Using the KOADX Modelling Tool

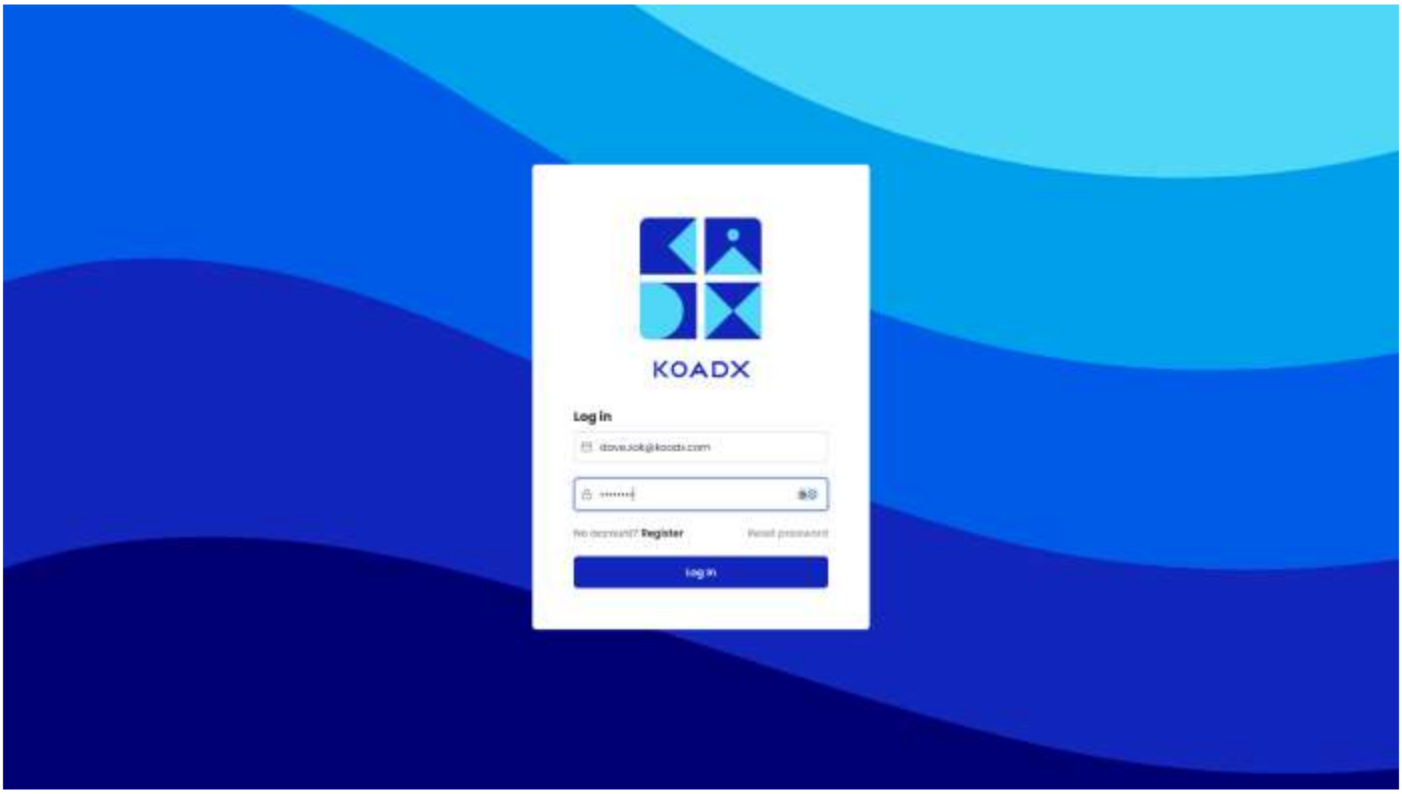
Note: This example, a Logistics Tracking System, is also shown in the Product Demonstration video.

Contents

1: Access KOADX Modelling Tool

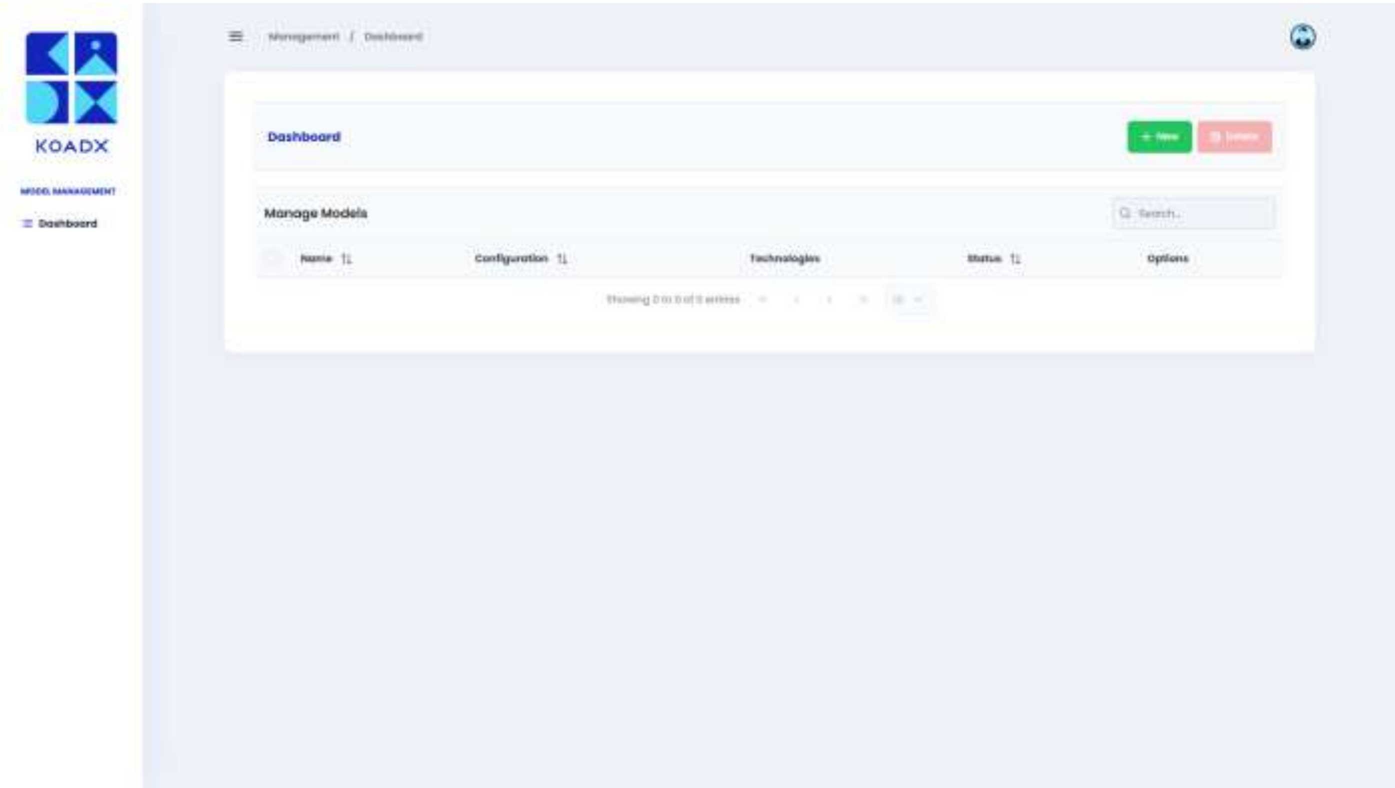
Sign Up to get access to the KOADX Modelling Tool.

Login using the details you registered with.



2: Create a new model

The first screen you will see is your KOADX Dashboard and you will do everything from this starting point.



3: Add your model information

Click **+New**

Enter the name of your model.

Select Configuration which is currently C# .Net 8 / SQL Server 2022.

You can save and close at this point, to pick up later, or you can carry on to configure your model.

Next, from this dialogue click **Configure.**

4: Configure Model

Select → **Configure**

This screen shown 5 tabs

- Technologies
- Lookups
- Roles
- Data Classes
- Relationships

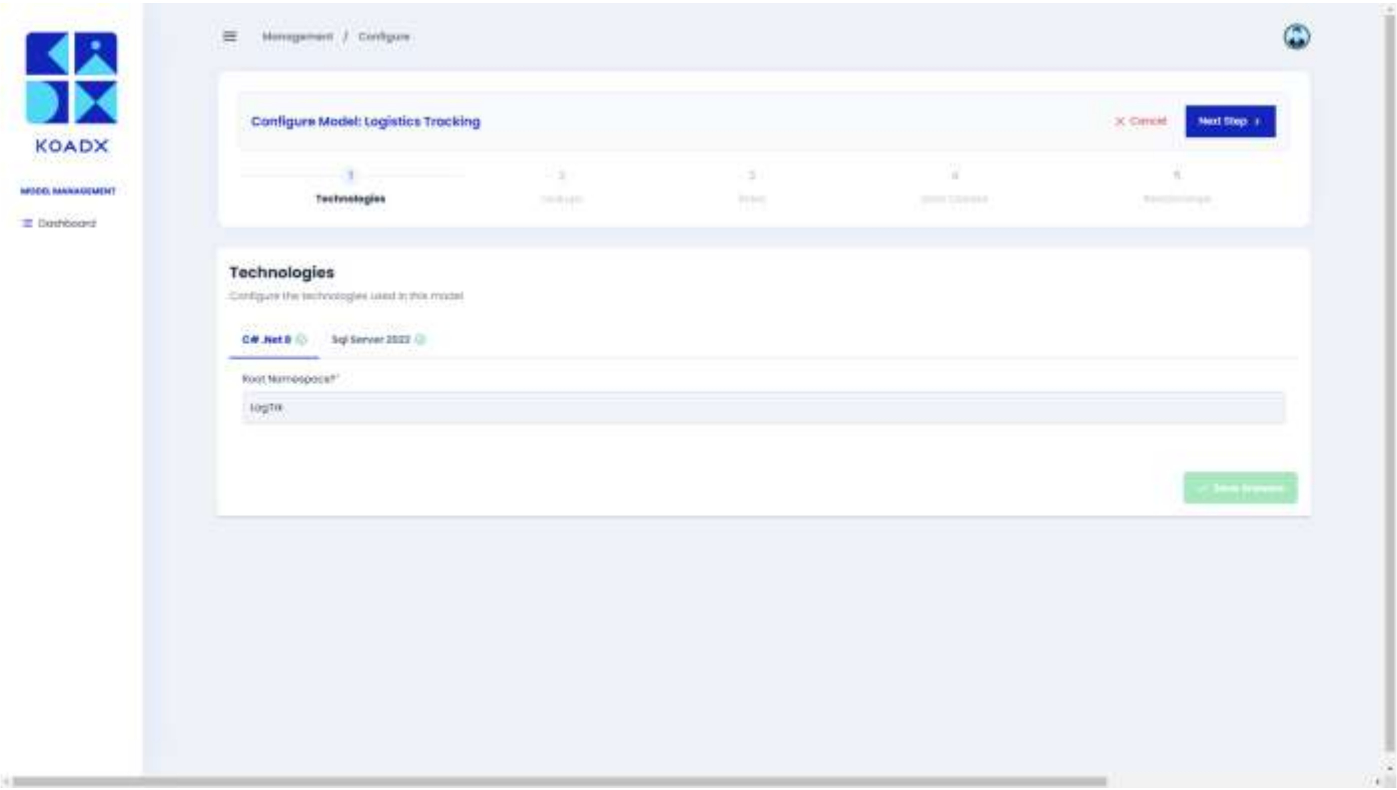
You need to tab through using the **Next Steps** button and complete information under all of those tabs.

You will notice **'Save Answers'** cannot be selected until you have finished entering Configuration information.

4.1: Technologies

Technologies is the first 'page' at the moment your options are limited.

C# .Net 8 is highlighted and a green tick shows you have completed the information. You need to give you model a **Root Namespace** the red * indicates this is essential. In this case we have entered LogTrk.



You must then **click on the SQL Server 2022** tab and complete that information. The red cross will become a green tick to show you have done it. Then **Save Answers.**

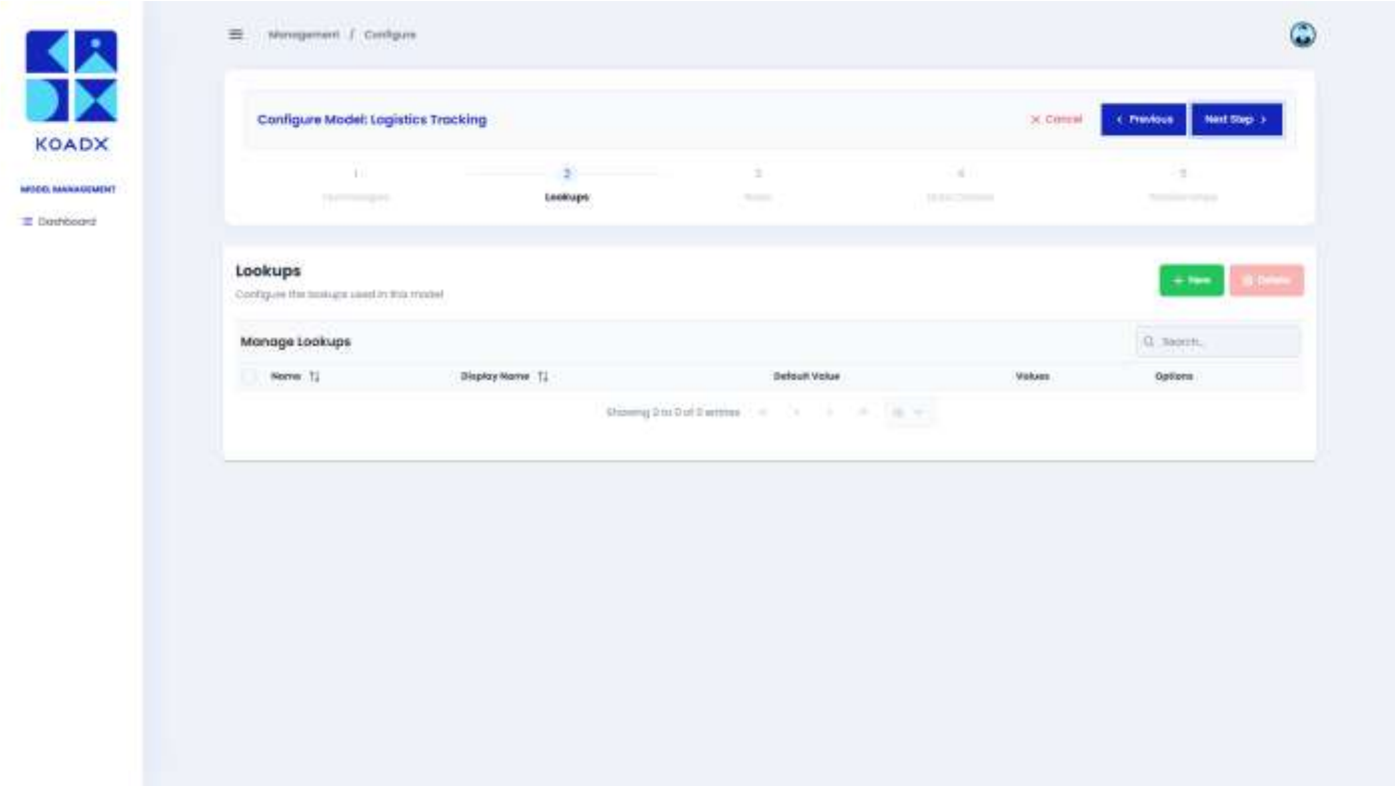
Most of the SQL questions relate to Tenanting. In KOADX, every generated API is multi-tenanted out of the box.

This means that users from different organisations can access their information, without seeing information from any other organisation. There is a 'master tenant' who can see all the information for any tenant/organisation.

Once the SQL Server 2022 answers have been given and **Save Answers** pressed, select **Next Step** at the top right of **Configure Model: Logistics Tracking.** This will move you onto the second tab, **Lookups.**

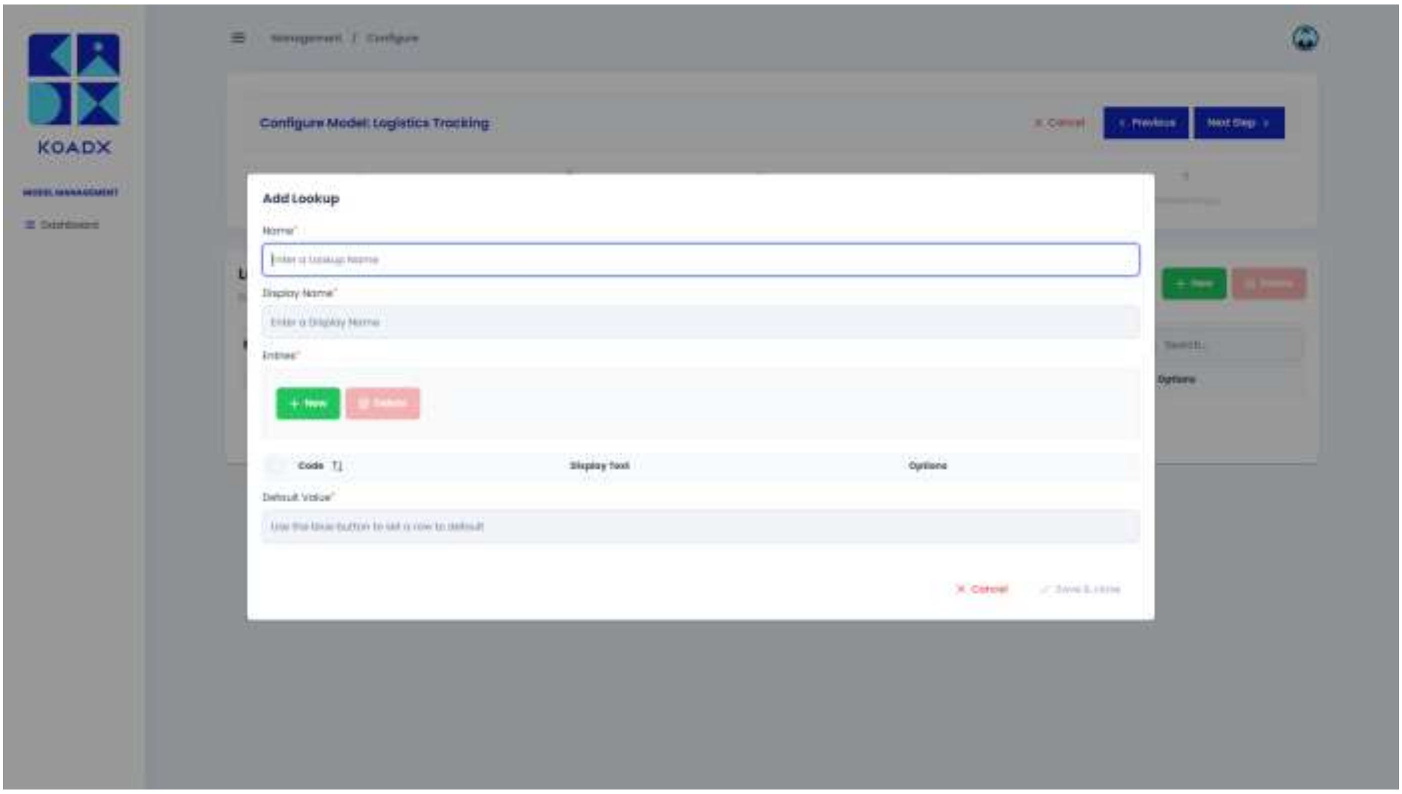
4.2: Lookups

If your system needs lookups (picklists) this is where you add that information. You can have a perfectly valid system without using them.

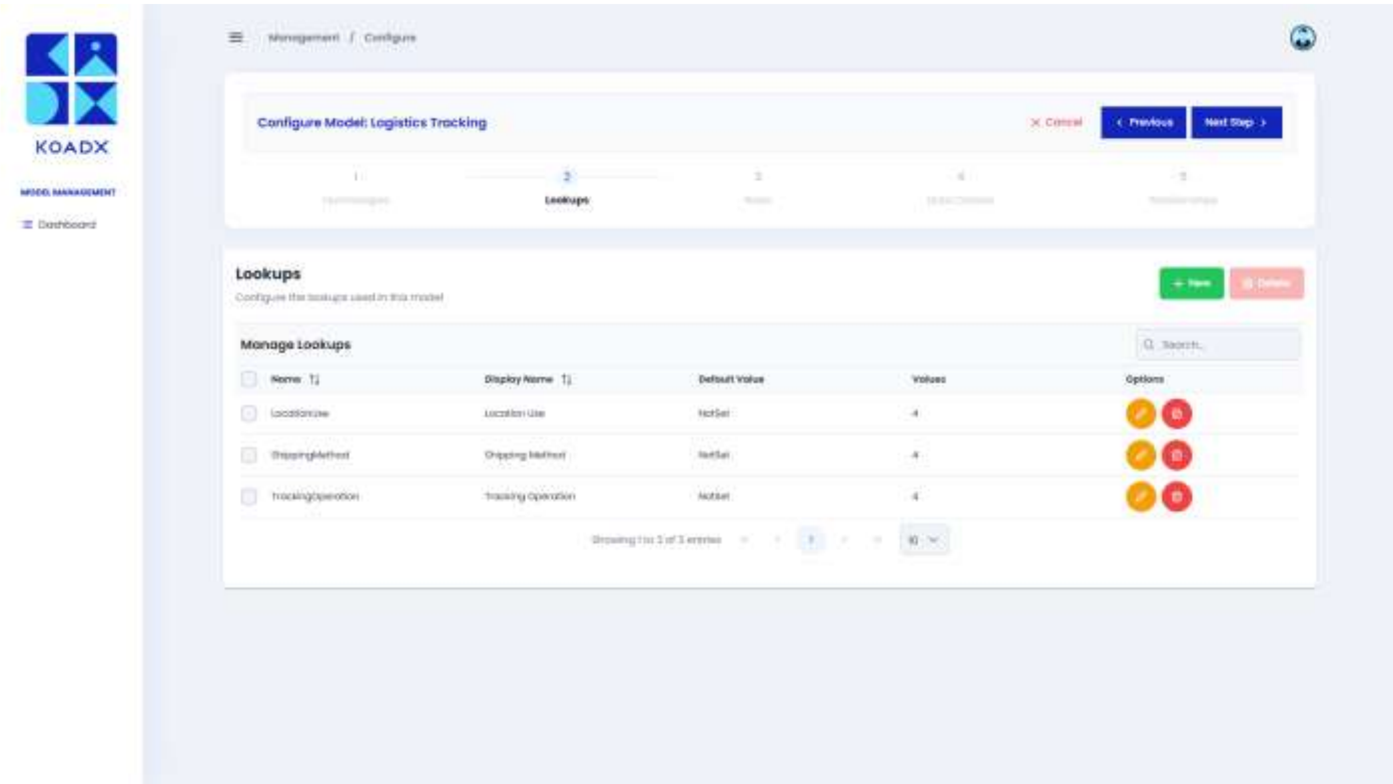


Select **+New.**

You will give your lookup a name and display name and then add the entries for that lookup list using the **+New** button on the pop-up screen.

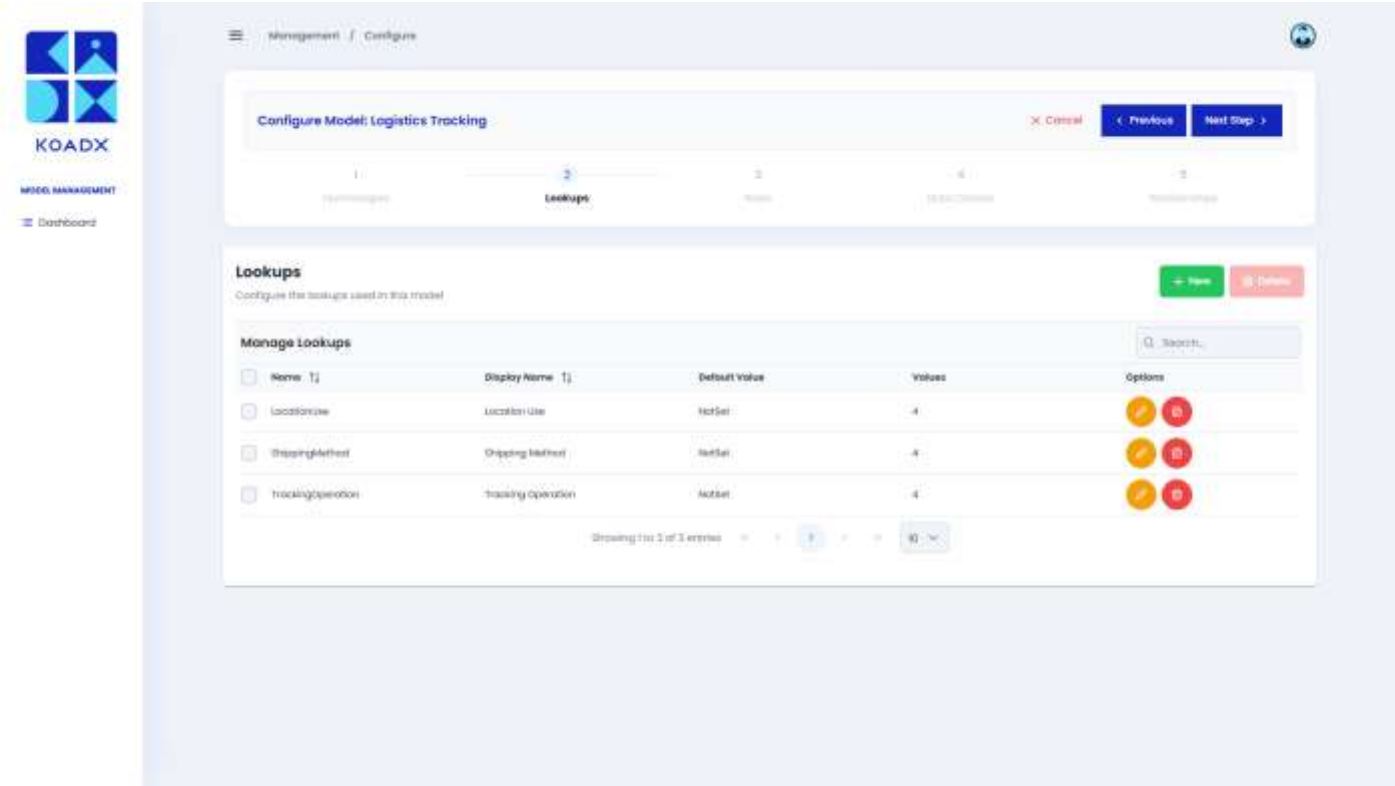


Your additions will appear as a list which can be edited.

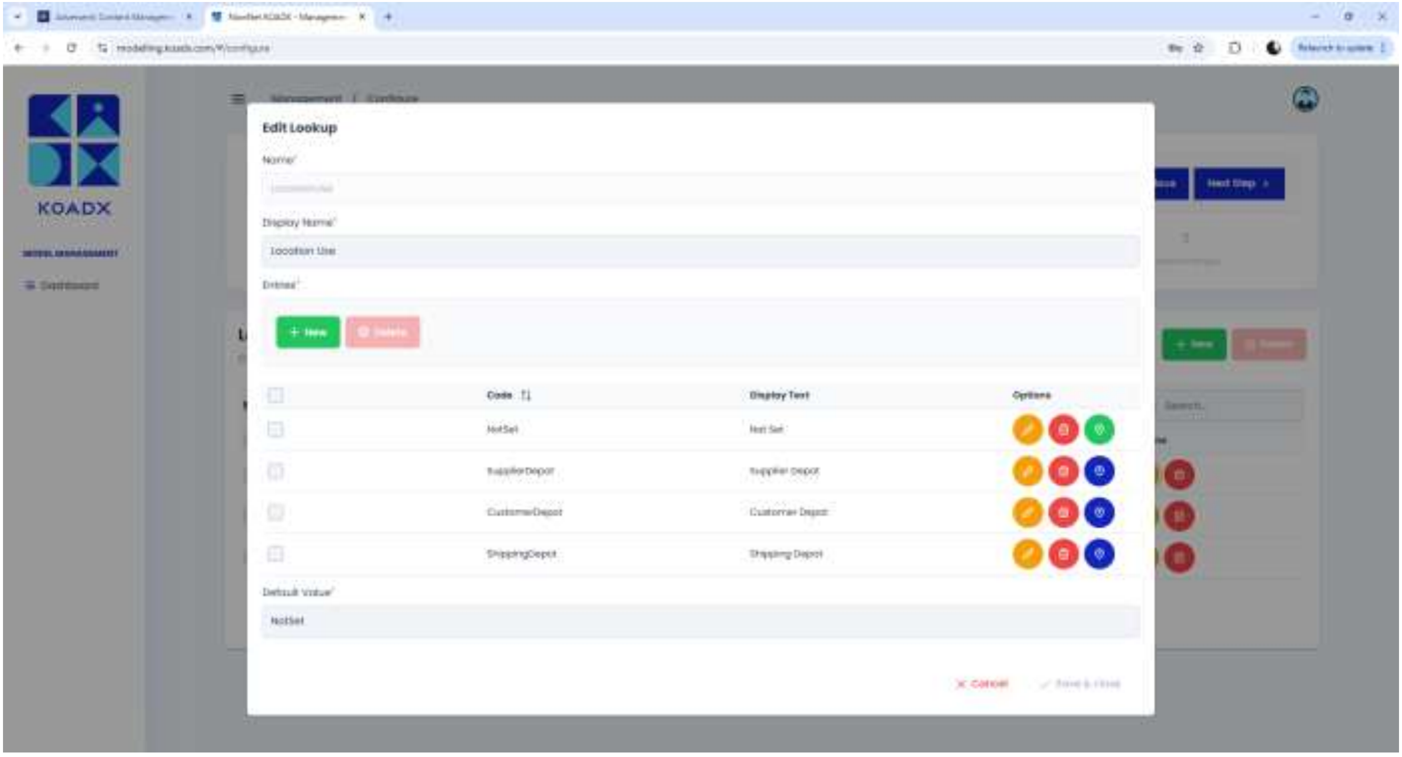


By clicking the orange Edit button under **Options**, you can edit or delete entries and change your default value.

Below you can see that three lookups have been created and each has four values. To add another Lookup click on the green **+New** button.



Using the Edit option, you **must** set a default value, by clicking on the blue button associated with the code you want, before you can save.



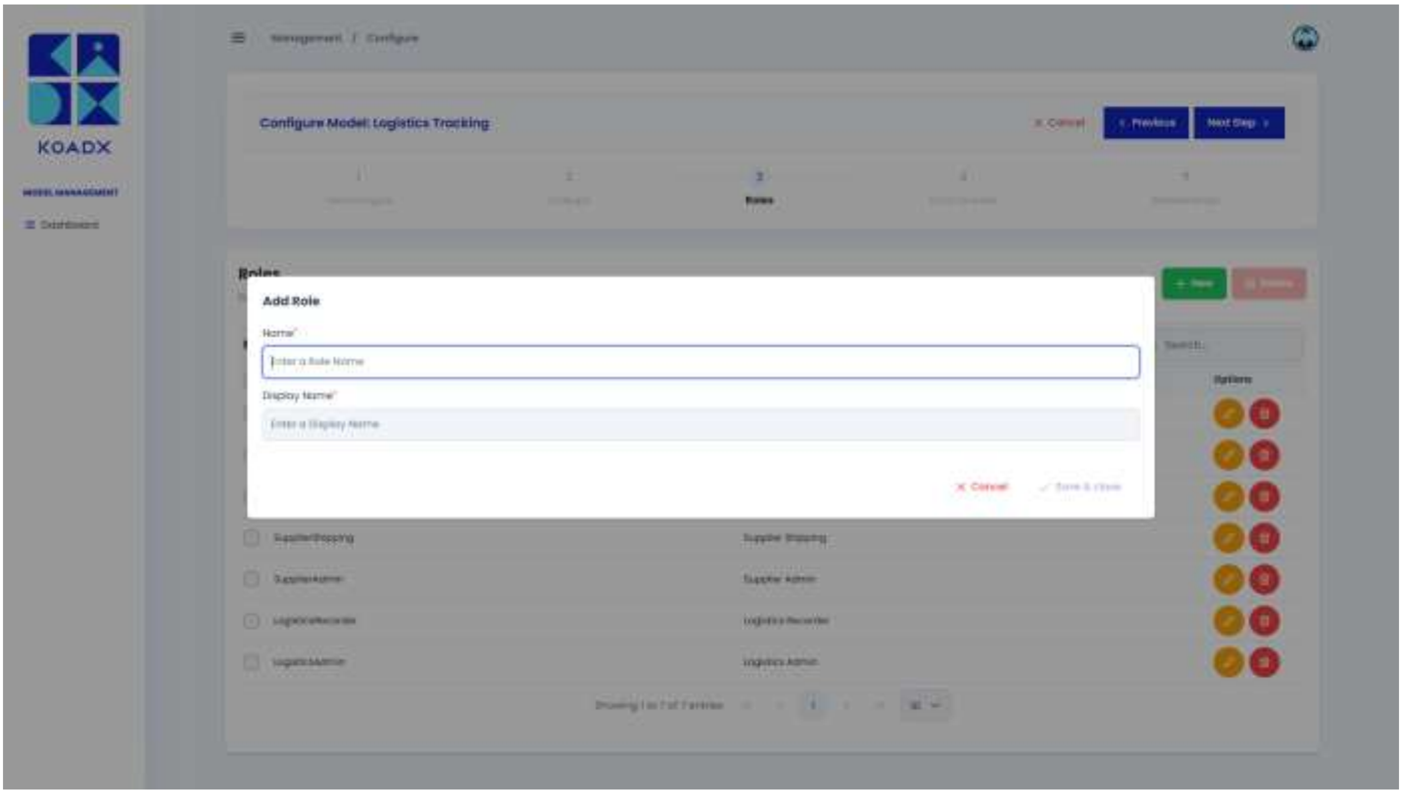
Then **Save & Close**. Repeat the process for all your system lookups.

When you have finished press **Next Step** to move onto **Roles.**

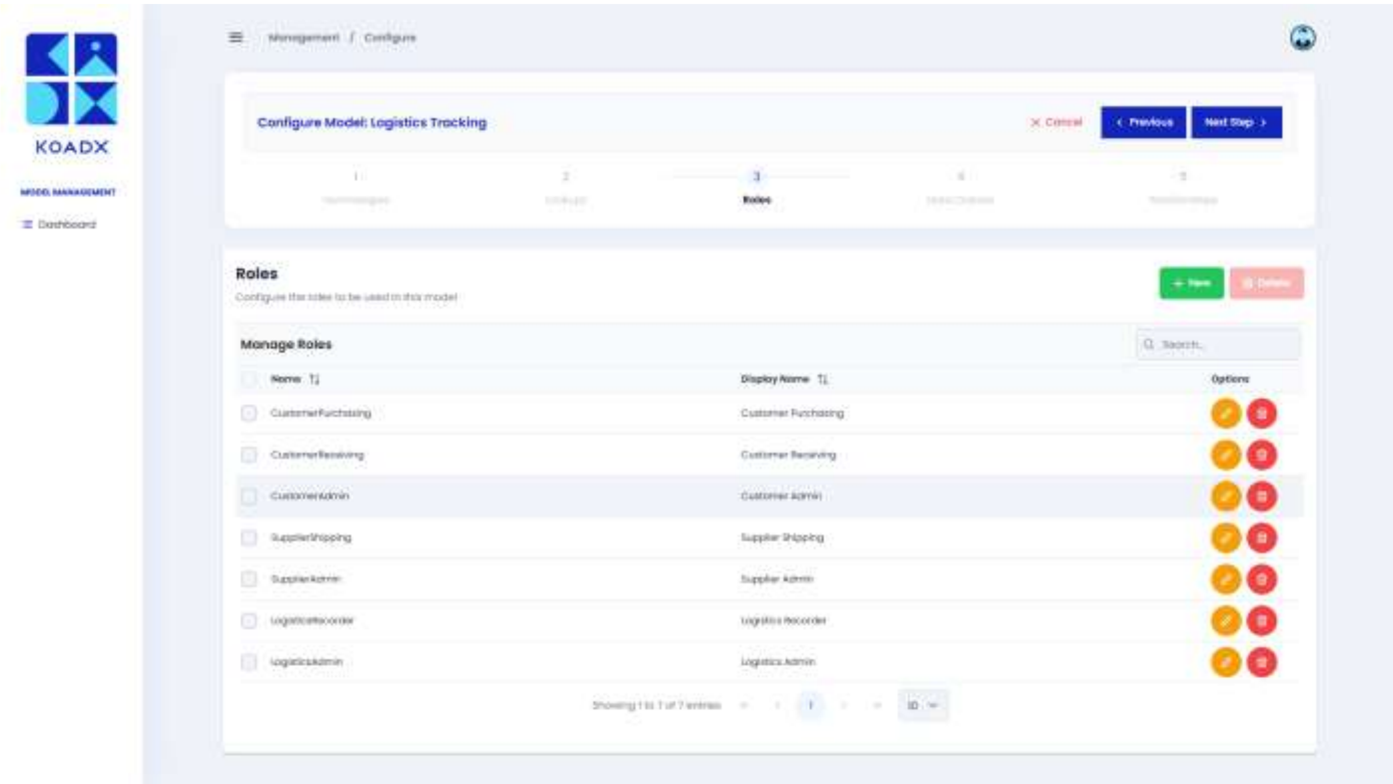
4.3: Roles

For role-based user management you need to add the information here. This will enable your system to operate with information security and workflow control.

In the same way as before use the green **+New** button to add each of the roles.



Provide a Name and Display Name then **Save & Close**.



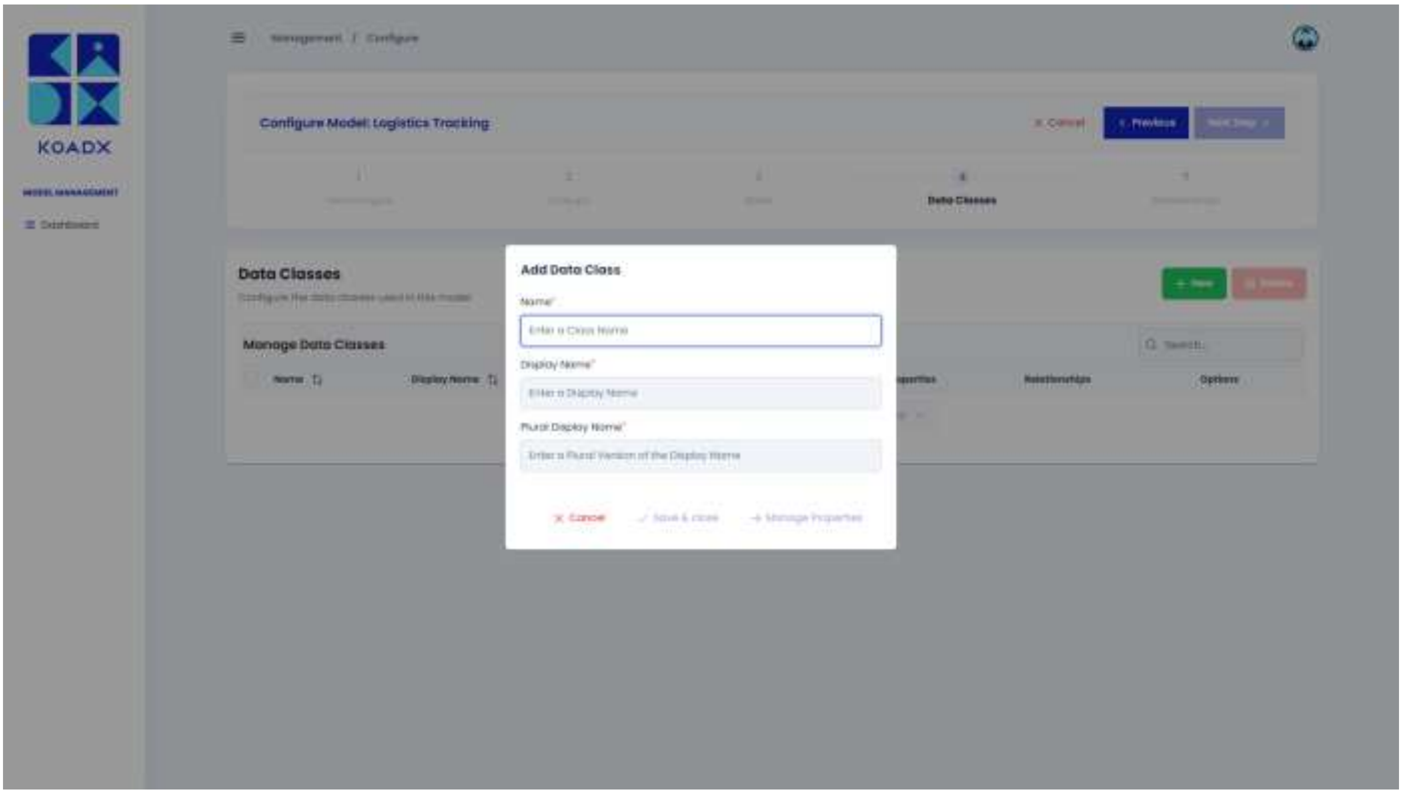
You will see Roles appear in a listing, just like Lookups, and when you have finished entering them click **Next Step** and this will take you to **Data Classes.**

4.4: Data Classes

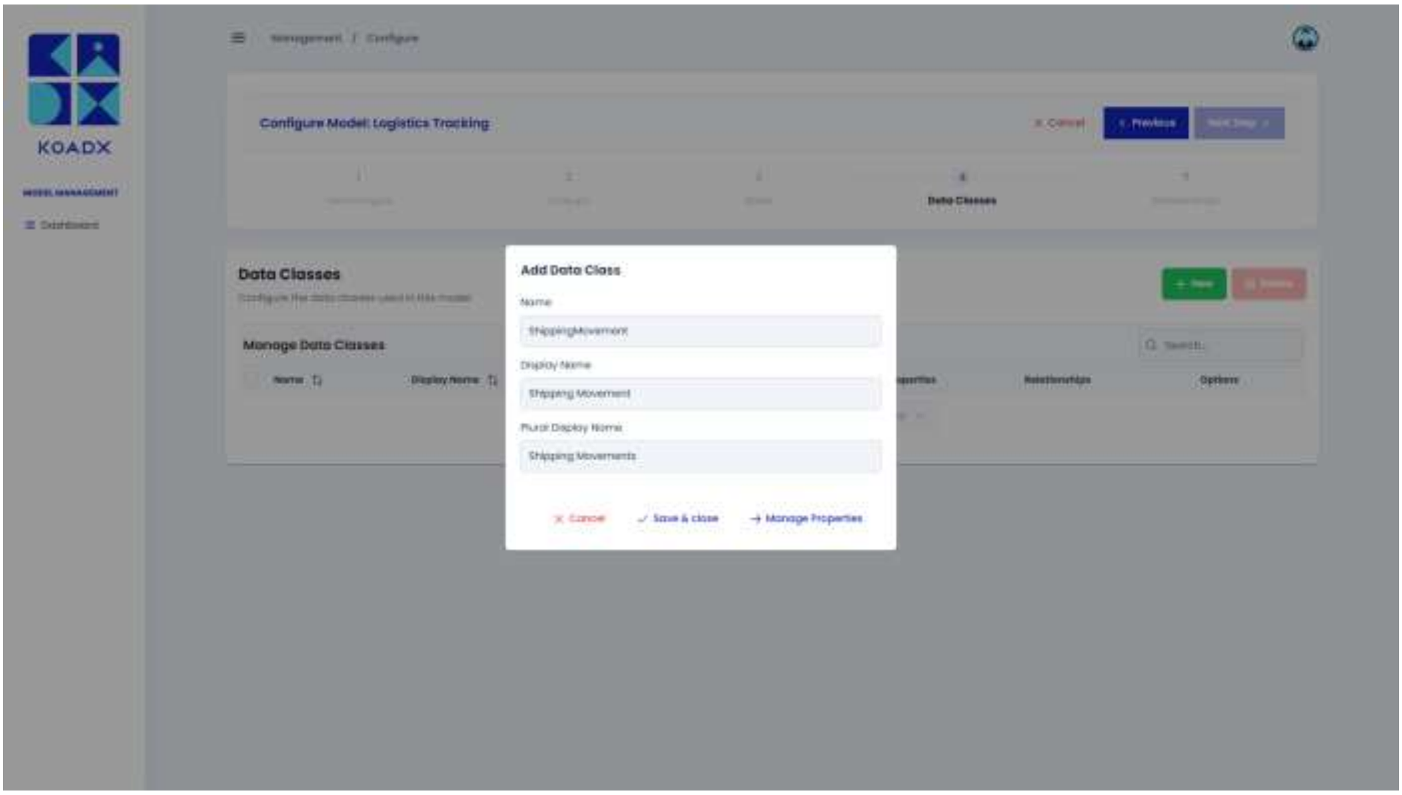
You must have at least one **Data Class** with one **Property** in your model. There are some protected words,[1] but KOADX will warn you if you try to use one as a name.

To start select **+New.**

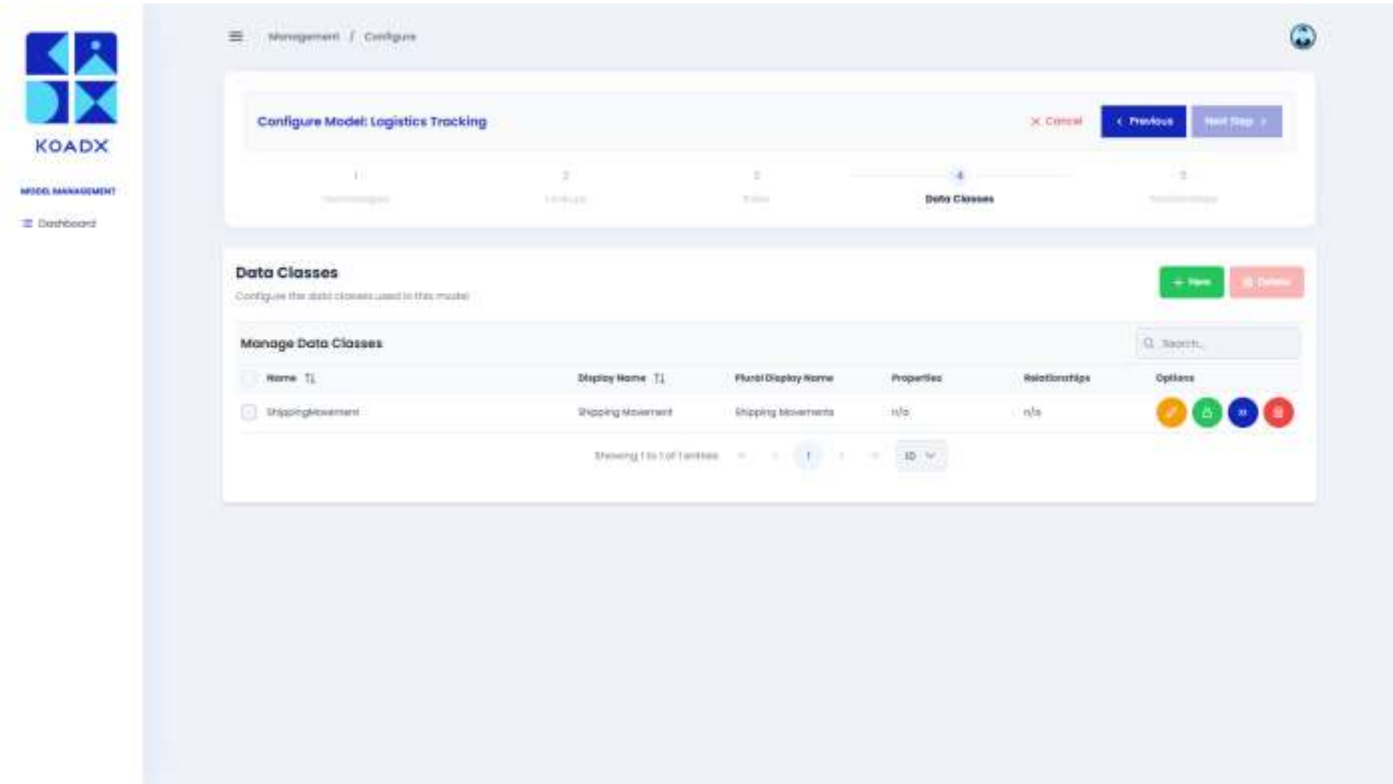
Add your first **Data Class**. You can add all your data classes and then go back to Manage the properties of that **Data Class** or Manage the **Properties** for each **Data Class** as you enter them. See relevant sections.



[1] Protected words are the reserved words in selected technologies, they cannot be used in the modelling tool as they have special meaning.



The Data Class will appear in a listing along with options for action. You will see in the screenshot below that there are currently no Properties or Relationships associated with the Data Class ShippingMovements.

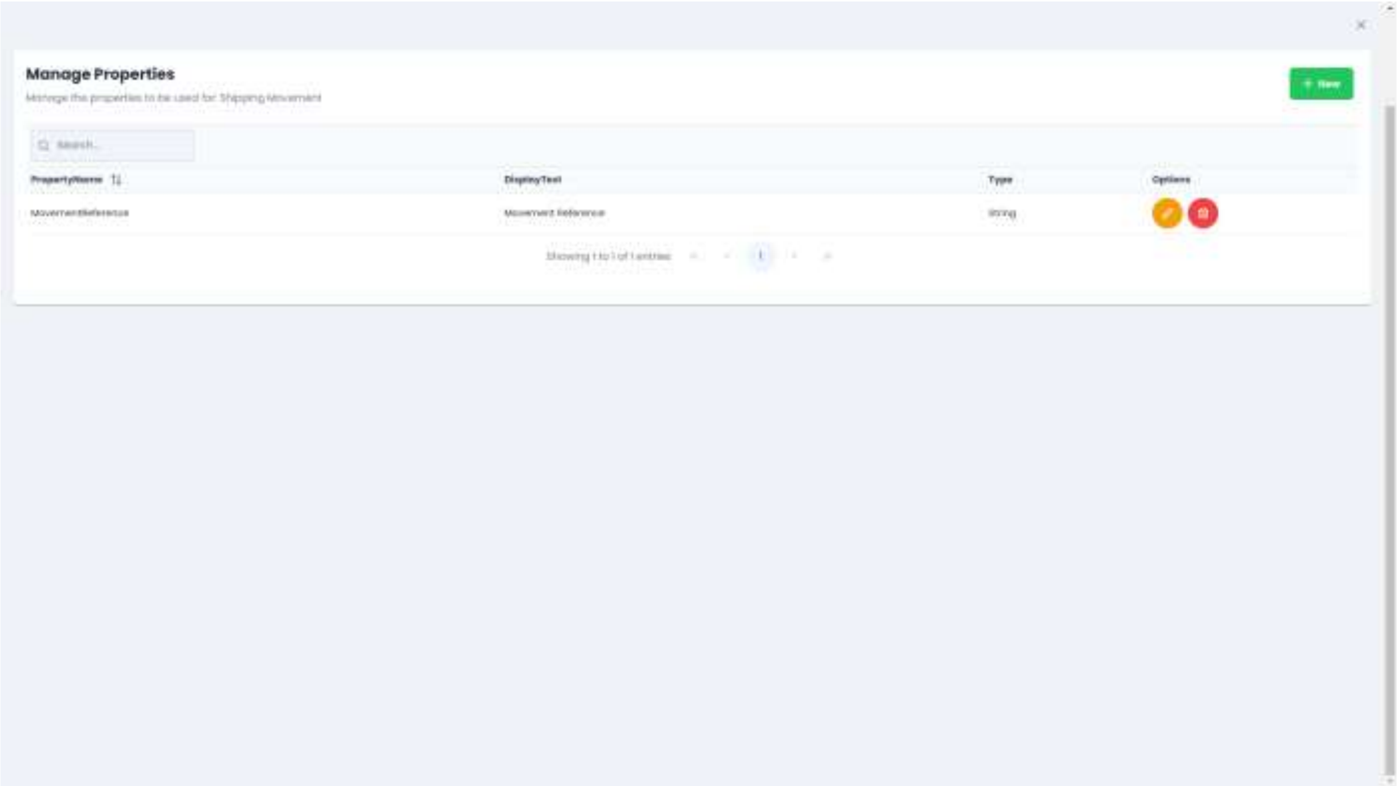


Click the orange **Edit** button

Click **Manage Properties**

4.4.1: Manage Properties for Data Classes

When you press **Manage Properties**, an overlay screen will appear where you can manage the properties for the selected Data Class. Please find details in the **Managing Properties** (Section 4.7).



You must have at least one property in your data class to continue.

4.4.2: Manage Workflow for Data Classes

All data classes can have a workflow associated with them. This allows the API user to track the current state of a data record.. In the example given in Section 4.8 where a Product can be Proposed, then moved to Active.. When the product is no longer for sale, it can be moved into an Archived state.

These workflow ‘transitions’ are available to all authorised users of the API..An enhanced level of authorisation can be attained by only allowing the users that belong to certain roles to be able to carry out particular transitions.. In the above example, you might stipulate that only Supplier Admins can move an Active Product to the Archived state. Refer to Section 4.8.

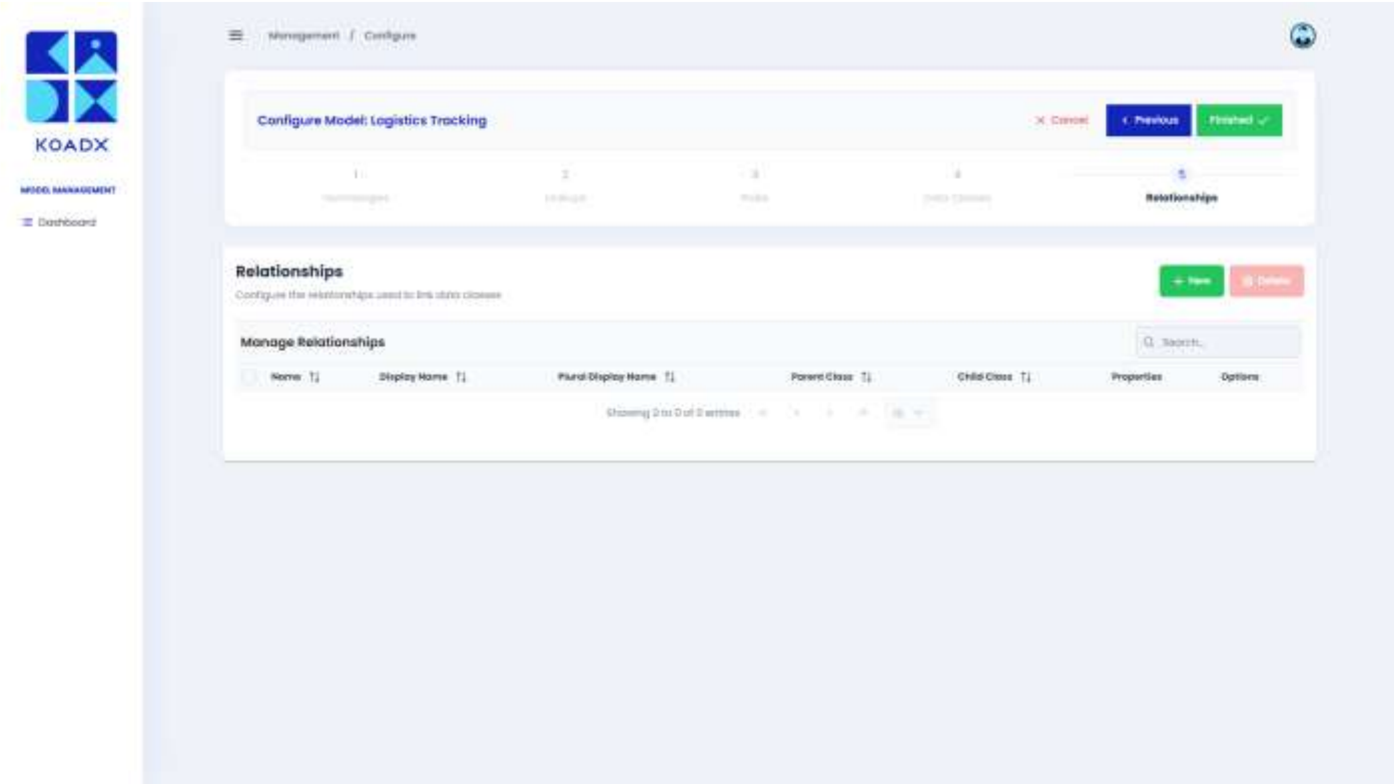
4.4.3: Add API Endpoint Restrictions for Data Classes

Although every API endpoint in the generated system requires the calling user to be authenticated, you may wish for more restrictive access to be placed on certain operations. An example might be unlocking a read-only supplier record, so that it can be editing, and this operation should only be available to Supplier Administrators. For more information, please see Section 4.9.

Once you have finished setting up Data Classes, move on to setting up Relationships by pressing **Next Step**.

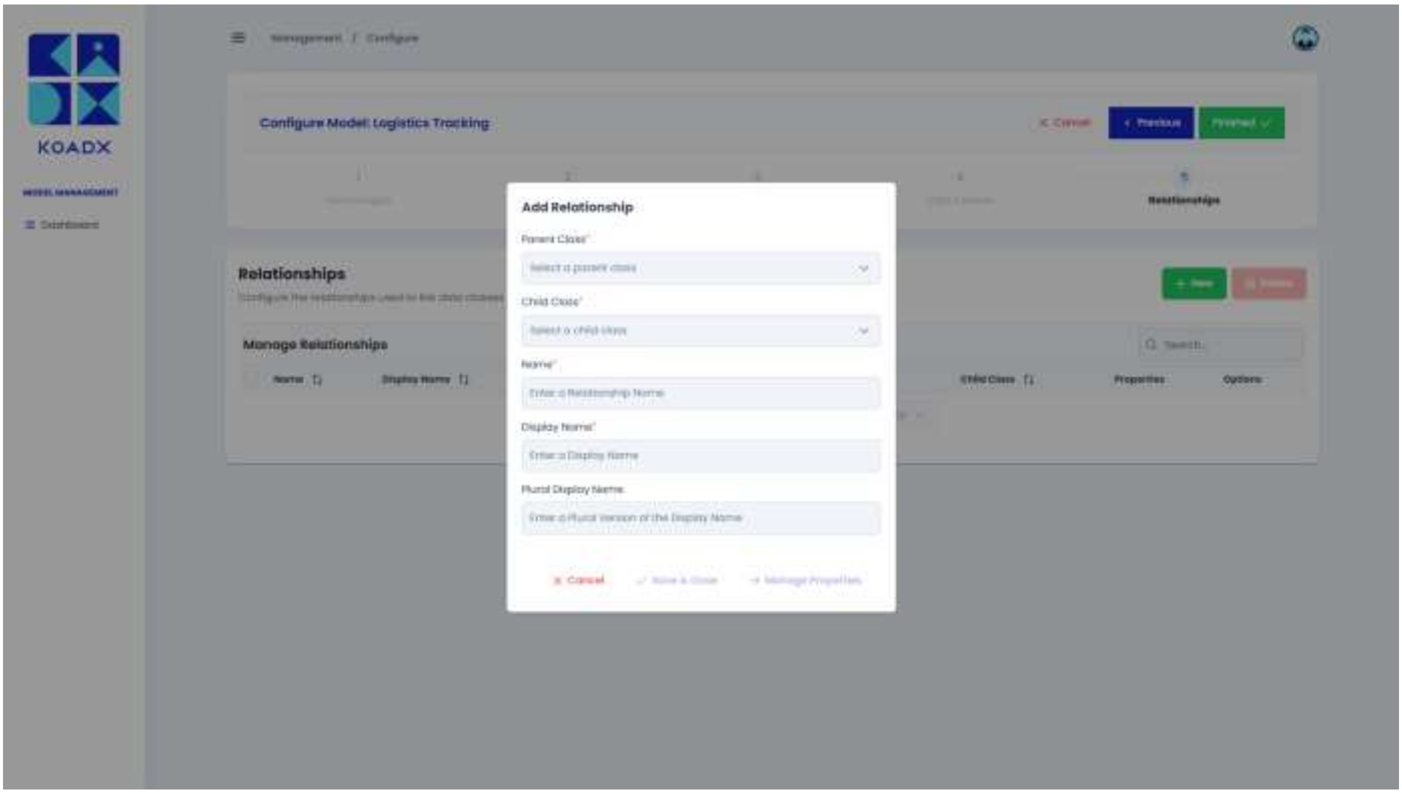
4.5: Relationships

Note that, strictly speaking, you do not need to add any Relationships, so the green **'Finished'** button is active.

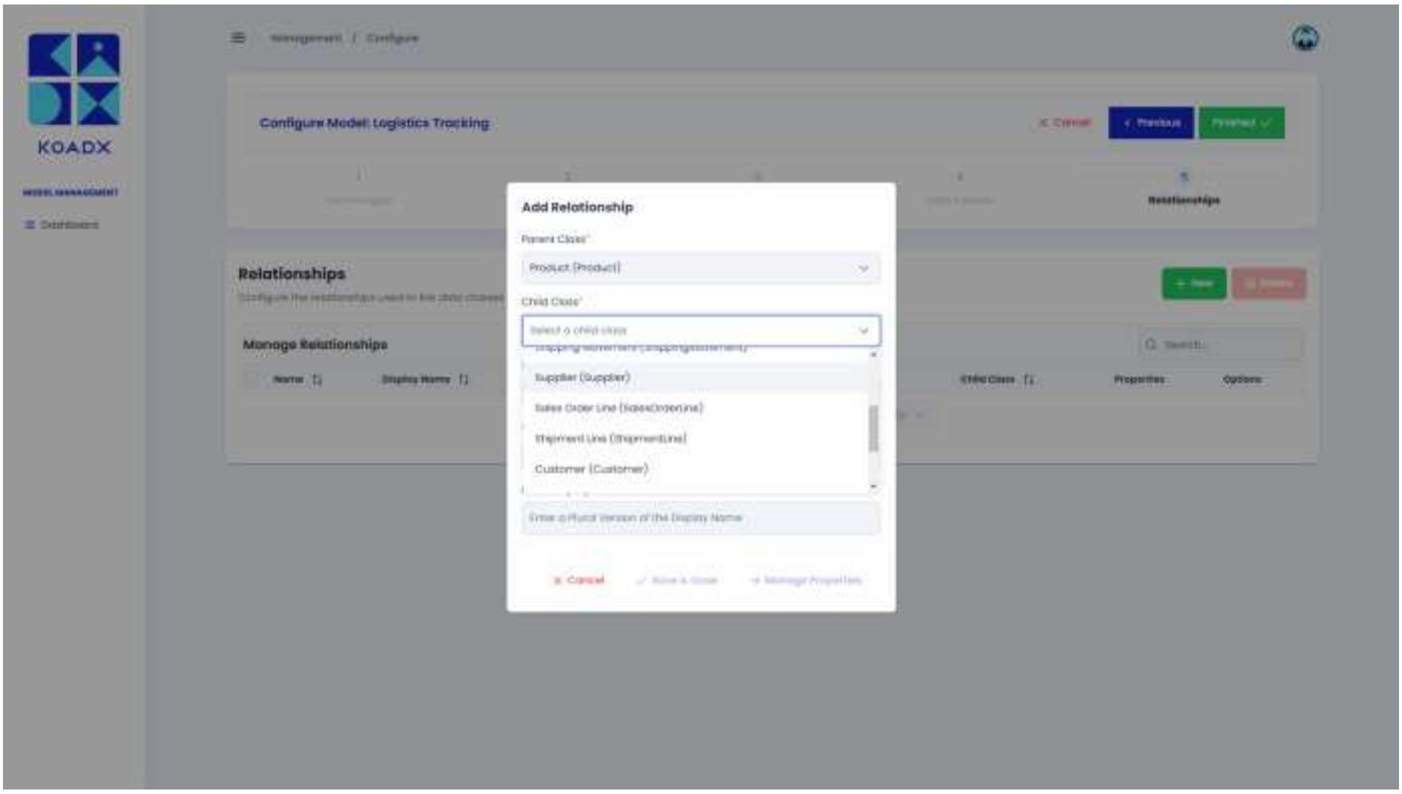


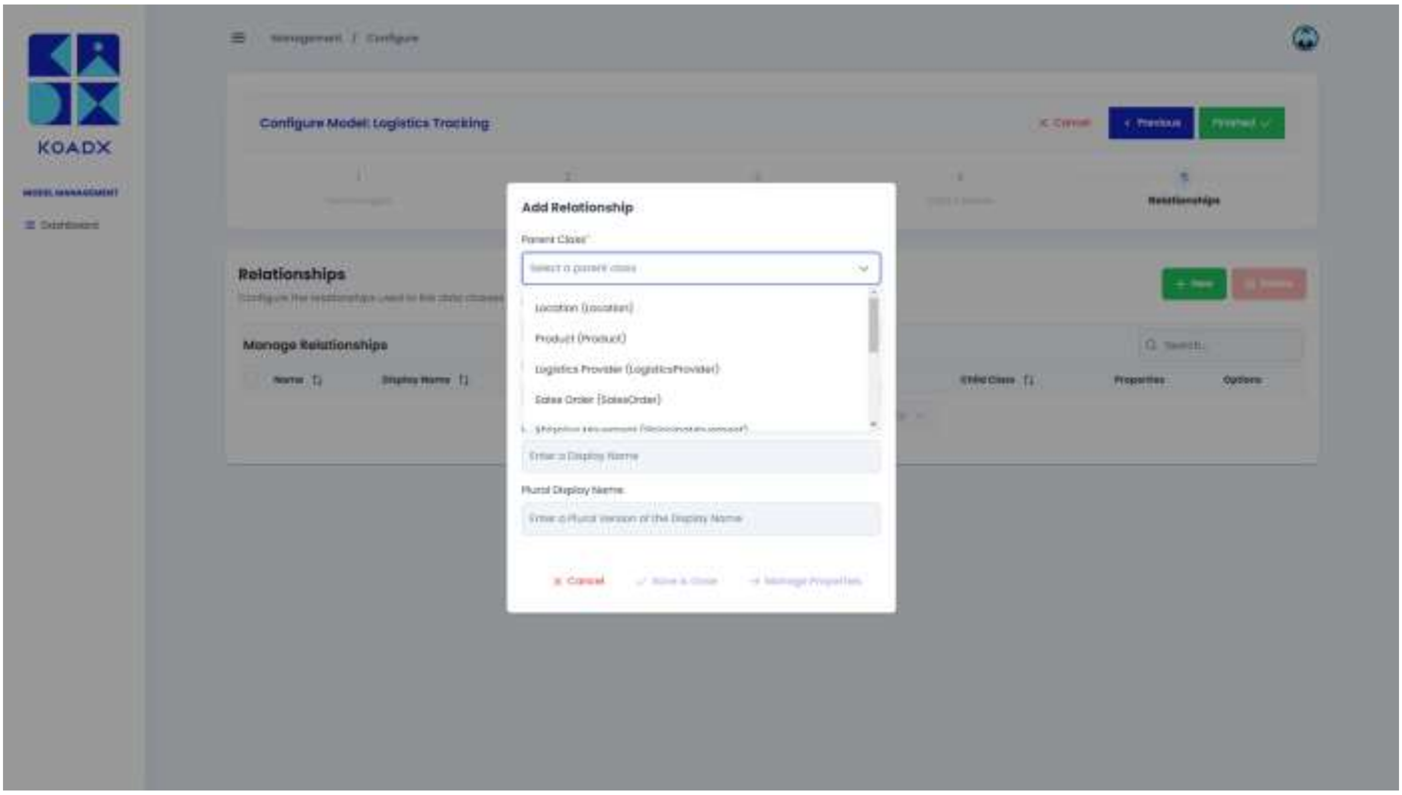
Most models will need relationships, including this Logistics Tracking model example.

Press the **+New** to add a relationship.

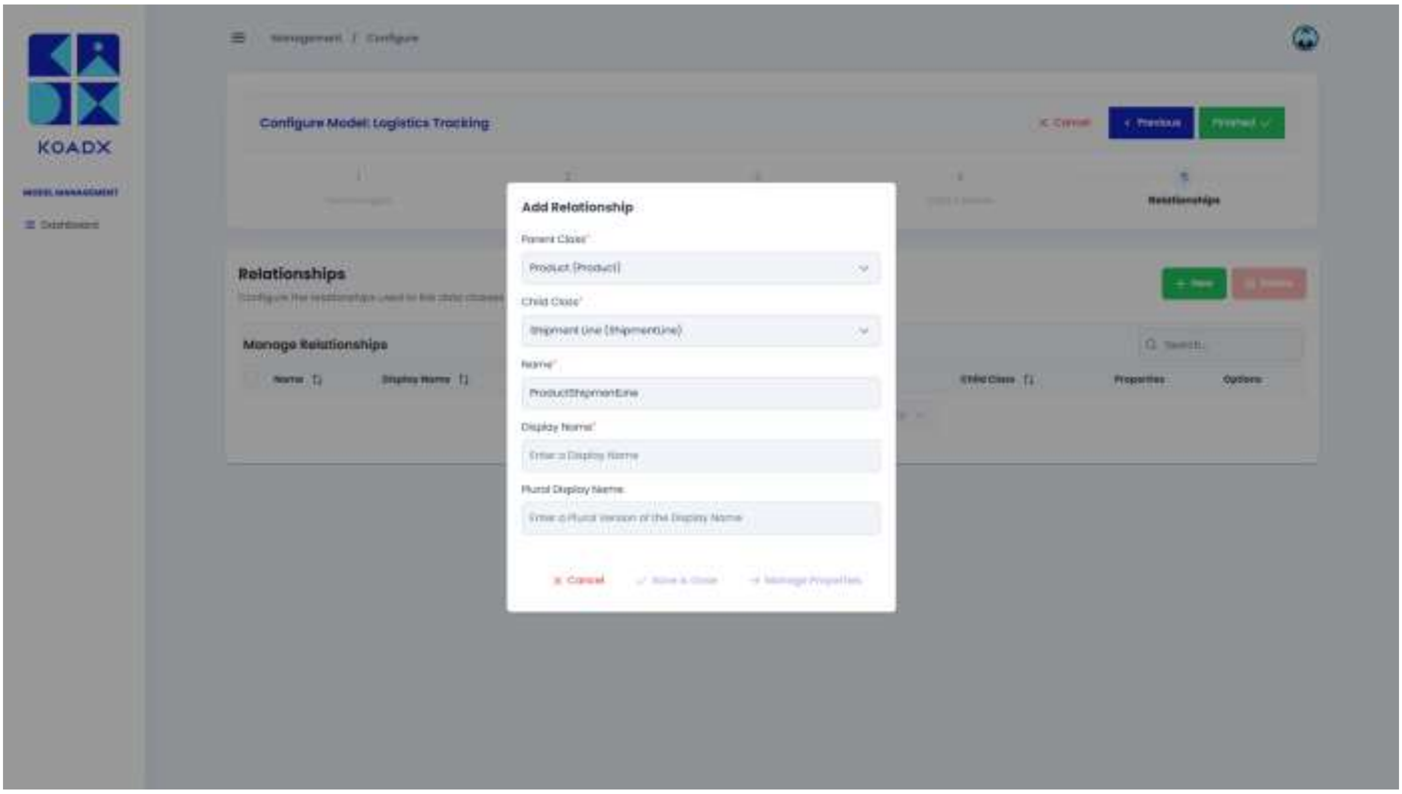


A relationship is between a parent and a child data class. Select these from the first two drop downs.

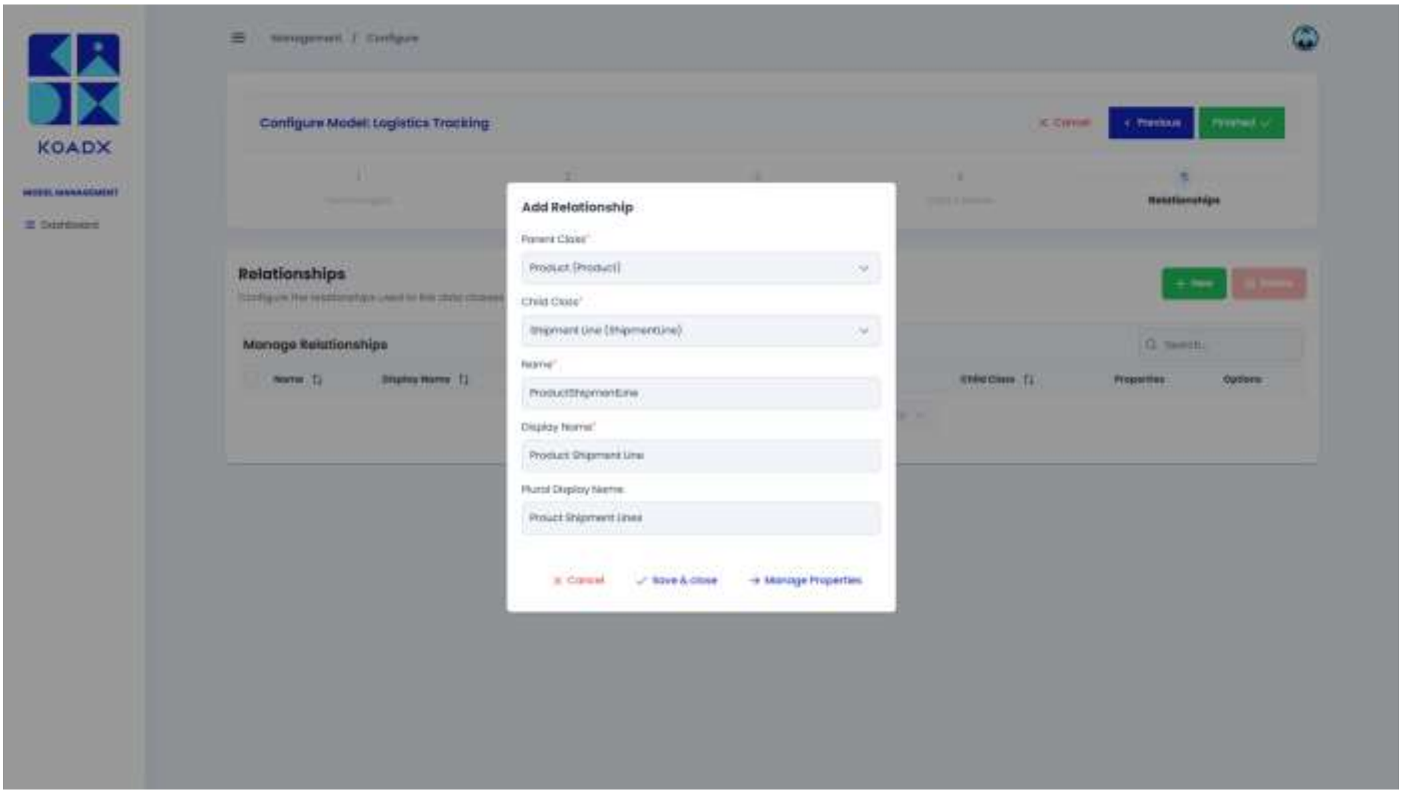




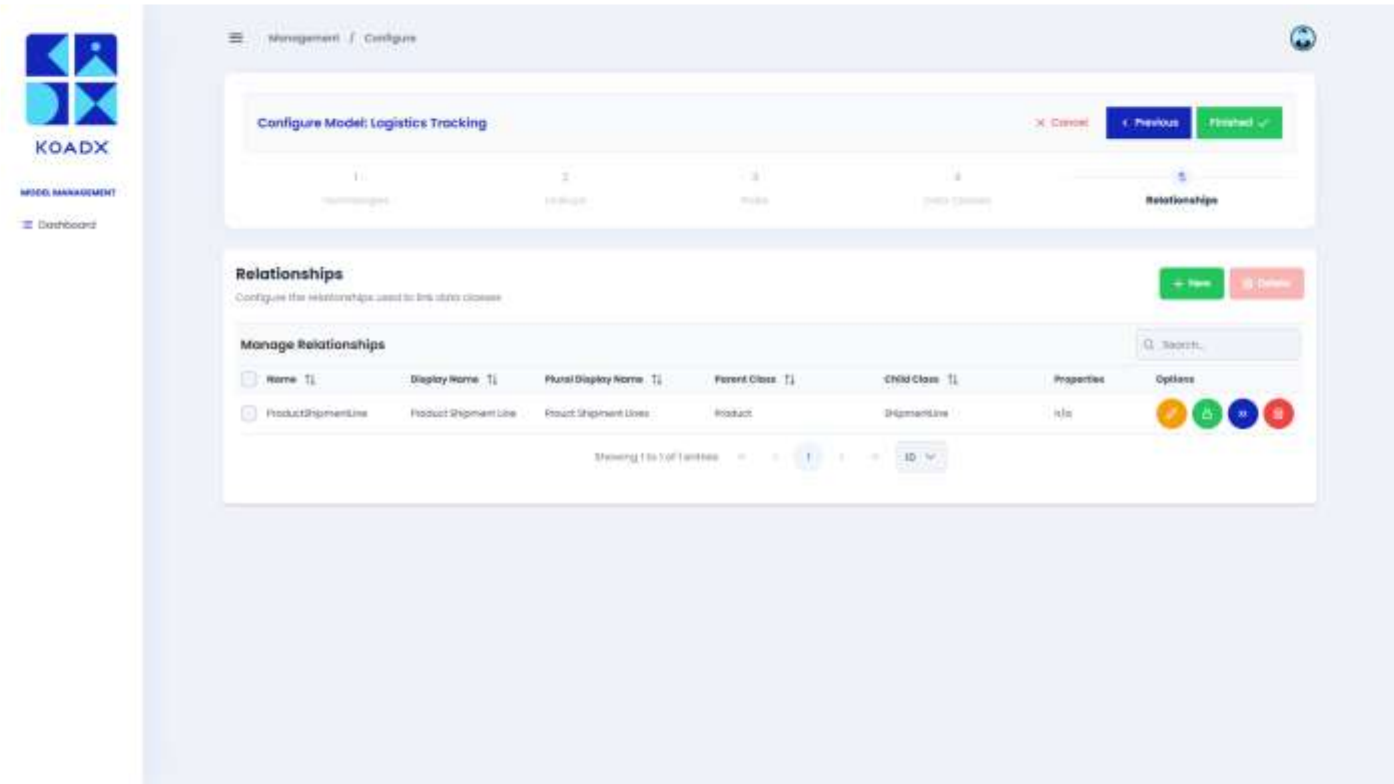
Note that after selecting the child data class, a relationship name has been suggested.



Fill out the display name and plural display name.

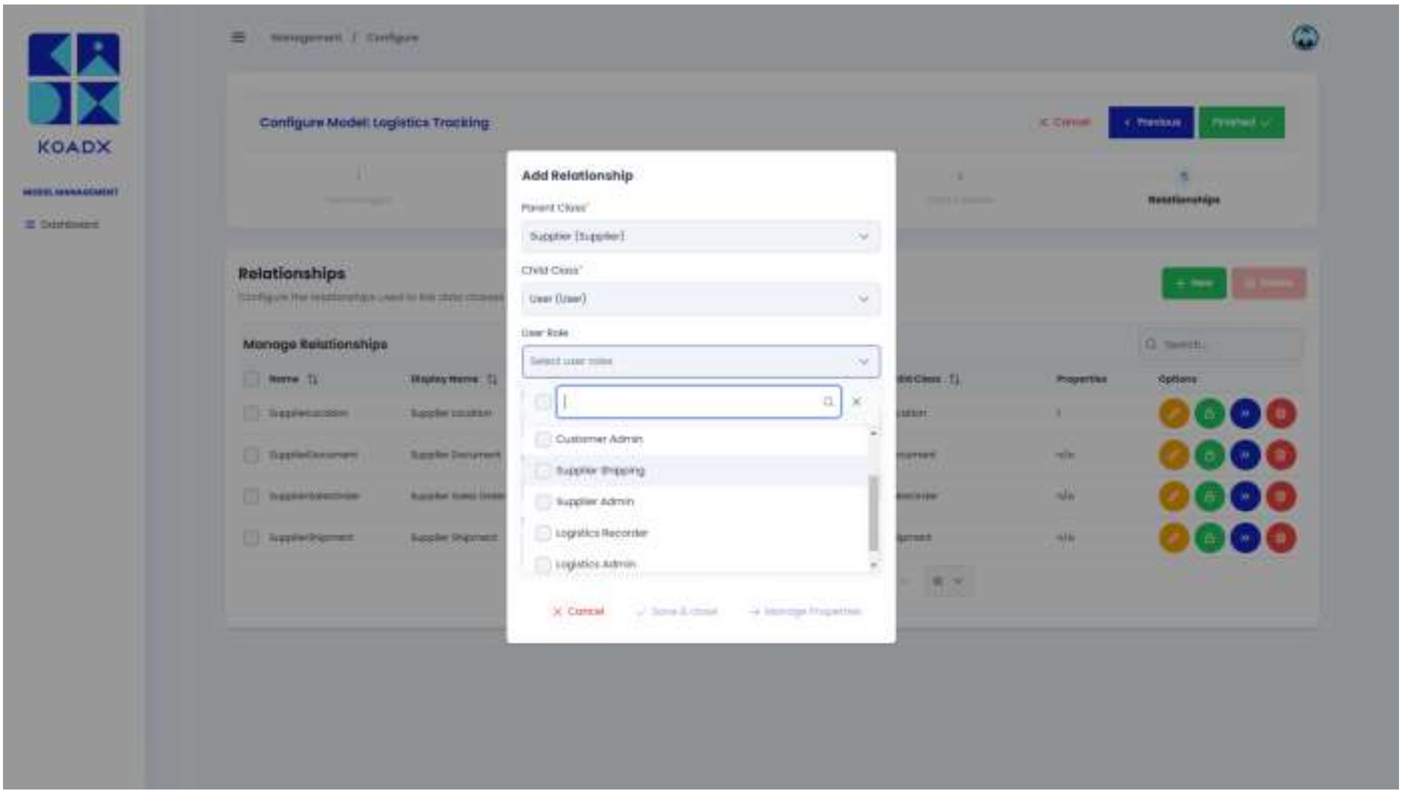


Just like Data Classes, it is possible to add properties to a Relationship. Please find details in the **Managing Properties** (Section 4.7). In our example the Product Shipment Line does not need properties whereas ShippingMovementShipment does have properties. **Save & Close**.



4.5.1: Creating Special User and Document relationships.

With the Supplier/User relationship, selecting the special **User Child Class** displays an additional field **User Role**, allowing the selection of the users, with particular roles, that can be connected to a supplier. Not selecting any roles will allow any user to be directly connected with the supplier and that is probably not ideal.



In a similar fashion to the selection of a **User** as the **Child** in a relationship, you can also select **Document** as a **Child**. This would give the user the ability to store documents against a data class.

Within the Logistics Tracking example, we create a ProductDocument relationship. This allows a product to be connected with documents associated with it, such as data sheets, designs, certificates, etc.

Both the **User** and **Document** special relationships can have properties associated with them. As an example, the ProductDocument relationship may include a Review Date Date/Time, which can be used to prompt the user to carry out the appropriate document review.

4.5.2: Manage Properties for Relationships

When you press **Manage Properties**, an overlay screen will appear where you can manage the properties for the selected Relationship. .Please find details in the **Managing Properties** Section 4.7.

4.5.3: Manage Workflow for Relationships

All Relationships can have a workflow associated with them. This allows the API user to track the current state of a relationship record. For example, workflow can be added to ShipmentShipmentLine. The states could be Picking (retrieving items from warehouse), Checked, Ready For Dispatch and Dispatched.

These workflow 'transitions' are available to all authorised users of the API. An enhanced level of authorisation can be attained by only allowing the users in certain roles to carry out particular transitions.

In the above example. You might decide to include a state to represent 'On Hold', if you are having difficulty with a Customer. You might only want Supplier Admins to move an On Hold ShipmentShipmentLine, to the Ready for Dispatch state. Refer to Section 4.8.

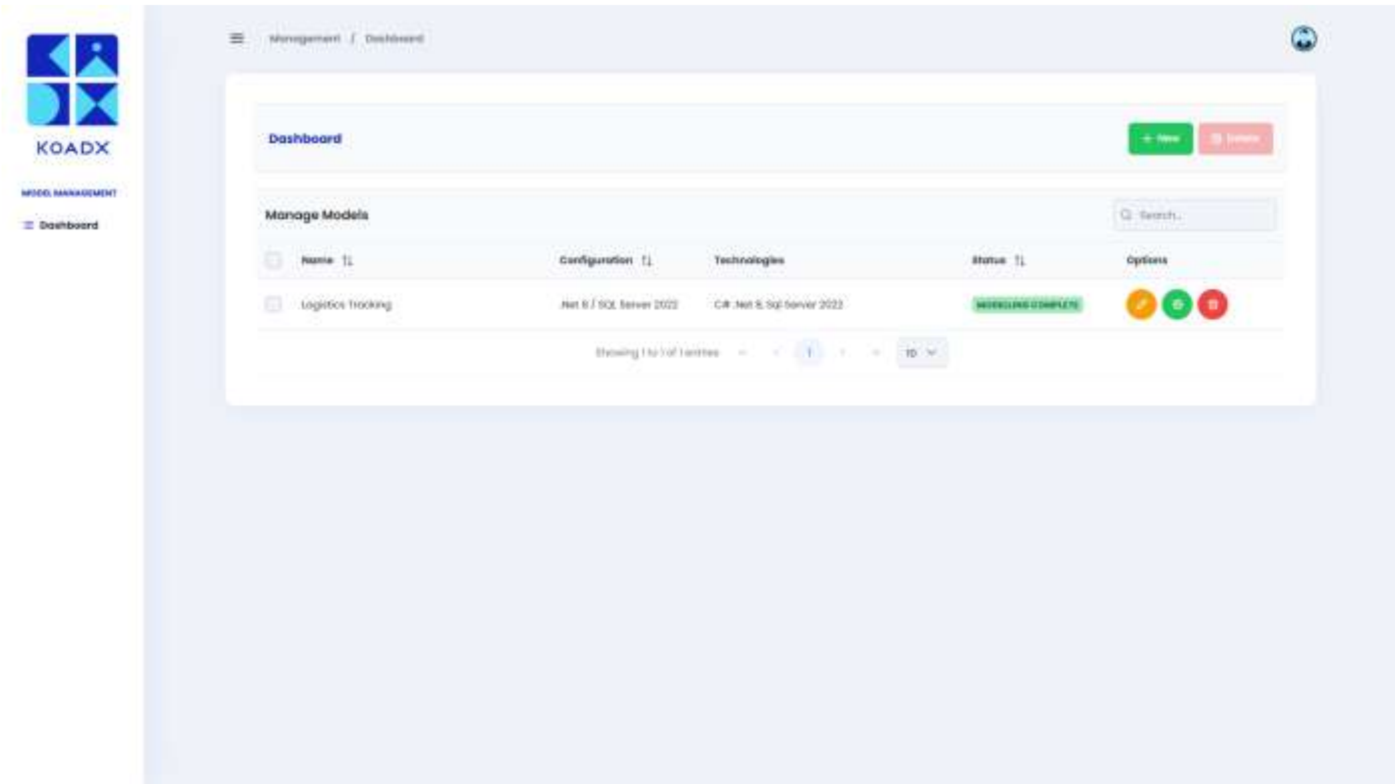
4.5.4: Add Endpoint API Restrictions For Relationships

Although every API endpoint in the generated system requires the calling user to be authenticated, you may wish for more restrictive access to be placed on certain operations. An example might be deleting a supplier location record, to reflect the fact that the supplier no longer uses that location, and this operation should only be available to Supplier Administrators.

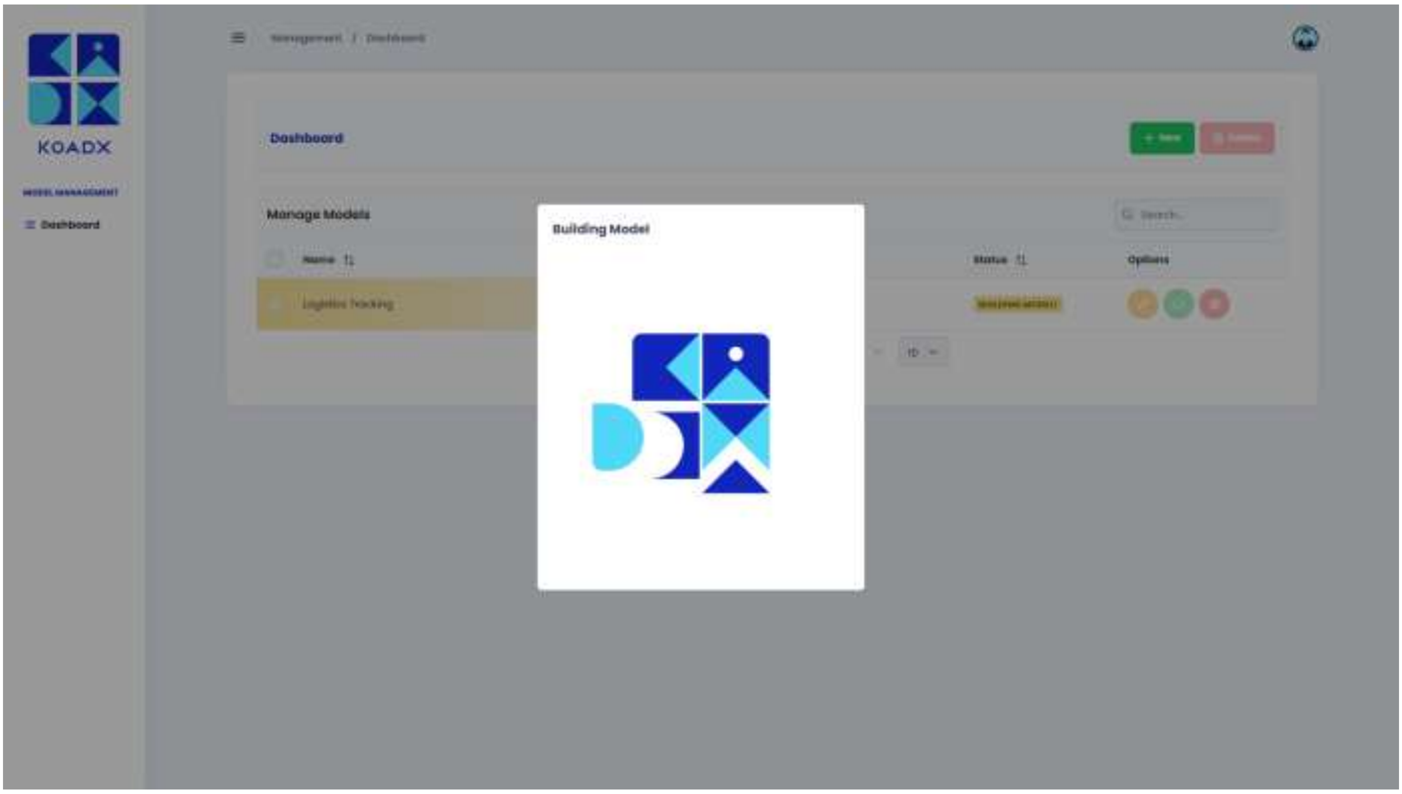
For more information, please see Section 4.9.

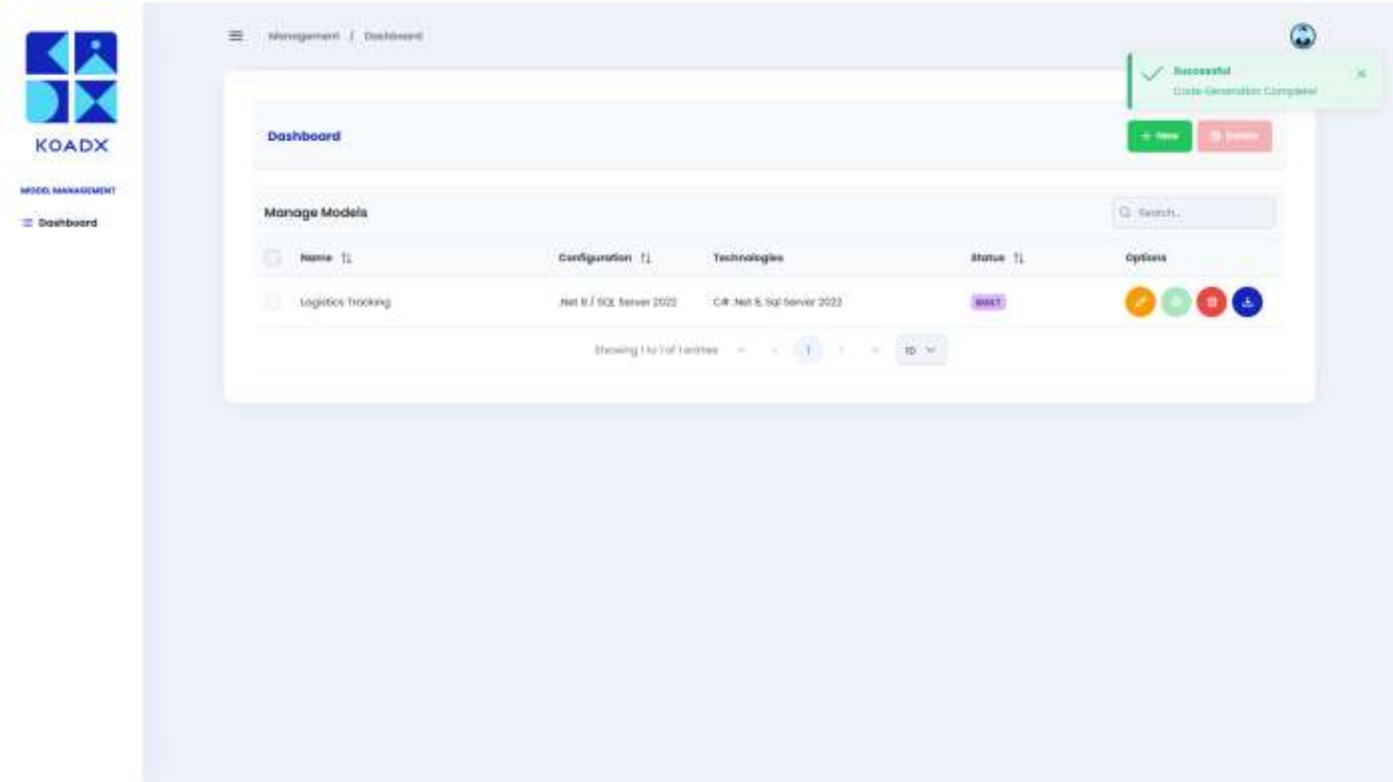
4.6: Finishing Model Entry and Building Your Code

After moving on from Relationships model entry is completed, so press the green **Finished** button and you will see this screen.



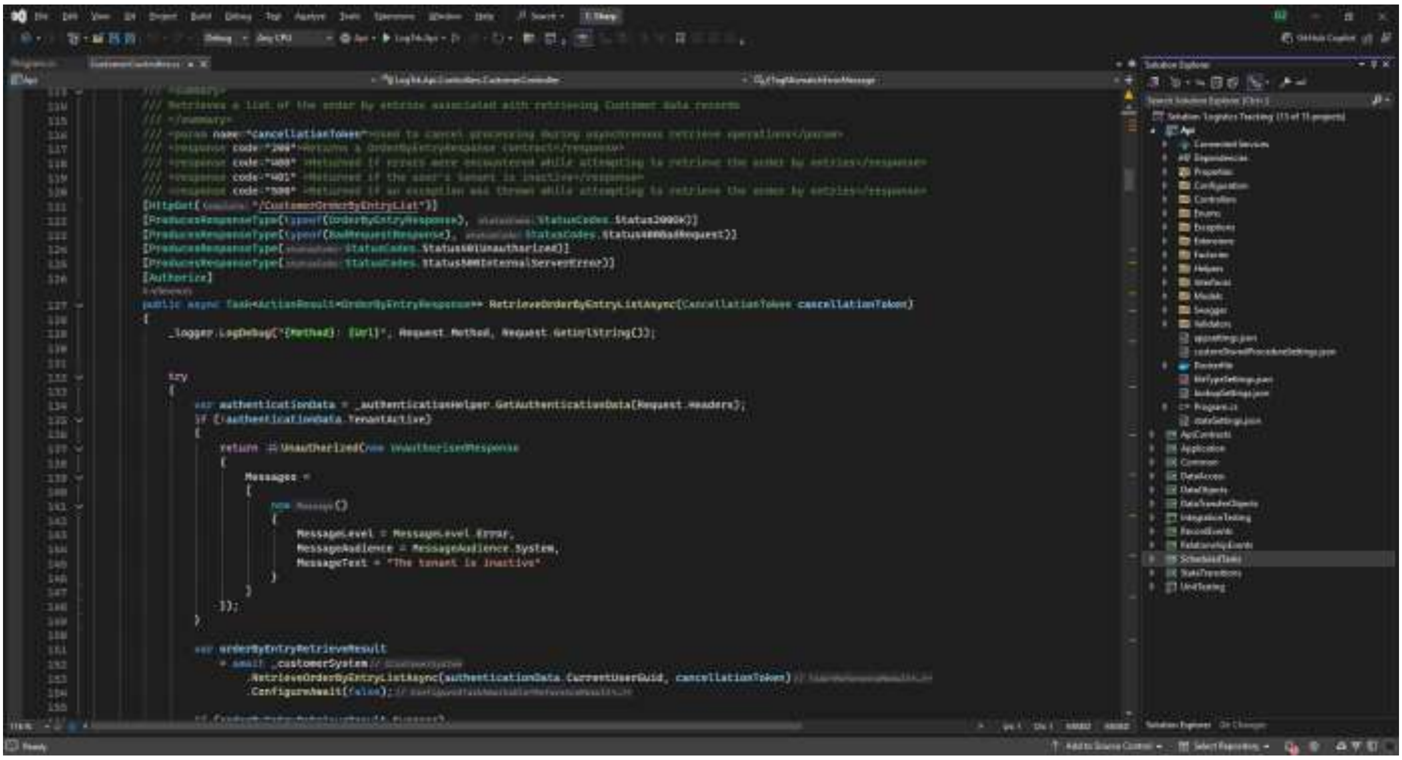
To run the build, press the green Build button.





The **Status** now says **Built,** and a blue button appears. Using this you are now able to download your generated code and it can be opened in the editor of your choice i.e VisualStudio.

If you go back and make any changes you will need to re-run the build process.



4.7: Managing Properties

Here we have listed the Property types that can be selected in the KOADX modelling tool. They are:

- String
- Date/Time
- Integer and Long Integer
- Decimal
- Boolean
- Lookup

For each Property Type you need to give it a Name / Display Name and on each dialog, there are also **Mandatory** and **Include in Summary** fields.

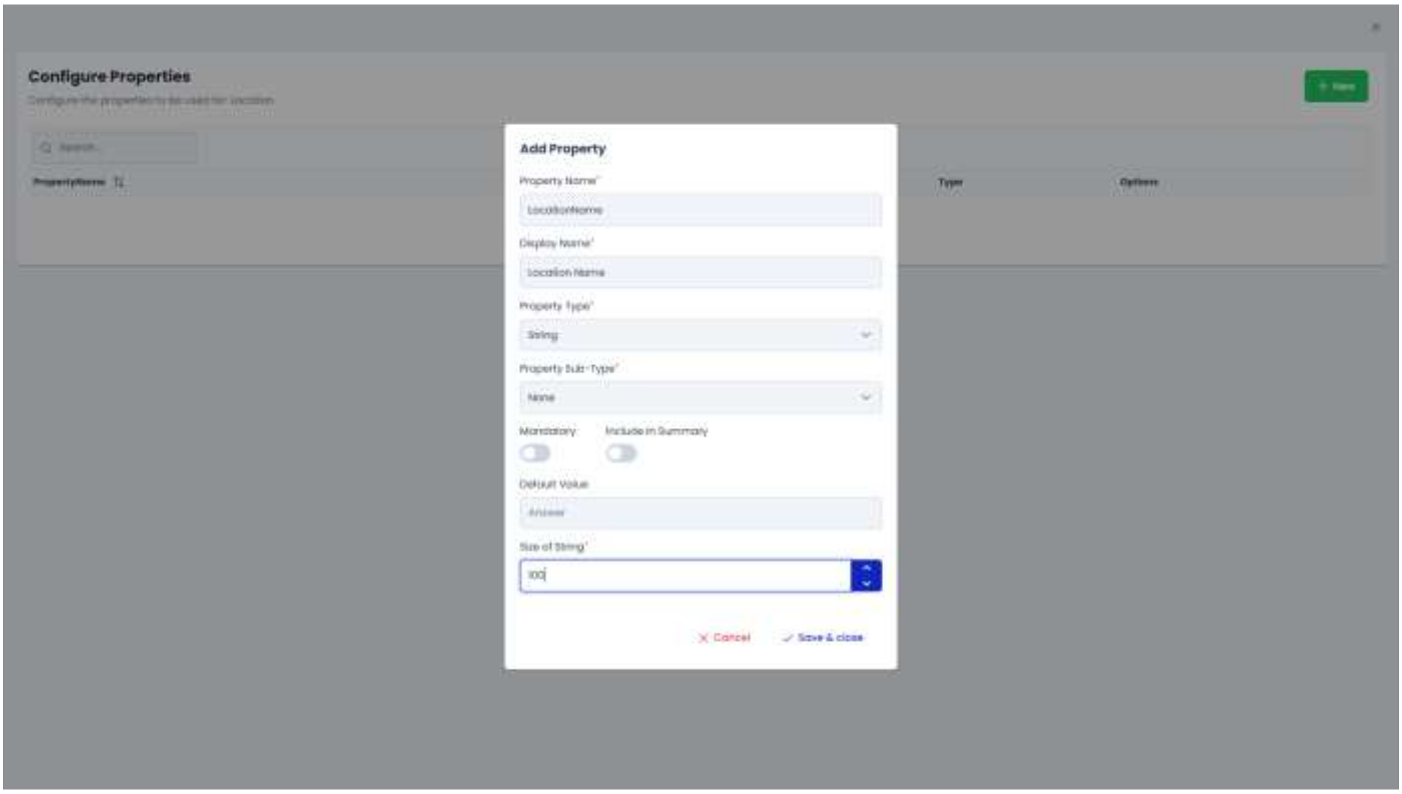
If **Mandatory** is switched on, when an API call creates the data class or relationship, a value of that property must be supplied.. Failure to supply the value will generate an error message.

Include in Summary allows you to limit the number of properties that appear in a record listing on your UI.

There is information, specific to each property, that appears on selection of the Property Type, and we have included screenshots in this section.

4.7.1: String

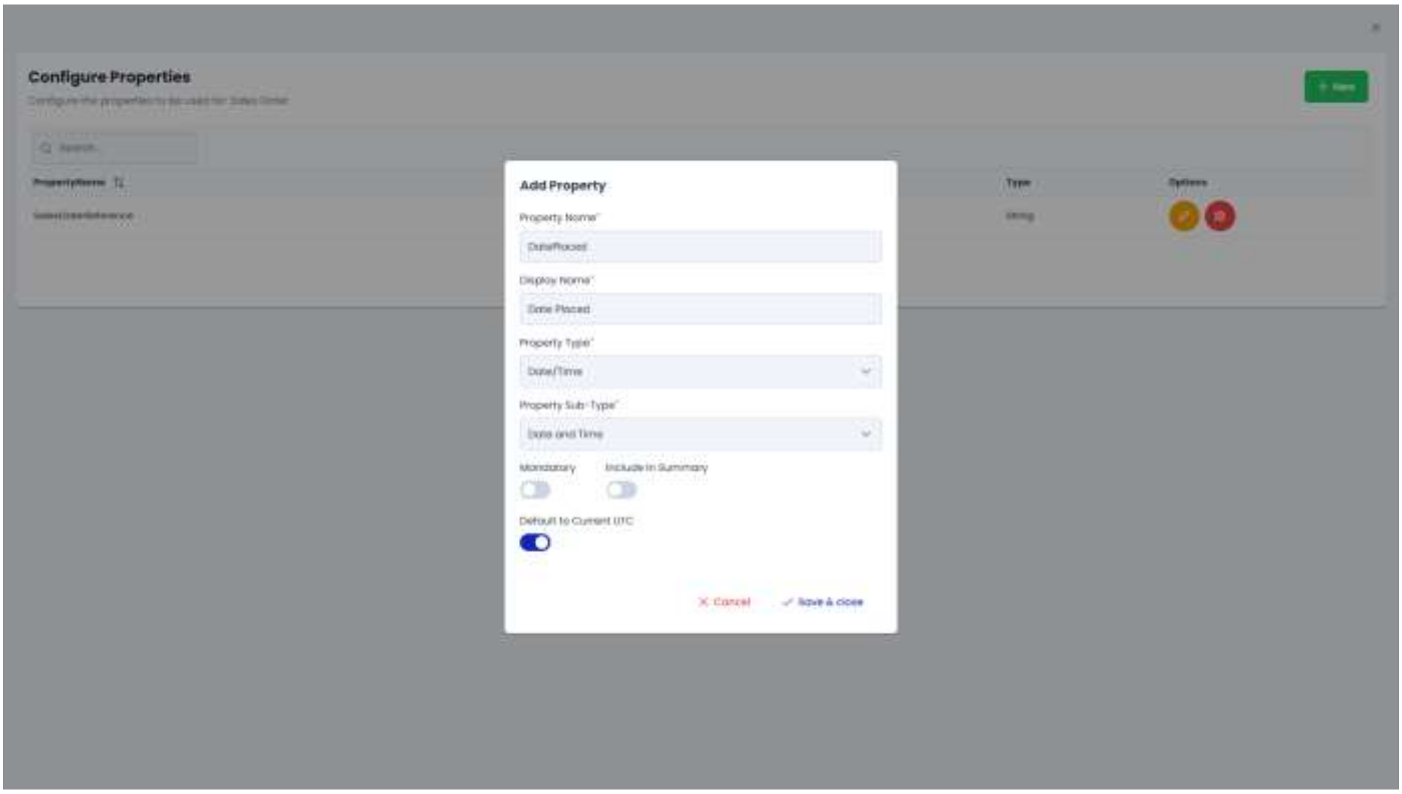
Enter the Property Name and its Display Name. Select Property Type, and property Sub-Type, from the associated dropdowns. Choose Mandatory and if you want it included in a Record Summary. Select your Default Value and the Size of String if applicable. The Size defaults to -1 which is the max string length in SQL.



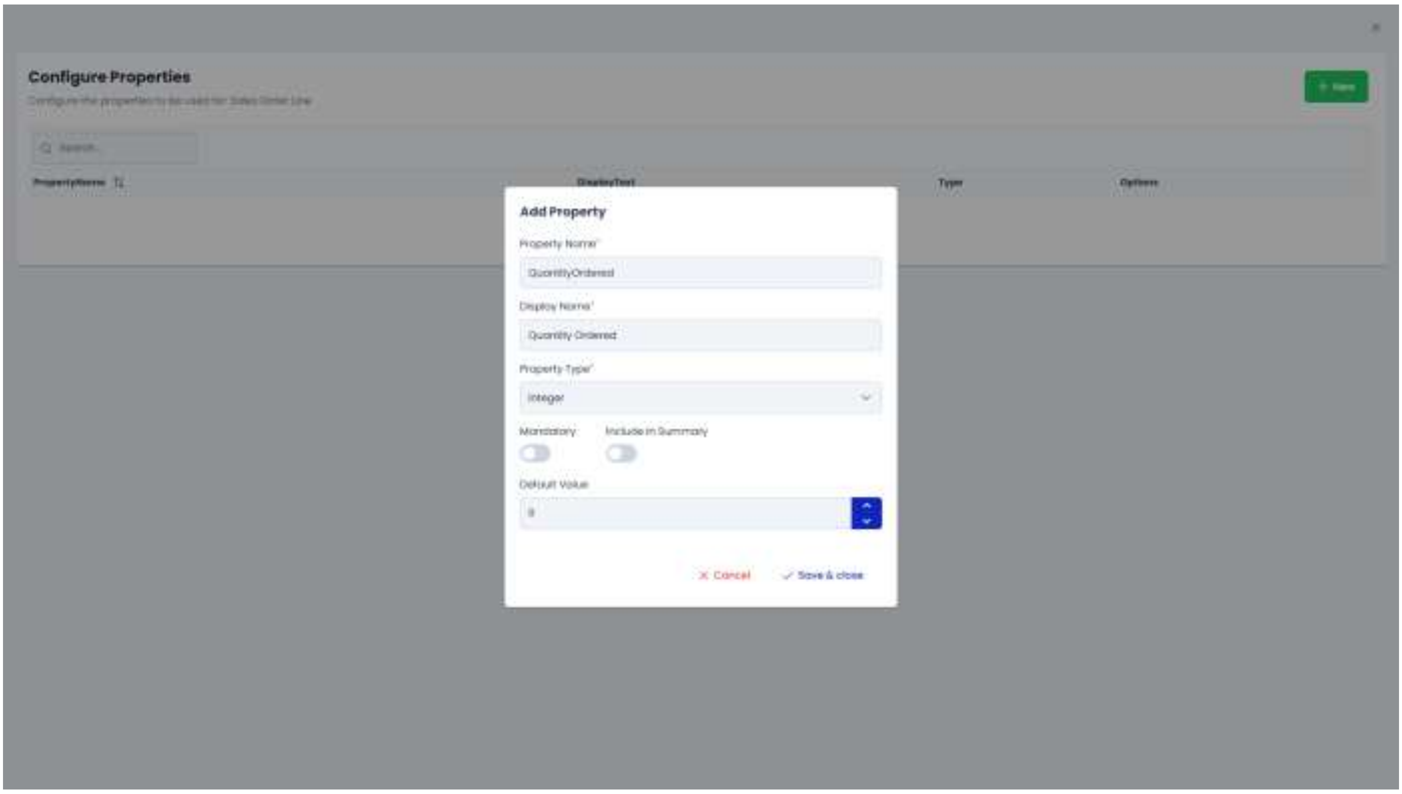
4.7.2: Date/Time

Here you also have fields for Property Sub-Type. You can select a full date/time or only a date.

You can choose to default to Current UTC (Coordinated Universal Time)

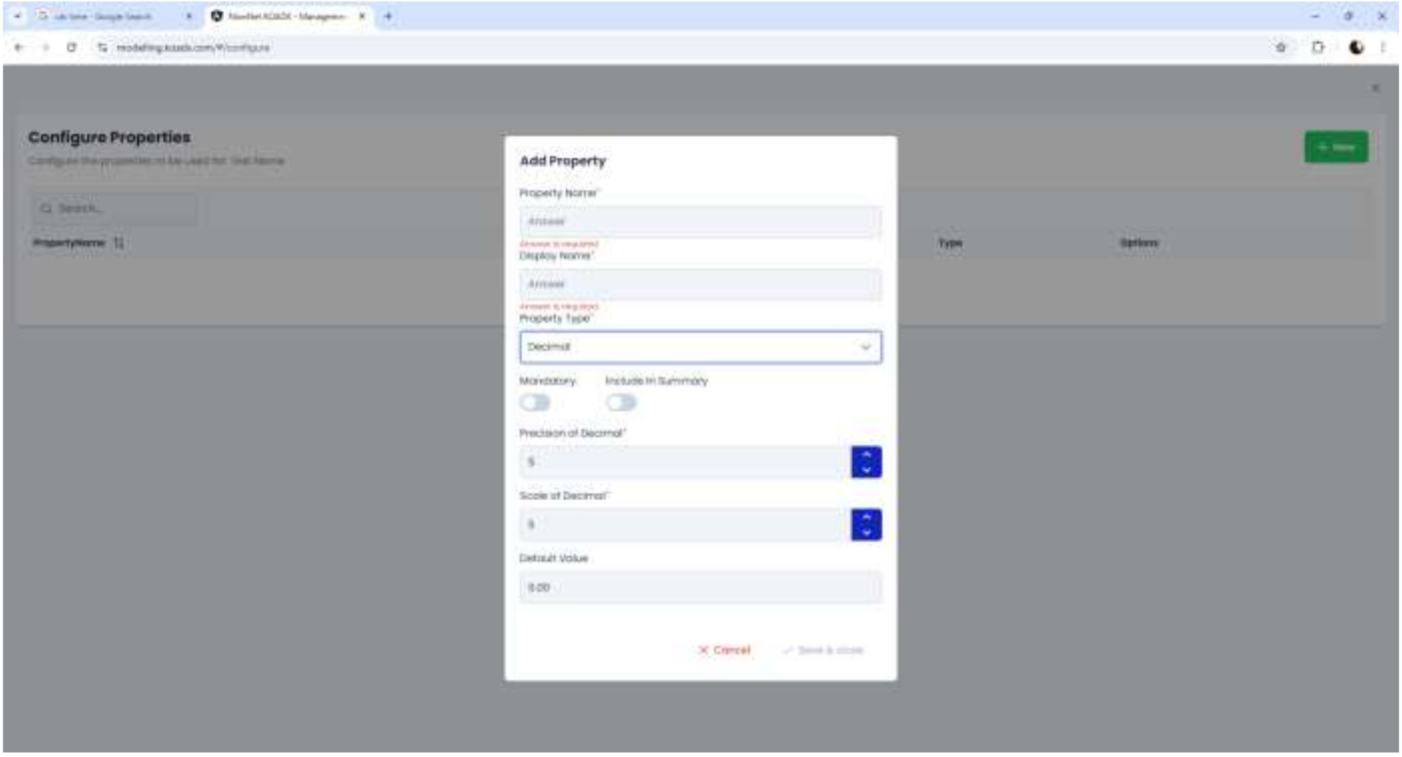


4.7.3: Integer and Long Integer



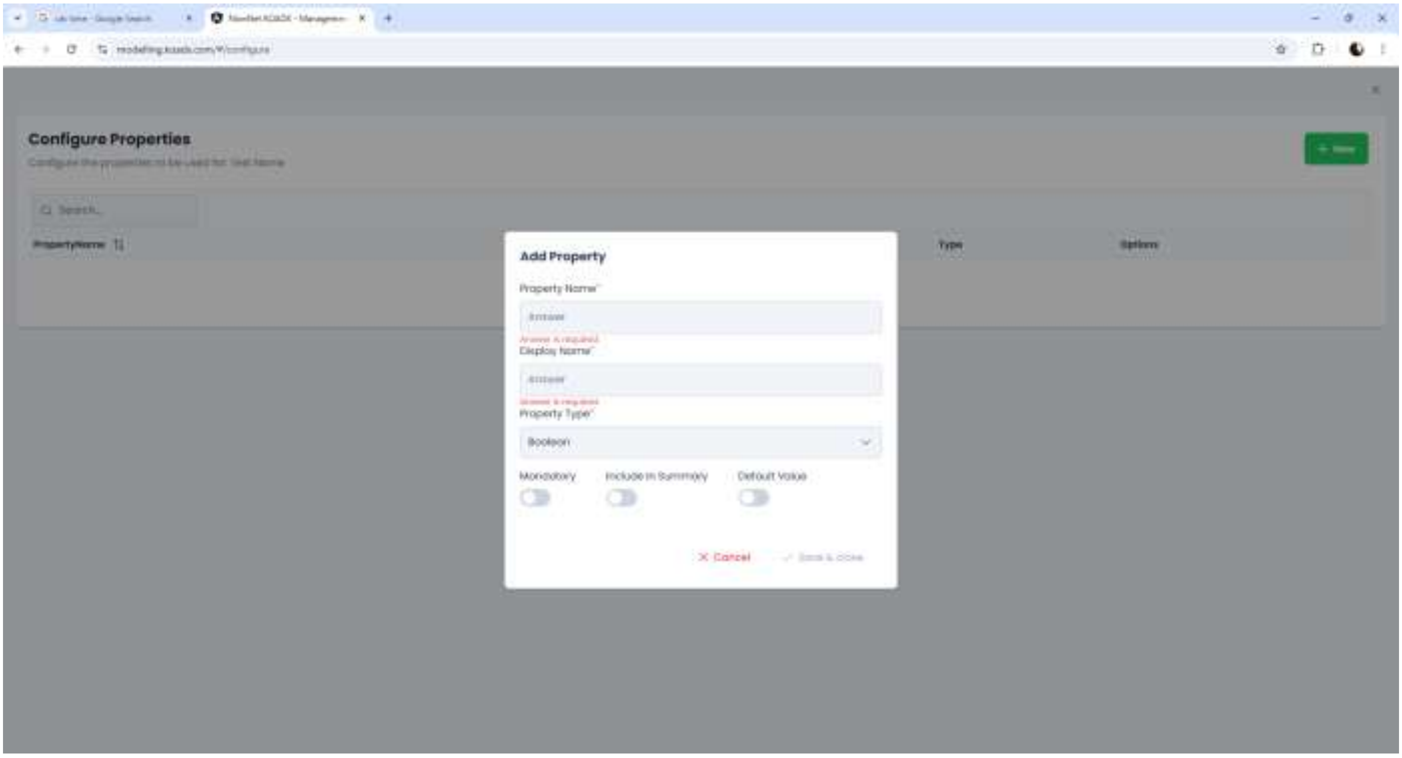
4.7.4: Decimal

In the decimal pop up you have precision and scale fields as well as default. We pre-select precision as 19 and scale as 5 which are the most normal settings for financial transactions.



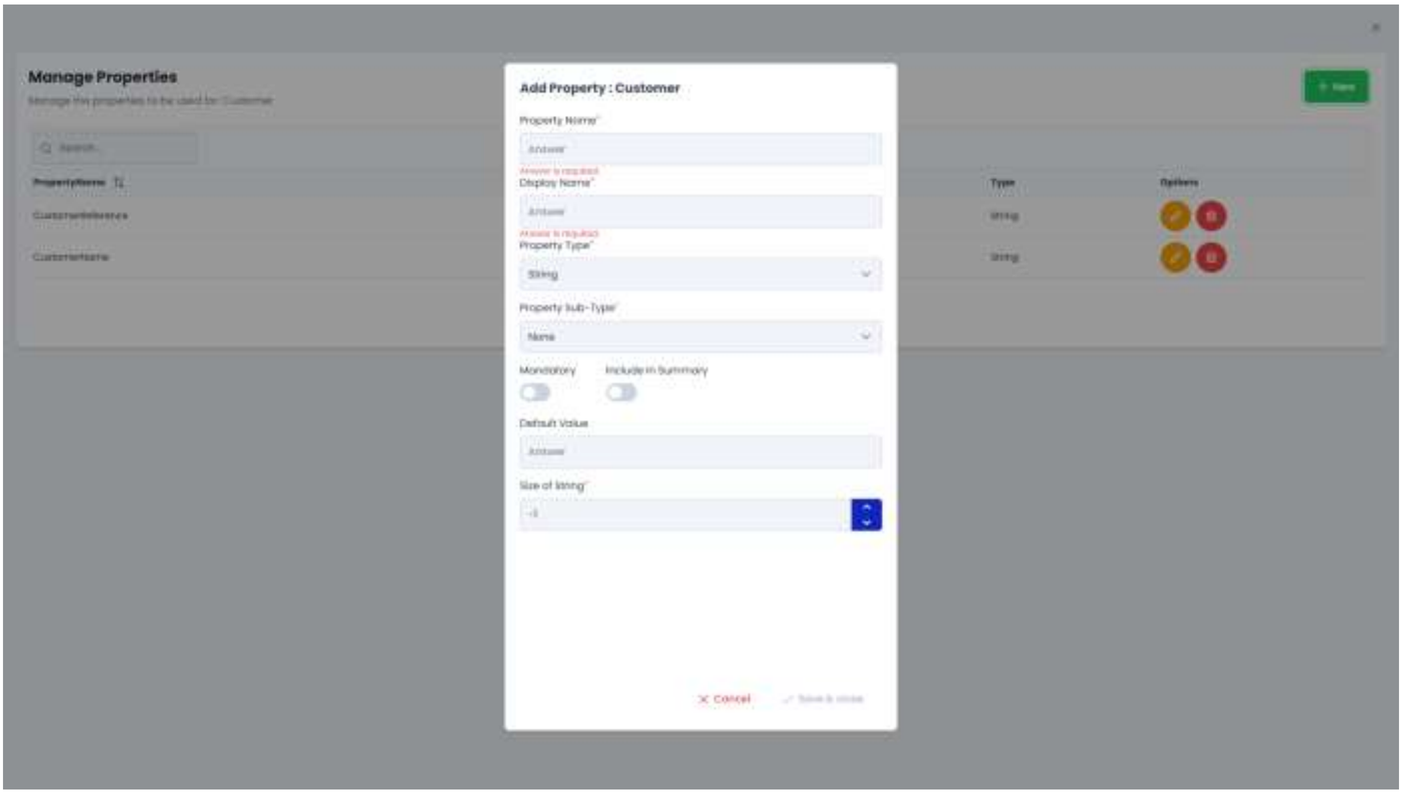
4.7.5: Boolean

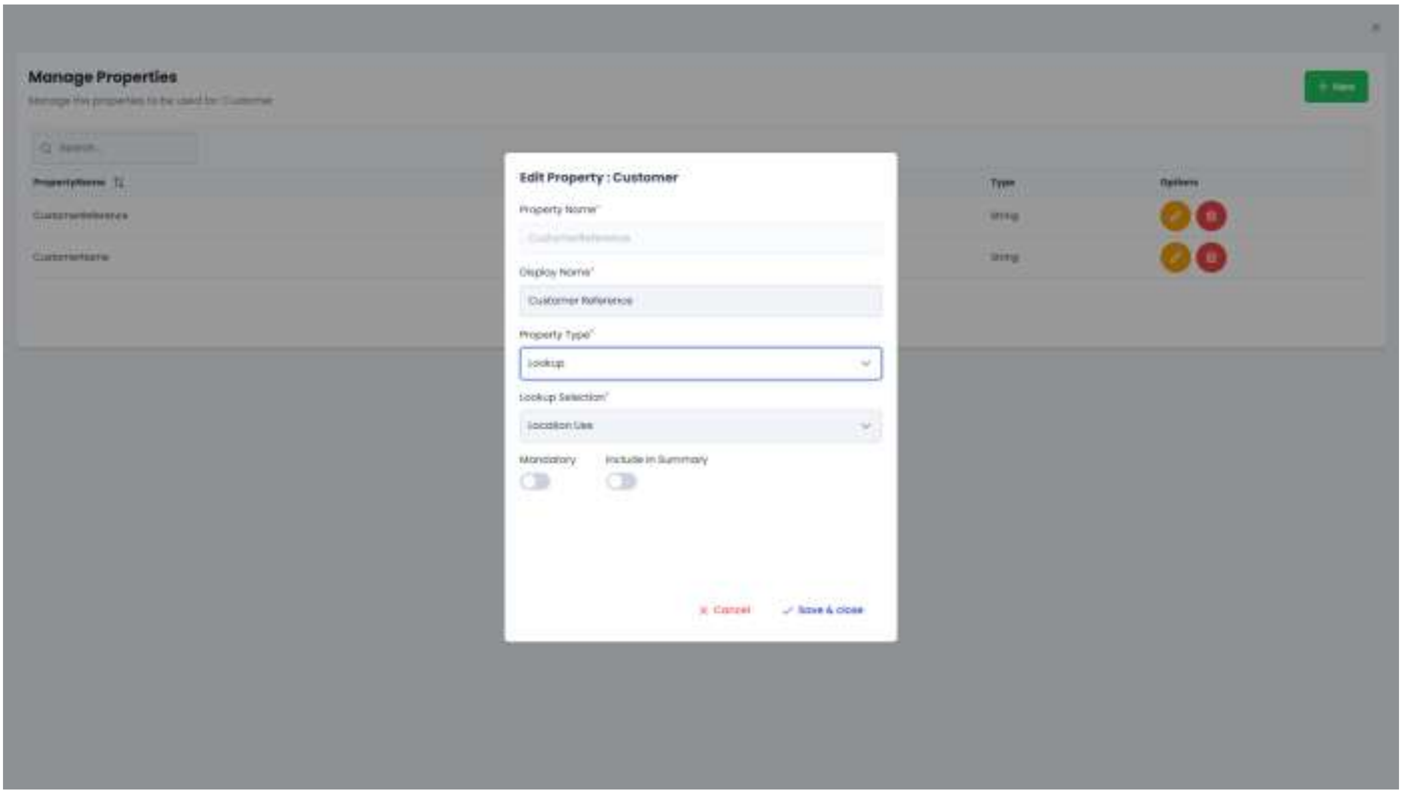
A Boolean can only take the values of true or false, and by default, these properties are set to false. The Default Value toggle allows the user to set the property to true.



4.7.6: Lookup

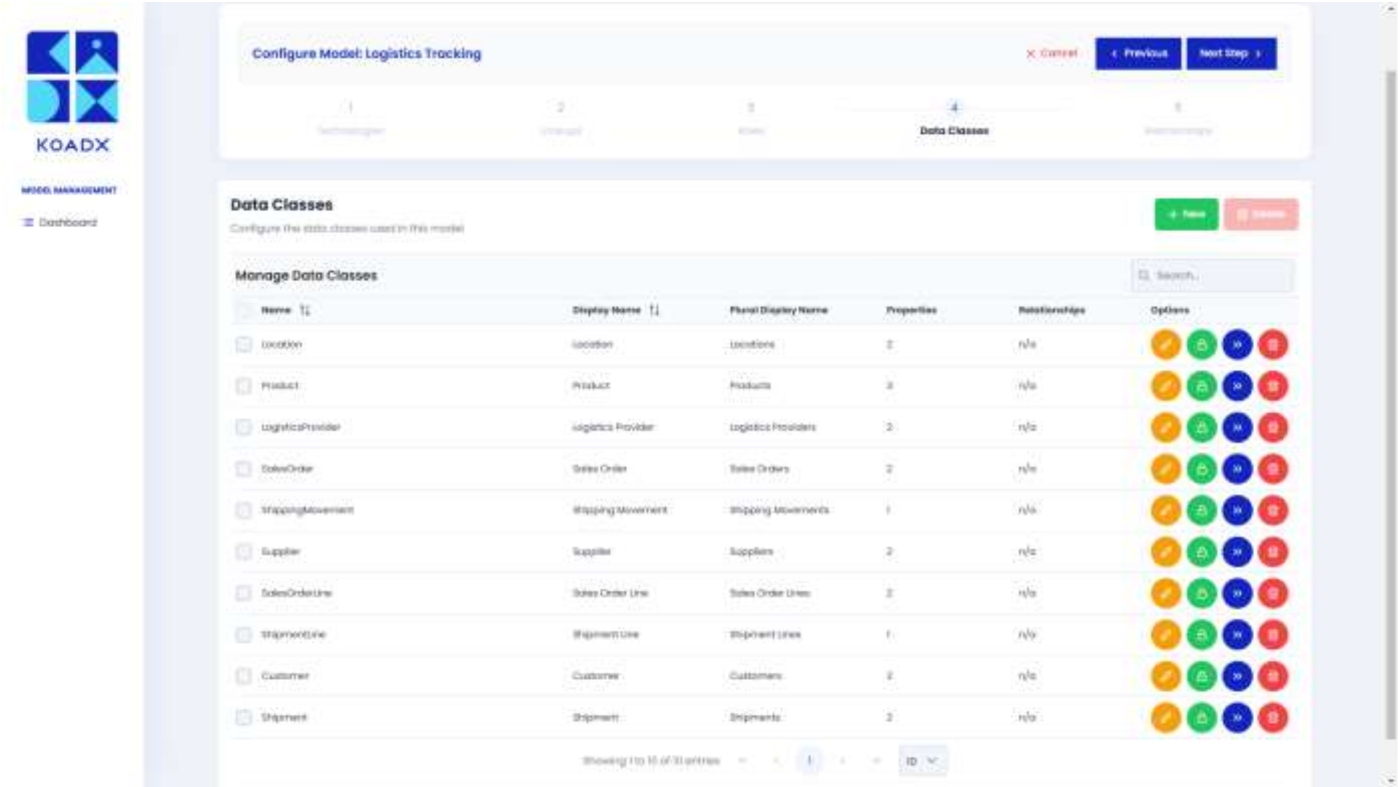
Creating a lookup property provides a 'picklist' to your UI. As well as selecting the lookup property type, you must also select a lookup (discussed in Section 4.2). If you have not entered any lookups, you will not be able to create a lookup property.





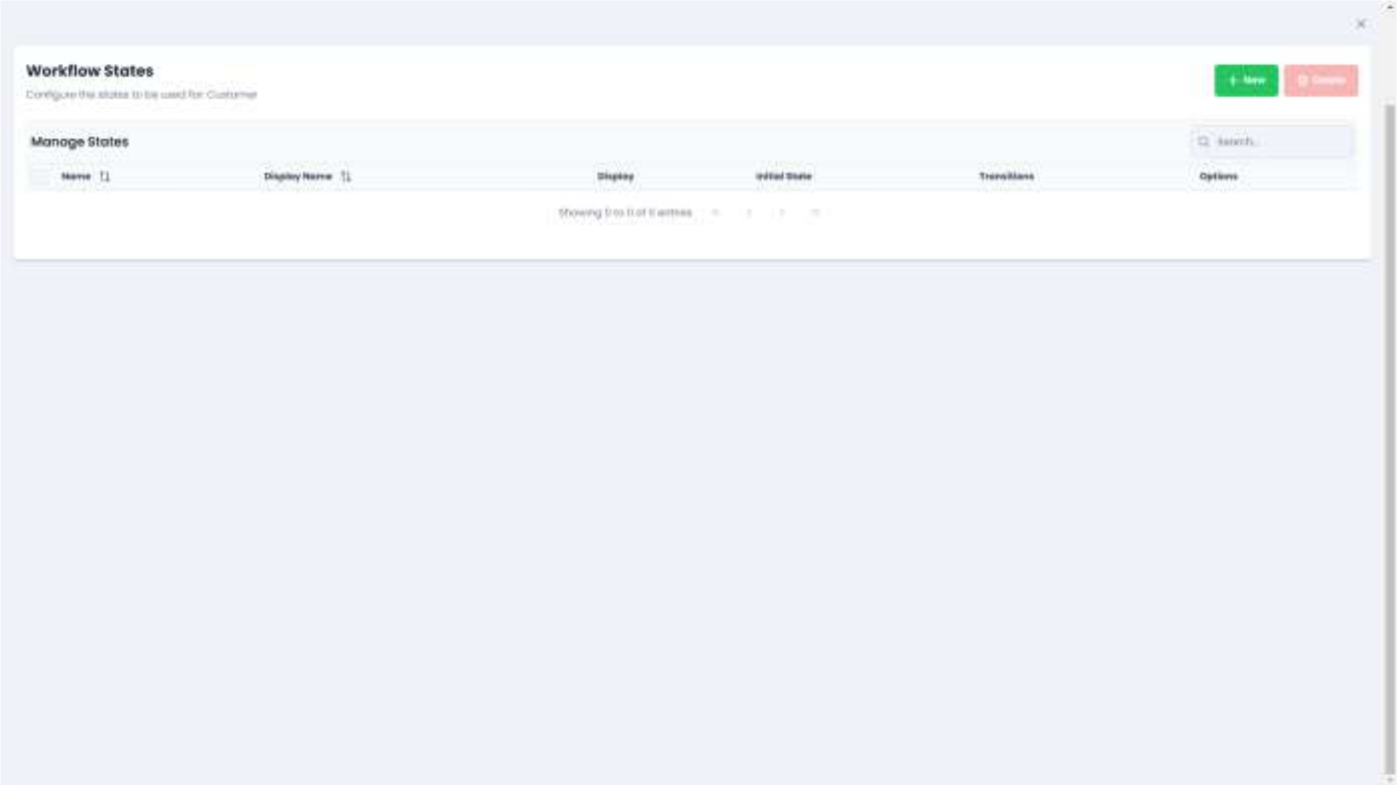
4.8: Managing Workflow

This is where you enter information about how your data moves through your system. For example, in Logistics Tracking, how an order is processed along a shipping pipeline, and who can do what to the associated information. Workflows are available for Data Classes and Relationships.

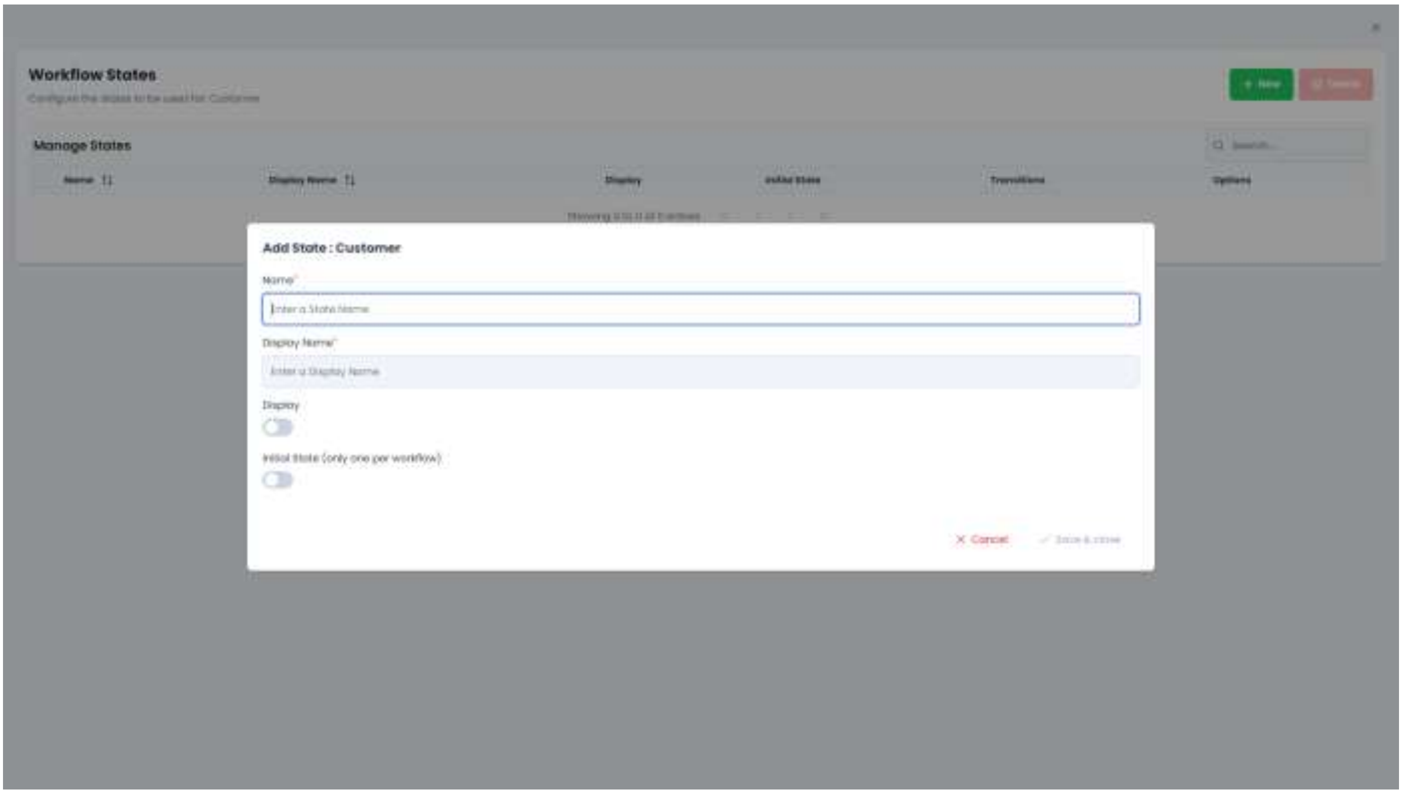


4.8.1: Add Workflow States

Clicking the **blue** chevrons button, Manage Workflows, against the relevant Data Class (or Relationship) will show this screen.

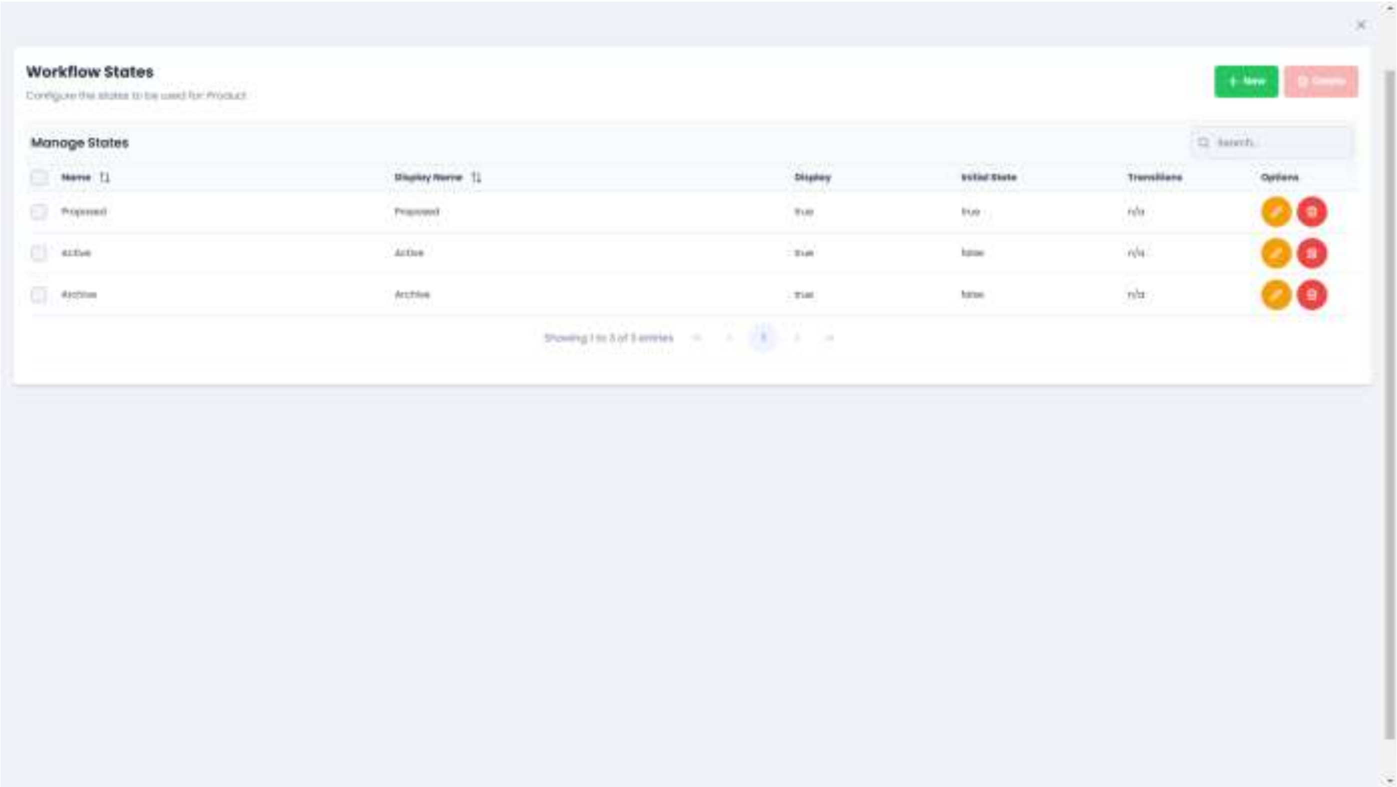


Select **+New** to add a Workflow State.



When adding, or editing states, the user is presented with a ‘Display’ and an ‘Initial State’ toggle. ‘Display’ simply sends an indicator to your UI that this is a state that should be displayed to the user, as opposed to states that only exist for reporting and programmatic control. ‘Initial State’ indicates that this state begins the workflow, for example the initial state of a product may be ‘Proposed’.

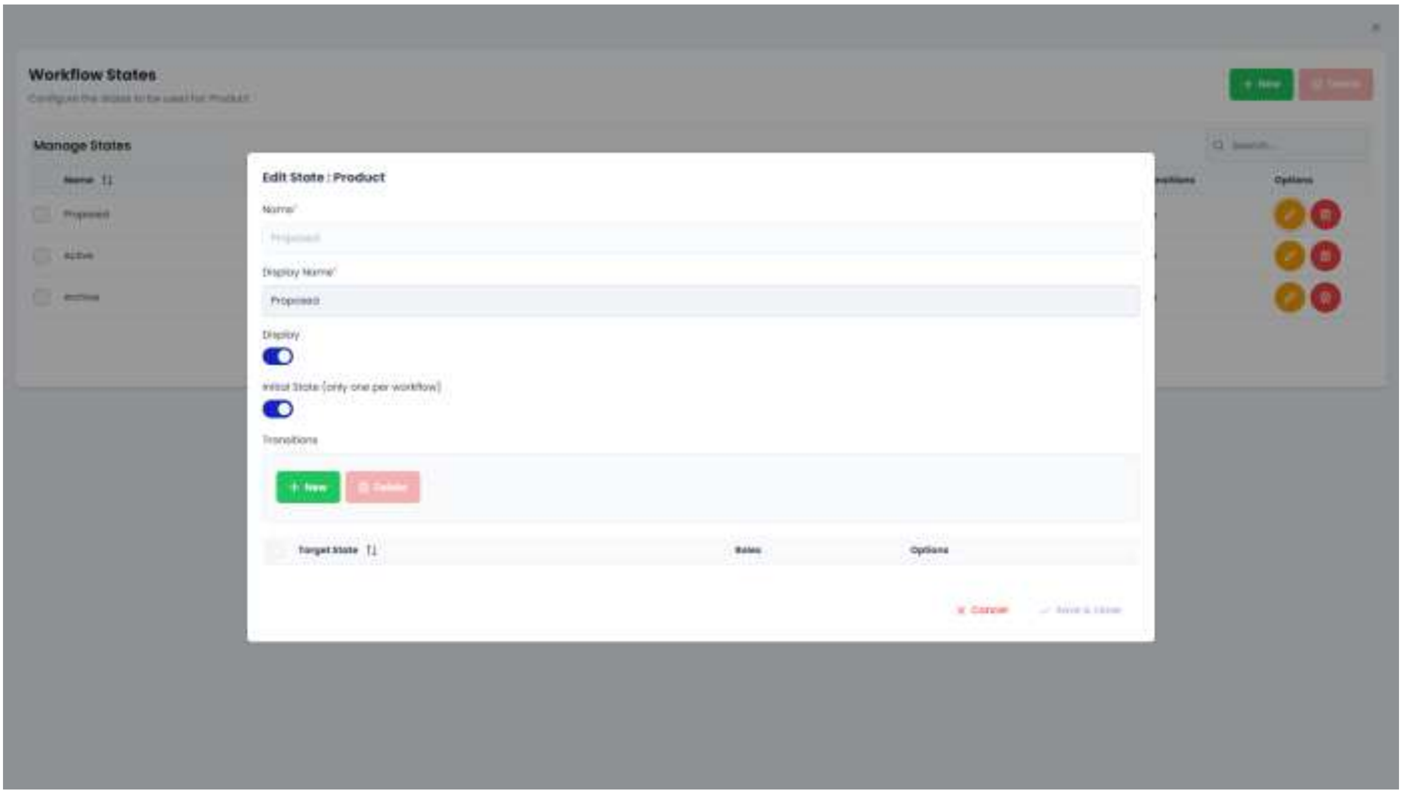
There can only be one initial state for each workflow.



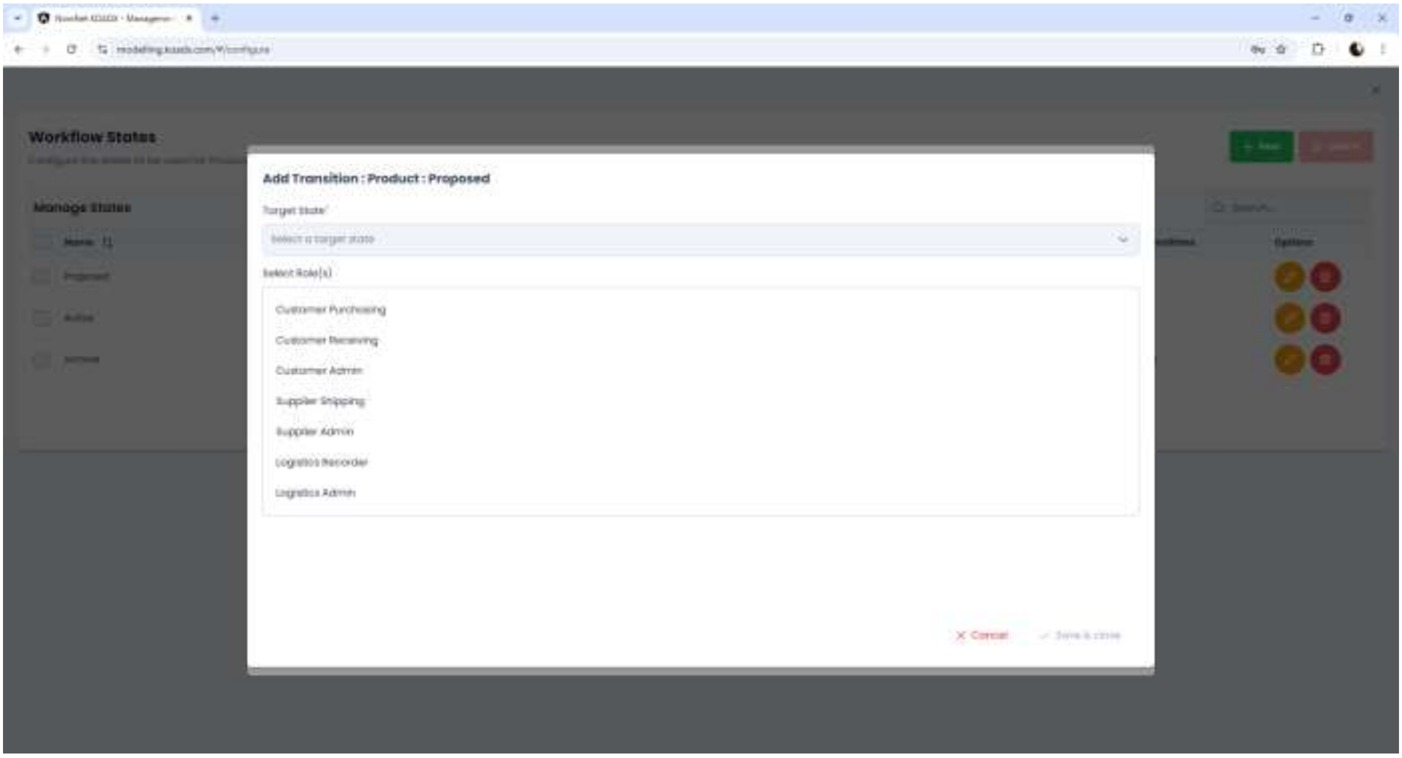
To close, click the ‘X’, top right of the screen.

4.8.2: Add a Transition from one State to Another

Select the State you are transitioning from and press the **Edit** button associated with it.



Select **+New** and pick the Target State for the Transition.

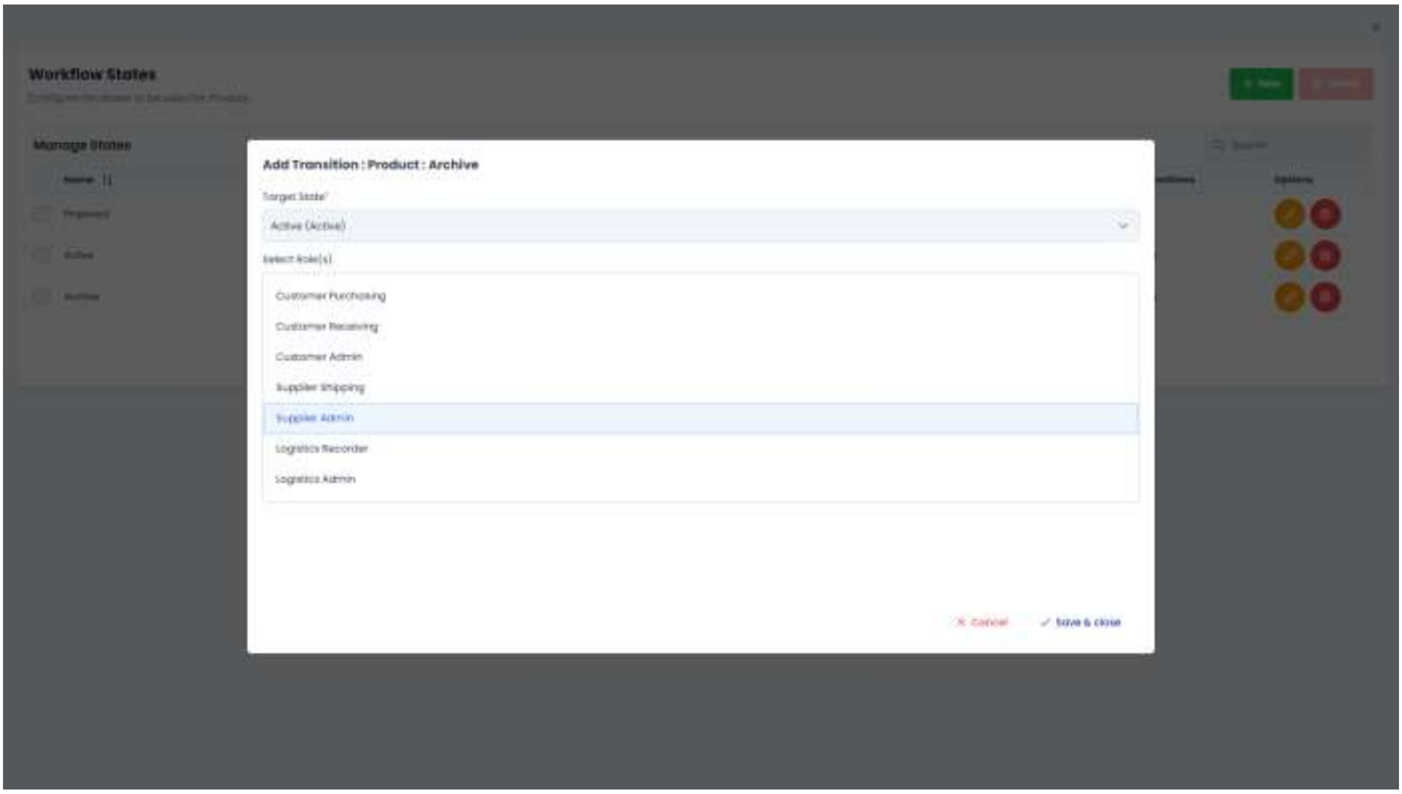


In this case, a Proposed Product can be moved to being an Active Product.

Click on the Target State field and select Active.

In certain cases, you may want to restrict the users who can move between particular states. In the example of the Product, a product that has been updated may be moved to Archive.

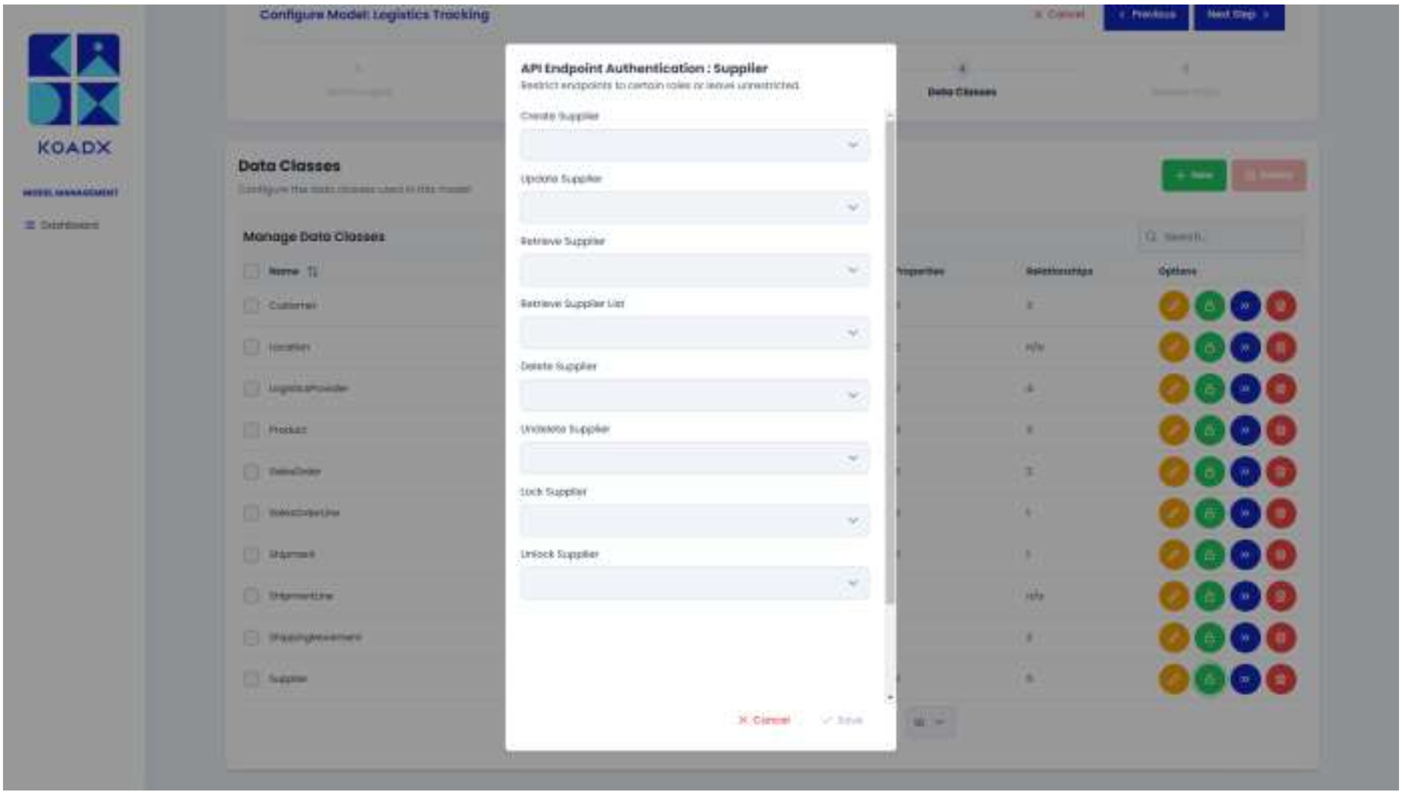
From customer feedback, you may discover that an ‘updated product’ is unpopular. You may want to revert to the previous ‘older’ version. In this case, an Administrator may move the archived product back the Active.



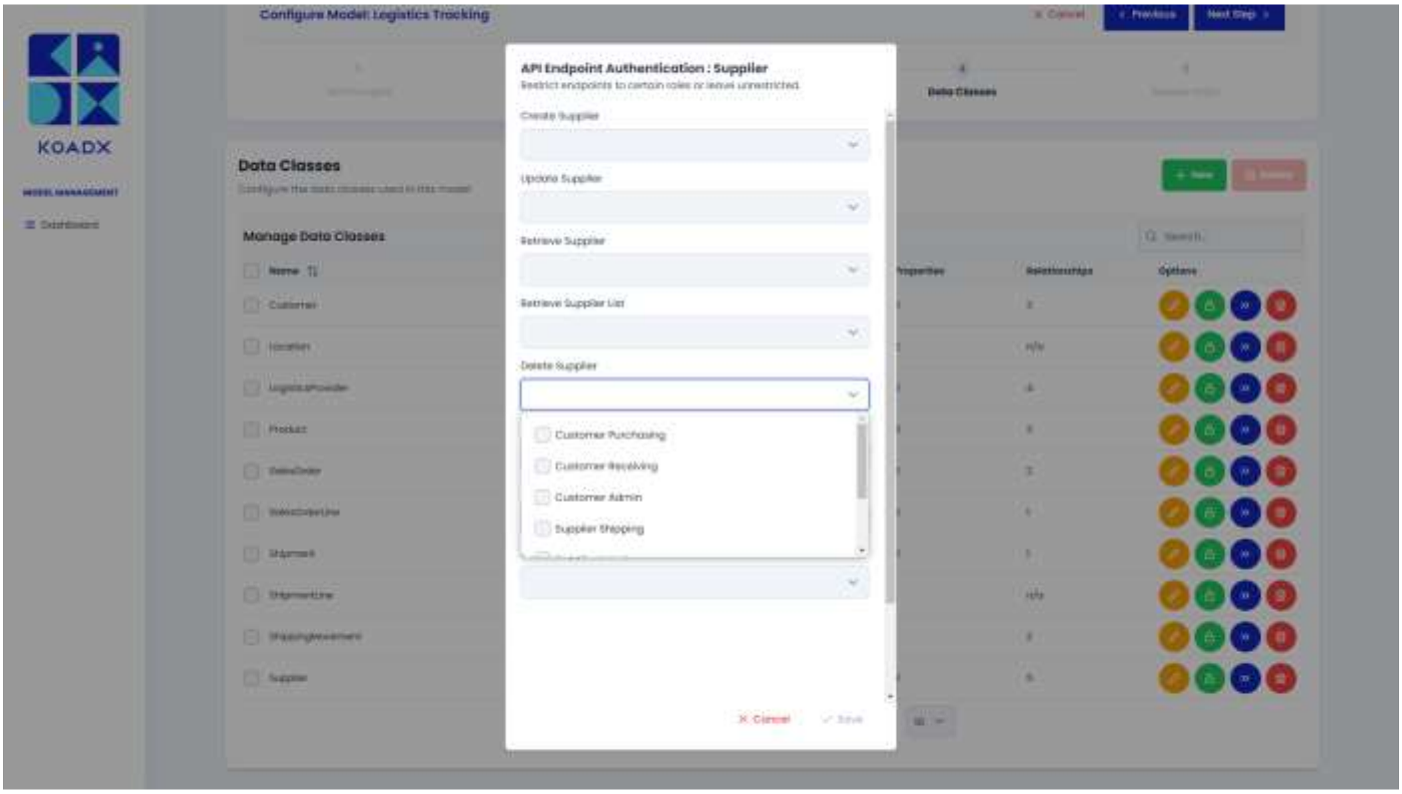
This transition can only be carried out by the Supplier Admin.

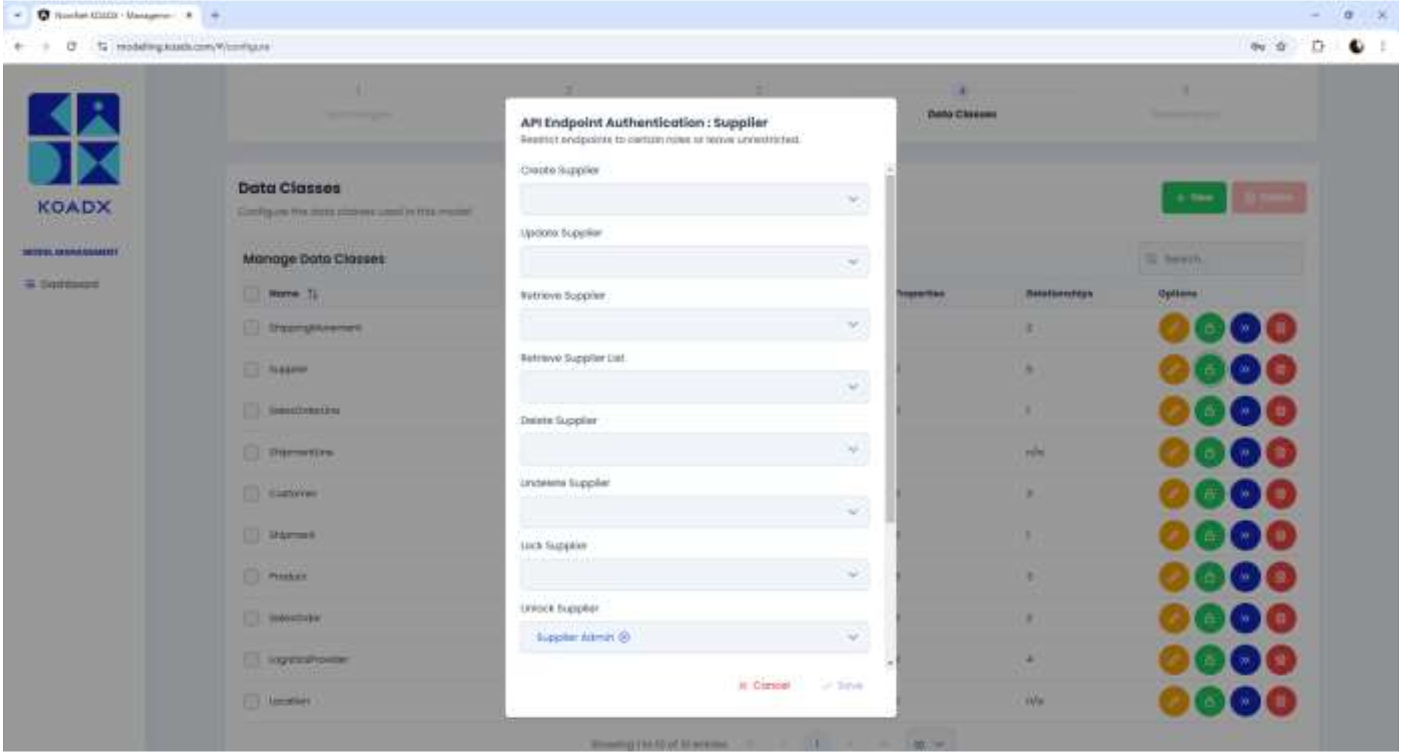
4.9: Managing API Endpoint Restrictions

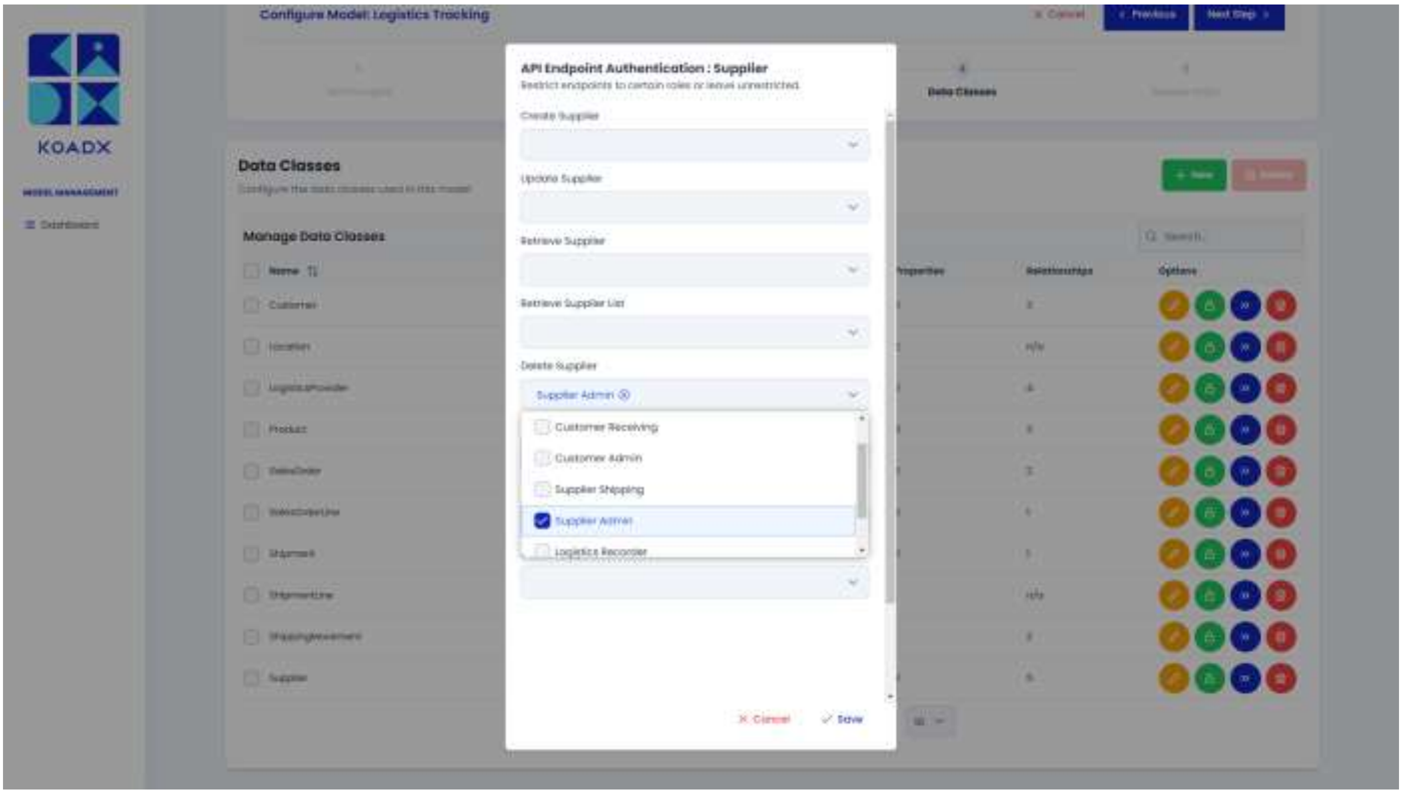
Additional role-based restrictions can be added to any of the API endpoints, for both data classes and relationships. Against a data class/relationship, click the green padlock icon, and the following dialog appears.



Click on the dropdown next to Deleting Supplier, then click on the checkbox next to ‘Supplier Admin’, selecting that role to be able to submit a request to the supplier delete API endpoint.







For any other queries, please email info@KOADX.com.