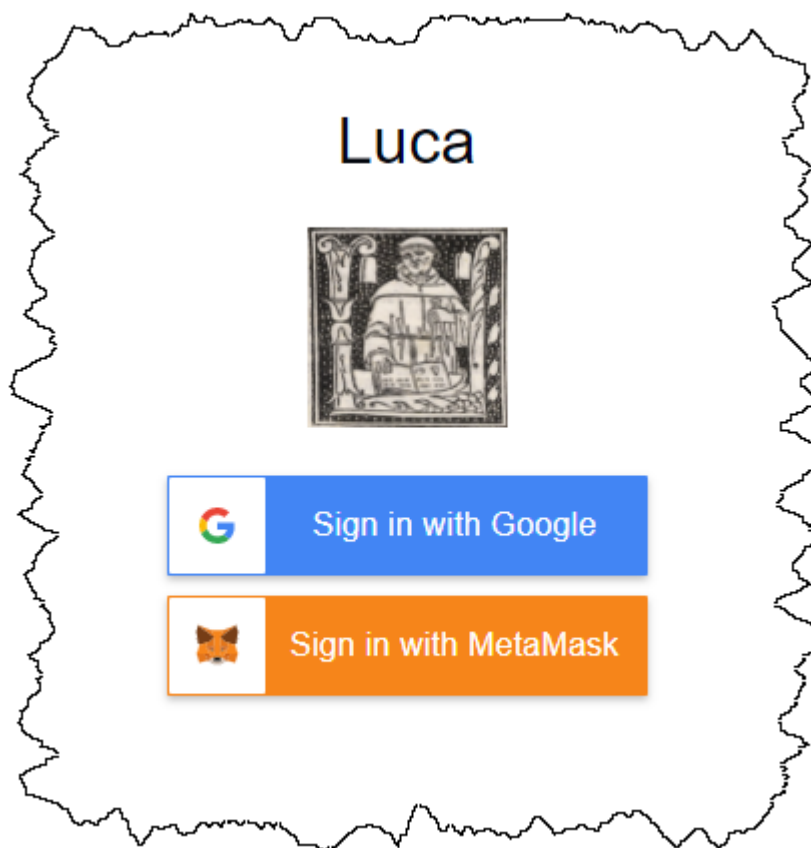


Accounting Equation Tutorial¹

This tutorial walks you through creating a very basic financial report for the accounting equation using a web application version of a similar Windows Forms software application called Luca².

To use the Luca web application, navigate to the following URL in your browser:

<http://luca.yaxbri.com/>



Currently you can sign in using Google sign in or you can use the MetaMask crypto currency wallet. Simply click "Sign in with Google", select the Google account (gmail account) that you want to sign in with, and you will be logged into the application using that Google account. Alternatively, you can sign in using MetaMask by connecting Luca to your MetaMask wallet.

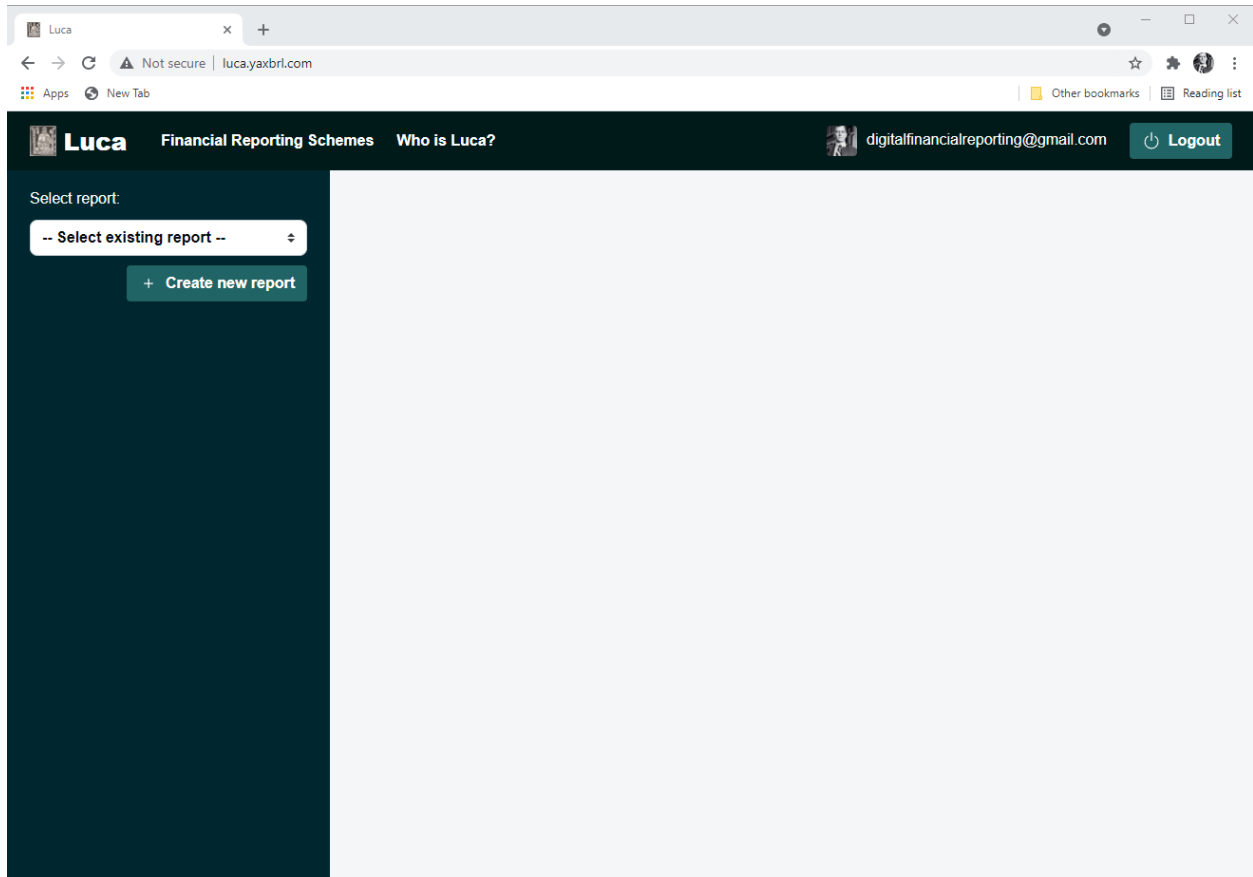
NOTE that while we are showing you how to create a financial report step-by-step manually, Luca is not just a GUI application. There is also an API interface to Luca and information can be imported into Luca using Excel. And with Luca, you can generate XBRL-based financial reports or generate a PDF, HTML, Microsoft Word, or Google Documents version of such reports. Fundamentally, Luca is a rules-based expert system API and a GUI for creating financial reports.

¹ Accounting Equation Representation, <http://xbri.azurewebsites.net/2020/master/ae/index.html>

² Windows Forms-based Luca, <http://xbri.squarespace.com/journal/2020/9/15/luca.html>

There are two primary objectives of this very first basic tutorial. The first objective is to help you understand very basic information about using the Luca financial report creation software application. The second objective is to help you understand the logical model of a financial report.

After you sign in, in your browser window you will see the following:



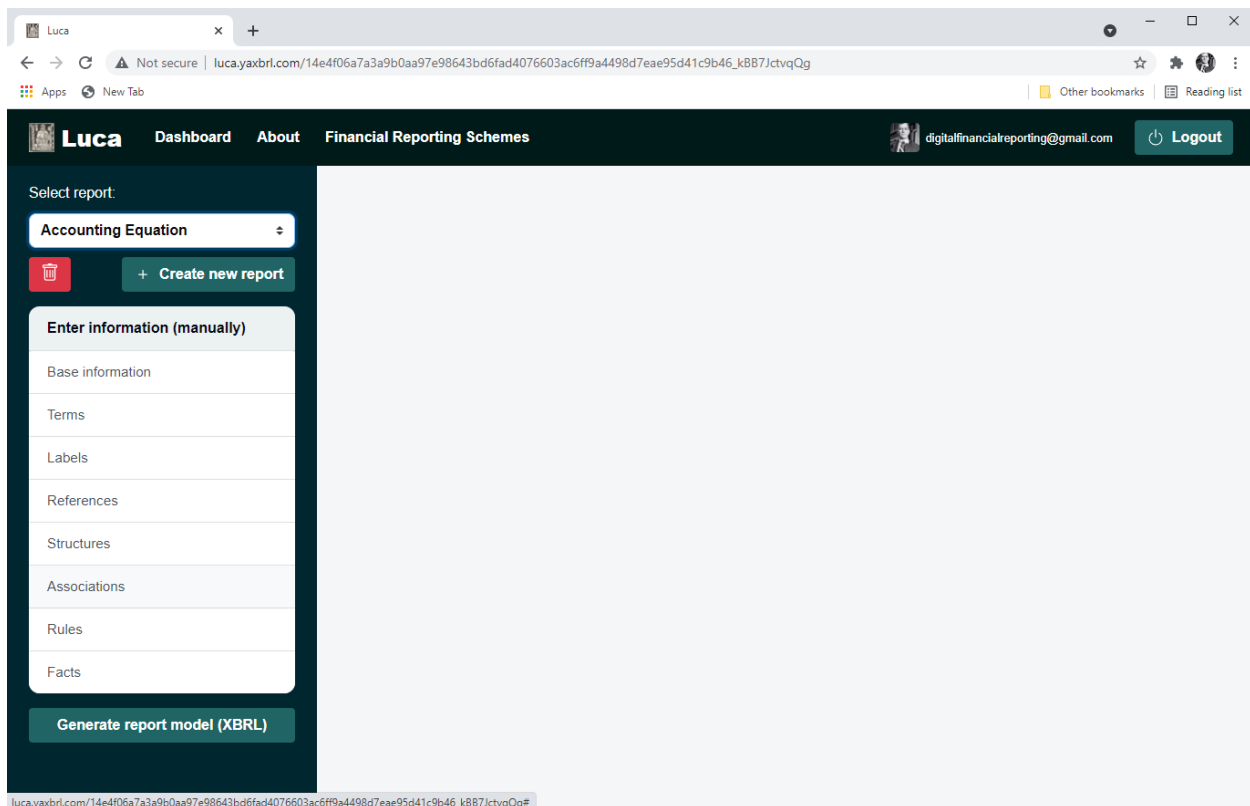
From the left and side of the screen notice the green “Create new report” button. Click that button to create a new report and the following form will be shown:

A screenshot of a modal form titled "Add new report" with a close button (X) in the top right corner. The form has a white background and is set against a dark green background. It contains a label "Report name" followed by a text input field containing the text "Accounting Equation". At the bottom right of the form are two buttons: a green "Save" button and a red "Cancel" button.

In the report name field enter the name of the report which you would like to create. We will be creating the accounting equation report, so enter “Accounting Equation”.

Press the green “Save” button to create the new report.

A shell has been created for your report and your browser application should look something like what you see below. Note your “Accounting Equation” report is selected and there is a menu of information which needs to be entered to create the report.



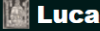
We are trying to keep this tutorial as simple as possible. We encourage you to follow each step exactly in order to get the most out of this tutorial. We will build on this foundation in further tutorials that increase the complexity of the financial report being created. This tutorial simply walks you through the basics.


Also recognize that Luca is a work in progress and incremental improvements will be made to make the application easier to use.


Let's start by entering some basic information about the report being created.

Step 1: Entering Basic information.

From the menu on the left, click on “Base information” and the following form will appear:



Financial Reporting Schemes Who is Luca?


digitalfinancialreporting@gmail.com



Select report:

Accounting Equation


+ Create new report

Enter information (manually)

Base information

Report element

Labels

References

Structures


Associations

Rules (in progress)

Facts (in progress)

Toggle Filter

+ Add



Code	Taxonomy	Prefix	Namespace identifier	Scheme filename	Schema location	Default language	Taxonomy description	Actions
There are no records to show								

Per page

10

«

<

1

>

»

This form lets you enter base information about the report you are creating related to the financial report model being used by the financial report and information that identifies your financial report. Click on the “Add” button to add a new base information entry.

Add

Code

Taxonomy

NamespacePrefix

prefix, or EMPTY if Taxonomy is NOT Local

NamespaceIdentifier

http://site.com/prefix, or EMPTY if Taxonomy is NOT Local

SchemaLocation

report.xsd, or EMPTY if Taxonomy is NOT Local

DefaultLanguage

TaxonomyDescription

Enter your description...

Save

Cancel

There is an important idea that you need to understand at this point. That idea relates to the terms that will be used to create the financial report model of the financial report you are constructing.

Terms can come from one of two places:

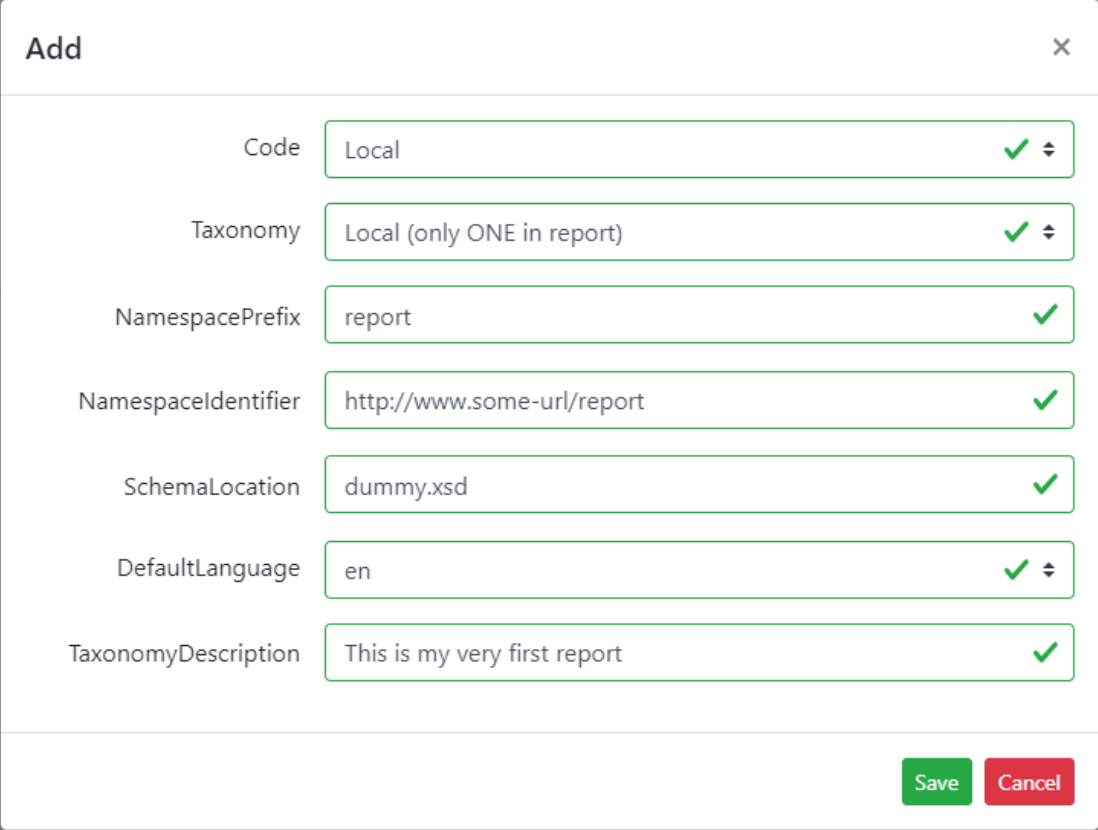
1. **Locally**, terms that you created directly within your report.
2. **Imported**, terms that you use from one or more XBRL taxonomies that you connect to the report.

If you select the “Taxonomy” field from the Base Information form a list of XBRL taxonomies that you can import is provided. You can use any of those XBRL taxonomies or you can point to other XBRL taxonomies which can be imported into your financial report model and used to help you create your financial report.

Code	Local
Taxonomy	Local (only ONE in report)
spacePrefix	Local (only ONE in report)
spaceIdentifier	Accounting Equation, very basic (Prototype)
nameLocation	Accounting Equation, with Net Assets Approach (Prototype)
faultLanguage	SFAC 6 Elements of Financial Statements, Very Basic
Description	SFAC 6 Elements of Financial Statements, with Hypercubes (Prototype)
	SFAC 6 Elements of Financial Statements, alternative hypercube approach
	Common Elements of Financial Report (Prototype)
	MINI Financial Reporting Scheme, Basic (no hypercubes)
	MINI Financial Reporting Scheme, with disclosures (Demonstration)
	Proof Financial Reporting Scheme (Prototype BASE)
	XASB Financial Reporting Scheme (Prototype)
	Not for Profit (US GAAP) Financial Reporting Scheme
	IPSAS Financial Reporting Scheme (Prototype)
	IFRS XBRL Taxonomy 2019
	US GAAP XBRL Taxonomy 2019 (only balance sheet network)
	PROOF BASELINE (Auditchain)
	MINI (Auditchain)
	ASB (Auditchain)

But for this first tutorial, we are not going to import an existing report model, we are going to create our own report model from scratch in order to understand some very important concepts related to creating financial report models.

And so, enter the information that you see below into the Luca application Base Information form:



The screenshot shows a modal window titled "Add" with a close button (X) in the top right corner. The form contains seven fields, each with a green checkmark indicating successful input:

- Code:** Local
- Taxonomy:** Local (only ONE in report)
- NamespacePrefix:** report
- NamespaceIdentifier:** http://www.some-url/report
- SchemaLocation:** dummy.xsd
- DefaultLanguage:** en
- TaxonomyDescription:** This is my very first report

At the bottom right of the form are two buttons: a green "Save" button and a red "Cancel" button.

Press the green “Save” button and you are on your way to creating your first financial report model using the Luca expert system for creating financial reports.

Step 2: Entering Terms information.

From the menu on the left, click on “Terms” and the following form will appear:

The screenshot shows the Luca Financial Reporting Schemes web application. The left sidebar contains a menu with options: Select report (Accounting Equation), Create new report, Enter information (manually), Base information, Terms (selected), Labels, References, Structures, Associations, Rules, and Facts. The main content area displays a table for 'Terms' with columns: Category, Prefix, StandardLabel, ReportElementName, Datatype, BalanceType, CalendarPeriodType, and Actions. The table is currently empty, showing 'There are no records to show'. The page also includes a 'Toggle Filter' button, a '+ Add' button, and a 'Per page' dropdown set to 10. The bottom of the sidebar has a 'Generate report model (XBRL)' button.

The term (a.k.a. report element) information is the fundamental elements that make up a financial report and the properties of those terms.

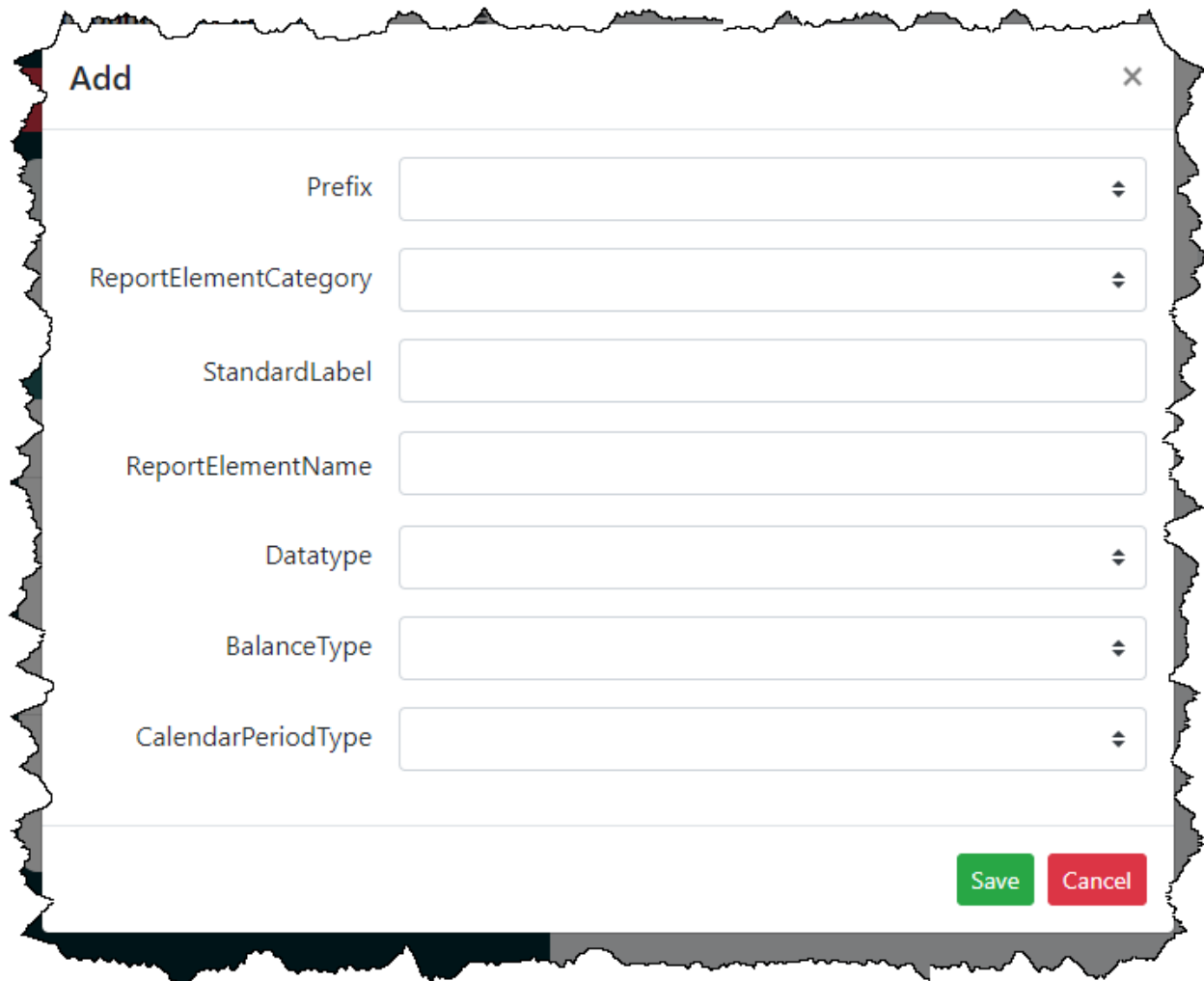
As you know the accounting equation is a rule that has three terms and if you go to Wikipedia³ it looks something like this:

A hand-drawn diagram of the accounting equation. It features a torn paper effect with the text 'Assets = Liabilities + Equity' in a serif font. Below this, the equation is written in a simpler font as $A = L + E$. The diagram is signed 'holder Eq' at the bottom.

The three terms of the accounting equation are: Assets, Liabilities, and Equity. Now as humans and as professional accountants, you understand more about that accounting equation than a computer does. You know that, say, “Assets” is a DEBIT and that it is a numeric monetary value and that the value is as of a specific point in time.

³ Wikipedia, Accounting Equation, https://en.wikipedia.org/wiki/Accounting_equation

But computers don't understand things unless you tell the computer what that information is. So, we have to be very specific and provide all the important details for information we will be using in our financial report model. That information is entered as terms using the terms form:



The image shows a screenshot of a web application window titled "Add" with a close button (X) in the top right corner. The window contains a form with seven input fields, each with a label to its left and a dropdown arrow on the right. The fields are: "Prefix", "ReportElementCategory", "StandardLabel", "ReportElementName", "Datatype", "BalanceType", and "CalendarPeriodType". At the bottom right of the form are two buttons: a green "Save" button and a red "Cancel" button. The entire screenshot is framed with a torn paper effect.

Here are a few things you need to understand about entering the financial terms.

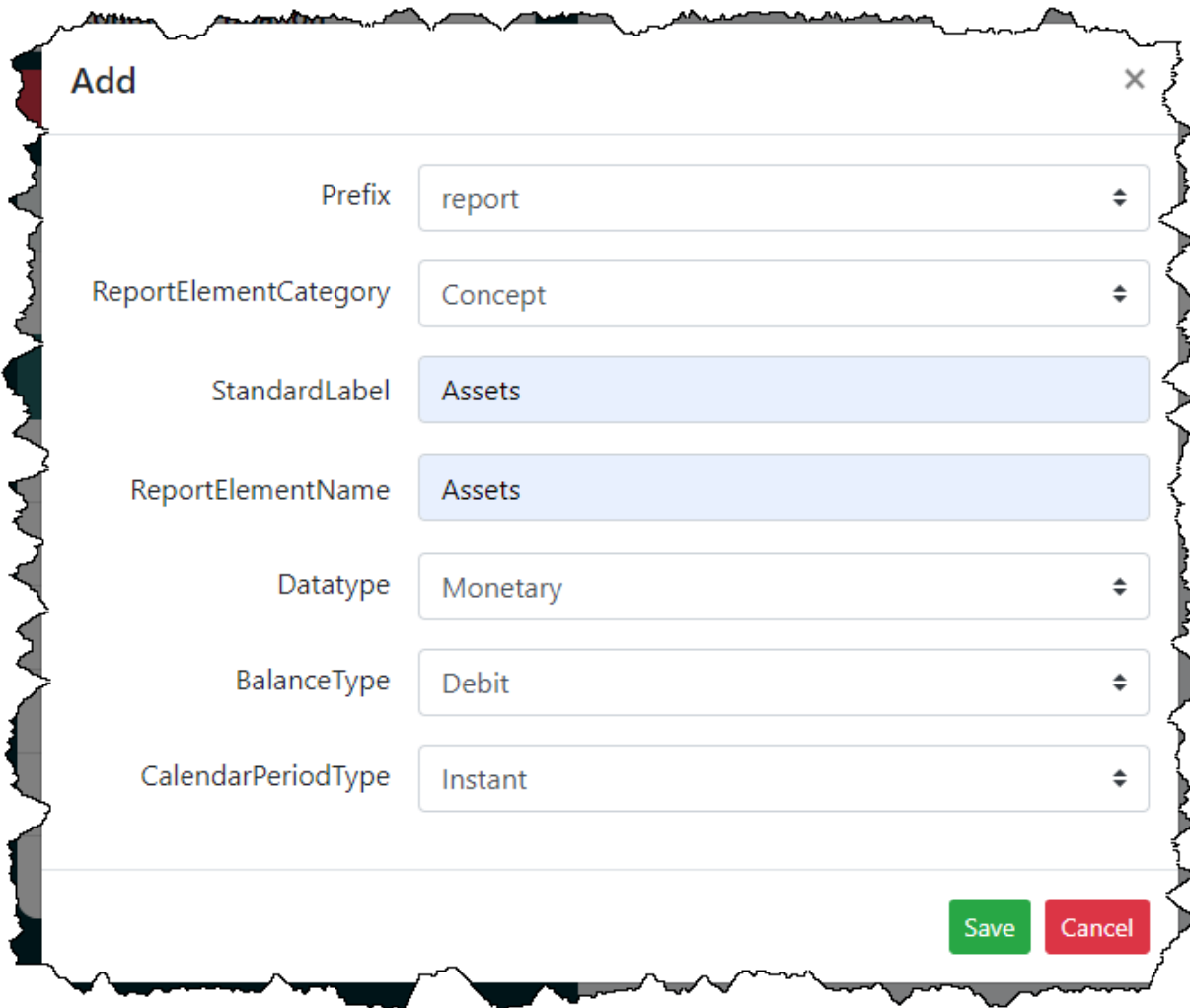
First, remember how we mentioned that a financial term can be provided in a "Local" report model or from one or more XBRL taxonomies that we "Import"? The way we distinguish which XBRL taxonomy a financial term comes from is by using the prefix of the XBRL taxonomy. The prefix simply identifies which of the XBRL taxonomies. We only have one XBRL taxonomy, our Local taxonomy, which we assigned the prefix "report". So, for this example we will use that prefix for all terms we enter.

Every term fits into one of five term categories: Hypercube, Dimension, Member, Lineltems, Abstract, and Concept. For this example we will only be using two categories: Concept and Abstract. Don't worry about any more details about term categories at this time, we will get to that later in another tutorial. For now, just use the term categories we give you.

So here is the term information you need to enter for the first three terms:

The first term is “Assets”. That term will be defined in our local report model so we will use the prefix “report”. This term is a Concept that has a data type of “Monetary” is a “Debit” and is an “Instant” because it is as of a specific point in time. The name and the standard label in this case is the same as the name which is “Assets” because our default language was set to English when we set up our base information.

And so, you would enter the term information for assets as follows:



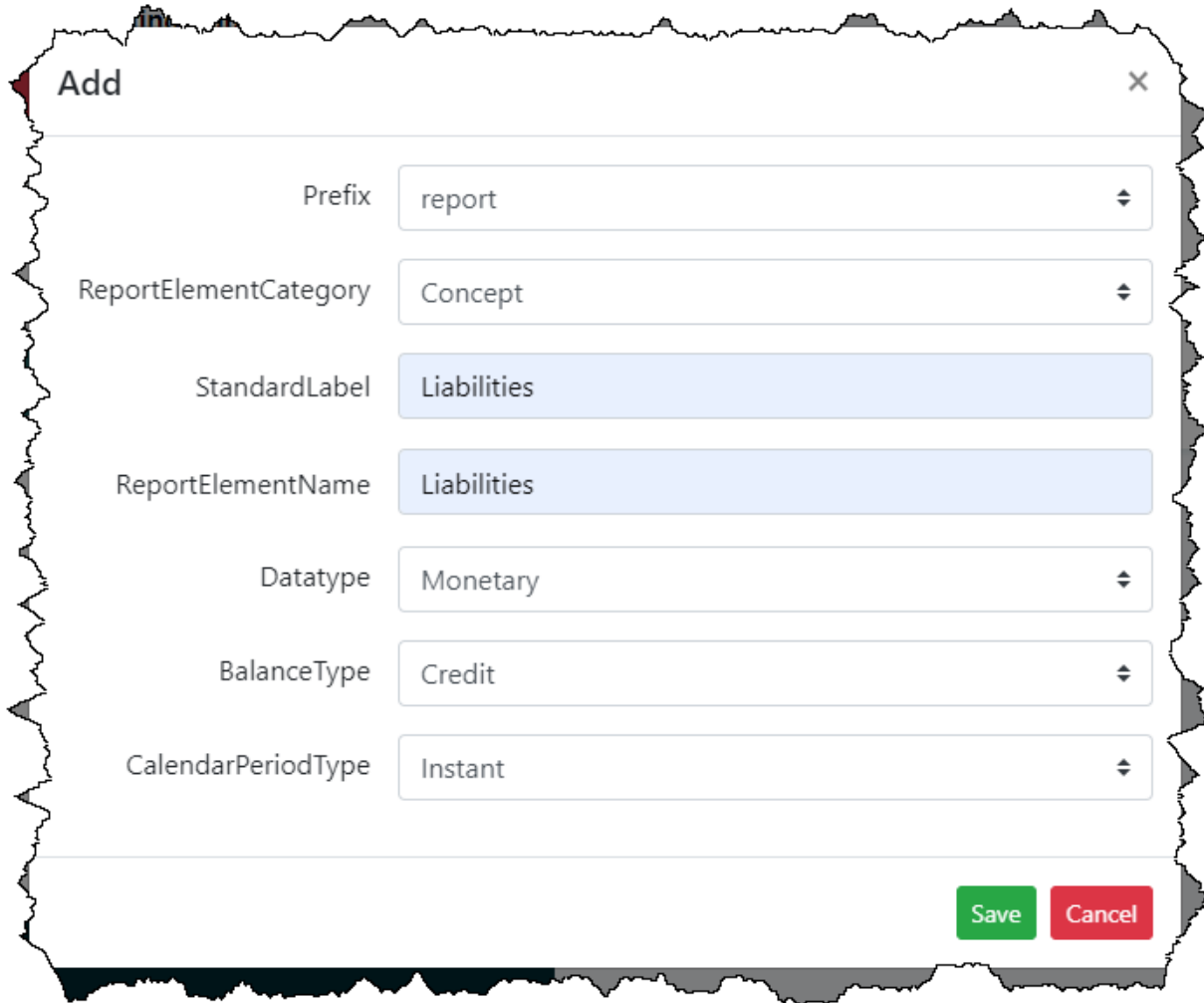
The image shows a screenshot of a software interface with a torn paper effect. It features a dialog box titled "Add" with a close button (X) in the top right corner. The dialog contains seven labeled input fields, each with a dropdown arrow on the right:

- Prefix:** report
- ReportElementCategory:** Concept
- StandardLabel:** Assets
- ReportElementName:** Assets
- Datatype:** Monetary
- BalanceType:** Debit
- CalendarPeriodType:** Instant

At the bottom right of the dialog, there are two buttons: a green "Save" button and a red "Cancel" button.

The second term is “Liabilities”. That term will be defined in our local report model so we will use the prefix “report”. This term is a Concept that has a data type of “Monetary” is a “Credit” and is an “Instant” because it is as of a specific point in time. The name and the standard label in this case is the same as the name which is “Liabilities” because our default language was set to English when we set up our base information.

And so, you would enter the term information for assets as follows:

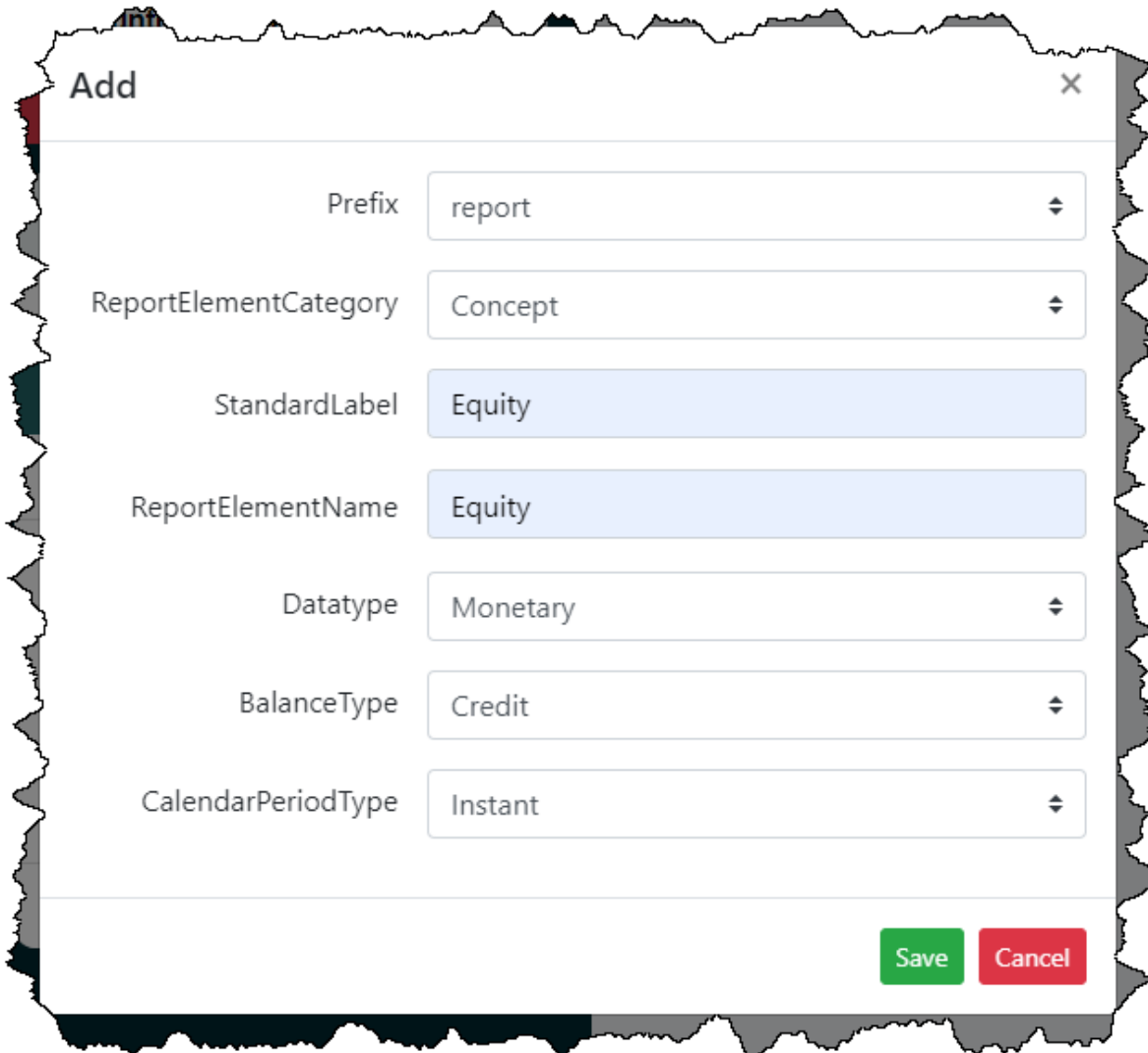


The image shows a screenshot of a software interface with a torn paper effect. It features a dialog box titled "Add" with a close button (X) in the top right corner. The dialog contains several labeled input fields, each with a dropdown menu. The fields and their values are: "Prefix" set to "report", "ReportElementCategory" set to "Concept", "StandardLabel" set to "Liabilities", "ReportElementName" set to "Liabilities", "Datatype" set to "Monetary", "BalanceType" set to "Credit", and "CalendarPeriodType" set to "Instant". At the bottom right of the dialog are two buttons: a green "Save" button and a red "Cancel" button.

Field	Value
Prefix	report
ReportElementCategory	Concept
StandardLabel	Liabilities
ReportElementName	Liabilities
Datatype	Monetary
BalanceType	Credit
CalendarPeriodType	Instant

The third term is “Equity”. That term will be defined in our local report model so we will use the prefix “report”. This term is a Concept that has a data type of “Monetary” is a “Credit” and is an “Instant” because it is as of a specific point in time. The name and the standard label in this case is the same as the name which is “Equity” because our default language was set to English when we set up our base information.

And so, you would enter the term information for assets as follows:



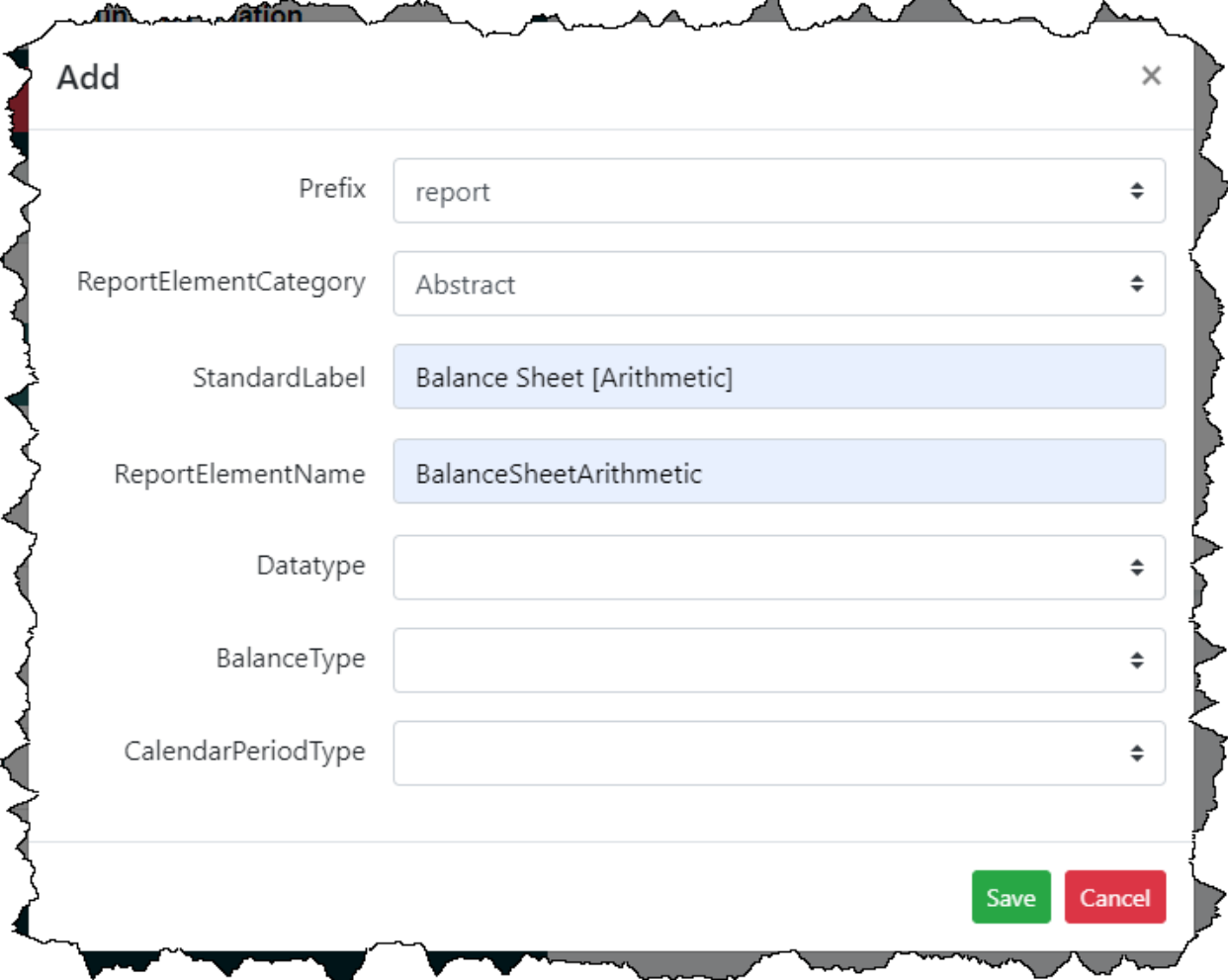
The image shows a screenshot of a software interface with a torn paper effect. It features a dialog box titled "Add" with a close button (X) in the top right corner. The dialog box contains several input fields for defining a new report element:

- Prefix:** A dropdown menu with "report" selected.
- ReportElementCategory:** A dropdown menu with "Concept" selected.
- StandardLabel:** A text input field containing "Equity".
- ReportElementName:** A text input field containing "Equity".
- Datatype:** A dropdown menu with "Monetary" selected.
- BalanceType:** A dropdown menu with "Credit" selected.
- CalendarPeriodType:** A dropdown menu with "Instant" selected.

At the bottom right of the dialog box, there are two buttons: a green "Save" button and a red "Cancel" button.

Our fourth term is a little different than the first three. This fourth term will make more sense in a bit, for now let's just create it and you will see what it is for when we get to it. We are creating this fourth term in our same local taxonomy so the prefix is still "report". The term category is going to be what is known as "Abstract". An abstract term is never actually used to report facts, it is simply used within the report model.

The label of the term will be "Balance Sheet [Arithmetic]". The name will be "BalanceSheetArithmetic". Because this term is abstract, it has no Data type, Balance type, or Calendar Period type so those will be blank.



The image shows a screenshot of a software interface with a torn-edge effect. It features a dialog box titled "Add" with a close button (X) in the top right corner. The dialog contains the following fields:

- Prefix:** A dropdown menu with "report" selected.
- ReportElementCategory:** A dropdown menu with "Abstract" selected.
- StandardLabel:** A text input field containing "Balance Sheet [Arithmetic]".
- ReportElementName:** A text input field containing "BalanceSheetArithmetic".
- Datatype:** A dropdown menu that is currently blank.
- BalanceType:** A dropdown menu that is currently blank.
- CalendarPeriodType:** A dropdown menu that is currently blank.

At the bottom right of the dialog, there are two buttons: a green "Save" button and a red "Cancel" button.

Press the green "Save" button.

Once back at the main data entry form you see the four terms that you have created.

The screenshot shows the Luca Financial Reporting Schemes dashboard. On the left is a sidebar with navigation options: Select report (Accounting Equation), Create new report, Enter information (manually) with sub-options like Base information, Terms, Labels, References, Structures, Associations, Rules, and Facts, and Generate report model (XBRL). The main area displays a table of terms with columns: Category, Prefix, StandardLabel, ReportElementName, Datatype, BalanceType, CalendarPeriodType, and Actions. The table contains four rows of data. Below the table are pagination controls showing 'Per page 10' and a page indicator '1'.

Category	Prefix	StandardLabel	ReportElementName	Datatype	BalanceType	CalendarPeriodType	Actions
Concept	report	Assets	Assets	Monetary	Debit	Instant	[Edit] [Delete]
Concept	report	Liabilities	Liabilities	Monetary	Credit	Instant	[Edit] [Delete]
Concept	report	Equity	Equity	Monetary	Credit	Instant	[Edit] [Delete]
Abstract	report	Balance Sheet [Arithmetic]	BalanceSheetArithmetic				[Edit] [Delete]

Note a couple of important things. If you press the “Toggle Filter” button you can search for or filter your list of terms.

The screenshot shows the 'Toggle Filter' dialog box. It has a 'Filter On' section with checkboxes for Category, Prefix, StandardLabel, ReportElementName, Datatype, BalanceType, and CalendarPeriodType. Below these is the instruction 'Leave all unchecked to filter on all data'. At the bottom, there is a 'Filter' input field with the placeholder text 'Type to Search' and a 'Clear' button.

Each form has a similar filter and search mechanism.

You can go back and edit a term or delete a term by pressing one of the Actions that you see towards the right of the form.

Now let's enter some additional labels to learn about labels. Press the Labels tab on the left and you can enter labels.

The screenshot shows the Luca Financial Reporting Schemes web application. The top navigation bar includes the Luca logo, "Financial Reporting Schemes", "Who is Luca?", a user profile icon, the email "digitalfinancialreporting@gmail.com", and a "Logout" button. On the left sidebar, under "Select report:", "Accounting Equation" is selected. Below this is a "Create new report" button and a list of tabs: "Enter information (manually)", "Base information", "Report elements", "Labels" (which is highlighted), "References", "Structures", "Associations", "Rules (in progress)", and "Facts (in progress)". The main content area shows a "Toggle Filter" button, an "Add" button, and a table header with columns: "ReportElementName", "Language", "LabelRole", "Label", and "Actions". The table body is empty with the message "There are no records to show". Below the table is a "Per page" dropdown set to "10" and pagination controls showing "1" of 1 pages.

Click on "Add" and the labels form appears.

The screenshot shows the "Add" form for creating a new label. The form has a title "Add" and a close button (X). It contains four input fields: "ReportElementName", "Language", "LabelRole", and "Label". The "Label" field has a placeholder text "Label". At the bottom right of the form are two buttons: "Save" (green) and "Cancel" (red).

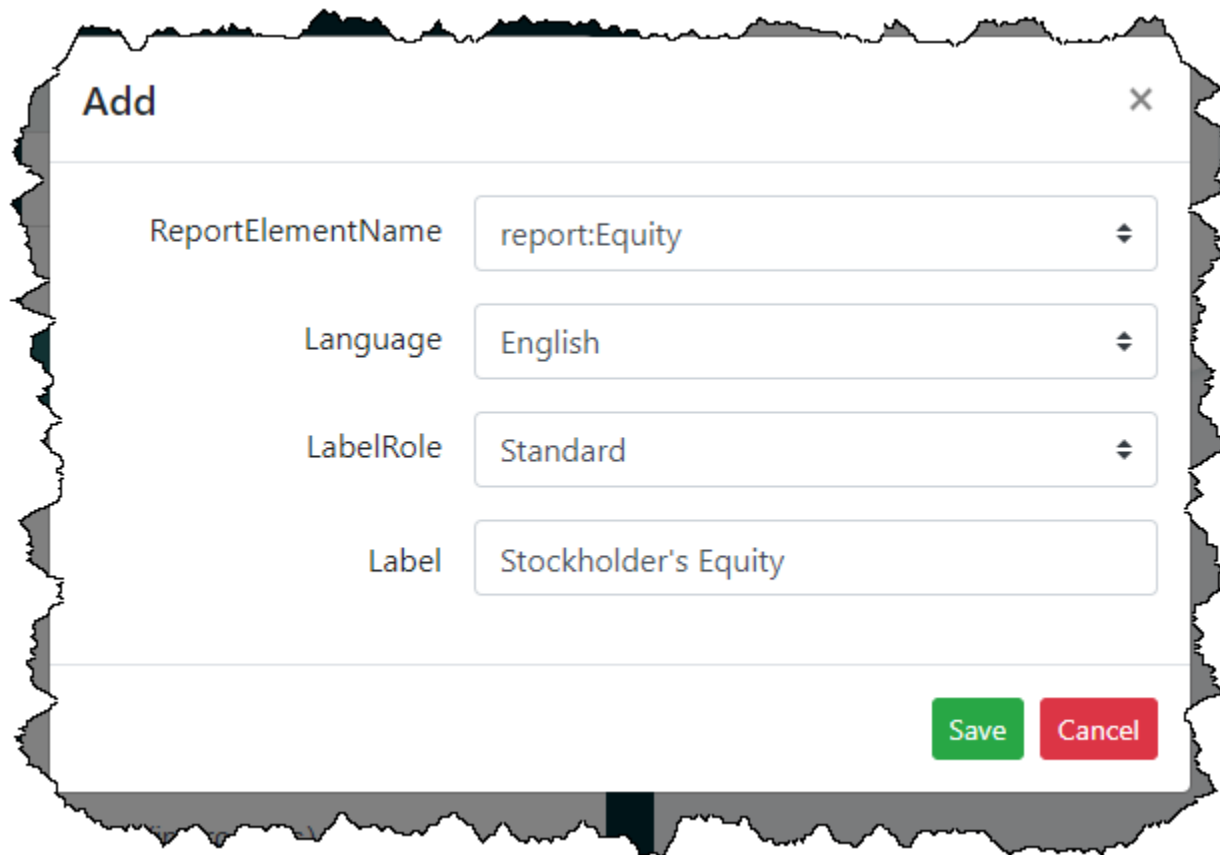
We are going to point out two reasons you might want to enter more labels. First, notice that when you entered the terms you entered a "Standard Label" for each term. That is because every term is required to contain a standard label. So every term will always have at least one label in any report model.

But you can add additional labels if you feel they might be necessary. The first reason you might want to enter another label is because you might feel others have a different preference for the label, they use for a term.

The accounting equation provides a good example of this. Notice that the accounting equation uses the terms “Equity” and “Stockholder’s Equity” and “Shareholder’s Equity” interchangeably. All three refer to the same idea which is “Equity”, but there seems to be three different preferred labels that could be used for that one term “Equity”: Equity, Stockholder’s Equity, and Shareholder’s Equity.

So, lets enter those two additional labels that we don’t have yet:

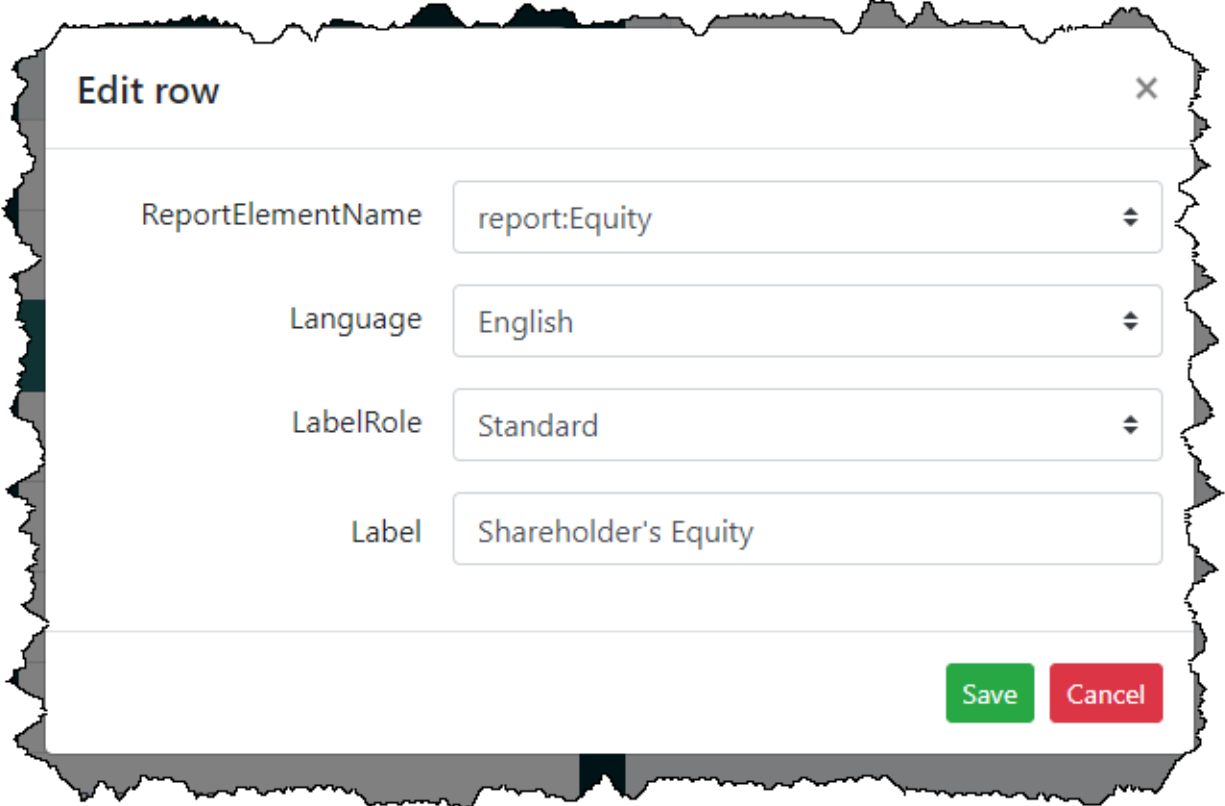
Stockholder’s Equity



The image shows a screenshot of a software interface with a dialog box titled "Add". The dialog box has a close button (X) in the top right corner. It contains four input fields, each with a label to its left: "ReportElementName" with the value "report:Equity", "Language" with the value "English", "LabelRole" with the value "Standard", and "Label" with the value "Stockholder's Equity". At the bottom right of the dialog box, there are two buttons: a green "Save" button and a red "Cancel" button. The entire dialog box is set against a background that looks like a torn piece of paper.

Field	Value
ReportElementName	report:Equity
Language	English
LabelRole	Standard
Label	Stockholder's Equity

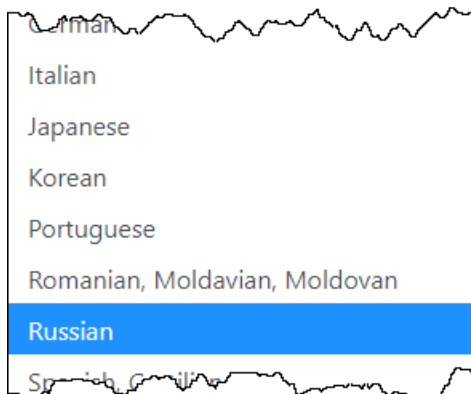
Shareholder's Equity:



The image shows a screenshot of a software interface with a torn-paper border. It features a dialog box titled "Edit row" with a close button (X) in the top right corner. Inside the dialog, there are four labeled input fields: "ReportElementName" with a dropdown menu showing "report:Equity", "Language" with a dropdown menu showing "English", "LabelRole" with a dropdown menu showing "Standard", and "Label" with a text input field containing "Shareholder's Equity". At the bottom right of the dialog, there are two buttons: a green "Save" button and a red "Cancel" button.

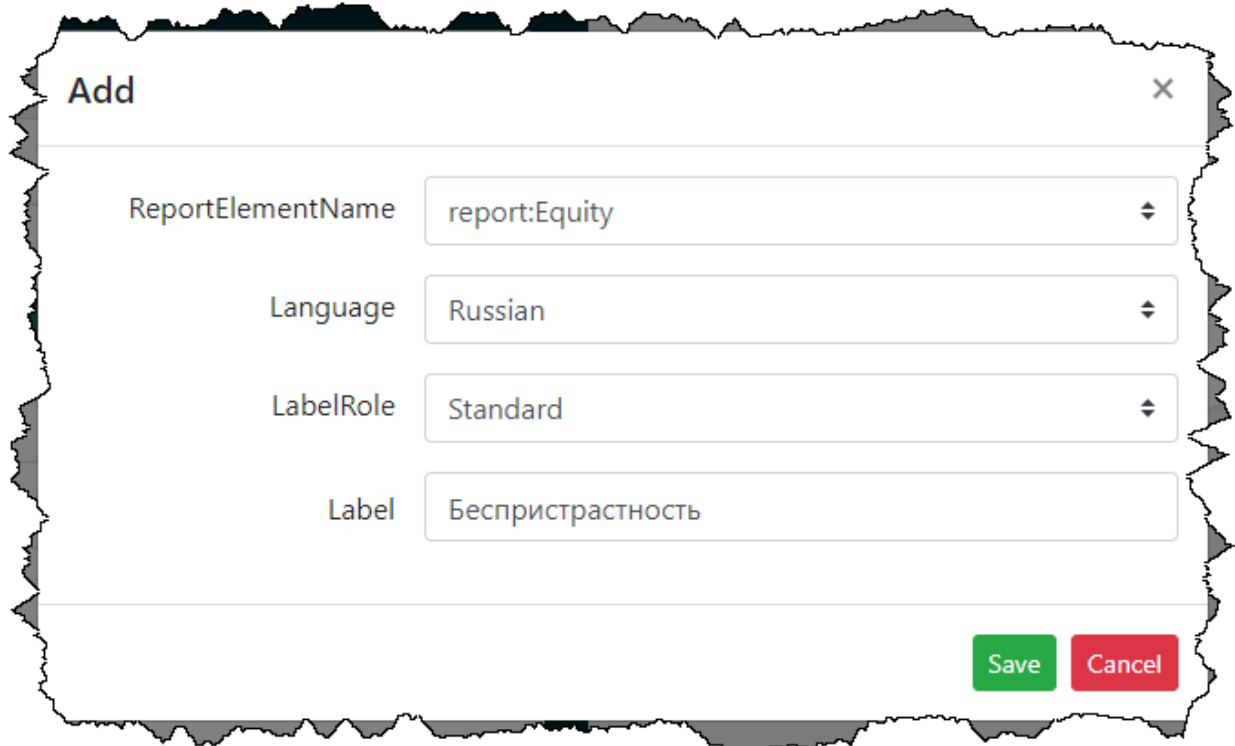
Another reason you might want to enter additional labels is because you want to users of other languages to understand a report. To do that, you simply provide a label in a different language and indicate the language that the label is for.

So, let's enter a Russian label for the term "Equity" that we entered into our financial report model. The only thing that we need to do that is different is select the language from the list of languages:



The image shows a screenshot of a language selection dropdown menu with a torn-paper border. The menu is open, displaying a list of languages: German, Italian, Japanese, Korean, Portuguese, Romanian, Moldavian, Moldovan, Russian (which is highlighted in blue), and Spanish, Catalan.

This is the information you need to enter to provide a Russian label for the term Equity.



The image shows a screenshot of a software interface with a torn-paper border. It features a dialog box titled "Add" with a close button (X) in the top right corner. Inside the dialog, there are four labeled input fields: "ReportElementName" with the value "report:Equity", "Language" with the value "Russian", "LabelRole" with the value "Standard", and "Label" with the value "Беспристрастность". At the bottom right of the dialog, there are two buttons: a green "Save" button and a red "Cancel" button.

Field	Value
ReportElementName	report:Equity
Language	Russian
LabelRole	Standard
Label	Беспристрастность

A final reason that you might want to add additional labels is to enter documentation that describes a term. To do that all you need to do is select the "Documentation" LabelRole from the combo box when you enter your information. We will not bother you with this specific example, this should be straight forward to you by now.

Step 3: Enter references.

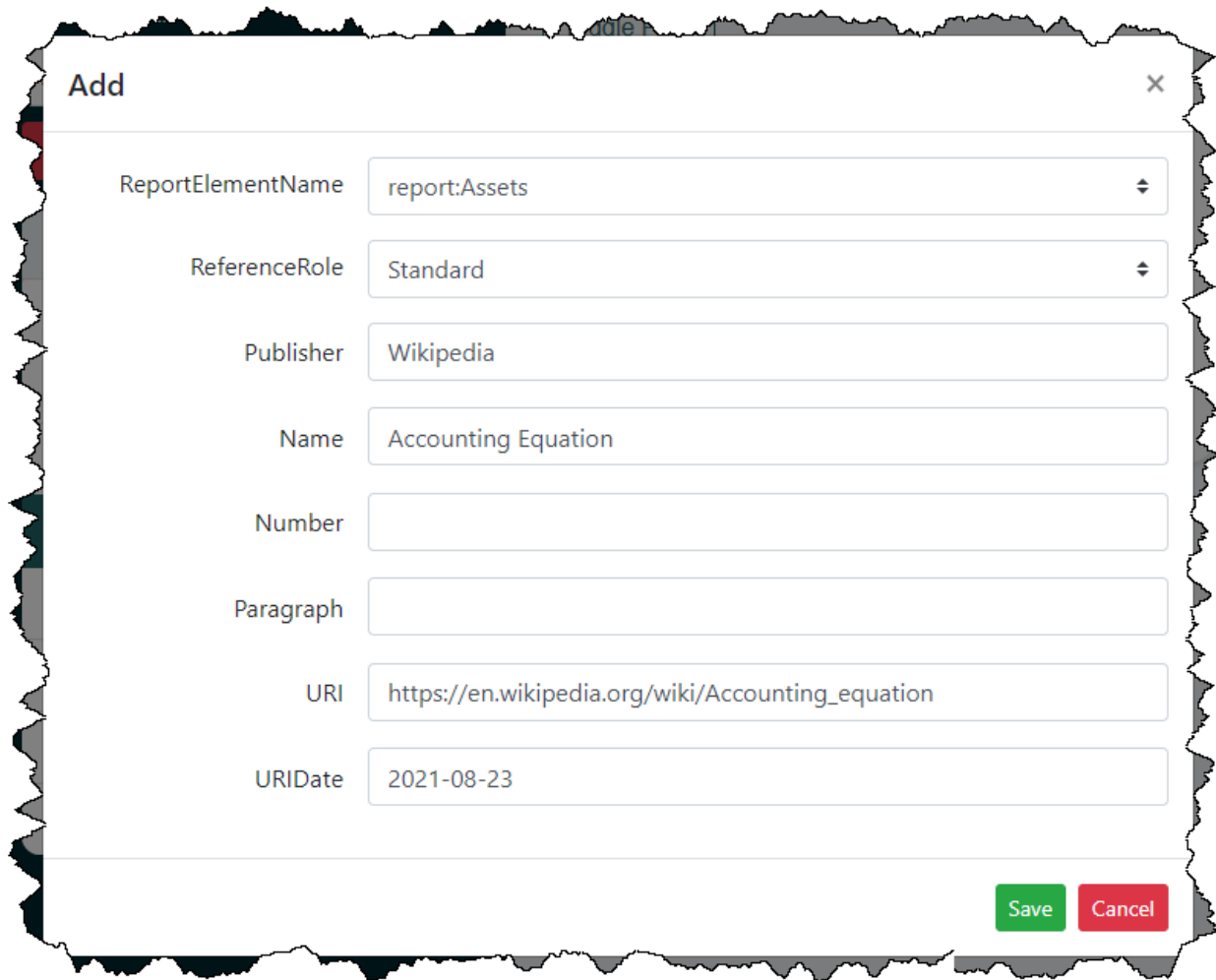
Another way of describing terms is to reference a term to authoritative literature or nonauthoritative interpretations of accounting standards. You can do this by entering a reference. Select the “References” item on the left and you can enter references.

The screenshot shows the Luca Financial Reporting Schemes web application. The top navigation bar includes the Luca logo, "Financial Reporting Schemes", "Who is Luca?", a user profile icon, the email "digitalfinancialreporting@gmail.com", and a "Logout" button. On the left sidebar, under "Select report:", "Accounting Equation" is selected. Below this are buttons for "Delete" (trash icon) and "Create new report". A section titled "Enter information (manually)" contains a list of options: "Base information", "Report elements", "Labels", "References" (highlighted in green), "Structures", "Associations", "Rules (in progress)", and "Facts (in progress)". The main content area has a "Toggle Filter" button and a "+ Add" button. Below these is a table header with columns: "ReportElementName", "ReferenceRole", "Publisher", "Name", "Number", "Paragraph", "URI", "URI Date", and "Actions". The table body is empty, displaying "There are no records to show". At the bottom of the table area, there is a "Per page" dropdown set to "10" and a pagination control showing "1" of 1 pages.

For example, you might add references for the terms Assets, Liabilities, and Equity to the Wikipedia page that describes those terms you are using.

Below you see a reference entered for the term Assets:

Select “Add” and the references form is shown:



The image shows a screenshot of a software interface with a torn paper effect. A dialog box titled "Add" is open, featuring a close button (X) in the top right corner. The dialog contains several input fields for adding a reference:

- ReportElementName:** A dropdown menu with "report:Assets" selected.
- ReferenceRole:** A dropdown menu with "Standard" selected.
- Publisher:** A text input field containing "Wikipedia".
- Name:** A text input field containing "Accounting Equation".
- Number:** An empty text input field.
- Paragraph:** An empty text input field.
- URI:** A text input field containing the URL "https://en.wikipedia.org/wiki/Accounting_equation".
- URIDate:** A text input field containing the date "2021-08-23".

At the bottom right of the dialog, there are two buttons: a green "Save" button and a red "Cancel" button.

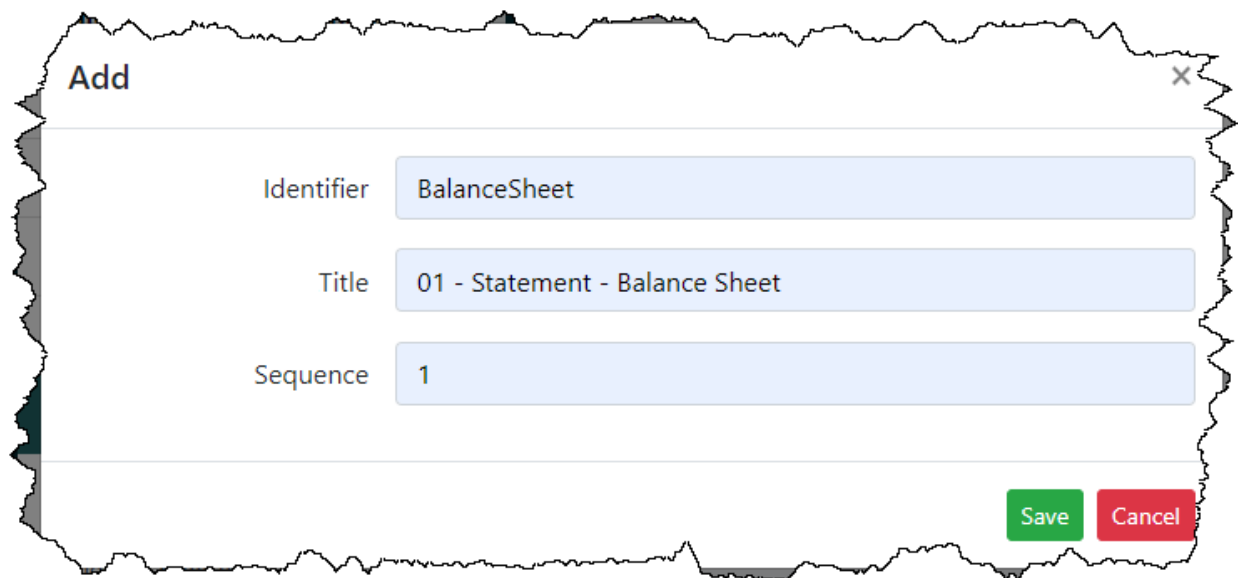
Step 4: Enter structure information.

We need to be able to organize terms into structures such as a balance sheet, income statement, a policy, or a detailed disclosure in the notes. To do that, we need to create structures. To do this, select the “Structures” tab on the main form. Then press the “Add” button.

The screenshot shows the Luca Financial Reporting Schemes interface. The top navigation bar includes the Luca logo, 'Financial Reporting Schemes', 'Who is Luca?', a user profile icon, the email 'digitalfinancialreporting@gmail.com', and a 'Logout' button. On the left sidebar, under 'Select report:', 'Accounting Equation' is selected. Below this is a '+ Create new report' button. The 'Enter information (manually)' section lists several tabs: 'Base information', 'Report elements', 'Labels', 'References', 'Structures' (which is highlighted), 'Associations', 'Rules (in progress)', and 'Facts (in progress)'. The main content area shows a 'Toggle Filter' button and a '+ Add' button. Below these is a table with columns: 'NetworkIdentifier', 'NetworkTitle', 'Sequence', and 'Actions'. The table is currently empty, displaying 'There are no records to show'. At the bottom of the table area, there is a 'Per page' dropdown set to '10' and a pagination control showing '1' of 1 pages.

The screenshot shows a modal form titled 'Add' with a close button (X) in the top right corner. The form contains three input fields: 'Identifier', 'Title', and 'Sequence'. At the bottom right of the form are two buttons: 'Save' (green) and 'Cancel' (red).

The accounting equation has only one structure, a balance sheet. Here is the information you should enter in Luca to define this one structure.

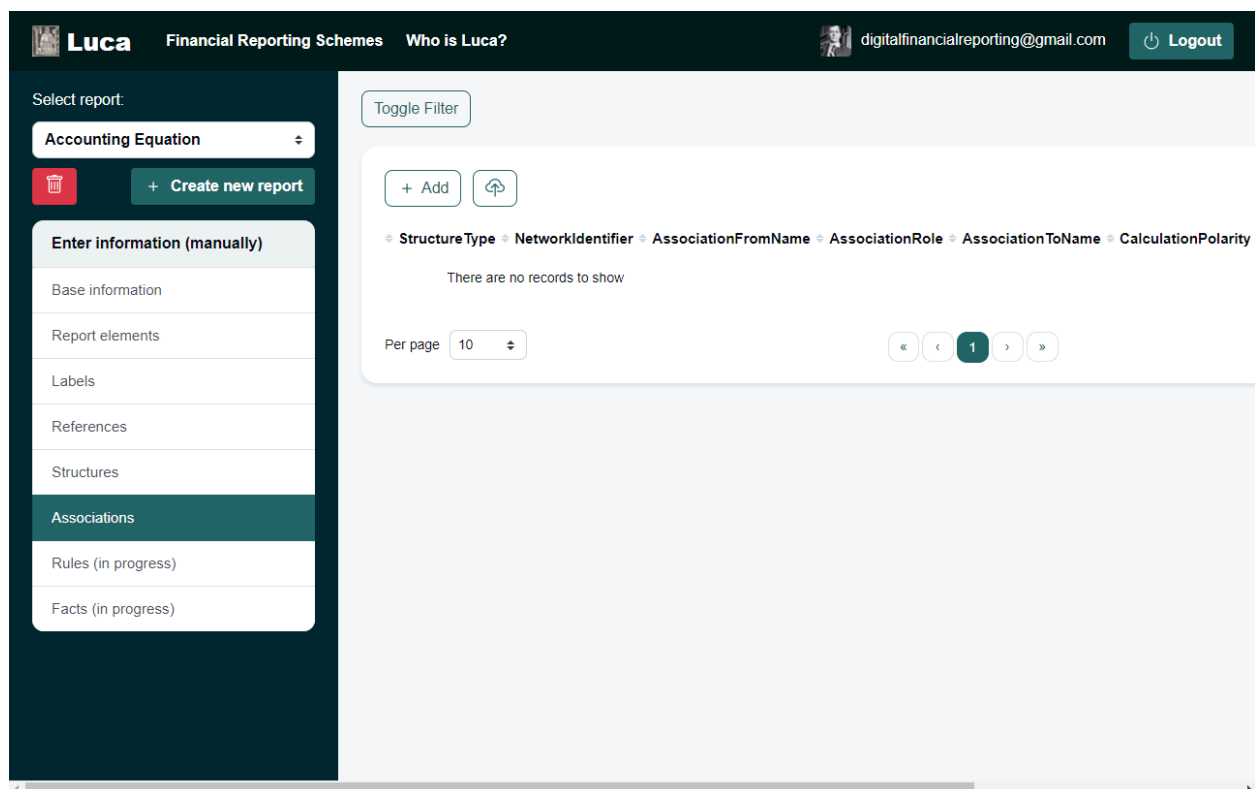


The 'Add' dialog box is shown with a torn paper border. It contains three input fields: 'Identifier' with the value 'BalanceSheet', 'Title' with the value '01 - Statement - Balance Sheet', and 'Sequence' with the value '1'. At the bottom right, there are two buttons: a green 'Save' button and a red 'Cancel' button.

Step 5: Enter associations.

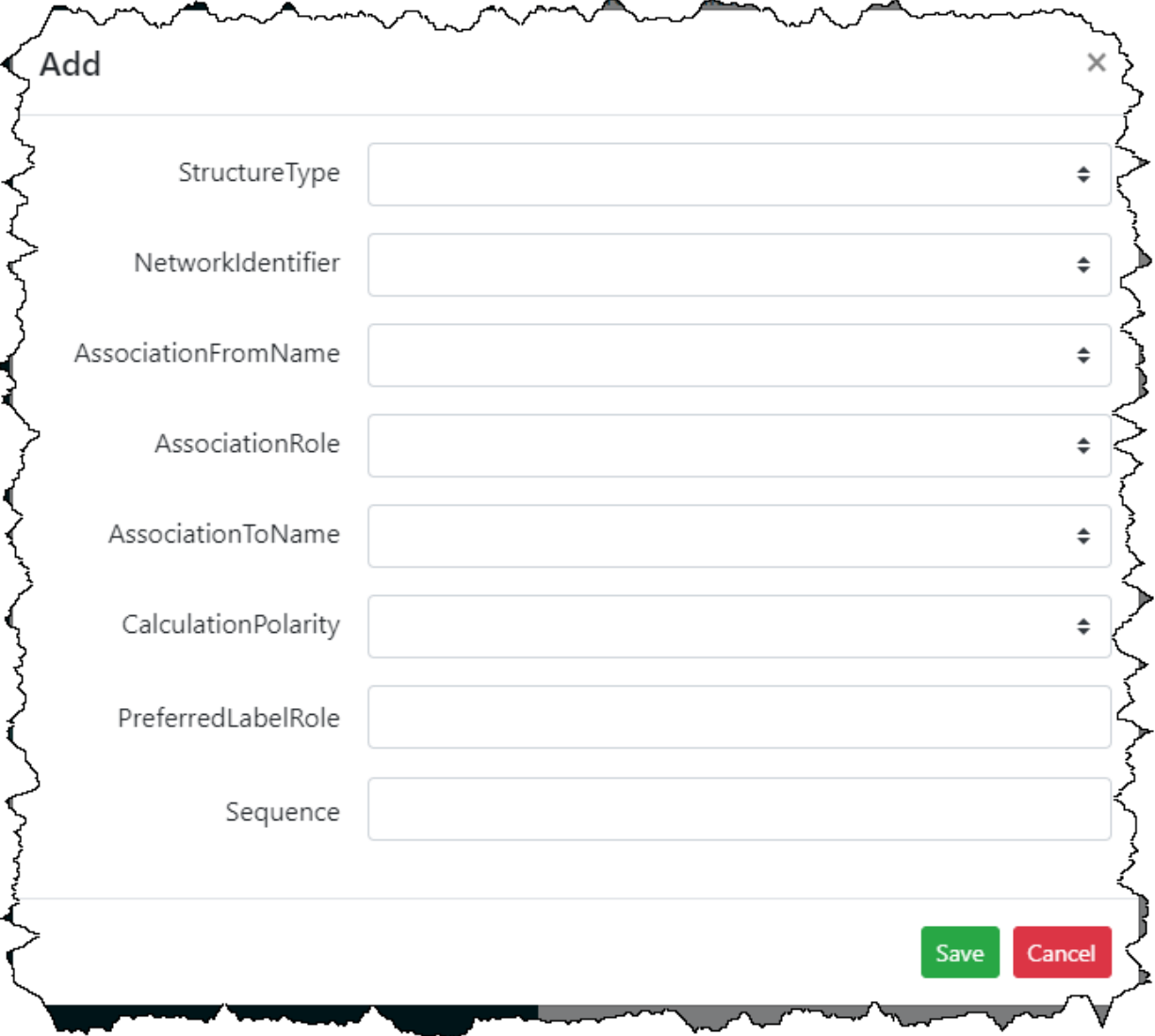
Within a structure, associations are defined between terms. An example of an association is to say that Assets, Liabilities, and Equity relate to the BalanceSheet structure.

To enter associations, select the associations tab on the left:



The screenshot shows the Luca Financial Reporting Schemes interface. The top navigation bar includes the Luca logo, 'Financial Reporting Schemes', 'Who is Luca?', a user profile icon, the email 'digitalfinancialreporting@gmail.com', and a 'Logout' button. On the left sidebar, under 'Select report:', 'Accounting Equation' is selected. Below this is a '+ Create new report' button. The sidebar menu includes 'Enter information (manually)' with sub-items: 'Base information', 'Report elements', 'Labels', 'References', 'Structures', 'Associations' (highlighted), 'Rules (in progress)', and 'Facts (in progress)'. The main content area has a 'Toggle Filter' button and '+ Add' and 'Upload' buttons. Below these are filter tabs: 'StructureType', 'NetworkIdentifier', 'AssociationFromName', 'AssociationRole', 'AssociationToName', and 'CalculationPolarity'. A message states 'There are no records to show'. At the bottom, there is a 'Per page' dropdown set to '10' and a pagination control showing '1'.

Now, we are intentionally going to do this the hard way in order to help you understand how associations work. Press the “Add” button and you see the form to add structures:

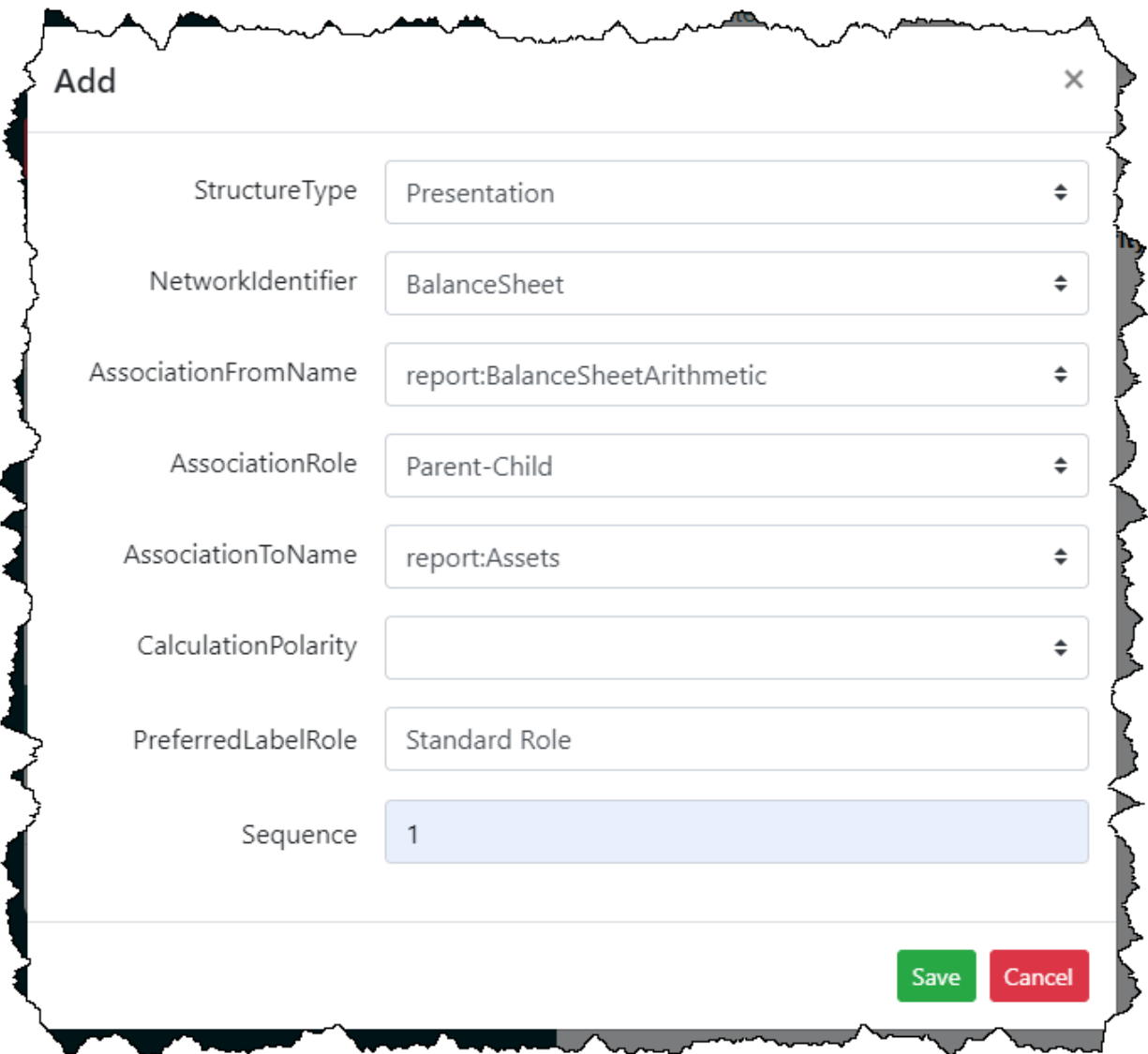


The image shows a screenshot of a software interface with a dialog box titled "Add". The dialog box has a close button (X) in the top right corner. Inside the dialog, there are seven input fields, each with a label and a dropdown arrow on the right side. The labels are: "StructureType", "NetworkIdentifier", "AssociationFromName", "AssociationRole", "AssociationToName", "CalculationPolarity", and "PreferredLabelRole". The "Sequence" field is a text input without a dropdown arrow. At the bottom right of the dialog, there are two buttons: "Save" (green) and "Cancel" (red).

Now, this might look a bit complicated, but I assure you that (a) going through entering associations this painful and perhaps scary way has benefit and (b) professional accountants will not generally be using this approach to entering structures. This is more to help software engineers understand some details.

We want to create a handful of associations for the structure balance sheet in order to define the relations that exist on that balance sheet for the accounting equation information. Effectively, what we want to do is state that Assets, Liabilities, and Equity are part of the balance sheet. To do that, we enter the following four rows of associations:

All of our associations will have the structure type of “Presentation” because it defines where information will be displayed in a rendering. The identifier of the structure will be “BalanceSheet”. The parent of the association will be the abstract element we defined “report:BalanceSheetAbstract”. The association role will be “Parent-Child” because all XBRL presentation relations are parent-child relations. The term being associational to that first from element is “report:Assets”. Calculation polarity is not applicable here. The preferred label role to be used to show the association will be the standard label of the terms used. This is the first association in this structure, for this identifier.



StructureType	Presentation
NetworkIdentifier	BalanceSheet
AssociationFromName	report:BalanceSheetArithmetic
AssociationRole	Parent-Child
AssociationToName	report:Assets
CalculationPolarity	
PreferredLabelRole	Standard Role
Sequence	1

Save Cancel

This same type of association is created for Liabilities and for Equity:

Add

StructureType

Presentation

NetworkIdentifier

BalanceSheet

AssociationFromName

report:BalanceSheetArithmetic

AssociationRole

Parent-Child

AssociationToName

report:Liabilities

CalculationPolarity

PreferredLabelRole

Standard Role

Sequence

2

Save

Cancel

Add

StructureType

Presentation

NetworkIdentifier

BalanceSheet

AssociationFromName

report:BalanceSheetArithmetic

AssociationRole

Parent-Child

AssociationToName

report:Equity

CalculationPolarity

PreferredLabelRole

Standard Role

Sequence

3

Save

Cancel

That is all there is to defining associations that we want to cover for the time being. Again, there will be better interfaces that will be provided for defining these associations, likely a tree control or an interface where associations will be created directly within a human readable rendering.

Step 6: Enter rules. (work in progress)

Rules are used to make sure that any facts are provided are consistent with permissible and expected mathematical relations between terms. To enter rules, we select the “Rules” tab from the main form:

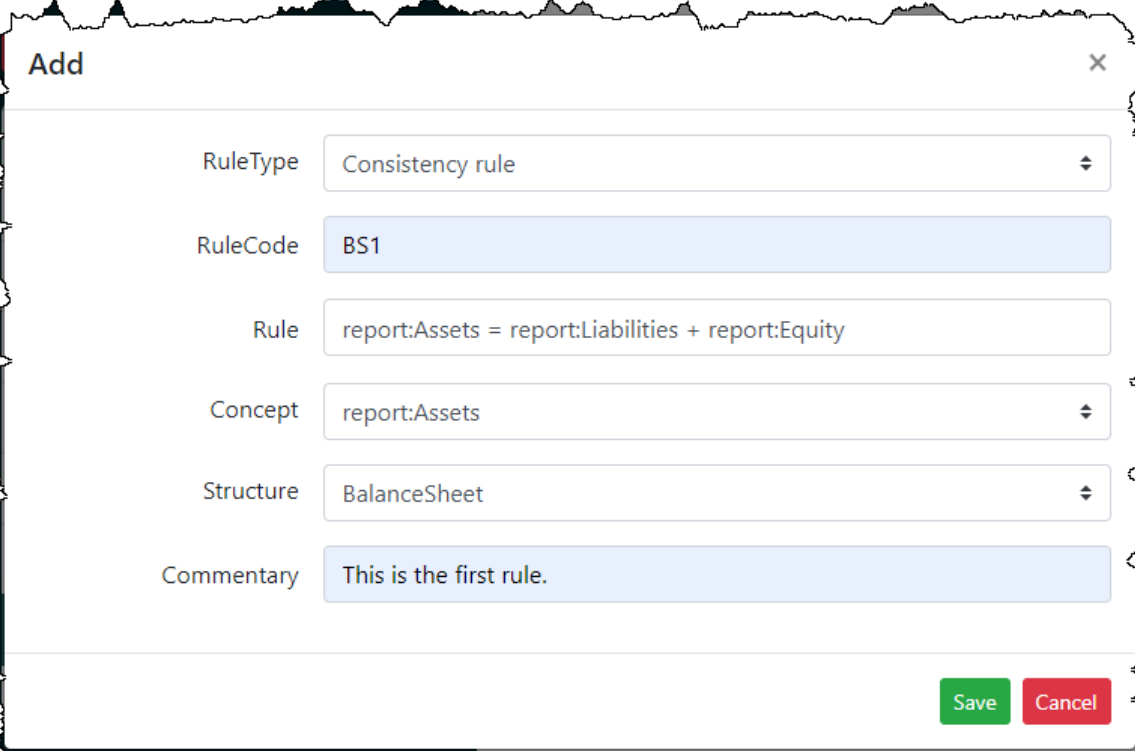
The screenshot displays the Luca Financial Reporting Schemes web application. The top navigation bar includes the Luca logo, 'Financial Reporting Schemes', 'Who is Luca?', a user profile icon, the email 'digitalfinancialreporting@gmail.com', and a 'Logout' button. On the left sidebar, under 'Select report:', 'Accounting Equation' is selected. Below this is a '+ Create new report' button and a list of options: 'Enter information (manually)', 'Base information', 'Report elements', 'Labels', 'References', 'Structures', 'Associations', 'Rules (in progress)', and 'Facts (in progress)'. The 'Rules (in progress)' option is highlighted. The main content area features a 'Toggle Filter' button, '+ Add' and '+ Import' buttons, and a table with columns: 'Rule type', 'Rule code', 'Rule', 'Concept', 'Structure', 'Commentary', and 'Actions'. The table is currently empty, displaying 'There are no records to show'. At the bottom of the table area, there is a 'Per page' dropdown set to '10' and a pagination control showing '1'.

Rule entry forms are different based on the pattern of the rule that you have selected to enter. The accounting equation has one rule, “Assets = Liabilities + Equity”. This is a consistency rule pattern which tests to see if a value or values on the LEFT side of an equation is equal to the value or values of the RIGHT side of the equation. In essence, this is a simple mathematical assertion.

We will focus on consistency rules only in this accounting equation example, we will get to the other rule patterns in the additional examples that will be provided.

Press the “Add” button to enter a rule using the rules form:

This is what the rule form looks like after the accounting equation rule has been entered:



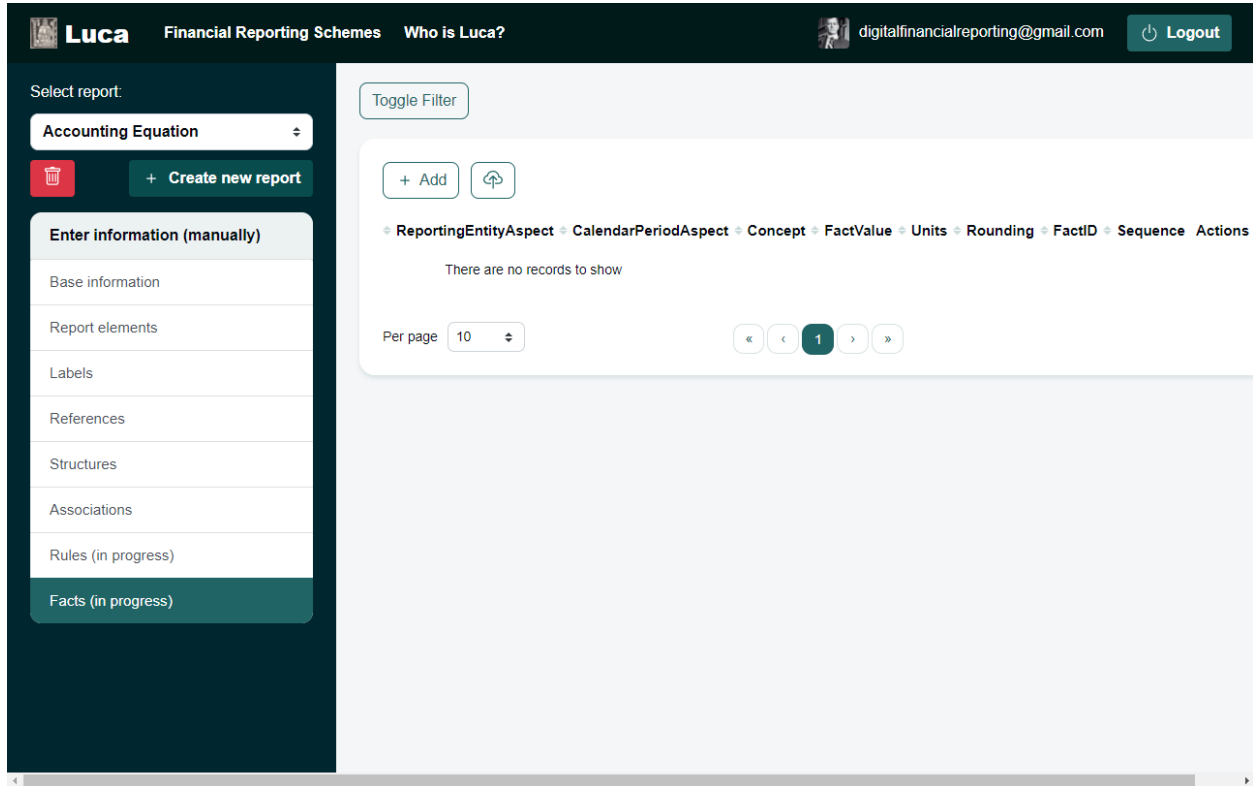
The image shows a screenshot of a web application window titled "Add" with a close button (X) in the top right corner. The window contains a form with the following fields:

- RuleType**: A dropdown menu with "Consistency rule" selected.
- RuleCode**: A text input field containing "BS1".
- Rule**: A text input field containing the accounting equation: $\text{report:Assets} = \text{report:Liabilities} + \text{report:Equity}$.
- Concept**: A dropdown menu with "report:Assets" selected.
- Structure**: A dropdown menu with "BalanceSheet" selected.
- Commentary**: A text input field containing "This is the first rule."

At the bottom right of the form, there are two buttons: a green "Save" button and a red "Cancel" button.

Step 7: Enter facts.

After we have created our financial report model, we can create a report which is effectively the facts that are reported per that financial report model. To enter facts, simply select the “Facts” tab from the main menu:



To enter facts using the facts entry form, simply press the “Add” button.

Add

ReportingEntityAspect
Example: GH259400TOMPUOLS65II | http://standards.iso.org/iso/17442

CalendarPeriodAspect
INSTANT such as 2020-12-31 or DURATION such as 2020-01-01 | 2020-12-31

Concept

FactValue

Units

Rounding

FactID

Sequence

Save Cancel

For the accounting equation we are going to create only three facts but this is plenty to give you an idea of how facts work and how facts interact with the financial report model.

The three facts we use in the accounting equation is Assets which will have a value of 1000; Liabilities with a value of 500; and Equity with a value of 500. All fact values will be reported using US Dollars. Don't worry about all the other details that you see, simply enter the information as it is shown.

The reporting entity identifier used will be "259400LGXW3K0GDAG361" which is an ISO Standard LEI⁴ or Legal Entity Identifier that has the following identifier scheme: <http://standards.iso.org/iso/17442>

Here are the three facts you should enter.

⁴ GLIEF, LEI, <https://www.gleif.org/en/about-lei/iso-17442-the-lei-code-structure/>

Edit row

ReportingEntityAspect

259400LGXW3K0GDAG361 | <http://standards.iso.org/iso/17442>

CalendarPeriodAspect

2021-12-31

Concept

report:Assets

FactValue

1000

Units

United States Dollar

Rounding

INF

FactID

ID01

Sequence

1

Save

Cancel

Edit row

ReportingEntityAspect

259400LGXW3K0GDAG361 | <http://standards.iso.org/iso/17442>

CalendarPeriodAspect

2021-12-31

Concept

report:Liabilities

FactValue

500

Units

United States Dollar

Rounding

INF

FactID

ID02

Sequence

2

Save

Cancel

Edit row

ReportingEntityAspect 259400LGXW3K0GDAG361 | <http://standards.iso.org/iso/17442>

CalendarPeriodAspect 2021-12-31

Concept report:Equity

FactValue 500

Units United States Dollar

Rounding INF

FactID ID03

Sequence 3

Save Cancel

Step 8: Generate your XBRL taxonomy schema, XBRL linkbases, and XBRL instance.

Again, I want to remind you that we are focusing on the mechanical steps of importing the set of files you need in order to generate a report model and a report. Don't worry if you don't understand everything that is in those Excel spreadsheets yet. We will get to that.

You can go explore what you have entered by selecting any of the forms on the left and then the edit icon on the right.

Next, we want to generate the XBRL files. To do that, press the green "Generate report model (XBRL)" on the lower left hand side of the main menu:

When you press the green “Generate report” a form appears which allows you to generate each of the XBRL files:

Press the “Download All” button at the bottom LEFT of the form to download a ZIP archive that contains all XBRL files generated. Alternatively on the RIGHT you can download each file individually.

Step 9: Verify the information output into that XBRL format.

Several XBRL files will be generated that contain the information that you entered into the Luca application. You can open these files using any XBRL tool. Below we show the XBRL taxonomy schema opened in Arelle⁵ which is a free open-source tool for working with XBRL.

Label	Name	ID	Abstract	Subs Grp	Type	Period Type	Balance
Assets	Assets	ae_Assets	false	xbri:item	xbri:monetaryItemType	instant	debit
Balance Sheet [Set]	BalanceSheetSet	ae_BalanceSheetSet	true	xbri:item	xbri:stringItemType	duration	
Equity	Equity	ae_Equity	false	xbri:item	xbri:monetaryItemType	instant	credit
Liabilities	Liabilities	ae_Liabilities	false	xbri:item	xbri:monetaryItemType	instant	credit

Step 10: Verify your XBRL files.

Finally, we will want to verify that the XBRL taxonomy that we created was consistent with the XBRL technical specification. Luca does not perform XBRL validation. You can use any off-the-shelf XBRL processor to verify that your XBRL is correct. Below you see the validation results provided by XBRL Cloud:

⁵ Arelle.org, Arelle Download, <https://arelle.org/arelle/>

XBRL Validation Report

Severity	Count
Error	0
Warning	0
Inconsistency	0
Best Practice	0
Information	0
Total	0

No Errors!

UBmatrix XBRL Processing Engine⁶ is another freely available open source software application for processing XBRL-based reports. Here is the UBmatrix validation results for the business rules which were created:

Business Rules Results

Mon May 03 07:31:29 PDT 2021

XBRL Processor Version:4.0.0.2125

Report name: Detailed Output

Summary

Formulas Compiled	Formula Fired	Assertions Compiled	Assertions Fired	Assertions Satisfied	Assertions Not Satisfied
0	0	1	2	2	0

Assertion Report

Value Assertions

id	satisfied	message
Arithmetic_BS1 (evaluation 1)	satisfied	\$Assets=1000 = (\$Liabilities=500 + \$Equity=500)
Arithmetic_BS1 (evaluation 2)	satisfied	\$Assets=10000 = (\$Liabilities=5000 + \$Equity=5000)

We already mentioned Arelle; here is the fact table of the XBRL-based report which you generated:

⁶ Sourceforge, UBmatrix XBRL processing Engine, <https://sourceforge.net/projects/ubmatrix-xbri/files/UBmatrix%20Processing%20Engine%202.5/2.500/>

Fact Table	Fact List	Presentation	Formulae
Concept		2020-12-31	2021-12-31
01-Balance Sheet			
Balance Sheet [Set]			
Assets		1,000	10,000
Liabilities		0	5,000
Equity		0	5,000

Another tool for working with XBRL-based reports is Pesseract⁷. Pesseract is a working proof of concept which is also freely available.

Below you see the technical perspective of the XBRL taxonomy that you created for the accounting equation:

The screenshot shows the Pesseract application interface. The main window displays a tree view of the taxonomy with '01 - Balance Sheet' expanded, showing 'Assets', 'Liabilities', and 'Equity'. A table below lists the elements with their prefixes, labels, names, element types, data types, balances, and period types. On the right, a 'Properties' panel shows details for the 'Assets' element, including its type, substitution group, period type, balance, abstract status, and prefix.

Prefix	Label	Name	Element Type	Data Type	Balance	Period Type
ae	Assets	Assets	Element	Monetary	debit	instant
ae	Balance Sheet [Set]	BalanceSheetSet	Abstract	String		duration
xbrl:dt	[dimension]Item	dimensionItem	Abstract	String		duration
ae	Equity	Equity	Element	Monetary	credit	instant
xbrl:dt	[hypercube]Item	hypercubeItem	Abstract	String		duration
ae	Liabilities	Liabilities	Element	Monetary	credit	instant

This is what your XBRL instance looks like in Pesseract:

⁷ Pesseract, <http://pesseract.azurewebsites.net/>

Instance (instance.xml) - Pesseract

File Home Options and Preferences Tools View Knowledge Base Debugging Windows Help

Get Started New Open Save XBRL-based general business reports

XBRL Syntax Model Structure To Do List Report Properties Referenced Taxonomies Viewer Application Mode

Report Profile Report Validation Status Properties

Instance (instance.xml) x Taxonomy (ae.xsd)

Components (1)

Network View Component View Block

Filter Type Filter Level Filter Status

Enter text to filter ... Clear

01-Balance Sheet Balance Sheet [Hypercube]

Component Properties

- Network 01-Balance Sheet
- Table Balance Sheet [Hypercube]
- Disclosure disclosures:UncategorizedI...
- Confidence MEDIUM
- Status InProgress

Collections Advanced

Message List Console

Loading was successful: no errors or warnings.

Rendering Model Structure Fact Table Business Rules Structure Business Rules Valid

Component: (Network and Table)

Network 01 - Unknown - Balance Sheet

Table Balance Sheet [Hypercube]

Reporting Entity [Axis] GH259400TOMPUOL56SII <http://standards.iso.org/iso/17442>

Period [Axis] 2019-12-31

Unit [Axis] USD

Drop Column Fields Here

Balance Sheet [Line Items] Fact Value

Balance Sheet [Arithmetic]

Assets	5,000
Liabilities	1,000
Equity	4,000

Agenda State Properties