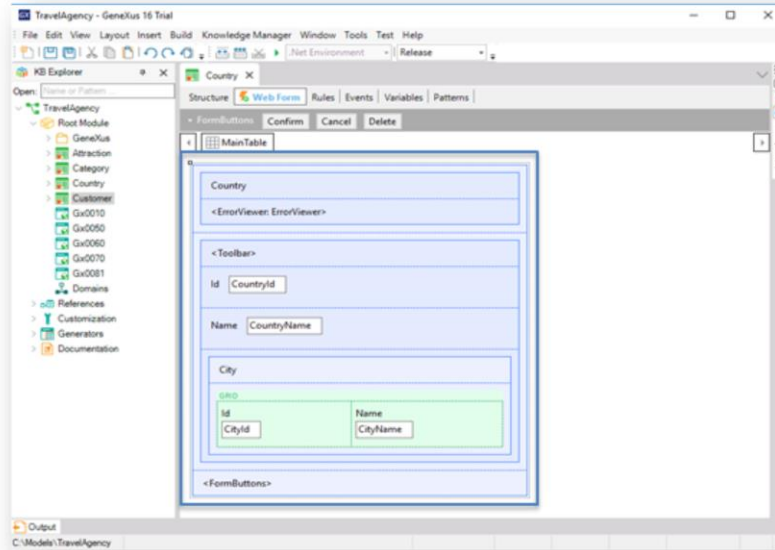


Adding functionalities with no programming required

Applying Patterns

GeneXus® 16

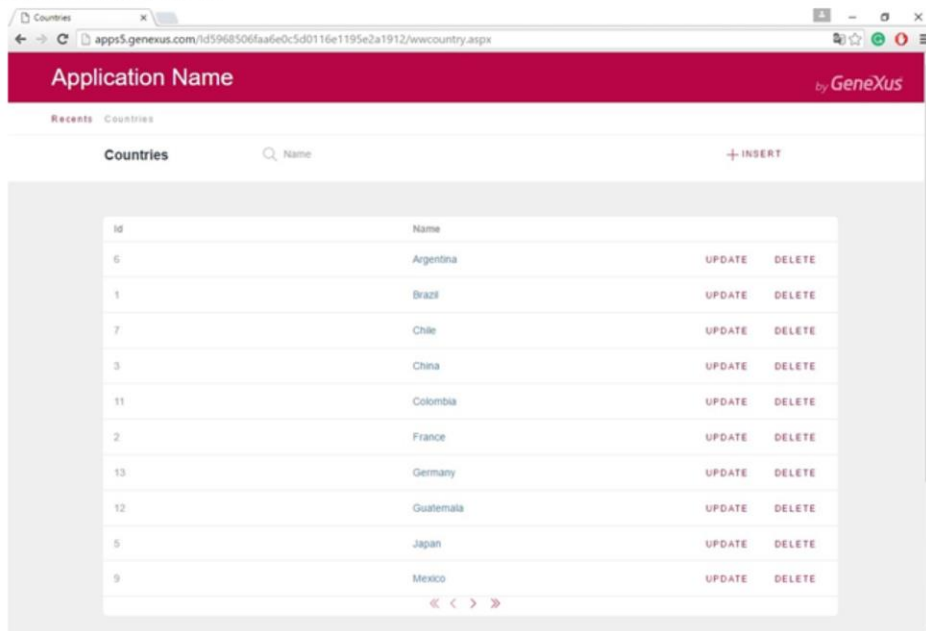
Web Form



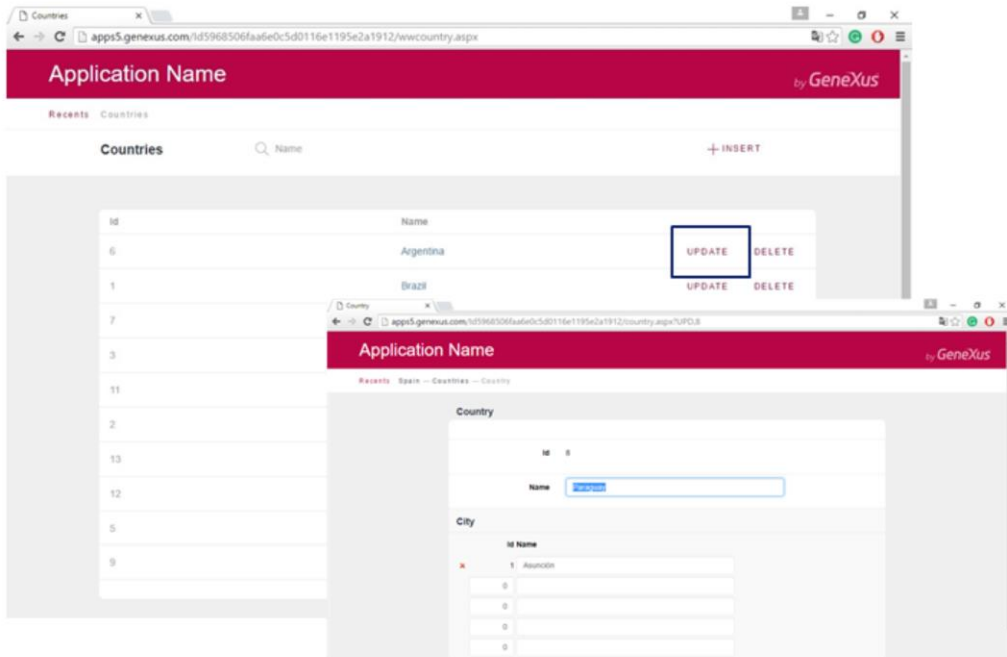
Patterns allow us to empower applications by easily adding new features.

When we apply a pattern, **GeneXus creates all the necessary objects** to provide the desired behavior without the need for us to program them.

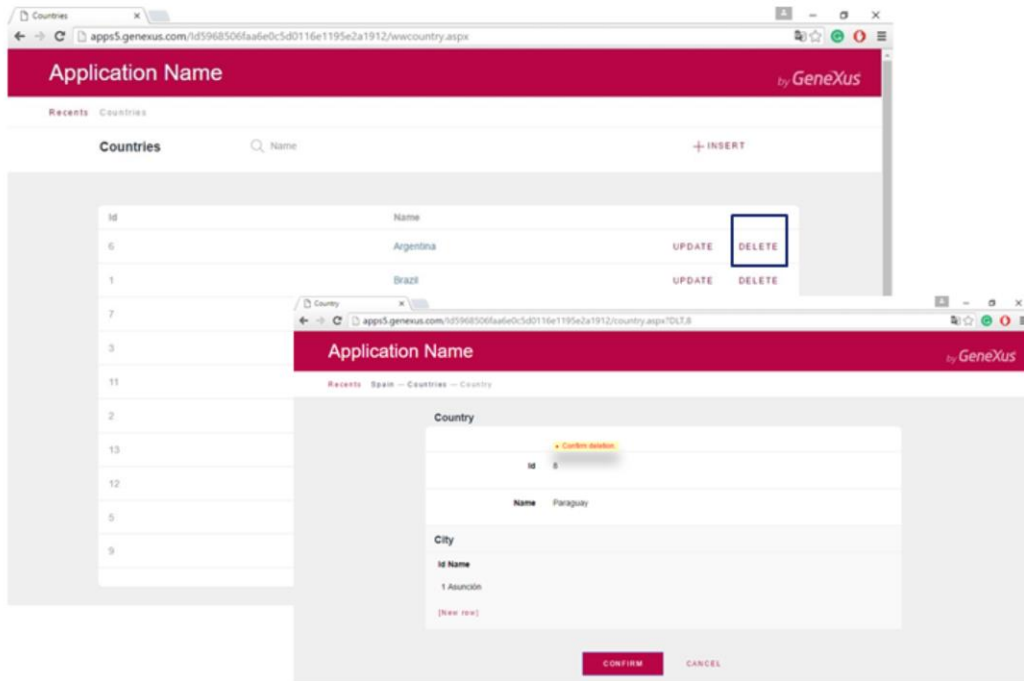
Pattern Work With for Web



For example, let's suppose that even though we have the Countries transaction to enter, change and delete countries... we also want an **attractive page to query countries** and show all the existing countries, filter by country name, support paging, and **enable us to go to the Countries transaction** to add a new country.



Also, it should allow us to change an existing country...

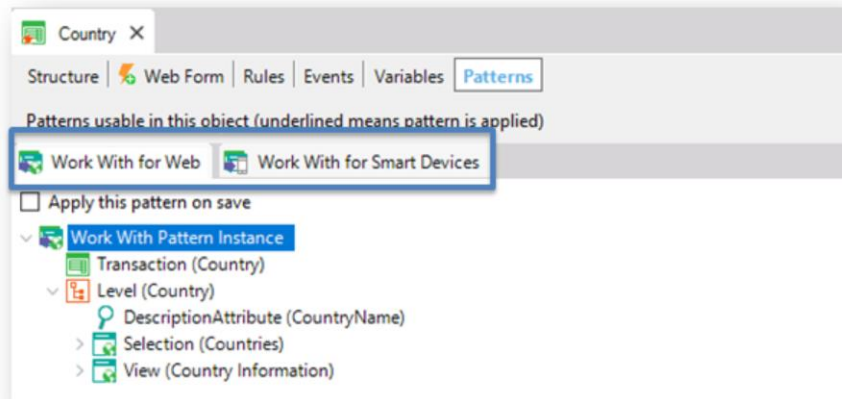


or delete it.

Patterns



for Web
for Smart Devices



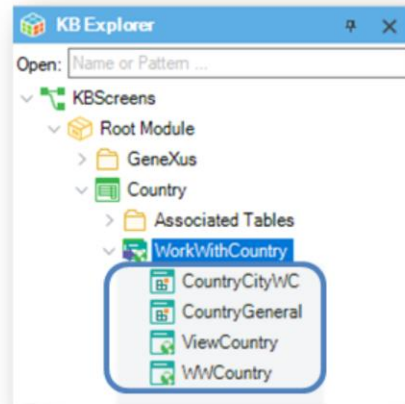
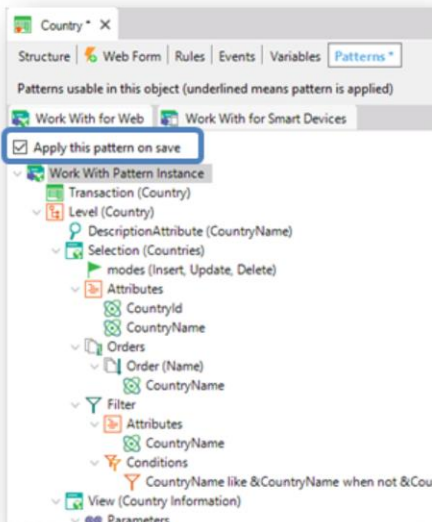
To quickly implement this, we have a pattern called "Work With" and we will show how to apply it to the Country transaction.

This pattern is available for web applications, such as the application in the example, or for Smart Device applications.

In the Patterns tab of the Country transaction, we can see both patterns.

How to obtain it

- In the Country transaction:



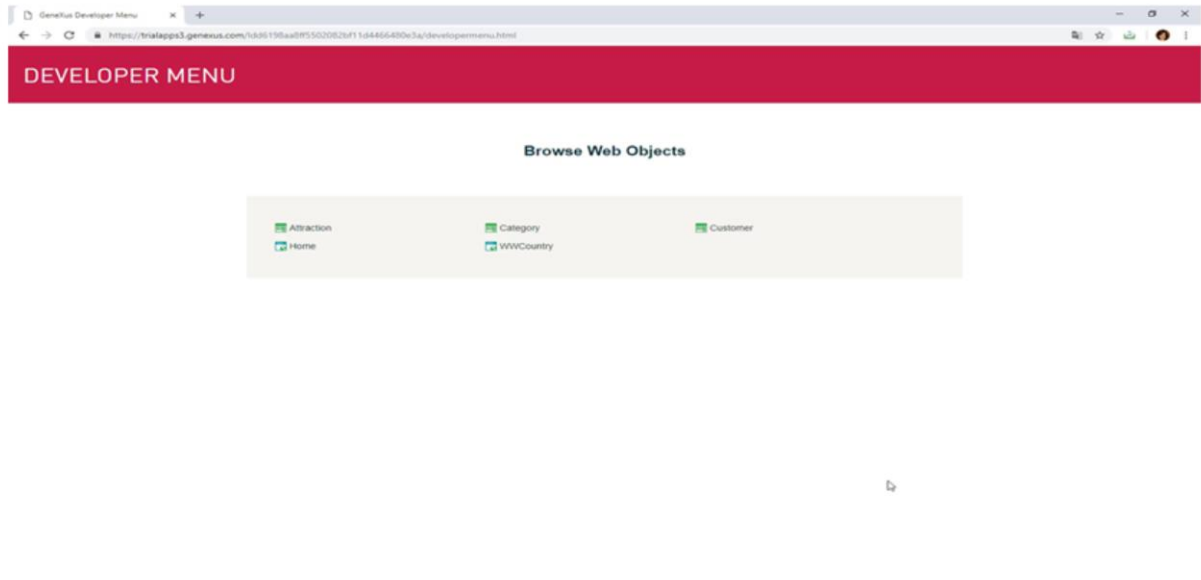
Automatically generated by GeneXus

Now we will see how to apply the Work With pattern for Web to the Country transaction.

In the Country transaction, we select the “Patterns” section, choose the Work With tab, click on “Apply this pattern on save” and save.

Now, if we place the Country transaction, we can see that below the transaction there are several objects that were created by GeneXus when the Work With pattern was applied.

DEMO



[DEMO: <https://youtu.be/XuzVrb6TWDE>]

Now we press F5 to run the application and **look at what has been automatically generated just by selecting an option and saving.**

First of all, note that a link is displayed with the text **“Work With Country”** for us to work with a wider range of features.

We click on this link...

...and see that a page is opened to show all the countries that we have entered.

For each line with a country there are 2 actions available: Edit the details of the country in the line... **we see that the transaction is opened** and allows us to change the information related to the selected country. Let's add a city for France and confirm.

This other action clearly offers us the option to delete the country in the line.

And the 'INSERT' action also allows inserting a new country. Running it opens the Countries transaction, ready for us to add a country and all its related data:

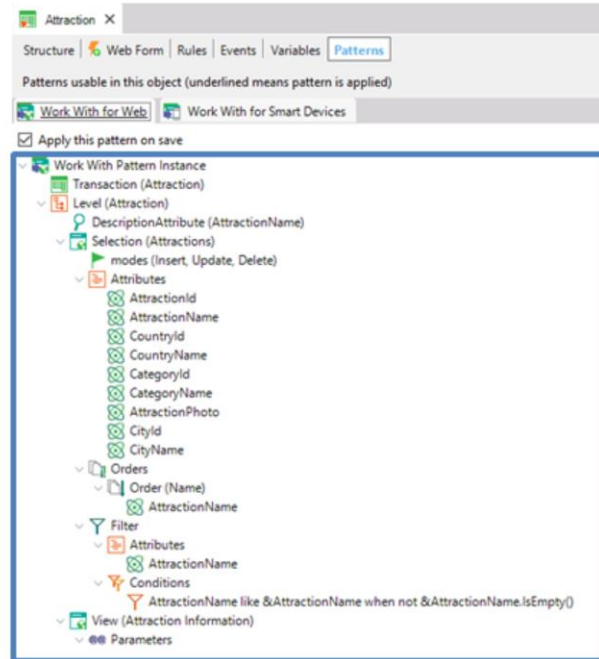
We enter "United States"... and a city, New York... We confirm.

Note that we can search by country name: if we type "F" it shows all the countries that begin with this letter. In this case, we only have France.

Note that the country name has a link. If we click on it, all the details of the selected country are displayed in the first tab and another tab labeled City shows the list of cities that belong to this country.

We choose to go back to Work With Countries.

Pattern instance



We easily applied the Work With pattern to the Country transaction and now we will apply it to the Attraction transaction.

We go back to GeneXus, open the Attraction transaction, open the “Patterns” section and in the Work With for Web tab we select the option “Apply this pattern on save”.

Upon saving, all the necessary objects are generated to implement all the features that we’ve seen, in this case, to work with Attractions.

We confirm that they have been generated, and press F5.

Note that just like in the previous case, we’re offered to “work with attractions” and from there the transaction is called.

We run “Work With Attractions”...

Again, we see that if we change the screen size, the information displayed is adjusted. In this case, instead of showing all the Attraction attributes, only the name is displayed.

Here we have the same query features that we saw for “Work With Countries”... and we will use it to enter more tourist attractions.

Let’s insert the Great Wall... in China... we select the path to the image... and indicate that it is in Beijing.

Now we will add the Eiffel Tower.

We type “Eiffel Tower”... It’s in France... and it is a monument. We select the path to the image... and indicate that the Eiffel Tower is in Paris.

Now, suppose that we are asked, in addition to filtering by attraction name, to provide the ability to filter the attractions in a certain country.

Let's see how to add another filter to "Work With Attractions"... Another request is that the grid shouldn't display the country or city codes... or the category... We go back to GeneXus.

So far, we have only selected "Apply this pattern on save" **and we've seen all the features that are automatically generated... what we haven't seen so far is this tree of configurable values.**

Let's take a quick look at this "Selection" node that also says "Attractions", because below it are all the configurable options for the "Work With Attractions" element that will be generated.

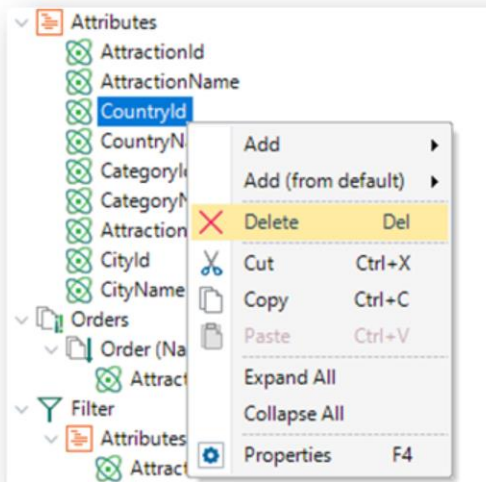
For instance, note that here we can see the operations that will be available to update the database, invoking the transaction to do so.

If you don't want to offer some of them, you can customize them in the properties window.

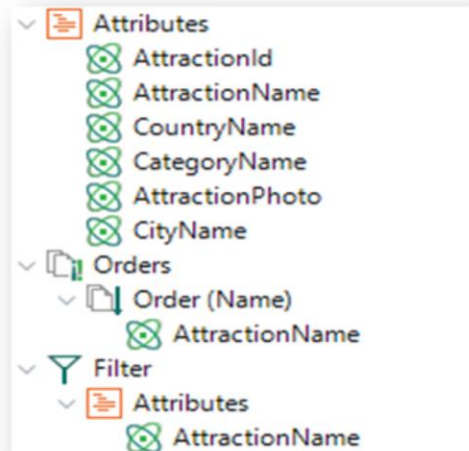
Right below is the Attributes node which contains the attributes that will be included in the "work with" grid.

Working with the instance

BEFORE

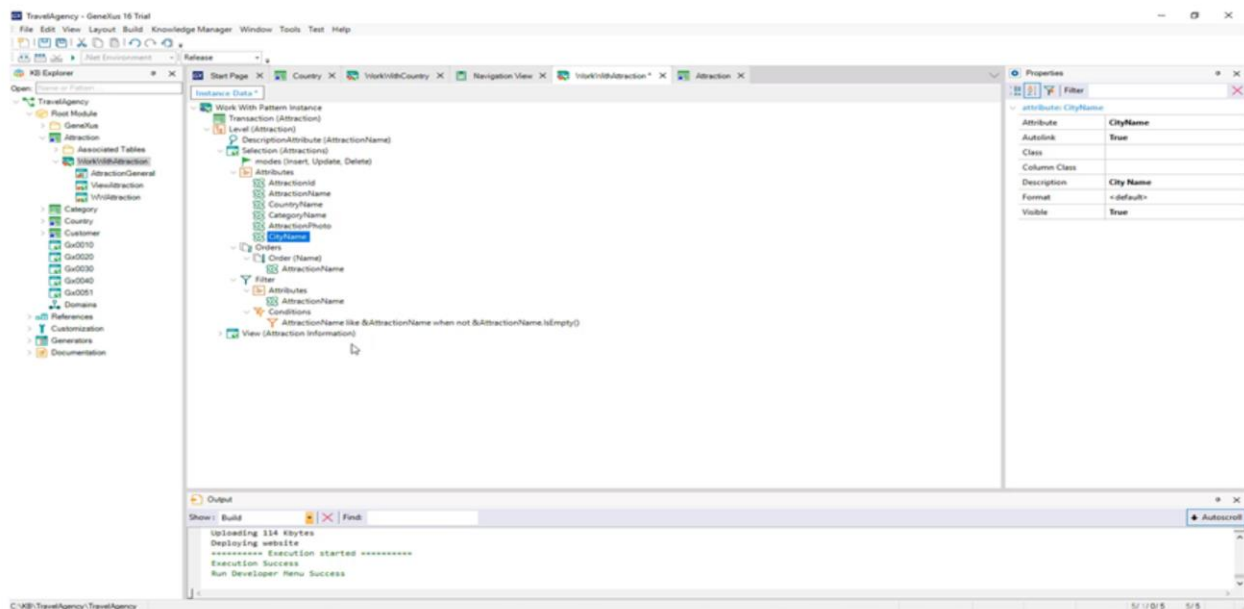


AFTER



Since we were asked not to display the country or city identifier in each line, nor the category, we will remove them.

DEMO



[DEMO: <https://youtu.be/5RFOW4Q63ZQ>]

We have also been asked to make it possible to filter all the attractions in a certain country. To do so, under “Filter”, we right-click on the “Attributes” node, and “Select Attributes...”.

In this selection dialog, we choose CountryName.

We are asked if we want the filter condition to be defined and we select Yes.

This automatic filtering condition is generated over the grid's data, which will add a field outside the grid (it will be a variable) for the user to enter characters in order to display only the countries that contain them.

We press F5 to see the result of the customizations we've made.

We see that the main filter by attraction name continues to be displayed over the grid, as before (also, the grid no longer displays the country, city and category identifiers). Now a column has been added to the left, which can be hidden and displayed again, and where all the extra filters added to the pattern will be displayed. In this case, there is only one: Country Name. If we press "F", we see that only the attributes of France are displayed.

If we also type “E” in Name the only data item that matches both conditions is the Eiffel Tower.

Note that if we type “E” in the country filter: “E”, there are no records to display that match these conditions.

And if we indicate that the country name starts with a “C” but don't enter any requirements for the attraction name, the Great Wall of China is displayed.

Now suppose that we are asked to make it possible to order the data in the grid, whether in alphabetical order by attraction name as we've been doing so far, or by country name. If we click on the column by which we want to order.

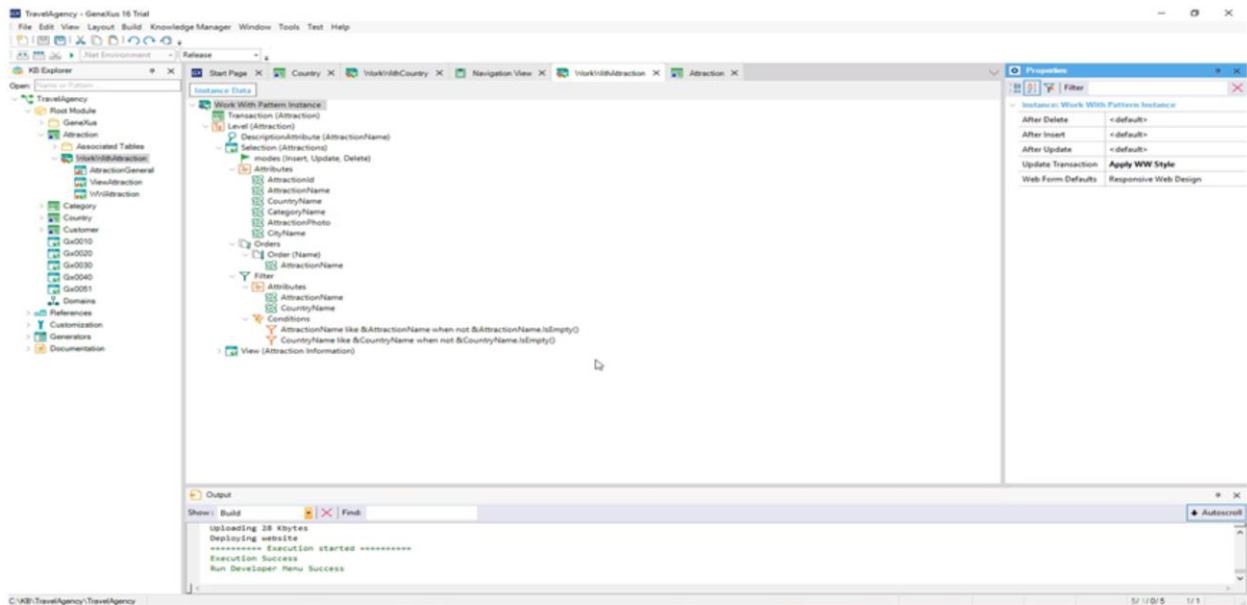
We see that it is already done, and that it even allows us to order in descending order.

That's why we wouldn't have to make any changes to the pattern. However, clicking on the column only orders the data that had already been loaded to the grid.

In this case, we only have 3 attractions in the database, but if we had 20, not all of them would be displayed. As we've said, the grid supports paging [go back to the countries ppt with paging shown at the beginning]. This means that only an X number of records are displayed at once. When the screen is opened, the first X are displayed, and it is possible to show the next X, and so on.

Therefore, the records displayed on each page will depend on the total ordering. To order **all** the records before loading them in the pages, we must do something in the pattern.

DEMO



[DEMO: <https://youtu.be/wDQYh4VgYng>]

We go back to GeneXus... and in this Orders node, we can see the ordering by attraction name is automatically provided.

We right-click on “Orders” and select “Add” / “Order”.

We give this order a name, in the properties section, such as: Country.

We right-click on the node of the new order and select “Add” / “Attribute”.

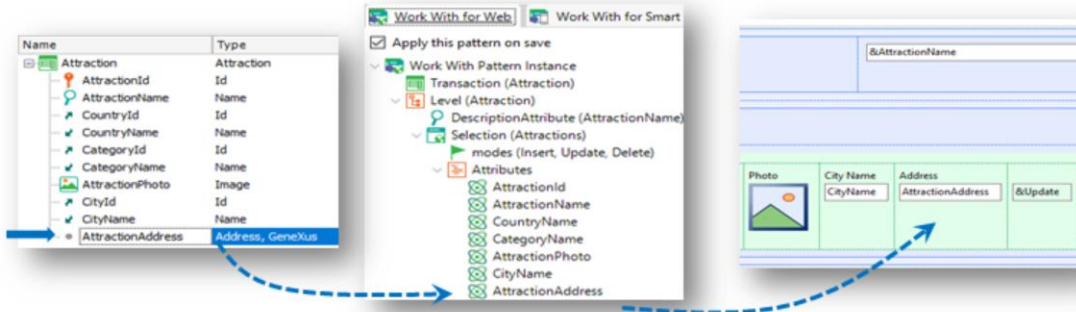
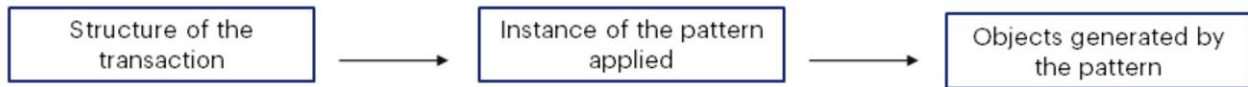
We select the CountryName attribute and press F5 to see what we’re offered.

Here, it indicates that the information is being ordered by Name; that is to say, by attraction name.

If now we want to do it by Country: the results will be displayed in alphabetical order by country.

Maintaining dynamism

- **Example:** New attribute AttractionAddress



Let's talk about something else:

What happens if, after applying the pattern, attributes are added to or deleted from the transaction structure?

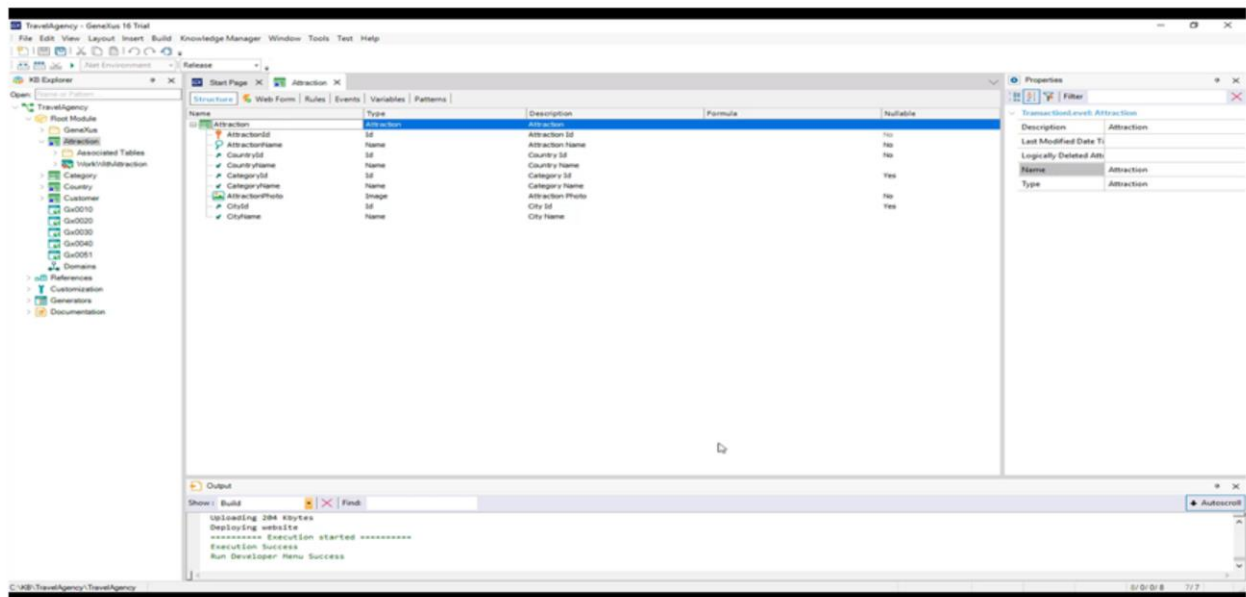
Once the Work With pattern has been applied to a transaction, a “dynamic relationship” (synchronization) is created between the transaction structure, the applied pattern **instance** and the generated objects.

This means that if we add a new attribute to the transaction structure, it will be automatically shown in the pattern instance, and it will be added in the objects generated by the pattern. For example, the object that implements the screen with the grid displayed at runtime.

Therefore, it will be shown when the application is run [press F5]. Since we have added an attribute, we need to reorganize.

Likewise, if an attribute is deleted from the transaction structure (let's delete AttractionAddress), it will be automatically deleted from the pattern instance applied and will be removed from the GeneXus objects generated. Let's reorganize once again.

DEMO



[DEMO: https://youtu.be/d-7eISwJ5_o]

When is this dynamic relationship lost?

For example, if we open one of the objects generated by the pattern [WWAttraction] and edit its form (we add a control or change something; for example, delete the attraction's photo), the dynamic relationship between the instance and the generated object is lost. That is to say, if we add the AttractionAddress attribute again to the transaction structure, it is added to the pattern structure, but not to the generated object. Let's remove it.

The same happens if we change the events, rules, or any other section of the object generated by the pattern.

So, losing the existing dynamic relationship means that the definitions made later in the pattern instance will no longer be applied to the generated objects, and they will have to be defined manually. For this reason, changing the objects generated by the pattern **is not recommended**.

Can the dynamic relationship be recovered? Yes, by opening the object that lost this relationship in edit mode, through the Apply Default options in the menu. Note that we can recover the dynamic relationship of the form, or of all the object's parts (Form, events, etc).

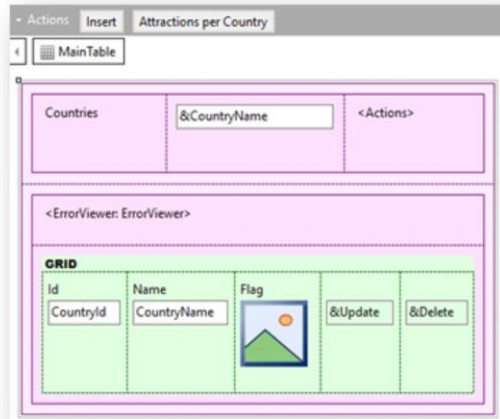
Let's retrieve the form that the pattern builds by default.

Note that the photo is displayed again.

Maintaining dynamism

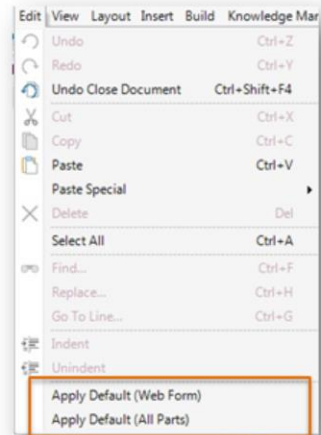
Is dynamism lost?

Yes, when the objects generated are edited.

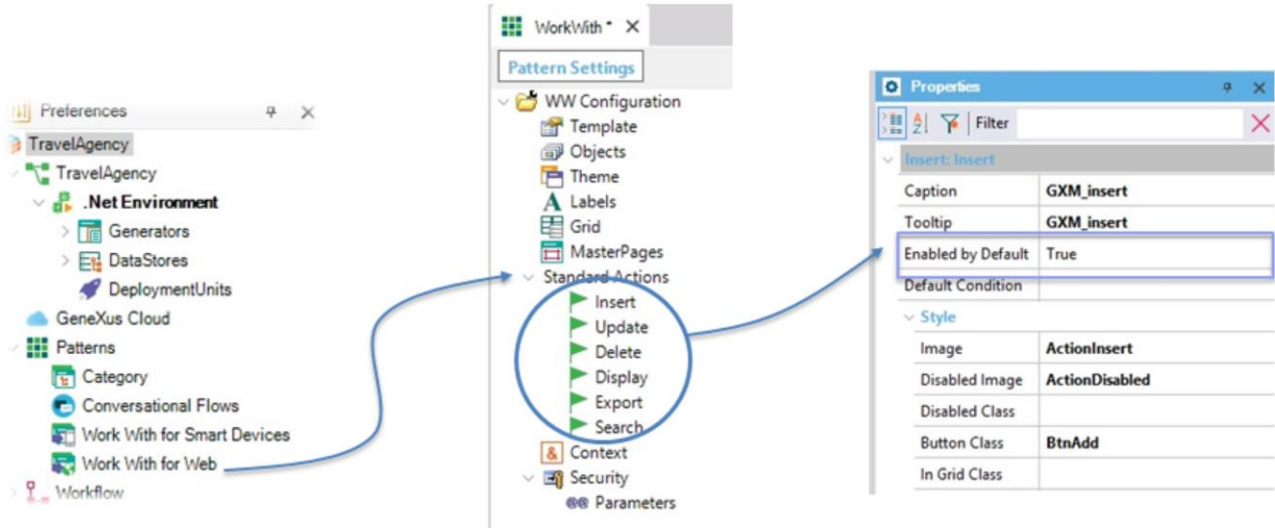


Is it possible to recover it?

Yes, through the Edit menu:



General Settings



Version full only

If now we want the "work with attractions" screen to no longer offer the possibility to insert a new attraction:

We open the pattern instance. Note that the Insert property is included in the Modes node properties.

As we can see, the possible values for this property are True, False and Default. As we saw at runtime, the Default value is True.

So as not to offer the possibility to insert a new attraction from the screen, we will only have to select False. We try it by pressing F5.

The option to insert new attractions is no longer displayed.

Where is the "Default" value of the Insert property defined? As for the values of the Update, Delete, Display, and Export properties, what's their purpose?

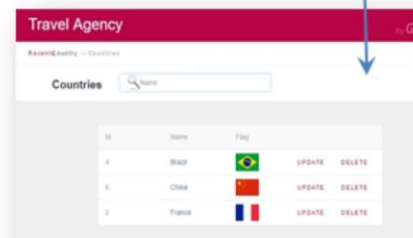
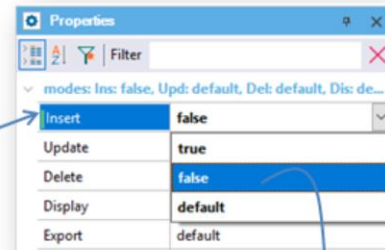
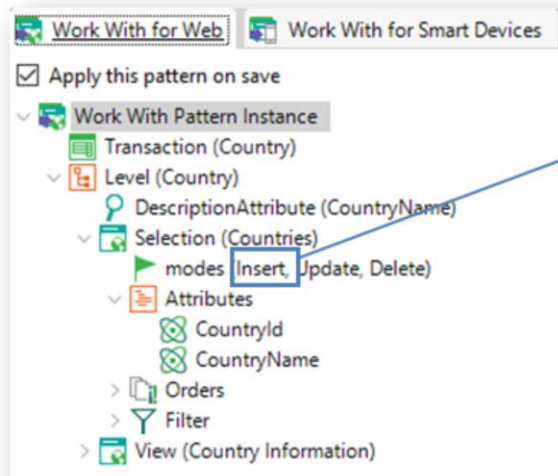
Suppose that we wanted all the "work with" elements (attractions, countries, categories if we applied it, customers as well) not to offer the possibility to make insertions. We have two options: open each transaction and in their pattern instance change the value of the Insert property as we just did for the Attraction, or go to where this "default" value is set and change it to False once; this will affect all the work with elements that still have "default" as their value.

In the GeneXus Trial version, that location is not accessible. In the Full version, it is in the Preferences window, below Patterns / Work With for Web.

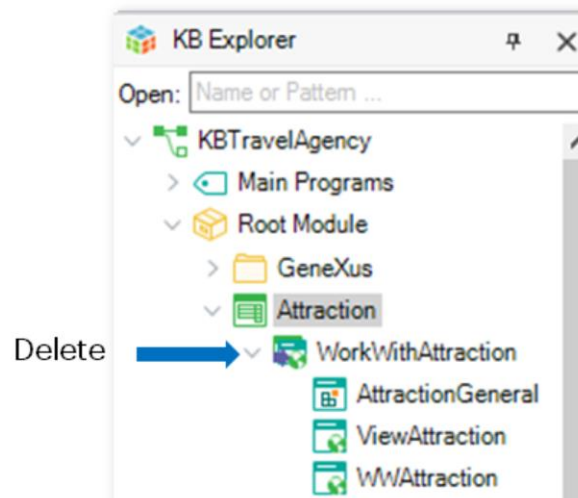
The values defined here are used to initialize the properties of each pattern, when the instances are created.

Modification of properties in a specific instance or general

Example: Not allowing the entry of countries (in its instance)



Deleting the pattern's application



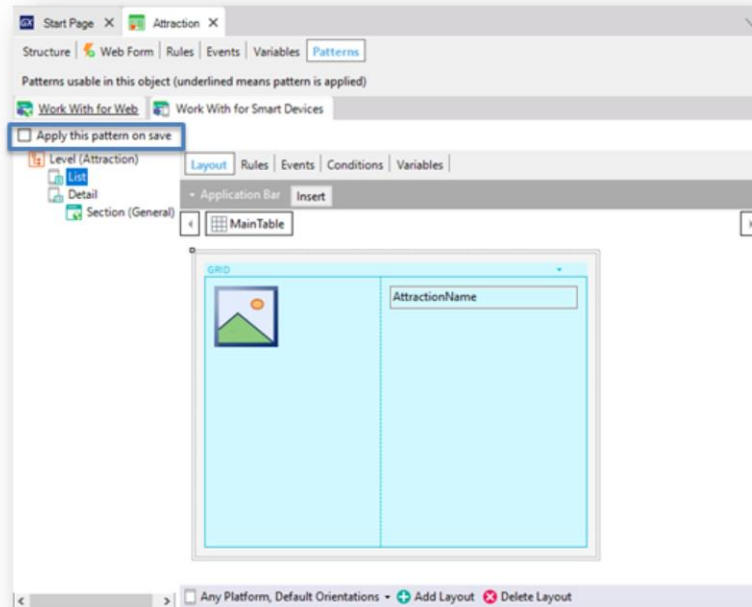
Another question that we can ask ourselves is if we can undo the application of the pattern to a transaction; that is to say, if we can delete all the objects and features of the pattern as if it had never been applied.

To undo the application of the pattern, we must select the instance below the transaction icon and delete it.

This deletes all the generated objects and automatically clears the box "Apply this pattern on Save" in the Patterns tab of the transaction. To apply the pattern again, we only need to check the box again and click on Save.

Lastly, we go back to GeneXus and save the changes in GeneXus Server.

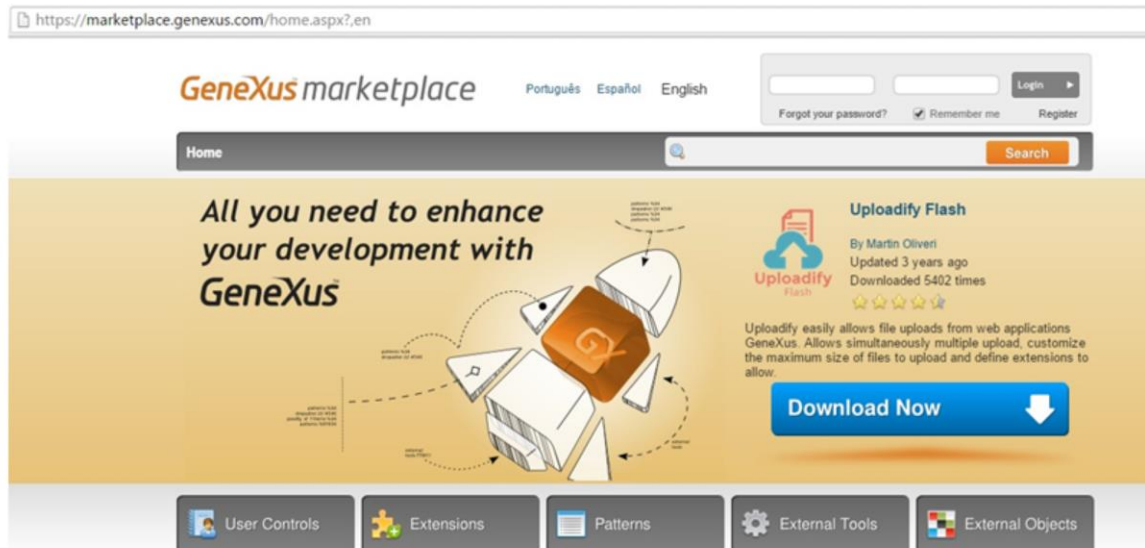
Pattern Work With for Smart Devices



Here we have seen how easy it is to apply a pattern; **in this case the Work With pattern...** we've also seen the various features that are automatically generated, as well as the options to customize them as we want, in order to adapt them to our needs.

In this video we've seen the Work With for Web pattern, and in another video we will see how to apply the Work With for Smart Devices pattern.

Other patterns...



In addition, there are other patterns that generate useful functionalities and they can be viewed in this page.



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