-lived Intangible...	Disclosure	Level3TextBlock/Level4...	RollUp	True	CONSISTENT	True	Schedule Of Finite Lived Intangible Assets Tab...	Finite Lived Intangible Assets Net

If you scroll down in this window you will see that there are 68 items listed and that the columns "Disclosure Found" and "Disclosure Consistent" are all green in color. That means that if a disclosure was found and if the found disclosure is consistent with the rules that exist, then the disclosure mechanics of the disclosure are OK.

Scroll down to line 39 where you will see the "Inventory, Net (Current) [Roll Up]" disclosure. Click on the "+" sign and the rules for that disclosure will open:



39	Inventory, Net (Current) [Roll Up]	Disclosure	Level3TextBlock/Lev...	RollUp	True	CONSISTENT	True	Schedule Of I

Rules | Line of Reasoning

This disclosure: disclosures:InventoryNetRollUp

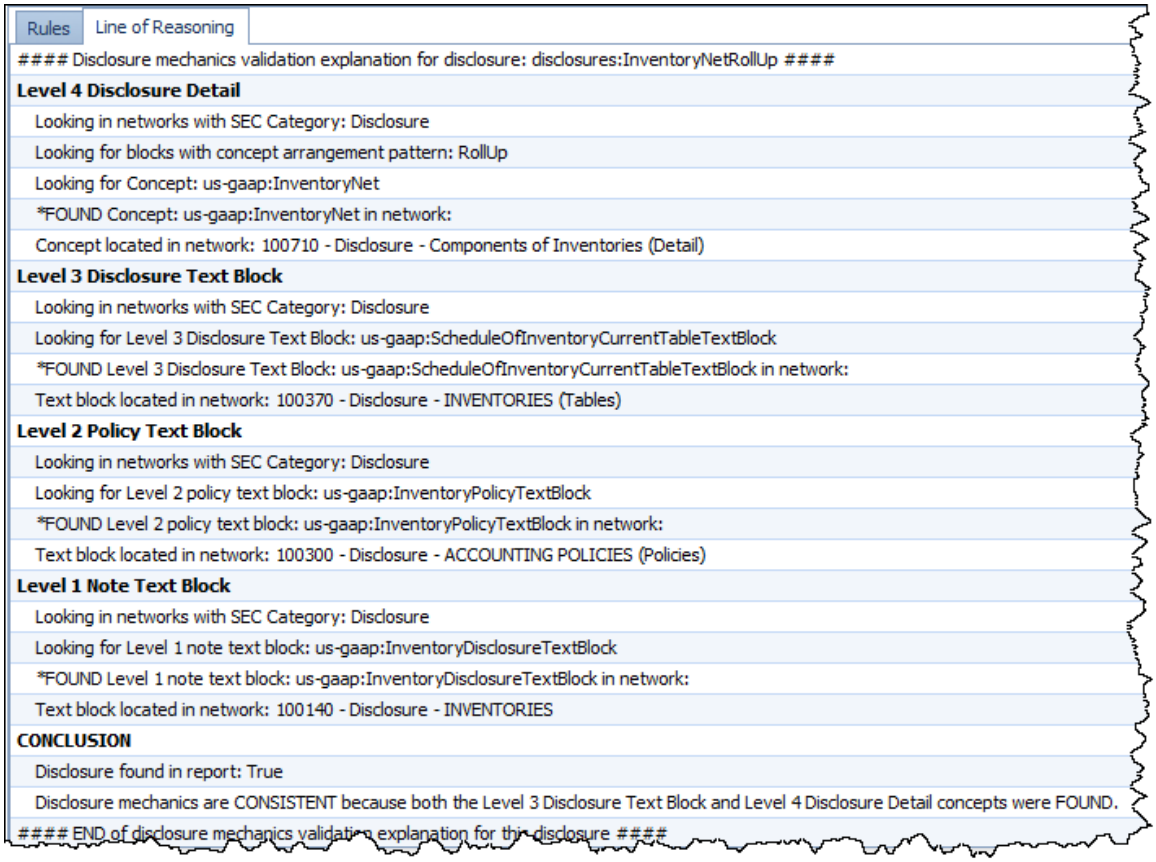
- MUST be represented by a network with the SEC Category: cm:DisclosureType
- MUST be represented as a **Level 4 Disclosure Detail** with the concept arrangement pattern: cm:RollUp
  - cm:RollUp REQUIRES total: us-gaap:InventoryNet
    - Or by the allowed alternative concept: us-gaap:InventoryNetOfAllowancesCustomerAdvancesAndProgressBillings
    - Or by the allowed alternative concept: us-gaap:PublicUtilitiesInventory
    - Or by the allowed alternative concept: us-gaap:AirlineRelatedInventory
    - Or by the allowed alternative concept: us-gaap:RetailRelatedInventory
    - Or by the allowed alternative concept: us-gaap:EnergyRelatedInventory
    - Or by the allowed alternative concept: us-gaap:AgriculturalRelatedInventory
- MUST be represented as using the **Level 3 Disclosure Text Block**: us-gaap:ScheduleOfInventoryCurrentTableTextBlock
  - Or by the allowed alternative concept: us-gaap:ScheduleOfUtilityInventoryTextBlock
- Requires the policy to be reported using the **Level 2 Policy Text Block**: us-gaap:InventoryPolicyTextBlock
  - Or by the allowed alternative concept: us-gaap:InventoryMajorClassesPolicy
  - Or by the allowed alternative concept: us-gaap:InventorySuppliesPolicy
  - Or by the allowed alternative concept: us-gaap:InventoryWorkInProcessPolicy
  - Or by the allowed alternative concept: us-gaap:InventoryFinishedGoodsPolicy

What you see are the rules that are used to determine if the mechanical and structural aspects of this disclosure are satisfied. We will not discuss these rules in detail now, but we will say that the rules come from an XBRL definition linkbase that is provided[46].

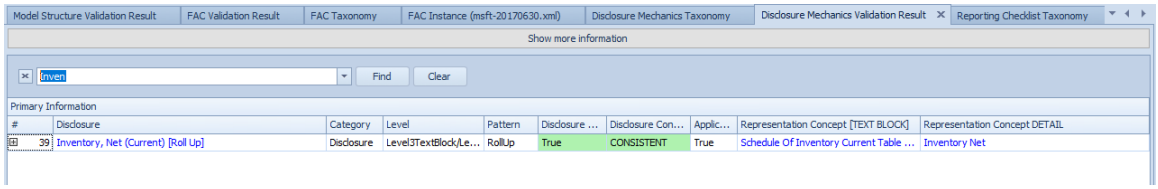
Click the "Line of Reasoning" tab. What you will see on that tab is the line of reasoning used by the rules engine in the Pesseract application to determine if the

[46] Inventory, Net (Current) [Roll Up] disclosure information, http://xbrlsite.azurewebsites.net/2020/reporting-scheme/us-gaap/disclosures-topics/disclosures-detail/Disclosure-517.html

disclosure is found or not and if the disclosure, when found, is consistent with the rules that exist that describe the disclosure:



Press "Control" and "F" at the same time and you will see that a search/filter control appears. Enter "Inven" into the text box and you will see that the disclosures are filtered:

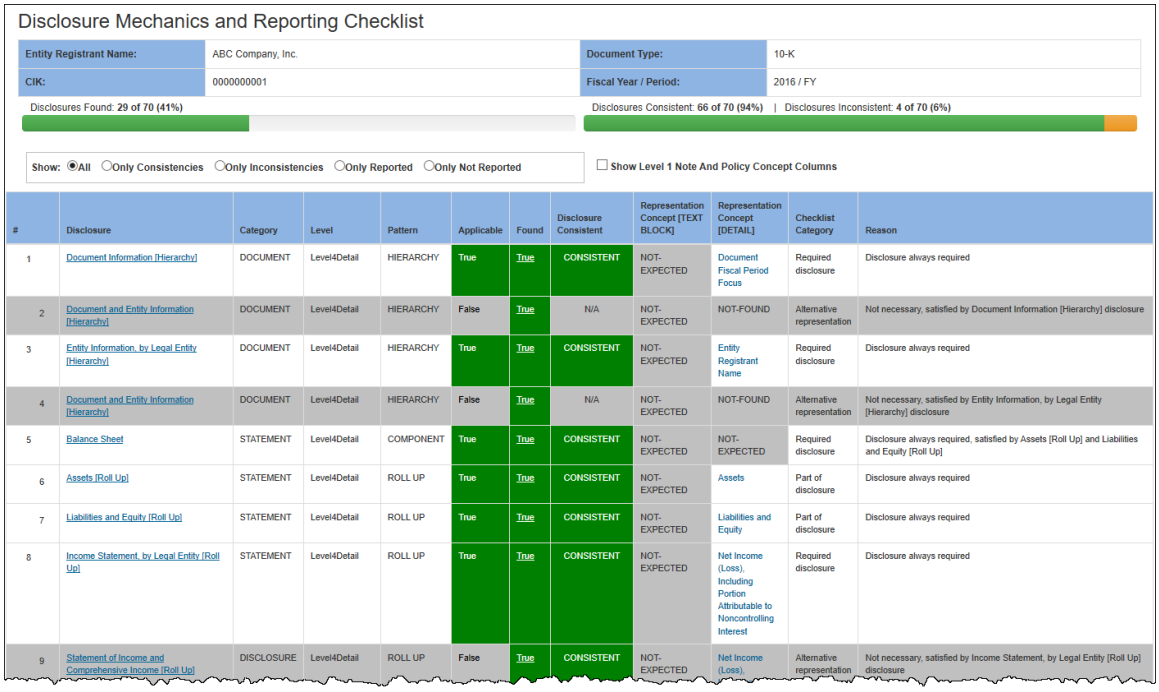


2.3.3.STEP 3: View Online Validation Results

We have run this same validation using the disclosure mechanics and reporting checklist validation tool provided by XBRL Cloud and have posted the validation results to our web site[47].

The HTML based disclosure mechanics and reporting checklist generated by XBRL Cloud is very similar to the Pesseract version of the same information. Go to the "Inventory, Net (Current) [Roll Up]" disclosure and look at the rules and the line of reasoning:

[47] XBRL Cloud Disclosure Mechanics and Reporting Checklist, http://xbrlsite.azurewebsites.net/2017/Prototypes/ReferenceImplementationSEC/Disclosure%20Mechanics%20and%20Reporting%20Checklist.html



Disclosure Mechanics and Reporting Checklist

Entity Registrant Name:	ABC Company, Inc.	Document Type:	10-K
CIK:	0000000001	Fiscal Year / Period:	2016 / FY

Disclosures Found: 29 of 70 (41%)

Disclosures Consistent: 66 of 70 (94%) | Disclosures Inconsistent: 4 of 70 (6%)

Show: ◉All ○Only Consistencies ○Only Inconsistencies ○Only Reported ○Only Not Reported ☐ Show Level 1 Note And Policy Concept Columns

#	Disclosure	Category	Level	Pattern	Applicable	Found	Disclosure Consistent	Representation Concept [TEXT BLOCK]	Representation Concept [DETAIL]	Checklist Category	Reason
1	Document Information [Hierarchy]	DOCUMENT	Level4Detail	HIERARCHY	True	True	CONSISTENT	NOT-EXPECTED	Document Fiscal Period Focus	Required disclosure	Disclosure always required
2	Document and Entity Information [Hierarchy]	DOCUMENT	Level4Detail	HIERARCHY	False	True	N/A	NOT-EXPECTED	NOT-FOUND	Alternative representation	Not necessary, satisfied by Document Information [Hierarchy] disclosure
3	Entity Information, by Legal Entity [Hierarchy]	DOCUMENT	Level4Detail	HIERARCHY	True	True	CONSISTENT	NOT-EXPECTED	Entity Registrant Name	Required disclosure	Disclosure always required
4	Document and Entity Information [Hierarchy]	DOCUMENT	Level4Detail	HIERARCHY	False	True	N/A	NOT-EXPECTED	NOT-FOUND	Alternative representation	Not necessary, satisfied by Entity Information, by Legal Entity [Hierarchy] disclosure
5	Balance Sheet	STATEMENT	Level4Detail	COMPONENT	True	True	CONSISTENT	NOT-EXPECTED	NOT-EXPECTED	Required disclosure	Disclosure always required, satisfied by Assets [Roll Up] and Liabilities and Equity [Roll Up]
6	Assets [Roll Up]	STATEMENT	Level4Detail	ROLL UP	True	True	CONSISTENT	NOT-EXPECTED	Assets	Part of disclosure	Disclosure always required
7	Liabilities and Equity [Roll Up]	STATEMENT	Level4Detail	ROLL UP	True	True	CONSISTENT	NOT-EXPECTED	Liabilities and Equity	Part of disclosure	Disclosure always required
8	Income Statement, by Legal Entity [Roll Up]	STATEMENT	Level4Detail	ROLL UP	True	True	CONSISTENT	NOT-EXPECTED	Net Income (Loss), Including Portion Attributable to Noncontrolling Interest	Required disclosure	Disclosure always required
9	Statement of Income and Comprehensive Income [Roll Up]	DISCLOSURE	Level4Detail	ROLL UP	False	True	CONSISTENT	NOT-EXPECTED	Net Income (Loss)	Alternative representation	Not necessary, satisfied by Income Statement, by Legal Entity [Roll Up] disclosure

The Microsoft 2017 10-K has exactly 194 structures. This is a breakdown of those structures by concept arrangement pattern[48] and by SEC reporting level:

Concept Arrangement Pattern	Count
Text Block	89
Set	64
Roll Up	31
Roll Forward	9
Roll Forward Info	1

SEC Level	Count
Level 4 Disclosure Detail	102
Level 3 Disclosure Text Block	47
Level 2 Policy Text Block	23
Level 1 Note Text Block	22

Of the 194 structures in the Microsoft 10-K, rules exist that verify only 49 of those which amounts to about 100 structures[49]. Remember that most parts of an SEC are reported three times; once as a Level 1 Note Text Block, again as a Level 3 Disclosure Text Block, and again as a Level 4 Disclosure Detail. The exception are the document and entity information and the primary financial statements which are not provided as text blocks. Policies are reported twice; once in a Level 1 Note Text Block that contains the significant accounting policies and again as the Level 2 Policy Text Block for the individual policies. I would estimate that I am verifying 94 structures; about half of the report. Estimating precisely is tricky because it is unclear what the appropriate level of validation is necessary for Level 1 Note Text Blocks which are presentation related and Level 2 Policy Text Blocks. The only way

[48] Concept Arrangement Pattern, http://xbrlsite.azurewebsites.net/2019/Framework/Details/ConceptArrangementPattern.html

[49] Microsoft Disclosure Mechanics validation result, http://xbrlsite.azurewebsites.net/2017/Prototypes/Microsoft2017/Disclosure%20Mechanics%20and%20Reporting%20Checklist.html

to really find out is to actually undertake the task to verify 100% of an entire report which is on my list of things to do.

The point is, disclosure mechanics can only be validated using automated processes to the extent that machine readable disclosure mechanics rules exist.

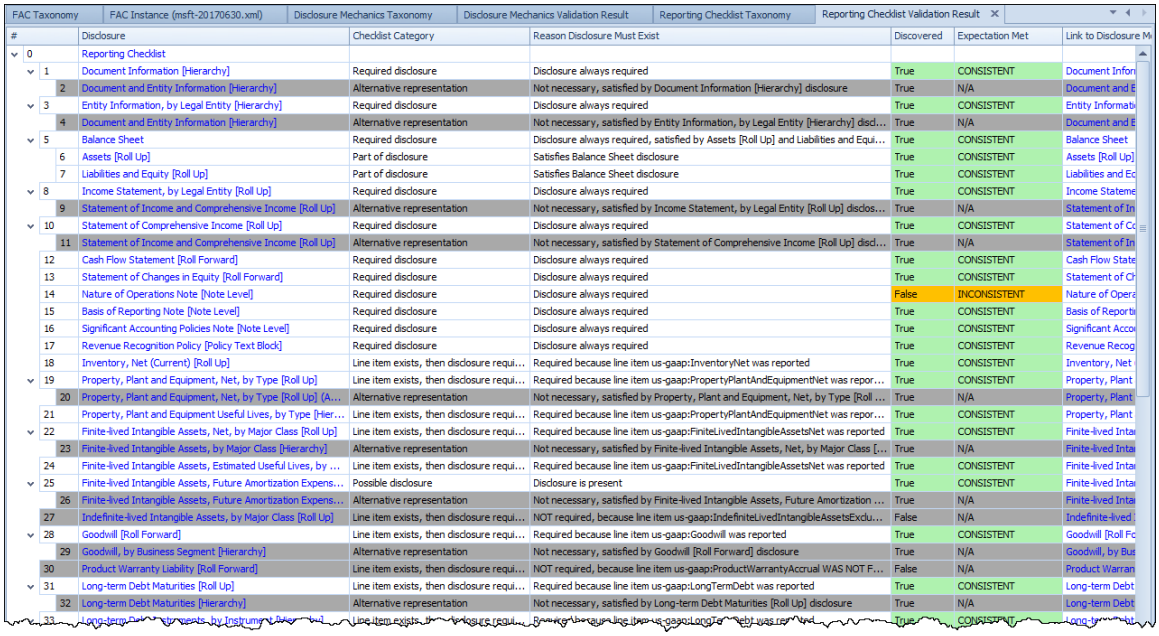
Again, this is intended to be an overview of the disclosure mechanics rules. Additional details will be provided in subsequent documents.

2.4. Validating Reporting Checklist

Next we validate an XBRL-based digital financial report to make sure that it is consistent with the disclosure rules provided within a machine-readable reporting checklist.

2.4.1.STEP 4: Reporting Checklist Validation Results

The validation process has already been run, so we don't need to run that process again. Select the "Reporting Checklist Validation Result" window, you will see the following:



FAC Taxonomy | FAC Instance (msft-20170630.xml) | Disclosure Mechanics Taxonomy | Disclosure Mechanics Validation Result | Reporting Checklist Taxonomy | Reporting Checklist Validation Result

#	Disclosure	Checklist Category	Reason Disclosure Must Exist	Discovered	Expectation Met	Link to Disclosure M
0	Reporting Checklist					
1	Document Information [Hierarchy]	Required disclosure	Disclosure always required	True	CONSISTENT	Document Infor
2	Document and Entity Information [Hierarchy]	Alternative representation	Not necessary, satisfied by Document Information [Hierarchy] disclosure	True	N/A	Document and E
3	Entity Information, by Legal Entity [Hierarchy]	Required disclosure	Disclosure always required	True	CONSISTENT	Entity Informati
4	Document and Entity Information [Hierarchy]	Alternative representation	Not necessary, satisfied by Entity Information, by Legal Entity [Hierarchy] disc...	True	N/A	Document and E
5	Balance Sheet	Required disclosure	Disclosure always required, satisfied by Assets [Roll Up] and Liabilities and Equi...	True	CONSISTENT	Balance Sheet
6	Assets [Roll Up]	Part of disclosure	Satisfies Balance Sheet disclosure	True	CONSISTENT	Assets [Roll Up]
7	Liabilities and Equity [Roll Up]	Part of disclosure	Satisfies Balance Sheet disclosure	True	CONSISTENT	Liabilities and Eq
8	Income Statement, by Legal Entity [Roll Up]	Required disclosure	Disclosure always required	True	CONSISTENT	Income Stateme
9	Statement of Income and Comprehensive Income [Roll Up]	Alternative representation	Not necessary, satisfied by Income Statement, by Legal Entity [Roll Up] disclos...	True	N/A	Statement of In
10	Statement of Comprehensive Income [Roll Up]	Required disclosure	Disclosure always required	True	CONSISTENT	Statement of Co
11	Statement of Income and Comprehensive Income [Roll Up]	Alternative representation	Not necessary, satisfied by Statement of Comprehensive Income [Roll Up] disc...	True	N/A	Statement of In
12	Cash Flow Statement [Roll Forward]	Required disclosure	Disclosure always required	True	CONSISTENT	Cash Flow State
13	Statement of Changes in Equity [Roll Forward]	Required disclosure	Disclosure always required	True	CONSISTENT	Statement of Ch
14	Nature of Operations Note [Note Level]	Required disclosure	Disclosure always required	False	INCONSISTENT	Nature of Opera
15	Basis of Reporting Note [Note Level]	Required disclosure	Disclosure always required	True	CONSISTENT	Basis of Reporti
16	Significant Accounting Policies Note [Note Level]	Required disclosure	Disclosure always required	True	CONSISTENT	Significant Acco
17	Revenue Recognition Policy [Policy Text Block]	Required disclosure	Disclosure always required	True	CONSISTENT	Revenue Recog
18	Inventory, Net (Current) [Roll Up]	Line item exists, then disclosure requi...	Required because line item us-gaap:InventoryNet was reported	True	CONSISTENT	Inventory, Net
19	Property, Plant and Equipment, Net, by Type [Roll Up]	Line item exists, then disclosure requi...	Required because line item us-gaap:PropertyPlantAndEquipmentNet was repor...	True	CONSISTENT	Property, Plant
20	Property, Plant and Equipment, Net, by Type [Roll Up] (A...	Alternative representation	Not necessary, satisfied by Property, Plant and Equipment, Net, by Type [Roll ...	True	N/A	Property, Plant
21	Property, Plant and Equipment Useful Lives, by Type [Hier...	Line item exists, then disclosure requi...	Required because line item us-gaap:PropertyPlantAndEquipmentNet was repor...	True	CONSISTENT	Property, Plant
22	Finite-lived Intangible Assets, Net, by Major Class [Roll Up]	Line item exists, then disclosure requi...	Required because line item us-gaap:FiniteLivedIntangibleAssetsNet was reported	True	CONSISTENT	Finite-lived Intar
23	Finite-lived Intangible Assets, by Major Class [Hierarchy]	Alternative representation	Not necessary, satisfied by Finite-lived Intangible Assets, Net, by Major Class [...	True	N/A	Finite-lived Intar
24	Finite-lived Intangible Assets, Estimated Useful Lives, by ...	Line item exists, then disclosure requi...	Required because line item us-gaap:FiniteLivedIntangibleAssetsNet was reported	True	CONSISTENT	Finite-lived Intar
25	Finite-lived Intangible Assets, Future Amortization Expens...	Possible disclosure	Disclosure is present	True	CONSISTENT	Finite-lived Intar
26	Finite-lived Intangible Assets, Future Amortization Expens...	Alternative representation	Not necessary, satisfied by Finite-lived Intangible Assets, Future Amortization ...	True	N/A	Finite-lived Intar
27	Indefinite-lived Intangible Assets, by Major Class [Roll Up]	Line item exists, then disclosure requi...	NOT required, because line item us-gaap:IndefiniteLivedIntangibleAssetsExclu...	False	N/A	Indefinite-lived I
28	Goodwill [Roll Forward]	Line item exists, then disclosure requi...	Required because line item us-gaap:Goodwill was reported	True	CONSISTENT	Goodwill [Roll Fo
29	Goodwill, by Business Segment [Hierarchy]	Alternative representation	Not necessary, satisfied by Goodwill [Roll Forward] disclosure	True	N/A	Goodwill, by Bus
30	Product Warranty Liability [Roll Forward]	Line item exists, then disclosure requi...	NOT required, because line item us-gaap:ProductWarrantyAccrual WAS NOT F...	False	N/A	Product Warran
31	Long-term Debt Maturities [Roll Up]	Line item exists, then disclosure requi...	Required because line item us-gaap:LongTermDebt was reported	True	CONSISTENT	Long-term Debt
32	Long-term Debt Maturities [Hierarchy]	Alternative representation	Not necessary, satisfied by Long-term Debt Maturities [Roll Up] disclosure	True	N/A	Long-term Debt
33	Long-term Debt, by Instrument [Axis]	Line item exists, then disclosure requi...	Required because line item us-gaap:LongTermDebt was reported	True	CONSISTENT	Long-term Debt

If you scroll all the way down to the bottom you will notice that there are 70 line items in this validation result window. That represent all of the items within a machine-readable reporting checklist, also represented using XBRL definition relations[50].

The reporting checklist represents information about what disclosures are always required to be provided in a report, what disclosures are required if some specific line item is reported, alternative disclosures which can be used for some expected disclosure, and other such information.

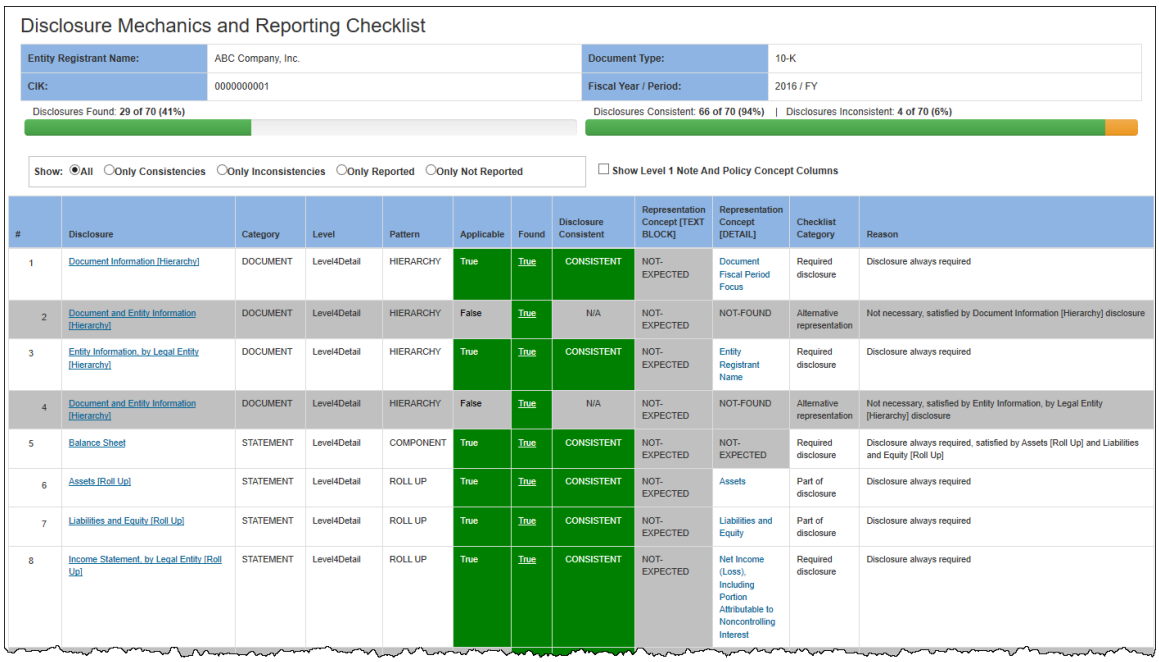
[50] Human-readable reporting checklist rules with a link to the machine-readable version of the same rules, http://xbrlsite.azurewebsites.net/2020/reporting-scheme/us-gaap/reporting-checklist/reporting-checklist-rules.html

Note that if you click on the name of the disclosure (on the left), you navigate to the reporting checklist rules. If you click on the link to disclosure name (on the right), you navigate to the disclosure mechanics rules validation results. There, if you click on the "Representation Concept Detail" you will navigate to the actual disclosure within the report.

Again, we are just providing an overview here, so we will call this good for now.

2.4.2.STEP 3: View Online Validation Results

XBRL Cloud implements the reporting checklist slightly different than Pesseract. In Pesseract, the reporting checklist and disclosure mechanics are separate. XBRL Cloud puts the two reports together. You can see that same checklist here which looks as follows[51]:



Disclosure Mechanics and Reporting Checklist

Entity Registrant Name:	ABC Company, Inc.	Document Type:	10-K
CIK:	0000000001	Fiscal Year / Period:	2016 / FY

Disclosures Found: **29 of 70 (41%)**

Disclosures Consistent: **66 of 70 (94%)** | Disclosures Inconsistent: **4 of 70 (6%)**

Show: ◉All ○Only Consistencies ○Only Inconsistencies ○Only Reported ○Only Not Reported ☐ Show Level 1 Note And Policy Concept Columns

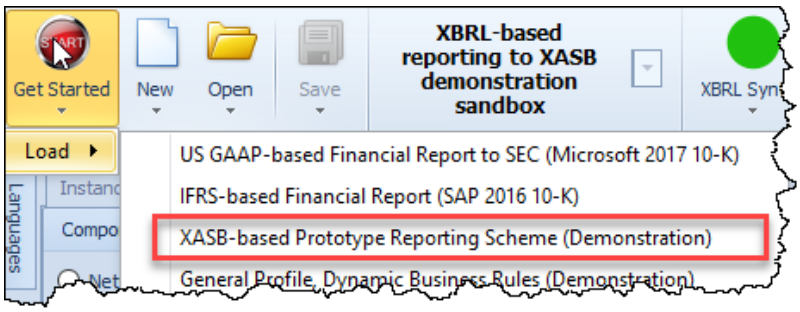
#	Disclosure	Category	Level	Pattern	Applicable	Found	Disclosure Consistent	Representation Concept [TEXT BLOCK]	Representation Concept [DETAIL]	Checklist Category	Reason
1	Document Information [Hierarchy]	DOCUMENT	Level4Detail	HIERARCHY	True	True	CONSISTENT	NOT-EXPECTED	Document Fiscal Period Focus	Required disclosure	Disclosure always required
2	Document and Entity Information [Hierarchy]	DOCUMENT	Level4Detail	HIERARCHY	False	True	N/A	NOT-EXPECTED	NOT-FOUND	Alternative representation	Not necessary, satisfied by Document Information [Hierarchy] disclosure
3	Entity Information, by Legal Entity [Hierarchy]	DOCUMENT	Level4Detail	HIERARCHY	True	True	CONSISTENT	NOT-EXPECTED	Entity Registrant Name	Required disclosure	Disclosure always required
4	Document and Entity Information [Hierarchy]	DOCUMENT	Level4Detail	HIERARCHY	False	True	N/A	NOT-EXPECTED	NOT-FOUND	Alternative representation	Not necessary, satisfied by Entity Information, by Legal Entity [Hierarchy] disclosure
5	Balance Sheet	STATEMENT	Level4Detail	COMPONENT	True	True	CONSISTENT	NOT-EXPECTED	NOT-EXPECTED	Required disclosure	Disclosure always required, satisfied by Assets [Roll Up] and Liabilities and Equity [Roll Up]
6	Assets [Roll Up]	STATEMENT	Level4Detail	ROLL UP	True	True	CONSISTENT	NOT-EXPECTED	Assets	Part of disclosure	Disclosure always required
7	Liabilities and Equity [Roll Up]	STATEMENT	Level4Detail	ROLL UP	True	True	CONSISTENT	NOT-EXPECTED	Liabilities and Equity	Part of disclosure	Disclosure always required
8	Income Statement, by Legal Entity [Roll Up]	STATEMENT	Level4Detail	ROLL UP	True	True	CONSISTENT	NOT-EXPECTED	Net Income (Loss), Including Portion Attributable to Noncontrolling Interest	Required disclosure	Disclosure always required

2.4.3.STEP 5: XASB Disclosure Mechanics and Reporting Checklist Validation Results

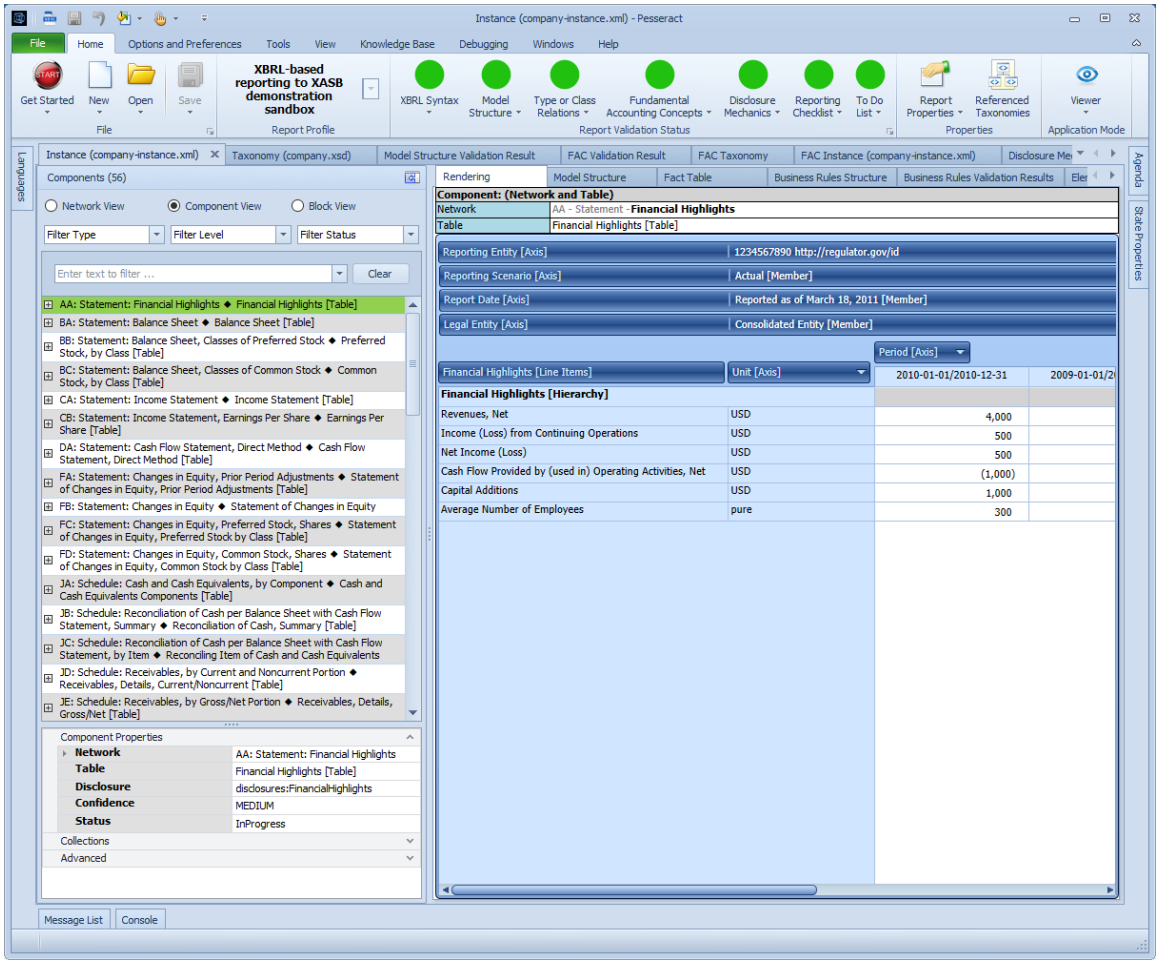
Close all of the Microsoft 10-K windows and we will now load the XASB prototype reporting scheme financial report and look at the disclosure mechanics and reporting checklist validation result.

On the menu ribbon, select the "Get Started" icon, then "Load", and then the "XASB-based Protoype Reporting Scheme (Demonstration)" report to load that report:

[51] XBRL Cloud Reporting Checklist that is combined with the Disclosure Mechanics validation result, http://xbrlsite.azurewebsites.net/2017/Prototypes/ReferenceImplementationSEC/Disclosure%20Mechanics%20and%20Reporting%20Checklist.html



After you load the report, select "Report Validation Status" lower right hand icon to validate all of the categories of rules and when the validation is complete in less than a minute, you will see the following:

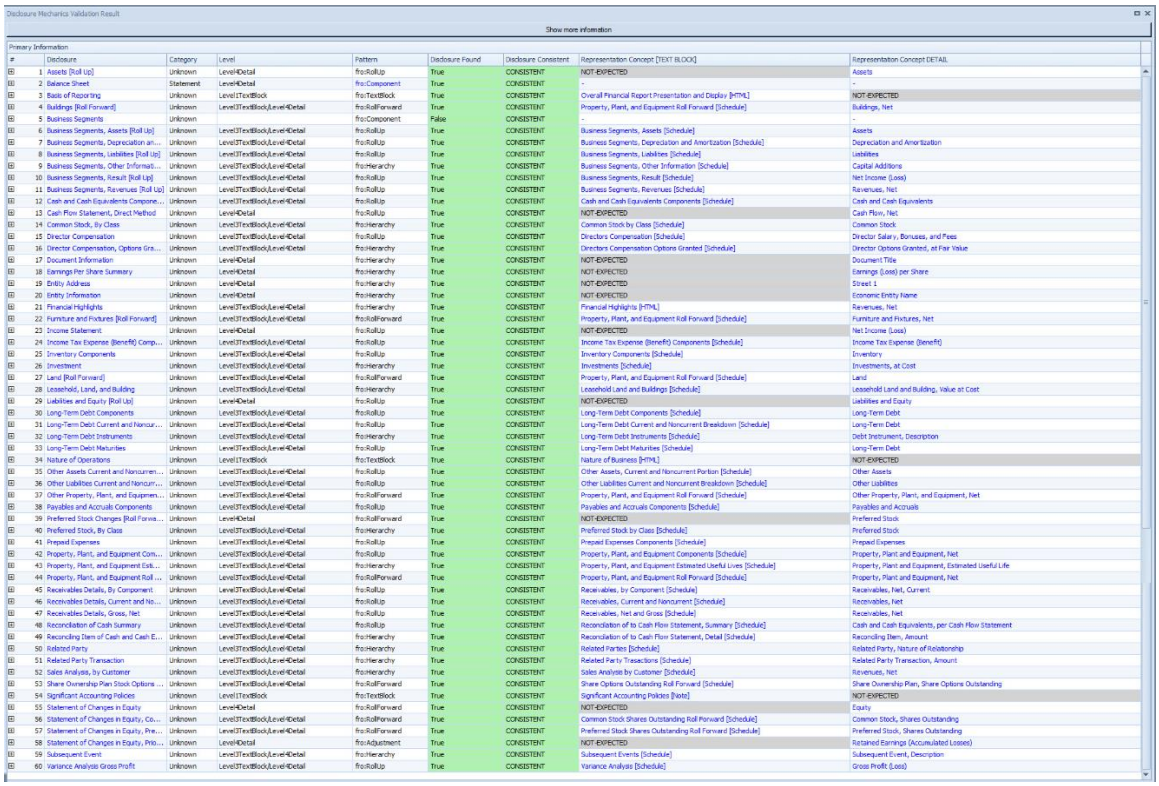


We are not going to repeat all the steps again. If you get lost simply go look at the Microsoft example again, repeat the steps if necessary until you are comfortable with the validation steps and navigating around in the documents that are provided.

What we want to point out in the XASB report is that there is a significantly higher correlation between the number of fact sets provided in the financial report and the rules provided to verify the disclosures. There are 133 fact sets in the report. There are 60 disclosures listed in the disclosure mechanics listing. Note that the disclosure mechanics listing has many disclosure that exist as Level 3 Disclosure Text Block and

as Level 4 Detail. In addition, there are 12 policies that exist in the fact sets but would not show up in the disclosure mechanics listing.

The point is that all of the pieces of the report can be accounted for. If all of the disclosures provided in an XBRL-based report are provided for and used by the disclosure mechanics validation result because the machine-readable rules exist, then 100% of the fact sets of a report can be verified to be consistent with the disclosure mechanics rules[52]:



#	Disclosure	Category	Level	Pattern	Disclosure Found	Disclosure Consistent	Representation Concept [TEXT BLOCK]	Representation Concept DETAIL
1	Assets [Roll Up]	Unknown	Level4Detail	fro:RollUp	True	CONSISTENT	NOT-EXPECTED	Assets
2	Balance Sheet	Statement	Level4Detail	fro:Component	True	CONSISTENT	-	-
3	Basis of Reporting	Unknown	Level3TextBlock	fro:TextBlock	True	CONSISTENT	Overall Financial Report Presentation and Display [HTML]	NOT-EXPECTED
4	Buildings [Roll Forward]	Unknown	Level3TextBlock,Level4Detail	fro:RollForward	True	CONSISTENT	Property, Plant, and Equipment Roll Forward [Schedule]	Buildings, Net
5	Business Segments	Unknown		fro:Component	False	CONSISTENT	-	-
6	Business Segments, Assets [Roll Up]	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Business Segments, Assets [Schedule]	Assets
7	Business Segments, Depreciation an...	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Business Segments, Depreciation and Amortization [Schedule]	Depreciation and Amortization
8	Business Segments, Liabilities [Roll Up]	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Business Segments, Liabilities [Schedule]	Liabilities
9	Business Segments, Other Informat...	Unknown	Level3TextBlock,Level4Detail	fro:Hierarchy	True	CONSISTENT	Business Segments, Other Information [Schedule]	Capital Additions
10	Business Segments, Result [Roll Up]	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Business Segments, Result [Schedule]	Net Income (Loss)
11	Business Segments, Revenues [Roll Up]	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Business Segments, Revenues [Schedule]	Revenues, Net
12	Cash and Cash Equivalents Compone...	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Cash and Cash Equivalents Components [Schedule]	Cash and Cash Equivalents
13	Cash Flow Statement, Direct Method	Unknown	Level4Detail	fro:RollUp	True	CONSISTENT	NOT-EXPECTED	Cash Flow, Net
14	Common Stock, by Class	Unknown	Level3TextBlock,Level4Detail	fro:Hierarchy	True	CONSISTENT	Common Stock by Class [Schedule]	Common Stock
15	Director Compensation	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Directors Compensation [Schedule]	Director Salary, Bonuses, and Fees
16	Director Compensation, Options Gra...	Unknown	Level3TextBlock,Level4Detail	fro:Hierarchy	True	CONSISTENT	Directors Compensation Options Granted [Schedule]	Director Options Granted, at Fair Value
17	Document Information	Unknown	Level4Detail	fro:Hierarchy	True	CONSISTENT	NOT-EXPECTED	Document Title
18	Earnings Per Share Summary	Unknown	Level4Detail	fro:Hierarchy	True	CONSISTENT	NOT-EXPECTED	Earnings (Loss) per Share
19	Entity Address	Unknown	Level4Detail	fro:Hierarchy	True	CONSISTENT	NOT-EXPECTED	Street 1
20	Entity Information	Unknown	Level4Detail	fro:Hierarchy	True	CONSISTENT	NOT-EXPECTED	Economic Entity Name
21	Financial Highlights	Unknown	Level3TextBlock,Level4Detail	fro:Hierarchy	True	CONSISTENT	Financial Highlights [HTML]	Revenues, Net
22	Furniture and Fixtures [Roll Forward]	Unknown	Level3TextBlock,Level4Detail	fro:RollForward	True	CONSISTENT	Property, Plant, and Equipment Roll Forward [Schedule]	Furniture and Fixtures, Net
23	Income Statement	Unknown	Level4Detail	fro:RollUp	True	CONSISTENT	NOT-EXPECTED	Net Income (Loss)
24	Income Tax Expense (Benefit) Comp...	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Income Tax Expense (Benefit) Components [Schedule]	Income Tax Expense (Benefit)
25	Inventory Components	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Inventory Components [Schedule]	Inventory
26	Investment	Unknown	Level3TextBlock,Level4Detail	fro:Hierarchy	True	CONSISTENT	Investments [Schedule]	Investments, at Cost
27	Land [Roll Forward]	Unknown	Level3TextBlock,Level4Detail	fro:RollForward	True	CONSISTENT	Property, Plant, and Equipment Roll Forward [Schedule]	Land
28	Leasehold, Land, and Building	Unknown	Level3TextBlock,Level4Detail	fro:Hierarchy	True	CONSISTENT	Leasehold Land and Buildings [Schedule]	Leasehold Land and Building, Value at Cost
29	Liabilities and Equity [Roll Up]	Unknown	Level4Detail	fro:RollUp	True	CONSISTENT	NOT-EXPECTED	Liabilities and Equity
30	Long-Term Debt Components	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Long-Term Debt Components [Schedule]	Long-Term Debt
31	Long-Term Debt Current and Noncur...	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Long-Term Debt Current and Noncurrent Breakdown [Schedule]	Long-Term Debt
32	Long-Term Debt Instruments	Unknown	Level3TextBlock,Level4Detail	fro:Hierarchy	True	CONSISTENT	Long-Term Debt Instruments [Schedule]	Debt Instrument, Description
33	Long-Term Debt Maturities	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Long-Term Debt Maturities [Schedule]	Long-Term Debt
34	Nature of Operations	Unknown	Level1TextBlock	fro:TextBlock	True	CONSISTENT	Nature of Business [HTML]	NOT-EXPECTED
35	Other Assets Current and Noncurren...	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Other Assets, Current and Noncurrent Portion [Schedule]	Other Assets
36	Other Liabilities Current and Noncur...	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Other Liabilities Current and Noncurrent Breakdown [Schedule]	Other Liabilities
37	Other Property, Plant, and Equipmen...	Unknown	Level3TextBlock,Level4Detail	fro:RollForward	True	CONSISTENT	Property, Plant, and Equipment Roll Forward [Schedule]	Other Property, Plant, and Equipment, Net
38	Payables and Accruals Components	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Payables and Accruals Components [Schedule]	Payables and Accruals
39	Preferred Stock Changes [Roll Forwa...	Unknown	Level4Detail	fro:RollForward	True	CONSISTENT	NOT-EXPECTED	Preferred Stock
40	Preferred Stock, By Class	Unknown	Level3TextBlock,Level4Detail	fro:Hierarchy	True	CONSISTENT	Preferred Stock by Class [Schedule]	Preferred Stock
41	Prepaid Expenses	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Prepaid Expenses Components [Schedule]	Prepaid Expenses
42	Property, Plant, and Equipment Com...	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Property, Plant, and Equipment Components [Schedule]	Property, Plant and Equipment, Net
43	Property, Plant, and Equipment Esti...	Unknown	Level3TextBlock,Level4Detail	fro:Hierarchy	True	CONSISTENT	Property, Plant, and Equipment Estimated Useful Lives [Schedule]	Property, Plant and Equipment, Estimated Useful Life
44	Property, Plant, and Equipment Roll ...	Unknown	Level3TextBlock,Level4Detail	fro:RollForward	True	CONSISTENT	Property, Plant, and Equipment Roll Forward [Schedule]	Property, Plant and Equipment, Net
45	Receivables Details, By Component	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Receivables, by Component [Schedule]	Receivables, Net, Current
46	Receivables Details, Current and No...	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Receivables, Current and Noncurrent [Schedule]	Receivables, Net
47	Receivables Details, Gross, Net	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Receivables, Net and Gross [Schedule]	Receivables, Net
48	Reconciliation of Cash Summary	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Reconciliation of to Cash Flow Statement, Summary [Schedule]	Cash and Cash Equivalents, per Cash Flow Statement
49	Reconciling Item of Cash and Cash E...	Unknown	Level3TextBlock,Level4Detail	fro:Hierarchy	True	CONSISTENT	Reconciliation of to Cash Flow Statement, Detail [Schedule]	Reconciling Item, Amount
50	Related Party	Unknown	Level3TextBlock,Level4Detail	fro:Hierarchy	True	CONSISTENT	Related Parties [Schedule]	Related Party, Nature of Relationship
51	Related Party Transaction	Unknown	Level3TextBlock,Level4Detail	fro:Hierarchy	True	CONSISTENT	Related Party Transactions [Schedule]	Related Party Transaction, Amount
52	Sales Analysis, by Customer	Unknown	Level3TextBlock,Level4Detail	fro:Hierarchy	True	CONSISTENT	Sales Analysis by Customer [Schedule]	Revenues, Net
53	Share Ownership Plan Stock Options ...	Unknown	Level3TextBlock,Level4Detail	fro:RollForward	True	CONSISTENT	Share Options Outstanding Roll Forward [Schedule]	Share Ownership Plan, Share Options Outstanding
54	Significant Accounting Policies	Unknown	Level1TextBlock	fro:TextBlock	True	CONSISTENT	Significant Accounting Policies [Note]	NOT-EXPECTED
55	Statement of Changes in Equity	Unknown	Level4Detail	fro:RollForward	True	CONSISTENT	NOT-EXPECTED	Equity
56	Statement of Changes in Equity, Co...	Unknown	Level3TextBlock,Level4Detail	fro:RollForward	True	CONSISTENT	Common Stock Shares Outstanding Roll Forward [Schedule]	Common Stock, Shares Outstanding
57	Statement of Changes in Equity, Pre...	Unknown	Level3TextBlock,Level4Detail	fro:RollForward	True	CONSISTENT	Preferred Stock Shares Outstanding Roll Forward [Schedule]	Preferred Stock, Shares Outstanding
58	Statement of Changes in Equity, Prio...	Unknown	Level4Detail	fro:Adjustment	True	CONSISTENT	NOT-EXPECTED	Retained Earnings (Accumulated Losses)
59	Subsequent Event	Unknown	Level3TextBlock,Level4Detail	fro:Hierarchy	True	CONSISTENT	Subsequent Events [Schedule]	Subsequent Event, Description
60	Variance Analysis Gross Profit	Unknown	Level3TextBlock,Level4Detail	fro:RollUp	True	CONSISTENT	Variance Analysis [Schedule]	Gross Profit (Loss)

This is similarly the case for the reporting checklist validation.

Explore the validation results of the XASB report!

[52] Pesseract disclosure mechanics validation result, http://xbrlsite.azurewebsites.net/2016/conceptual-model/reporting-scheme/xasb/taxonomy/Validation_DisclosureMechanics.jpg