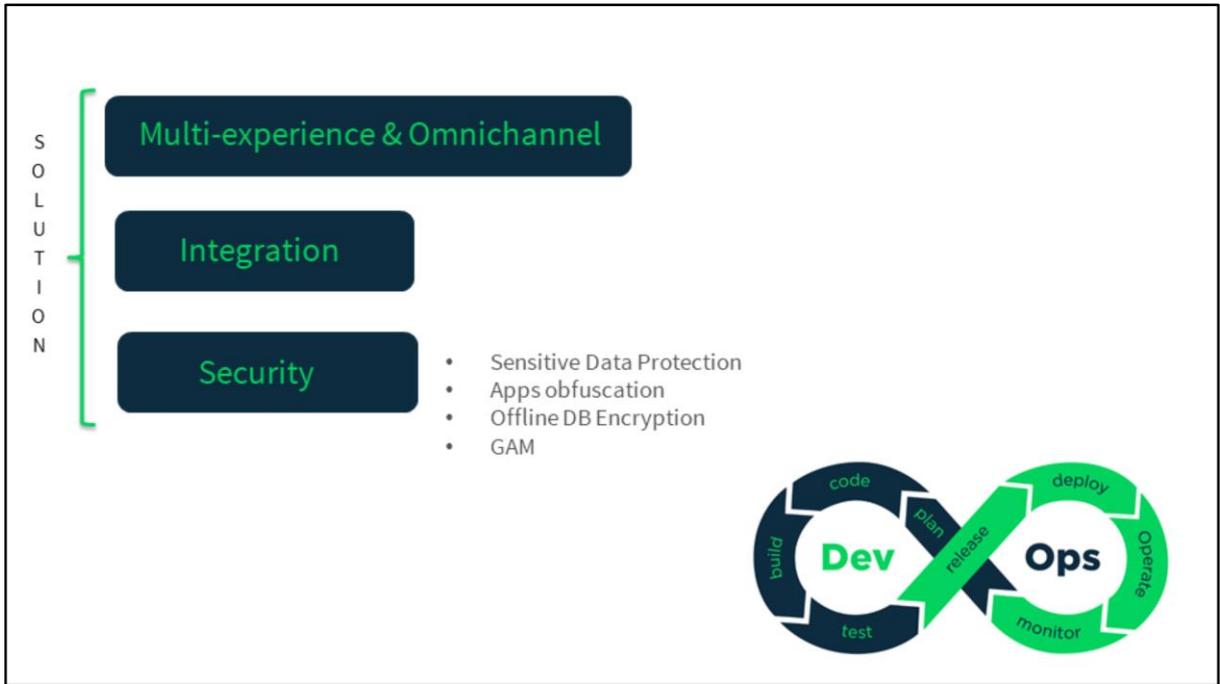


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Security

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Now we will enter into the security aspects of the data of our apps.

## Data Security

Sensitive Data Protection

Apps Obfuscation

Offline DB Encryption

GeneXus Access Manager

On the first issues we talked about before, so now we will talk specifically about GAM.

# GeneXus Access Manager

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## GAM Events Subscription

- User\_Insert, User\_Update, User\_Delete
- User\_UpdateRoles
- User\_GetCustomInfo : Get user's information on the server when the [GAM Remote](#) login is executed
- User\_SaveCustomInfo : This event is executed on the client when the [GAM Remote](#) login is successfully finished.
- Role\_Update, Role\_Delete
- Repository\_Login
- Repository\_Logout
- Application\_CheckPermissionFail

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User\_Insert: Insert of a GAM User

User\_Update: Update of a GAM User

User\_Delete: Delete of a GAM User

User\_UpdateRoles: Change of roles of a list of users

User\_GetCustomInfo : Get user's information on the server when the [GAM Remote](#) login is executed. It's executed when the user logs in to the server, and also in the SSO login (when an app connects from another tab of the browser, and the session already exists so the user doesn't need to login again)

User\_SaveCustomInfo : This event is executed on the client when the [GAM Remote](#) login is successfully finished.

Role\_Insert: Insert of a role

Role\_Update: Update of a role

Role\_Delete: Delete of a role

Repository\_Login: GAM User login (any [GAM Authentication Types](#) is supported)

Repository\_Logout: GAM log out

Application\_CheckPermissionFail : Failure of a permission verification.

## Dynamic Menu

Example: getting the menu options

```
For &AppMenuOption in &Application.GetMenuOptions(&MenuId, &Filter, &Errors)
```

```
    &Id      = &AppMenuOption.Id  
    &Name   = &AppMenuOption.Name  
    &Dsc    = &AppMenuOption.Description  
    &Type   = &AppMenuOption.Type  
EndFor
```

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Using [GeneXus Access Manager \(GAM\)](#), your WEB application menu can be defined (dynamically) at runtime, based on the [GAM Permissions](#) and [GAM Roles](#) of the user logged-in.

The end user will view only the Menu options linked to resources associated with the permissions that the user may access.

The purpose is to filter the menu options according to the end user's permissions. Here, GAM returns the menu structure depending on the permissions of the user so that this structure may be loaded at runtime with any User Control.

The menu may be displayed using any User Control.

See <http://wiki.genexus.com/commwiki/servlet/wiki?29743,Howto%3A+Display+a+GAM+Menu+using+Jscookmenu+UC>,

This is an example of getting the menu options for the current user.

## Oauth 2.0 Authentication type

- Office 365
- Mercado Libre
- Instagram
- LinkedIn
- Google
- Facebook

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<https://wiki.genexus.com/commwiki/servlet/wiki?39484,GAM%20auth%202.0%20Authentication%20Type>

The definition of this [GAM Authentication Type](#) is the same as any other type of authentication already existing in GAM, only that this type of authentication requires detailed configuration of the protocol used by the Provider.

At runtime, the operation is similar to the one we already know about Facebook / Google authentication, for example. When we select this type of authentication, the login is redirected to the Identity Provider configured.

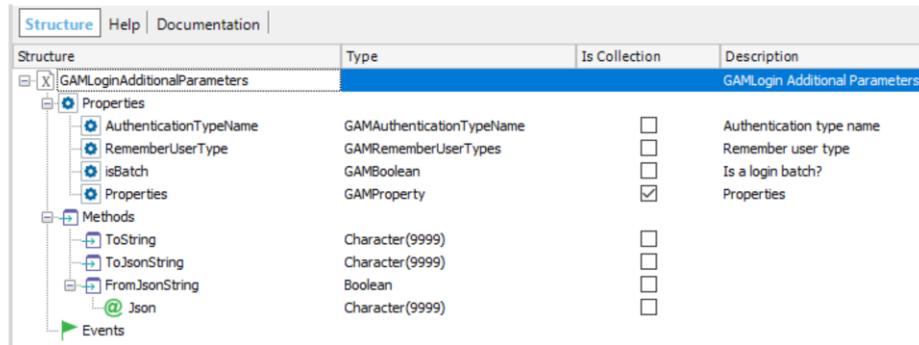
The Login is displayed by the Provider; there, the user enters his/her credentials and then is redirected back to the application.

## More than one Authentication of the same type in the repository: WEB login

```
GAMRepository.LoginFacebook()
```

```
&AdditionalParameter.AuthenticationTypeName = !"Facebook1"
```

```
&LoginOK = GAMRepository.Login(&UserName, &UserPassword, &AdditionalParameter, &Errors )
```



The screenshot shows the Structure view of the GAMLoginAdditionalParameters class in Visual Studio. The class is expanded to show its Properties and Methods. The Properties section includes AuthenticationTypeName, RememberUserType, isBatch, and Properties. The Methods section includes ToString, ToJsonString, FromJsonString, and Json. The Properties section is further expanded to show the details of the Properties property.

Structure	Type	Is Collection	Description
GAMLoginAdditionalParameters			GAMLogin Additional Parameters
Properties			
AuthenticationTypeName	GMAAuthenticationTypeName	<input type="checkbox"/>	Authentication type name
RememberUserType	GAMRememberUserTypes	<input type="checkbox"/>	Remember user type
isBatch	GAMBoolean	<input type="checkbox"/>	Is a login batch?
Properties	GAMProperty	<input checked="" type="checkbox"/>	Properties
Methods			
ToString	Character(9999)	<input type="checkbox"/>	
ToJsonString	Character(9999)	<input type="checkbox"/>	
FromJsonString	Boolean	<input type="checkbox"/>	
Json	Character(9999)	<input type="checkbox"/>	
Events			

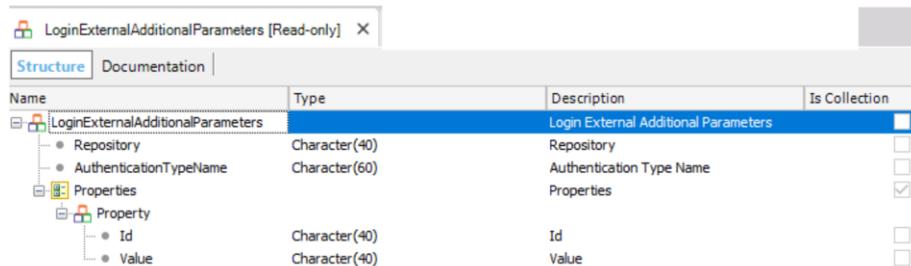
GeneXus

## More than one Authentication of the same type in the repository : SD

```
GeneXus.SD.Actions.LoginExternal(GAMAuthenticationTypes.GAMRemote, &User, &Password)
```

```
&LoginExternalAdditionalParameters.AuthenticationTypeName = !"GAMRemote1"
```

```
GeneXus.SD.Actions.LoginExternal(GAMAuthenticationTypes.GAMRemote, &User, &Password,  
&LoginExternalAdditionalParameters)
```



Name	Type	Description	Is Collection
LoginExternalAdditionalParameters		Login External Additional Parameters	<input type="checkbox"/>
Repository	Character(40)	Repository	<input type="checkbox"/>
AuthenticationTypeName	Character(60)	Authentication Type Name	<input type="checkbox"/>
Properties		Properties	<input checked="" type="checkbox"/>
Property			
Id	Character(40)	Id	<input type="checkbox"/>
Value	Character(40)	Value	<input type="checkbox"/>

GeneXus

In the case of the SD login method, the LoginExternalAdditionalParameters allows to establish the Repository GUID to which to connect to. It's useful when there is more than one [GAM Repository Connection](#) in the connection.gam file on the server. Given a value to the Repository property of the &LoginExternalAdditionalParameters parameter, you can establish the connection to use (any connection in the connection.gam which refers to this Repository GUID).

## Establish the GAM Repository to connect to, from an SD app

```
Event 'GXLogin'  
  Composite  
    GeneXus.Common.UI.Progress.ShowWithTitle("Connecting...")  
    &LoginExternalAdditionalParameters.Repository=!"1e89a9ca-bc52-482b-a344-c4cda4a9cc8f"  
    GeneXus.SD.Actions.Login(&User,&Password,&LoginExternalAdditionalParameters)  
    GeneXus.Common.UI.Progress.Hide()  
  Return  
EndComposite  
EndEvent
```

GeneXus

If you have a multi-company SD app, with GAM; where you have defined more than one repository (one per company), to establish which repository to connect to, there is a new way to do it.

Sac  
43580

More information:  
[https://wiki.genexus.com/commwiki/servlet/wiki?27708,HowTo%3A+Multiple+Repositories+Scenario+in+an+SD+application,](https://wiki.genexus.com/commwiki/servlet/wiki?27708,HowTo%3A+Multiple+Repositories+Scenario+in+an+SD+application)

## Rest services in multi-company architecture

```
client_id=ad80c07c0a1046029c0655cdd9d99493&grant_type=password&scope=FullControl&username=adminfull&password=adminfull&additional_parameters={"AuthenticationTypeName":"local","Repository":"1e89a9ca-bc52-482b-a344-c4cda4a9cc8f"}
```

SAC 43563

## SSO scenario modeled with only one GAM database for all clients

All clients share the same GAM database

All clients and Identity Provider share the same GAM database

Use Impersonate (SAC 43517 )

## Anonymous user

Works when registration is:

FB, Twitter, Google, GAM remote & Oauth 2.0

<https://wiki.genexus.com/commwiki/servlet/wiki?19909,Auto-register%20anonymous%20user%20-%20How%20it%20works>

SAC 43508

## Impersonate is extended for other types of authentication

Have two different authentication mechanisms but both converge on the same user.

Facebook, Google, Twitter, GAM Remote and Oauth 2.0

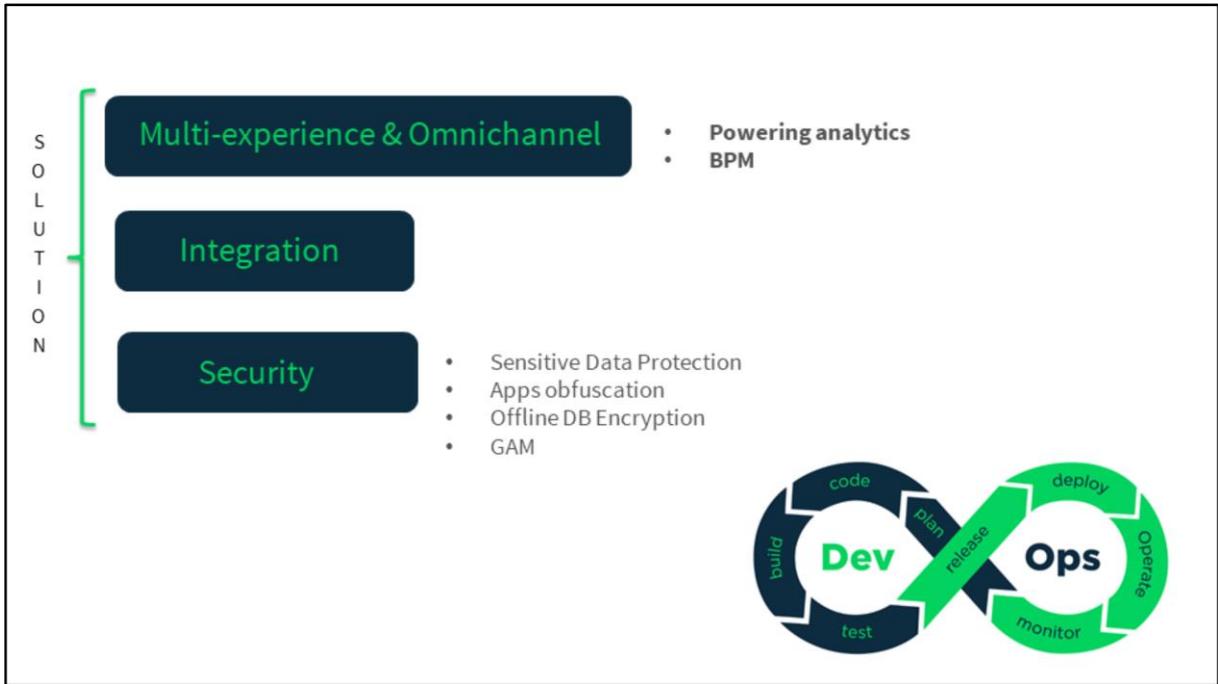
SAC 43466

## GAM deploy tool for Unix environments

- Distributed with GeneXus
- Command line
- Import / Export / Connection.gam update
- Takes the DB connection of the local environment
  
- [https://wiki.genexus.com/commwiki/servlet/wiki?37764,GAM+deploy+tool+command+line+%28windows+and+unix-like+operating+systems%29,](https://wiki.genexus.com/commwiki/servlet/wiki?37764,GAM+deploy+tool+command+line+%28windows+and+unix-like+operating+systems%29)

GeneXus

If you have a multi-company SD app, with GAM; where you have defined more than one repository (one per company), to establish which repository to connect to, there is a new way to do it.



We have seen security aspects. Now we will see how to give more power to the analytics of the data, and we will also see the changes in BPM.

BPM

*GeneXus™ 16*

**GXflow**

New GXflow Clients



New Platforms



IBM  
Bluemix



SAP HANA  
Cloud Platform



Microsoft  
Azure



Amazon  
Web Services



Google  
Cloud Platform

Performance and scalability improvements

*GeneXus*

# GXflow license

## PROTECTION METHOD

Protection Server ▾

HOST

USER

PASSWORD

OFFLINE AUTHORIZATION

SAVE

## LICENSES

[Request License](#) [Enter License](#)

Product	Version	Status	Type	Start Date	End Date	Copies	Unassig...
GXFLOW	16	AUTHORIZED	NOMINATED	09/18/18	09/17/18	100	100
GXFLOW CORPORATE	16	NOT AUTHORIZED	CORPORATE				

genEXUS

## GXflow

GXflow internally uses the Log external object to write low level log information

```
.....  
11:18:04,768 [1] DEBUG GeneXus.Data.GxSqlCursorDataReader - Return LoadFirstBlock, Parameters: CursorHandle 180150009  
11:18:04,768 [1] DEBUG GXFLOW.STATE_MACHINE - Evaluate outgoing sequence flow  
11:18:04,768 [1] DEBUG GXFLOW.STATE_MACHINE - Task: 27  
11:18:04,768 [1] DEBUG GXFLOW.STATE_MACHINE - Flow Type: F  
11:18:04,768 [1] DEBUG GXFLOW.STATE_MACHINE - Create outgoing task : 27  
11:18:04,772 [1] DEBUG GXFLOW.STATE_MACHINE - Create Workitem  
11:18:04,772 [1] DEBUG GeneXus.Data.ADO.GxCommand - GxCommand.FetchSize: 1, handle '1'  
.....
```

# Analytics: Reporting and Dashboards

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## &Today en el Query

The screenshot displays the GeneXus IDE interface for a query named 'DateinQuery'. The 'Structure' tab is active, showing a tree view of the query components. The main area shows a table with two columns: 'Structure' and 'Description'.

Structure	Description
DateinQuery	Datein Query
Attributes	
Count (ComplaintId)	Complaint Count
ComplaintDescription	Description
Parameters	
Filters (AND)	
OrderBy	

# For each

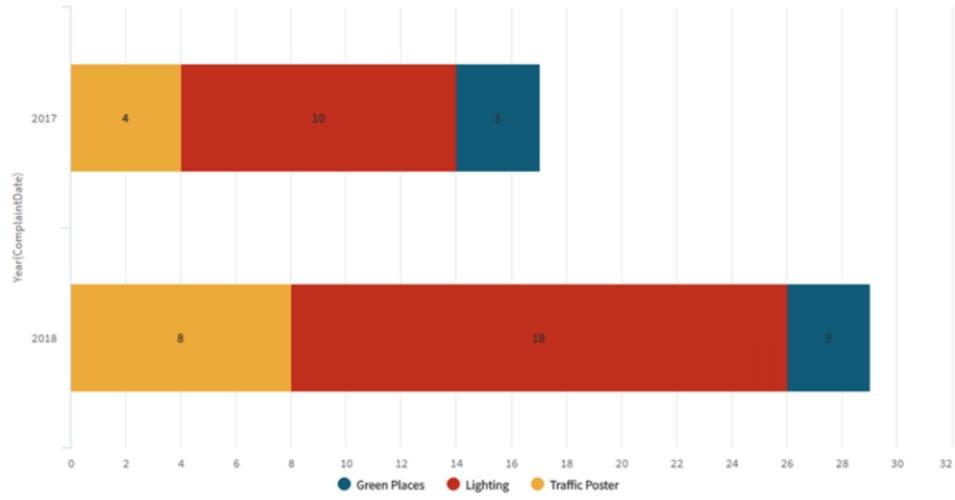
Start Page X ForEachQuery X  
Structure | SQL statement | Preview | Documentation |

Start Page X F

Structure SQL statementen

Structure

- ForEachQuery
  - Attributes
    - Count(Complain
    - Year(Complaint
  - Parameters
  - Filters (AND)
  - OrderBy



## Dashboard Object

New Object ✕

Select a Category:      Select a Type: ⌵

Common	Dashboard
Workflow	Query
<b>Reporting</b>	
Documentation	
Web	
Extensibility	
Deploy	
Chatbots	
Smart Devices	

Provides at-a-glance views of KPIs relevant to a particular objective or business process.

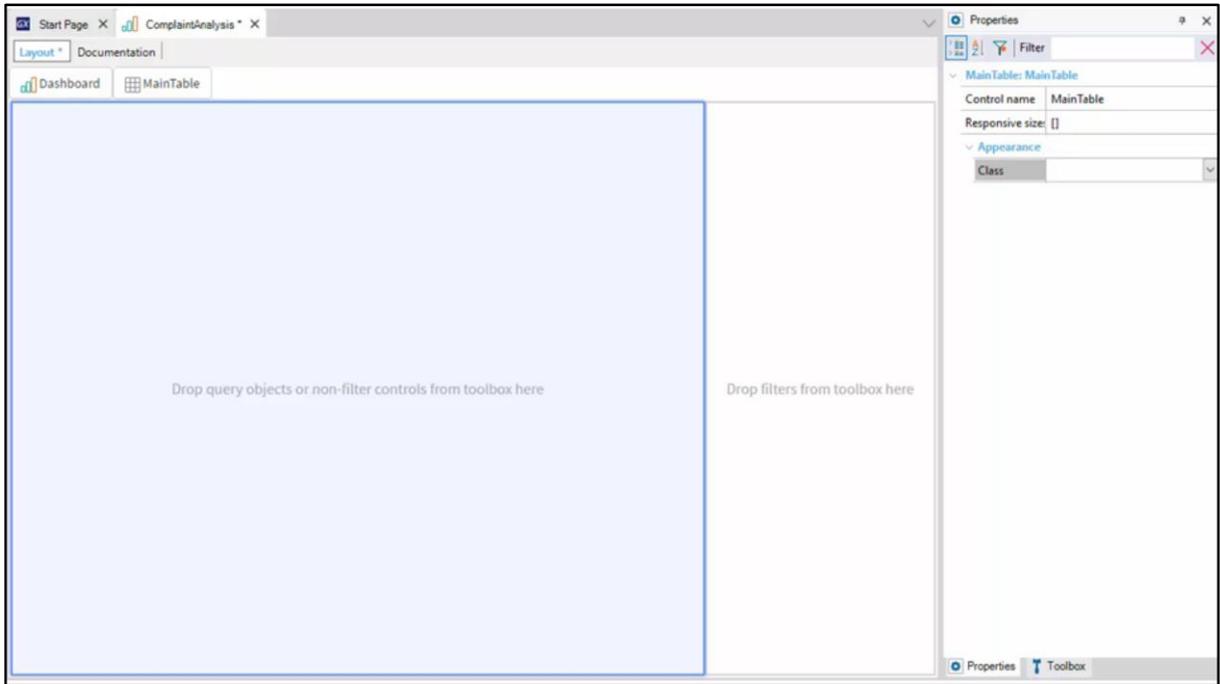
Name:

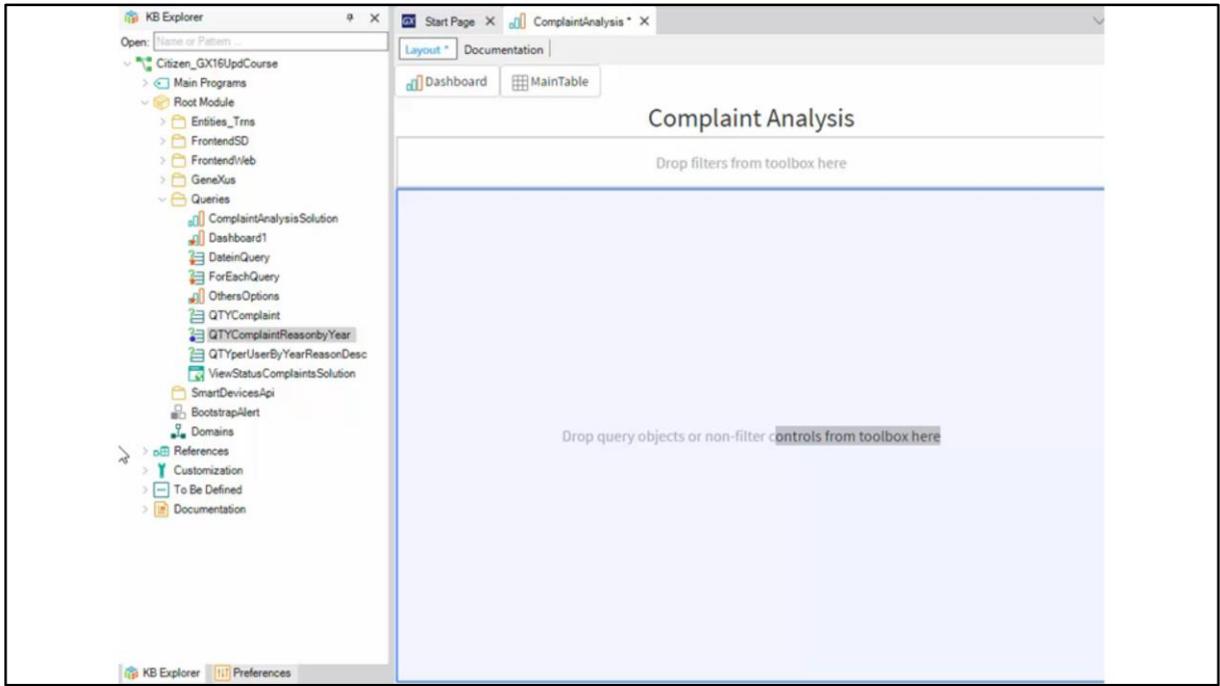
Description:

Module/Folder:

## Dashboard Object

- Not programming required
- Queries, Filters, Textblocks, Images
- Live editing
- Not executable object





Start Page x ComplaintAnalysis \* x QTYperUserByYearReasonDesc x

Layout \* Documentation

Dashboard Filters Filter1

## Complaint Analysis

complaintreasonname

Lighting

complaintdescription

Car parked in front of a garage

year

0

Drop filters from toolbox here

Drop filters here

User Name	Count (Complaint Id)

Drop query objects or non-filter controls from toolbox here

**Properties**

Filter: Filter1

Control name	Filter1
Type	Value
Data type	Character
Name	complaintreasonname
Value	Lighting
Visible	True
Caption	complaintreasonname
Picture	

Frame

Visible	False
---------	-------

Control

Type	Combo box
Dynamic	True
Item values	ComplaintReasonName
Item description	ComplaintReasonName
Sort description	True
Empty item	False
Conditions	

Appearance

Caption class	
Value class	
Container class	

Cell information

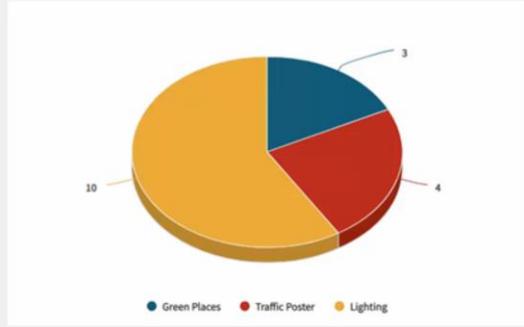
Cell class	
------------	--

Properties | Toolbox

Recents View Status Compla...

Year: 2017 | Complaint Reason: Green Places | **Lighting** | Traffic Poster | Description: Traffic light of Av. Italia and Solano López out of service.

Complaint by Year  
**17**  
Count (Complaint Id)



Drop filters here

User Name	Count (Complaint Id)
Eleonor Johnson	1
TOTAL	1

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