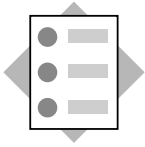




Contents:

- **Internet Graphics Services Overview**
- **Configuring Web Dynpro for Business Graphics**
- **Simple Business Graphics**
- **Introduction to the Chart Designer**
- **Advanced Business Graphics and Geo Maps**



After completing this lesson, you will be able to:

- **Have an understanding of the IGS architecture.**
- **Add charts to your Web Dynpro applications.**
- **Use Web Dynpro IGS integration to create simple Business Graphics.**
- **Understand the purpose of the Chart Designer.**
- **Understand what Geo Maps are and how they can be integrated into Web Dynpro.**
- **Understand how to configure the IGS for Web Dynpro Applications.**
- **Configure your Java Engine to create Business Graphics**



After completing this topic, you will be able to:

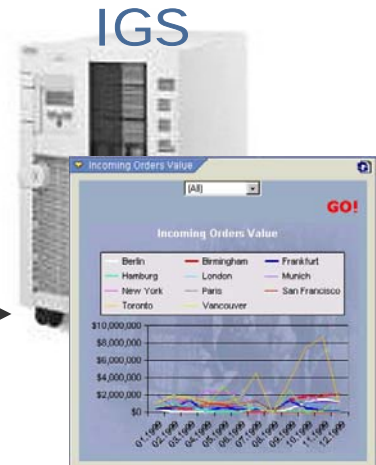
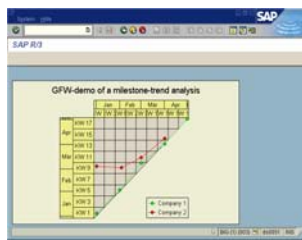
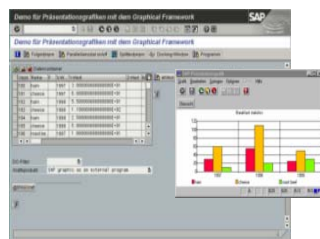
- **Have an understand of what the IGS can be used for.**
- **Have an understanding of the architecture of the IGS.**

Graphics @ SAP: Evolution

**Graphic (.exe) in
separate window
next to GUI
1990 - 1998**

**ActiveX Controls/
JavaBeans
in GUI
1998 - 2001**

**Internet Graphics
Service
2001 ++**



■ Graphics @ SAP: Evolution

Business graphics have been around for quite a while...but as technology has changed so has the way we support Business Graphics.

From the Popup Graphic screen, to embedded ActiveX controls, to the IGS today which is based on open internet standards (HTTP), but still supports the older SAP systems with the RFC protocol.

What is the Internet Graphics Service (IGS) ?

What is it / what is it for?

A server-based engine for generating content

How can you access the IGS?

RFC or HTTP

Data from SAP/external system

What front end can I use?

Front end-independent

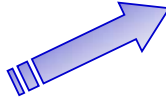
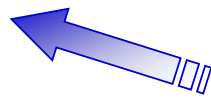
- SAP GUI for Windows, Java
- SAP GUI for HTML
- BSP applications
- **Web Dynpro applications**
- potentially ANY Web application



■ What is the internet Graphics Service (IGS)?

As of 6.40 Web AS the IGS is now part of the Web Application Server...when you install the 6.40 Web AS the IGS will also be installed.

By using the IGS Business Graphics can be displayed in our Web Dynpro applications.



Non-graphical output

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THE BEST-RUN BUSINESSES RUN SAP



IGS generates “content” for any application.

The IGS receives XML requests over HTTP, which it can parse and then create a business graphic based on the data in the XML request.

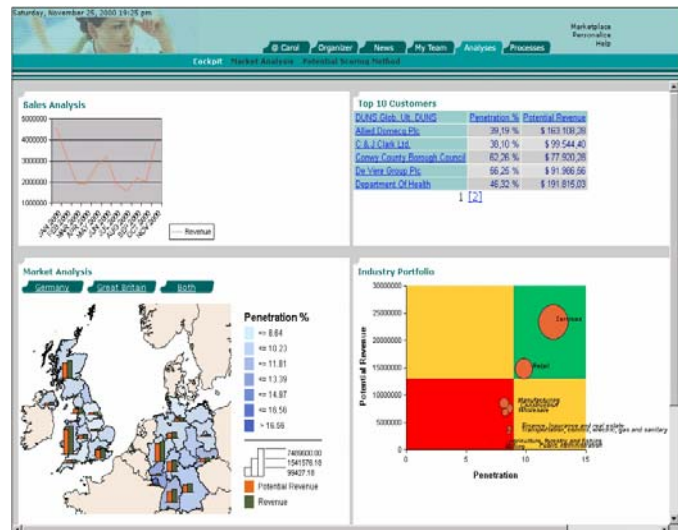
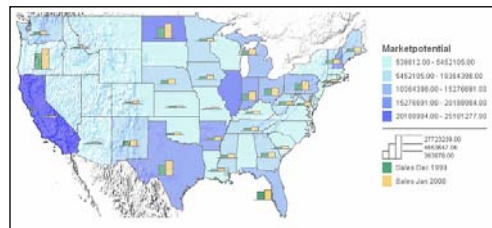
Benefits: Generates Content for Any Front End

Internet Browsers (HTML based)

Enterprise Portals

SAPGUI for Java / HTML

SAPGUI for Windows



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THE BEST-RUN BUSINESSES RUN SAP



■ Benefits: Generates Content for Any Front End

Since the IGS supports the HTTP protocol, it can support any front-end that can make a request over HTTP call. Although it does not support the Web Services standards such as SOAP, WSDL, etc.

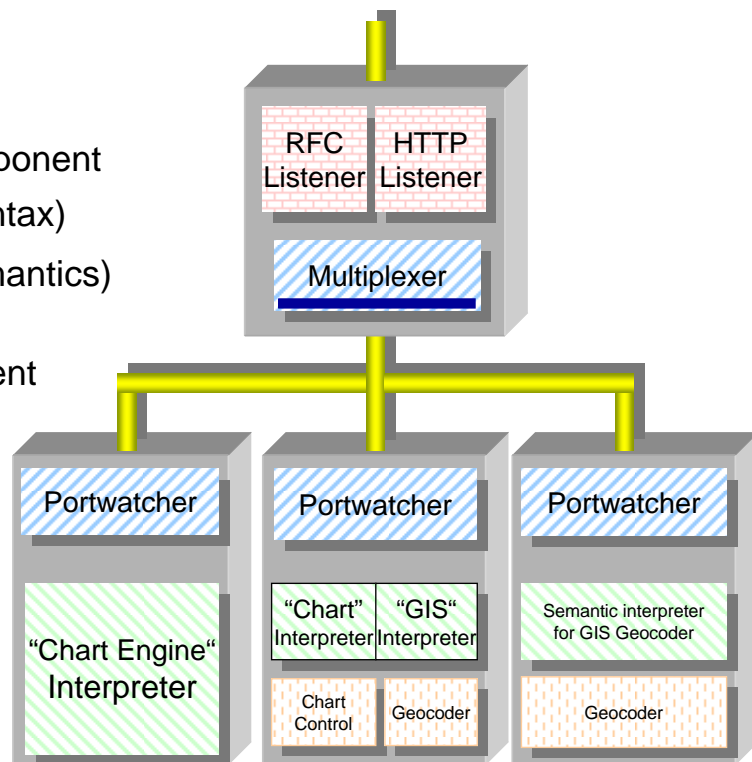
The IGS also supports the RFC protocol for communication with SAP systems.

Example: Business Warehouse Map & Chart Graphic



Inside IGS: Distributed Architecture

- System Boundaries
- Network
- Communication component
- Data conversion (syntax)
- Data interpreter (semantics)
- (optional) graphic generating Component
- Workload-balancing check



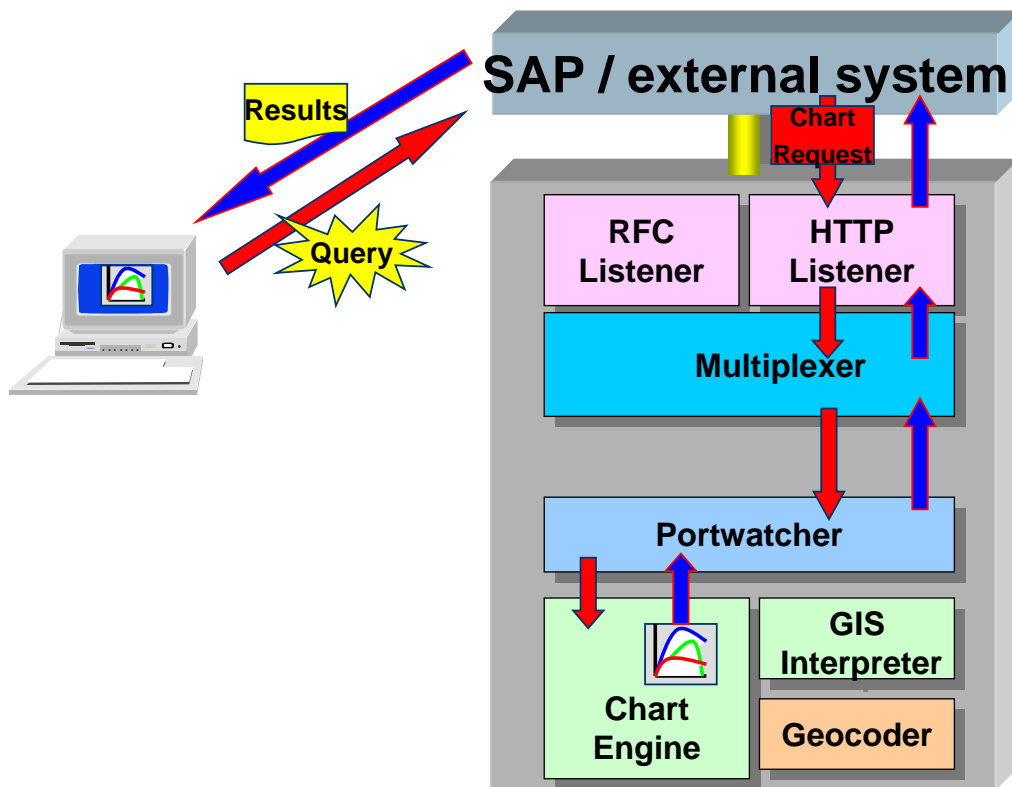
■ Inside IGS: Distributed Architecture

The IGS can be distributed across many systems if need be.

The Chart Engine is what generates the Business Graphics.

The IGS can support Geo Information Systems as well, these are 3rd party products that can be integrated, and are able to generate maps and routing information similar to what you see at <http://maps.yahoo.com>

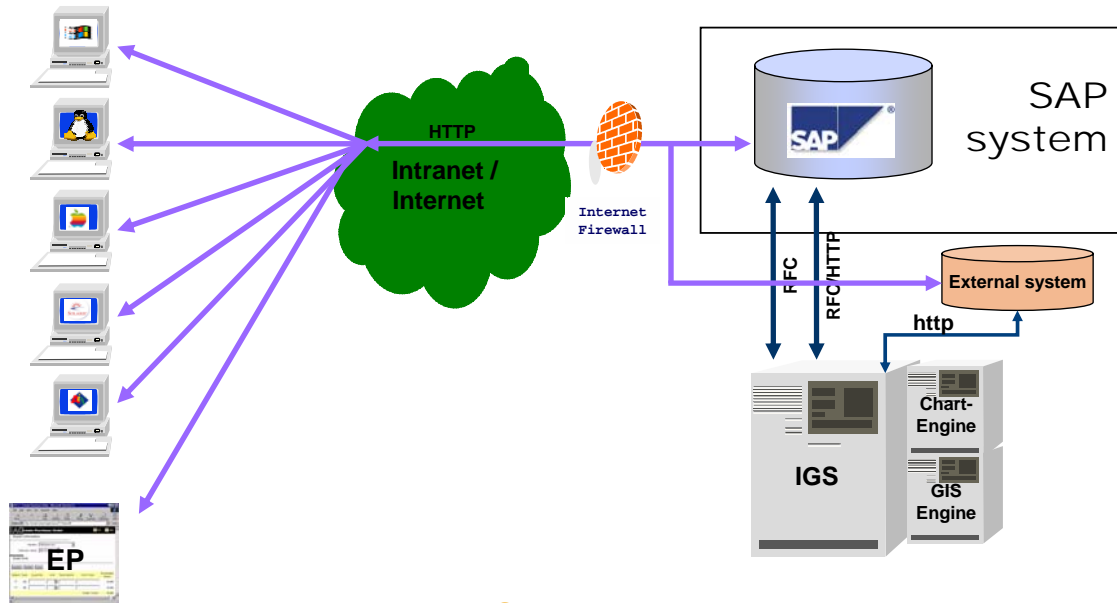
You can setup multiple "Portwatchers" if you need to scale your IGS to handle more load.



■ Inside IGS: Data Flow

An example showing a call to the IGS...in this case it is over HTTP, and a Business Graphic is being generated in the Chart Engine.

The IGS Landscape



Both SAP systems and external systems
can send data to the IGS

Graphics generated can be displayed
on any front end

■ The IGS Landscape

The IGS can be used for SAP systems or external systems since it supports both RFC and Web Services.

Local IGS Monitoring and Administration

The IGS web administration interface

Called via URL:

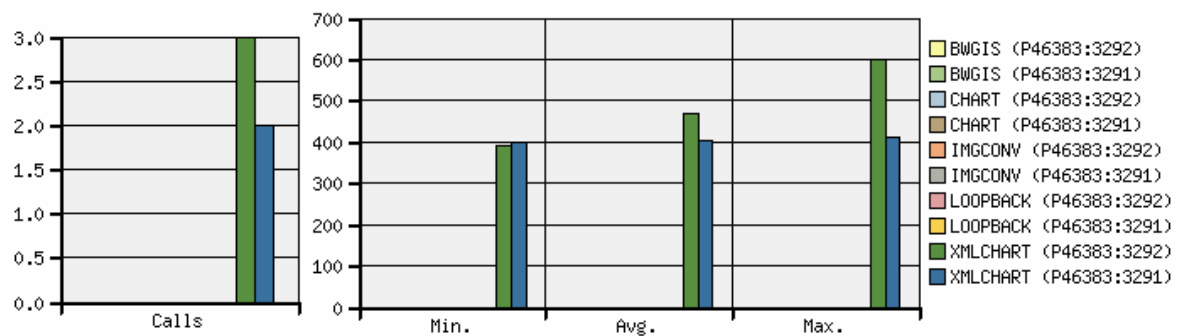
<http://<hostname>:<http listener port>>

Example:

<http://localhost:8030>

Version	6250.2017.23546.0
Build Date	Aug 30 2002
System	Windows 2000 Build 2195 Service Pack 2
Configuration File Path	C:\Program Files\SAP\Internet Graphics Server\config.xml

status	statistic	resources	mux logfile	pw logfile <input type="text" value="P46383:3291"/>
--------	-----------	-----------	-------------	---



■ Local IGS Monitoring and Administration

The IGS supports the HTTP protocol, and we can call it at <http://localhost:8030/> to make sure it is up and running, this default site also shows us some configuration and administration values.

Key Features and Benefits of the IGS

Server-based infrastructure

Scalable

- Multiprocessor (multiprocess, multithreaded)
- Distributed

Client independence

- SAP GUI, Web Dynpro, ...

Server platform independence

- All SAP Web AS platforms
- Even in mixed environments

Generates any type of content

- Supports various data output formats:
JPEG, BMP, WBMP, SVG, VML, GIF, PNG

Extensible

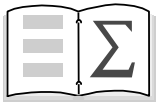
- Integration of new components
 - ◆ New chart types / interpreters
- SDK available for new interpreters

Support for various protocols

- RFC and HTTP
- Data from SAP or external systems

■ Key Features and Benefits of the IGS

The IGS now runs on all SAP Web AS supported systems.



You should now be able to:

- **Understand of what the IGS can be used for.**
- **Understand the architecture of the IGS.**

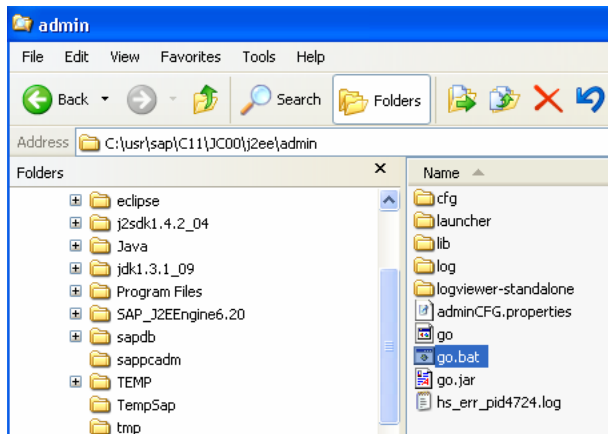


After completing this topic, you will be able to:

- **Configure your Java Engine to create Business Graphics**

Start the Visual Admin

- Start the engine administrator console from the path:
<Drive>:\usr\sap<System ID>\J000\j2ee\admin\go.bat

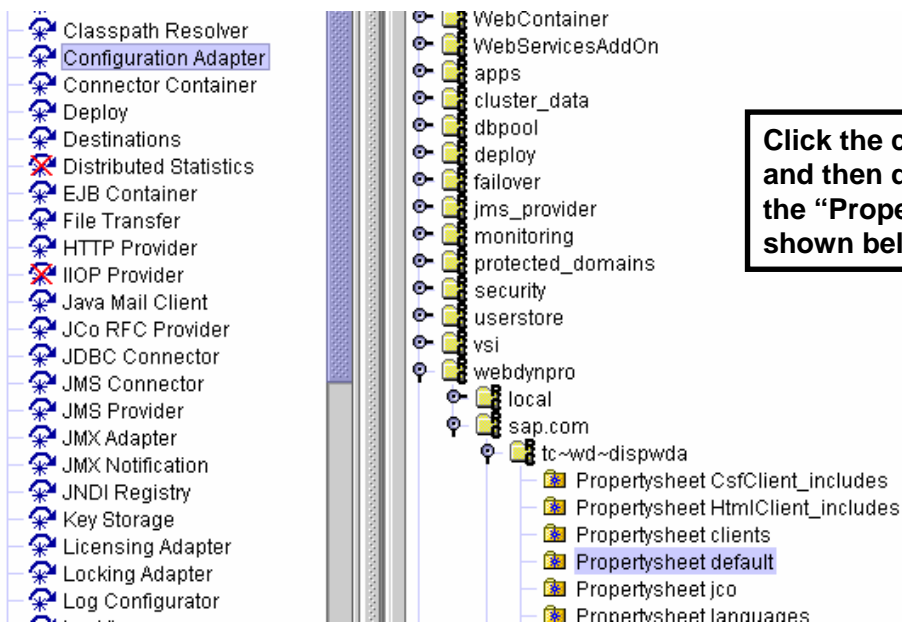


■ Start the Visual Admin

The Visual Admin tool allows you to configure you Java engine...in this case we are going to configure the default IGS that Web Dynpro applications use.

Configuration Adapter Service

The Configuration Adapter Service allows you to change the servers properties. In this case, you are to setup the default IGS Url property for Web Dynpro.



Click the change button and then double click the "PropertySheet default" shown below.

■ Configuration Adapter Service

Configuration Adapter service lets you change the configuration of the Java engine...in this case we are going to change the Web Dynpro configuration.

Setting the Default IGS Url

The image shows two SAP configuration windows. The first window, 'Change Configuration', is a table with columns 'name', 'value', and 'custom'. The 'IGSUrl' property is highlighted. An arrow points from a text box to this property. The second window, 'Change property entry', shows the details for the 'IGSUrl' property. It has fields for 'Description', 'Name' (set to 'IGSUrl'), 'Datatype' (set to 'java.lang.String'), 'default', and 'Custom'. The 'Custom' field contains the value 'http://localhost:8030/'. An arrow points from a text box to this field. Below the windows is a note box.

Click the IGSUrl property, this will show the below window.

Enter in your default local IGS.
The format is: <http://<server name>:<port>/>
Click "Apply Custom".

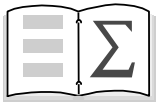
Note: Once you have applied you configuration setting you must restart The Java engine for it to take effect!

■ Setting the Default IGS Url

Web Dynpro communicates over HTTP to the IGS...so we must enter the HTTP location of our IGS in the IGSUrl property, in this case `http://localhost:8030/`

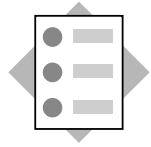
The IGS can be anywhere in your landscape, you do not need the IGS to run locally!
8030 is the default HTTP port of the IGS.

Anytime you change a configuration value using the Configuration Adapter you must restart your J2EE engine for it to take effect.



You should now be able to:

- **Configure your Java Engine to create Business Graphics**



After completing this topic, you will be able to:

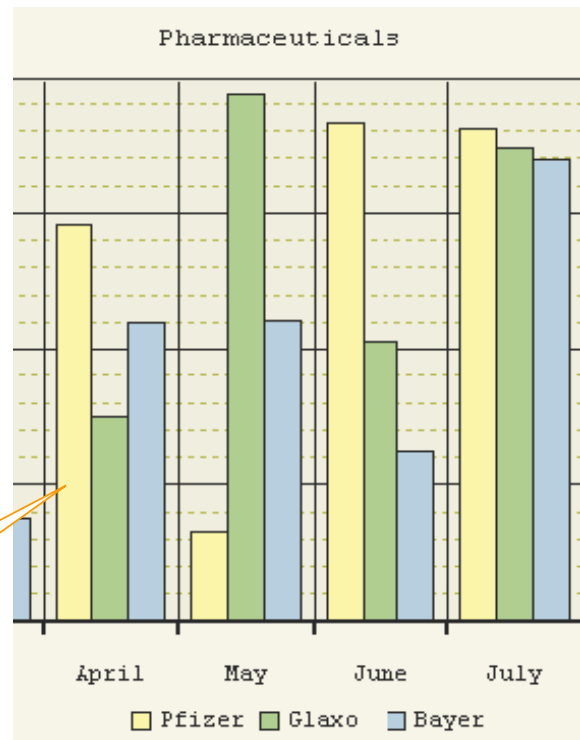
- **Add a Simple Business Graphic to your Web Dynpro application**
- **Use the important properties of Business Graphics.**
- **How to pass data to your Business Graphic.**

- A simple business graphic is a chart consisting of a category and one or more Simple Series.

- Column charts, bar charts and pie charts are typical examples of simple business graphics.

- Simple business graphics are to be distinguished from complex business graphics such as scatter charts and portfolio charts.

Column chart with 3 Simple Series



■ Simple Business Graphics

The example to the right shows a graphic with 3 Simple Series one each for Pfizer, Glaxo, Bayer.

Complex Business graphics rely on points and series, examples of this are Portfolio charts and Gantt charts.

Adding Business Graphics to Web Dynpro Apps

■ Add a BusinessGraphic UI Element type to your view.

- Do this by adding a child element of type “BusinessGraphics” to your view.



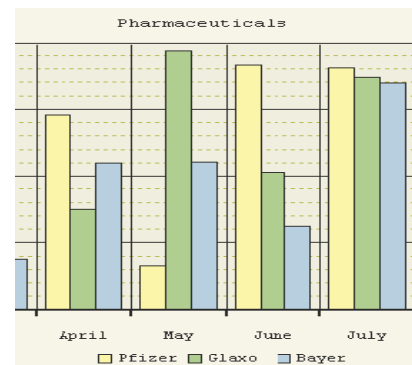
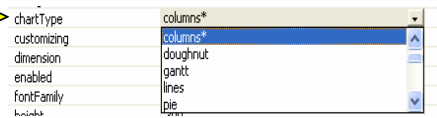
■ To change the chart type, go to the properties of your chart and change the “chartType” property.

■ Simple Business Graphics are made up of Simple Series.

Example: You want a graphic to compare 3 company’s sales per month over the past year. For this you would need to create 3 Simple Series, one for each company.

■ A Simple Series is essentially just an array.

- For the above example each Simple Series would have 12 values, one for each month.



■ Adding Business Graphics to Web Dynpro Apps

There are many different Chart types, you can see all of them currently supported in the chart Type property dropdown.

Adding Simple Series

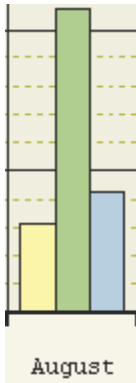
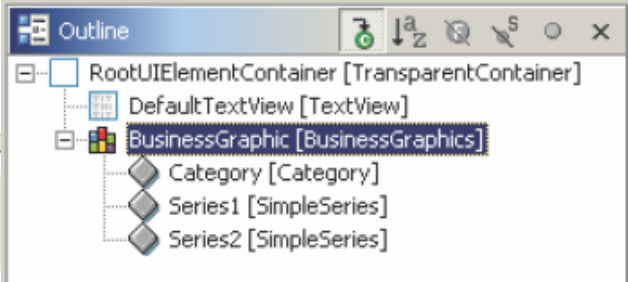
■ For your simple Business Graphic you **must define Simple Series**.

■ You **must define a Category**...the category defines your Simple Series. For instance, in the previous example the category would be used to store the name of the month.

Create new element

Id: Series4

Type: Series Series SimpleSeries



■ To add a Simple Series or category, just right click on your Business Graphic in the Outline window and select “Insert Category” or “Insert Series”

■ Adding Simple Series

When you select “Insert Series” a popup box allows you to select the type of series you want. For simple business graphics such as the “columns” chart we are showing here you should select “SimpleSeries”. For advanced business graphics such as a Gantt chart, you should select “Series”. “Series” types allow you to add “Points” to your business graphics. For more information on advanced business graphics, visit help.sap.com.

A Category is mandatory!

Mapping to Context Elements

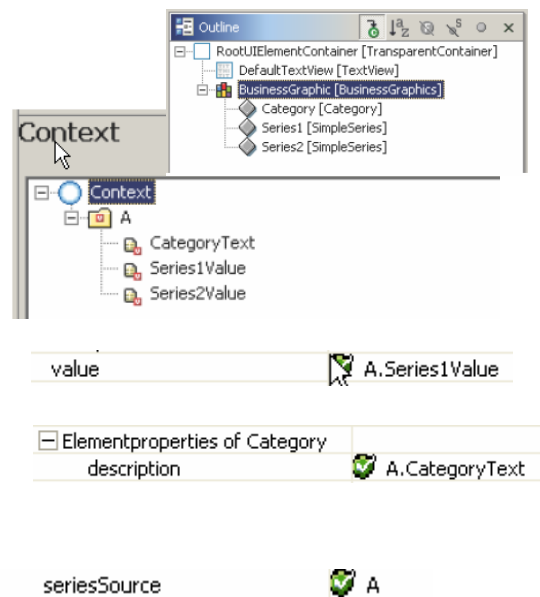
- **Business Graphics pull data from the view's context.**

- **Remember, a Simple Series is essentially an array. To create an array type structure in the context we need a Node.**

- **Each Simple Series you defined for your Business Graphic must be bound to a context element, which is of some numeric type.**

- **Categories must also be bound to context elements.**

- **The Business Graphic itself is bound to the Node that contains the Simple Series and Category context elements.**



■ Mapping to Context Elements

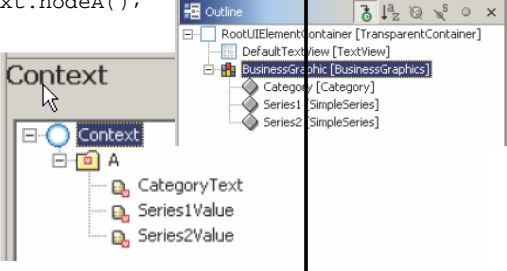
The above example shows Value Attributes and Nodes, but we could also use Model Attributes and Nodes as well.

Example: Loading Data Into the Context Elements

MyClass **X**

```
IPrivateSimpleGraphicsView.IANode aNode = wdContext.nodeA();
IPrivateSimpleGraphicsView.IAElement elm;

for (int i = 0; i < 10; i++)
{
    elm = wdContext.createAEElement();
    elm.setCategoryText("Category " + i);
    elm.setSeries1Value(i);
    elm.setSeries2Value(10 - i);
    aNode.addElement(elm);
}
```



The screenshot shows the SAP Business Graphics context structure. The 'Context' window displays a tree view with a 'Context' node containing an 'A' node, which in turn contains 'CategoryText', 'Series1Value', and 'Series2Value' elements. The 'Outline' window shows the overall structure, including 'RootUIElementContainer', 'DefaultTextView', 'BusinessGraphic', 'Category', 'Series1', and 'Series2'.

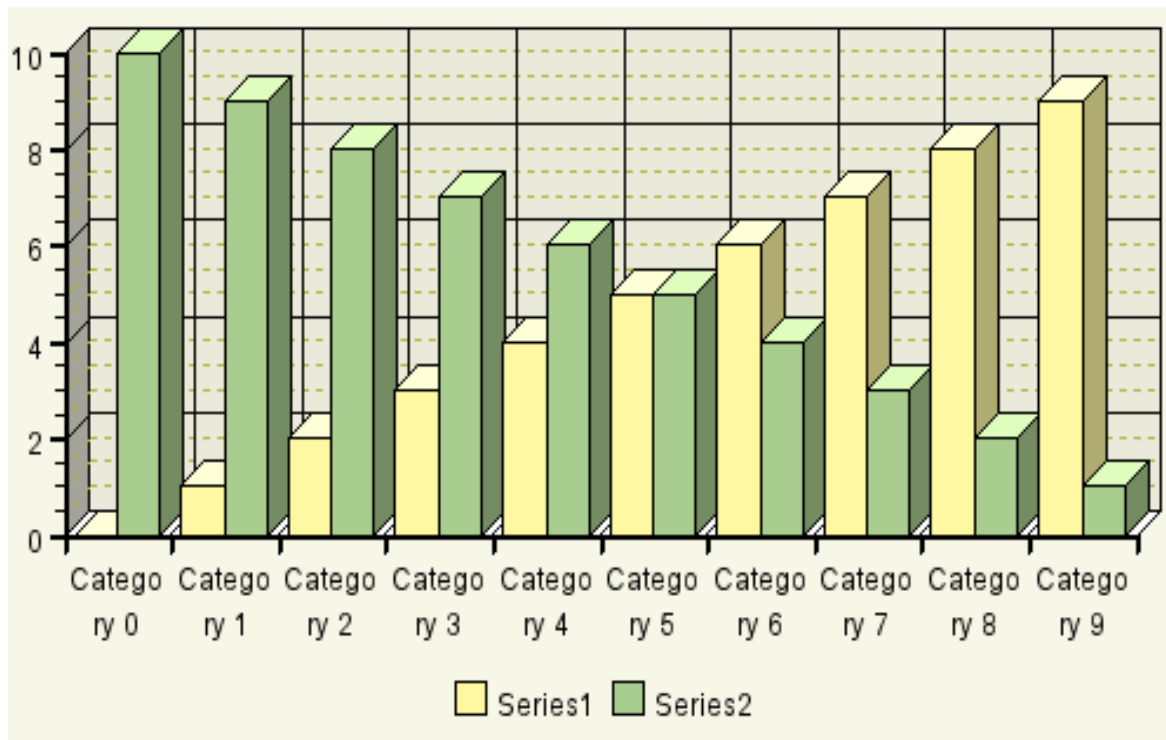
- The above code creates 10 elements in the “A” Node collection.
- Each element has 3 values: CategoryText, Series1Value, and Series2Value

■ Example: Loading Data Into the Context Elements

For this example we manually fill the context structure...but as said before, we could connect this straight to Model values and nodes, and the data could be pulled from a backend system...R/3 for instance.

Each node you create, must contain values for all value attributes.

Example Output



Other Important Properties

- Use the `igsUrl` property to override you configured IGS.

`igsUrl` `http://localhost:8030/`

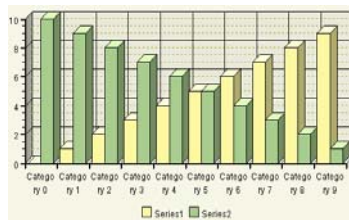
- Use the `width` and `height` properties to control the size of the resulting graphic.

`height` `300`

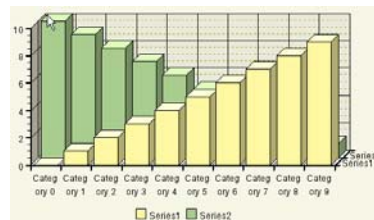
`width` `500`

- Use the property `dimension` to control the appearance of your graphic, below are the possible values and their corresponding renderings of the same business data

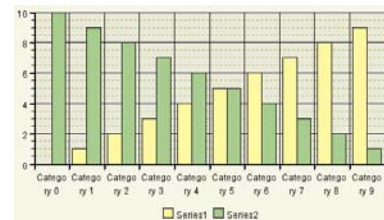
`dimension` `pseudo_three`



Pseudo Three



Three



Two

■ Other Important Properties

If you want to override your configured IGS, then you can set the property `igsUrl` on your Business Graphic UI Element.

As you can see the `dimension` attribute has a great effect on the graphic that the IGS creates.

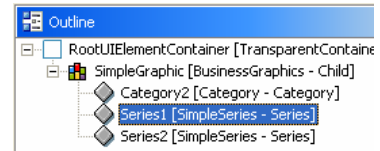
More Important Properties

- A legend for your Business Graphic is created by default.

- For each Simple Series, there is a legend description.

- To set the proper text for it, change the label property of your Business Graphic's Simple Series.

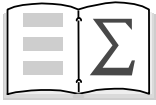
Series1 Series2



label Series One

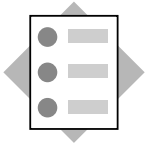
Series One Series Two

Result of change the
label property



You should now be able to:

- **Add a Simple Business Graphic to your Web Dynpro application**
- **Use the important properties of Business Graphics.**
- **How to pass data to your Business Graphic.**



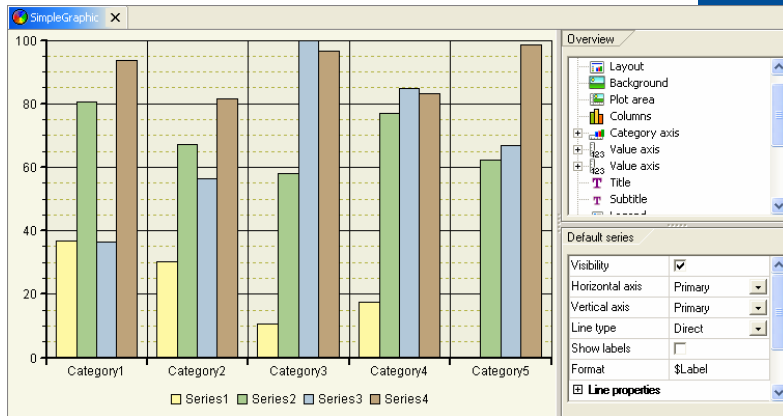
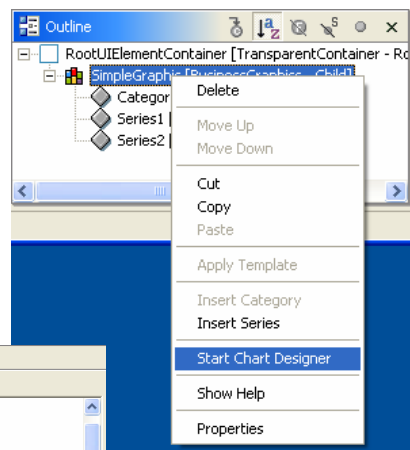
After completing this topic, you will be able to:

- **Learn how to start the Chart Designer.**
- **Use the Chart Designer to make basic changes to your Business Graphic.**

Starting the Chart Designer

■ To start the chart designer, right click on your Business Graphic in the Outline window and select Start Chart Designer.

■ This will open the Chart Designer in the editor window.



■ Starting the Chart Designer

The SAP Chart Designer is a tool for generating customizing settings (for example, colors and shading) for business graphics.

It is particularly useful for branding purposes, for example so that a company can generate graphics with a uniform appearance.

The Chart Designer can be used in conjunction with the Chart Engine in the context of the Internet Graphics Service. You use it to specify customizing settings, for example specifying chart types and colors.

Features of the Chart Designer

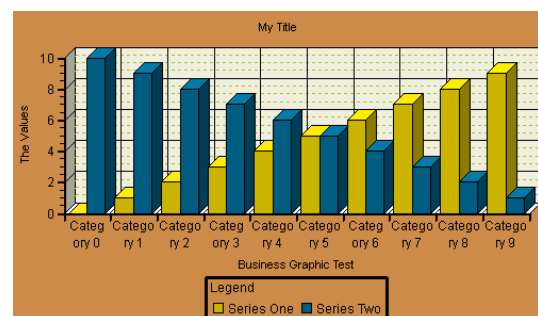
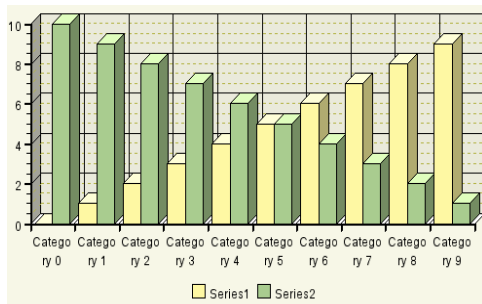
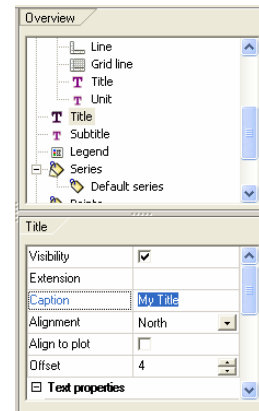
■ The features of the Chart Designer depend on the type of chart you are working with (ie: columns or pie chart).

■ Add Descriptions to the Legend

■ Add a Title to your Business Graphic

■ Give descriptions to the category axis and value axis (in the case it is a columns chart).

■ Change fonts, color schemes, back ground colors, borders etc.

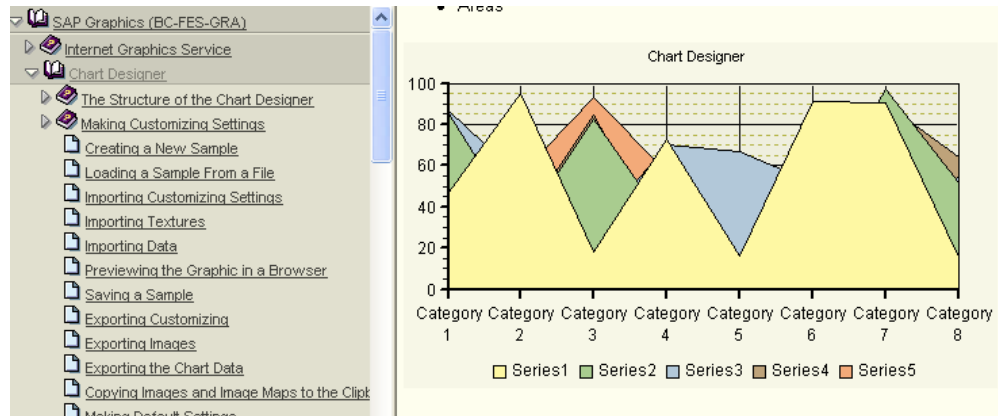


■ Features of the Chart Designer

The properties you can change depends on the type of graphic you are creating. For example, a Pie chart wouldn't have properties for the X-Axis where as a Column chart as shown about would.

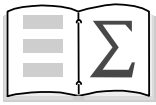
Chart Designer Help

<http://help.sap.com/nw4> > SAP Net Weaver > Application Platform > ABAP Technology > UI Technology > Frontend Services > Graphics > SAP Graphics > Chart Designer



■ Chart Designer Help

The help contains all the information on the properties and how they impact the graphic.



You should now be able to:

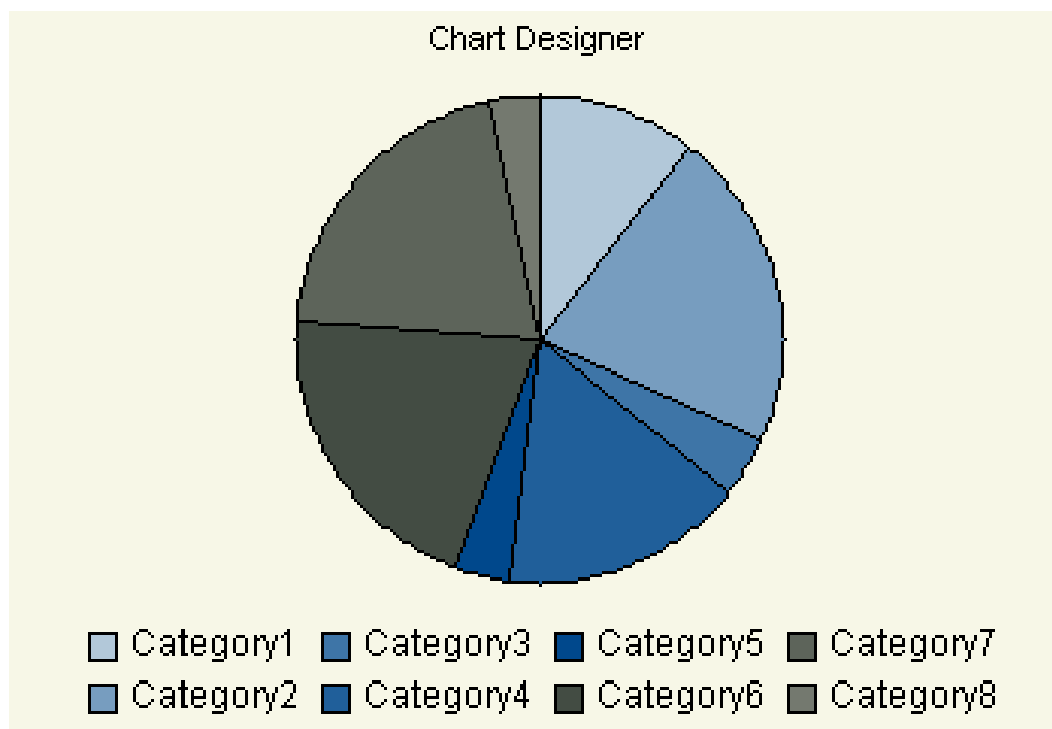
- **Start the Chart Designer.**
- **Use the Chart Designer to make basic changes to your Business Graphic.**



After completing this topic, you will be able to:

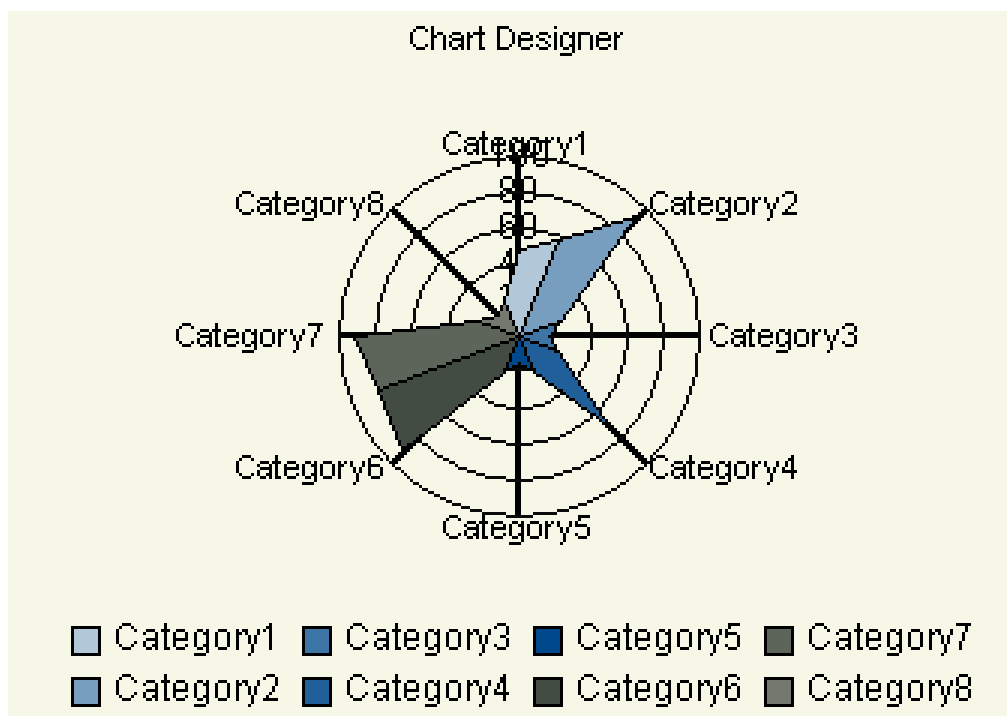
- **Get an idea of the advanced Business Graphics that are possible**
- **See what is possible with GeoMaps.**

Simple Pie Chart

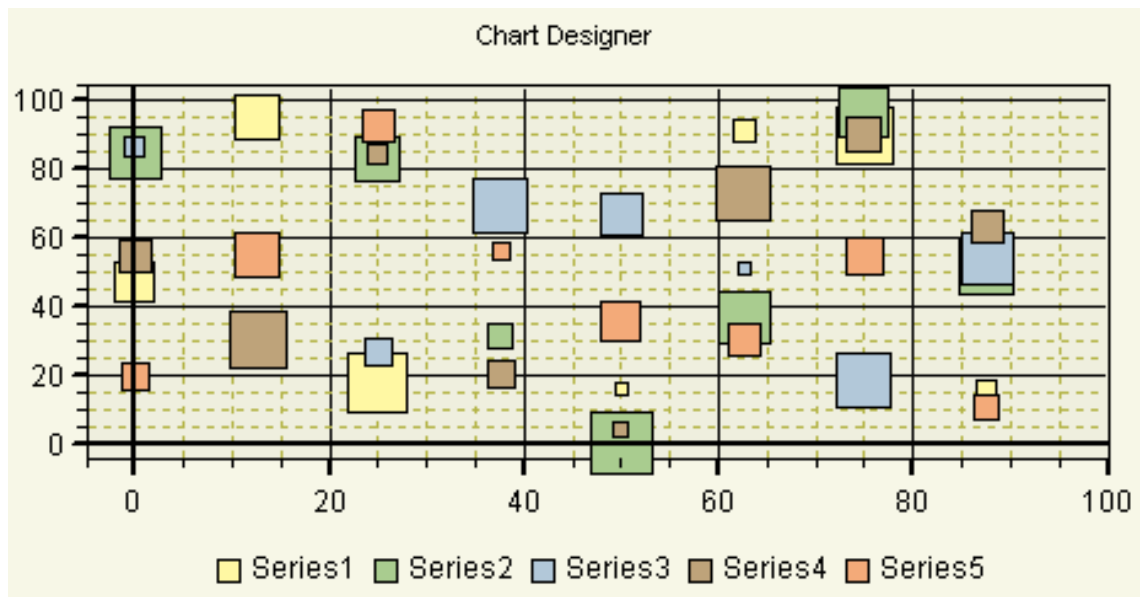


■ Simple Pie Chart

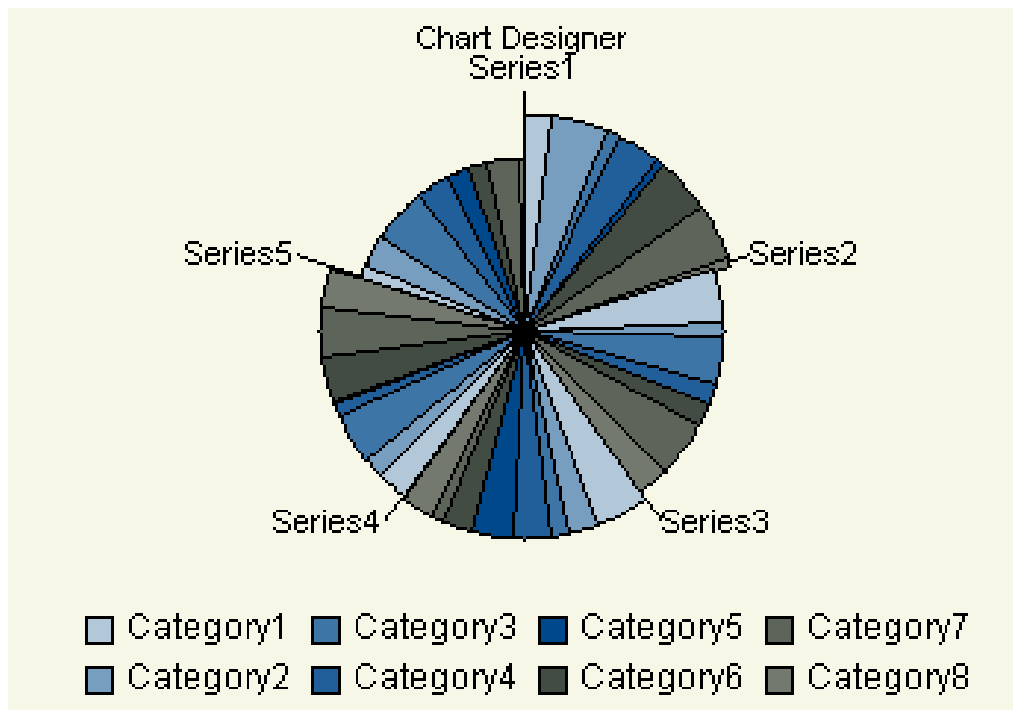
The Pie chart...a simple business graphic.



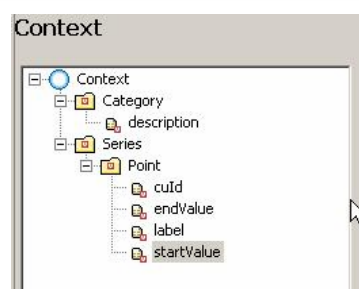
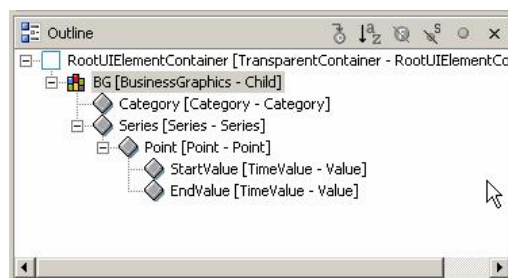
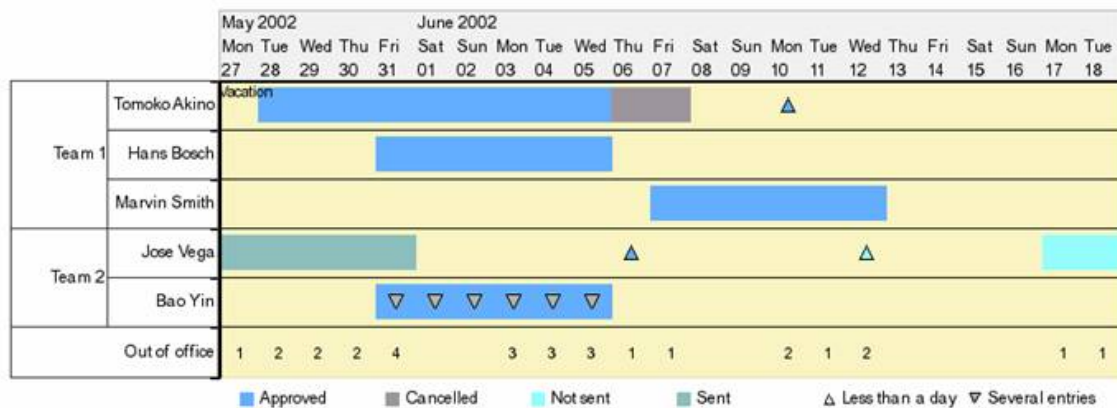
Portfolio Chart



Split Pie Chart



Gantt Chart

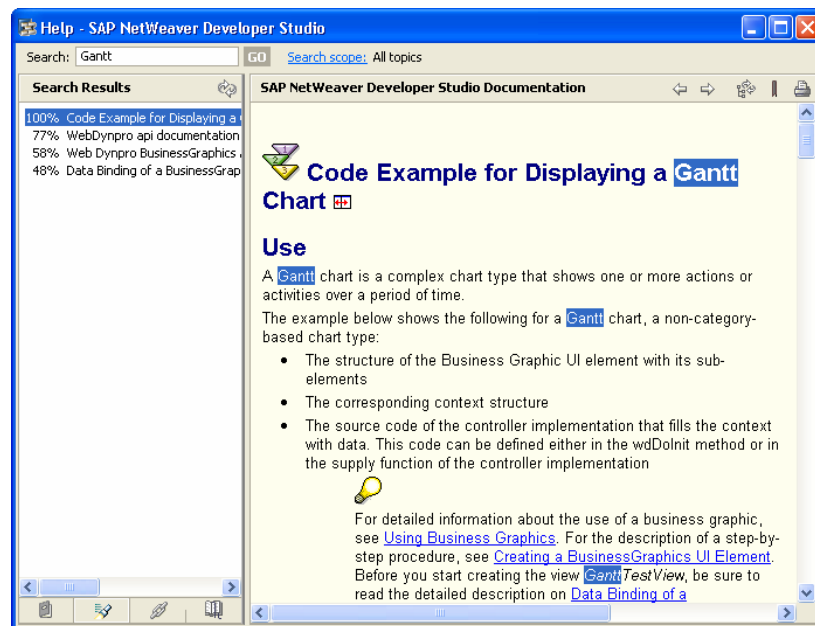


■ Gantt Chart

Advanced graphics need points defined. This is shown above in the views Outline...these points need to be mapped to the view's context, also shown above.

Gantt Chart Code Example

- There is a Gantt Chart tutorial available in the SAP Net Weaver Developer Studio Help.



■ Gantt Chart Code Example

There are lots of great examples & tutorials in the SAP NetWeaver Developer Studio help, Menu Path: *Help > Help Contents*

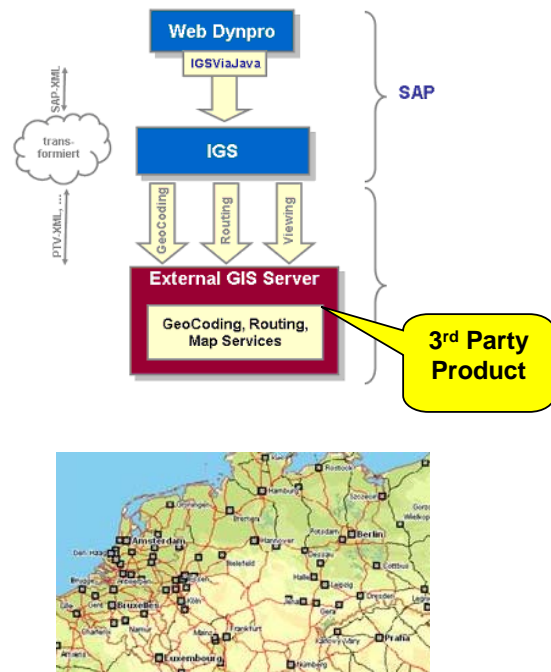
The Gantt chart code example is just one of them...make sure to use make use of this great resource!

■ Geo services comprise geocoding, routing, and map display.

■ **Geocoding** transforms an address into a geographical coordinate.

■ **Routing** is the calculation procedure used to determine a route between a starting point and a destination, via intermediate stops if desired. The results of this calculation are the route, the distance, and the navigation instructions.

Example: <http://maps.yahoo.com> allows you to calculate driving directions.



■ GeoServices and Geo Maps

The IGS is made to integrate with 3rd Party Geo Information Systems. These systems allow you to create maps and do routing determination.

Geo Services and Geo Map example

Example showing a Map of Germany. Allows you to enter a start address and Destination address...Geo Services will then determine the route for you.

Start

Code - City:

Street - Nr.:

Destination

Code - City:

Street - Nr.:

Route Information

Duration:

Distance: 0

[show route](#)



Geo Services and Geo Map example Continued

Route from Walldorf to Frankfurt.

Notice that distance and drive duration are displayed as well.

Start

Code - City: 69190 Walldorf
Street - Nr.: Neurotstr. 16

Destination

Code - City: 60549 Frankfurt
Street - Nr.: Flughafen

Route Information

Duration: 01:33:53
Distance: 94,626

[show route](#)



“Zoom in” functionality is also available.

Start

Code - City:
Street - Nr.:

Destination

Code - City:
Street - Nr.:

Route Information

Duration: 01:32:57
Distance: 95,95



Example Geo Map Coding

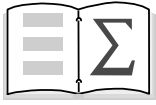
```
WDGeoCoderAddress addressStart = new WDGeoCoderAddress(
    "16", "Neurottstraße", "Walldorf", "", "69190", "DE");
WDGeoCoderAddress addressEnd = new WDGeoCoderAddress(
    "", "Flughafen", "Frankfurt", "", "60549", "DE");
// give the addresses to the geoCoder and let the geocoordinate calculate
IWDGeoCoder geoCoder = WDGeoFactory.createGeoCoder();
try {
    geoCoder.setIgsUrl(new URL("http://pgwdf134.wdf.sap.corp:44780"));
    try {
        geoCoder.addAddress("0", addressStart);
        geoCoder.addAddress("1", addressEnd);
    } catch (WDXException e1) {
        e1.printStackTrace();
    }
} catch (MalformedURLException e) {
    e.printStackTrace();
}
geoCoder.execute();
```

The IGS Url must point to an IGS configured for Geo Services.

You must use the Geo Services API in Web Dynpro to create The IGS Url must point to an IGS configured for Geo Services. your Geo Map images.

■ Example Geo Map Coding

There are examples and tutorials in the SAP NetWeaver Developer Studio help, but remember you need an IGS configured with a GIS system.



You should now be able to:

- **Have an understanding of the IGS architecture.**
- **Add charts to your Web Dynpro applications.**
- **Use the Web Dynpro API to create simple Business Graphics.**
- **Understand the purpose of the Chart Designer.**
- **Understand what GeoMaps are and how they can be integrated into Web Dynpro.**
- **Understand how to configure the IGS for Web Dynpro Applications.**
- **Configure your Java Engine to create Business Graphics**