



INFOFLEX v5 ANALYTICS CHART ITEMS USER GUIDE



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1 OVERVIEW

This guide describes how to use the charting item in InfoFlex.

Charts are available on a per subject (i.e. patient) basis to help display and visualise patterns of data.

The charting functionality allows InfoFlex users to add one or more charts to events. A chart item can be added to a panel (e.g. patient demographics) in a similar way to dates, values and coded items etc.

Chart data can be based on one or more items or it can be based on a query.

In the Design Management module the designer of the data entry screen will add a chart item to the domain view and configure it in accordance with the user requirements.

Example scenarios where charts can be used could be:

- Pathology tests such as repeated blood test results.
- Recording blood pressures at each contact.
- Recording changes in weight and or Body Mass Index (BMI) at each contact.

However there are no limits to the InfoFlex data that you may use and these are just some ideas.

Chart items contain a snapshot of data that is saved in the database as a bitmap image. The image can be updated whenever a user returns to the event. The saved image can be included in a patient document.

Charts can be used in documents (to graph results per subject) and in reports (to graph results across many subjects).

This user guide assumes some knowledge of Design Management, Screen and Panel Design, Data Entry, Document Definition, Query Design Manager and Report Definition.

2 CREATING CHARTS IN DESIGN MANAGEMENT

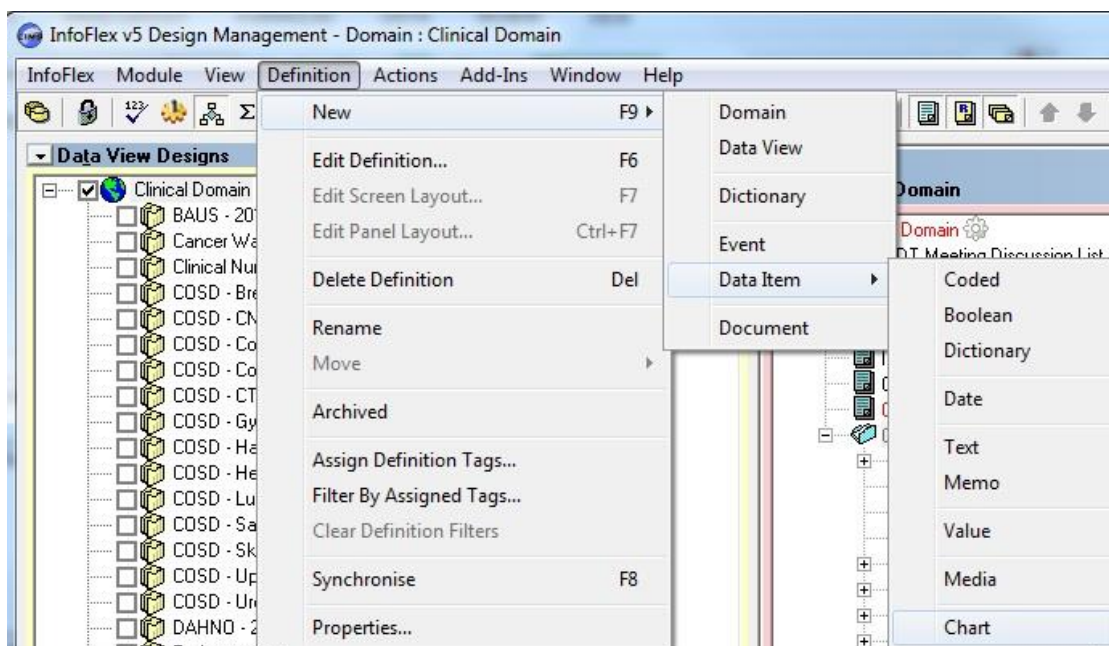
2.1 How to add a Chart Item to a Domain

To create a chart populated from data items (rather than query items) the chart item should be in the parent event of the repeating event containing the data items being charted. A chart item can chart data from items in any child events. A chart item cannot chart data from items in the same event or from items that are not contained in child events.

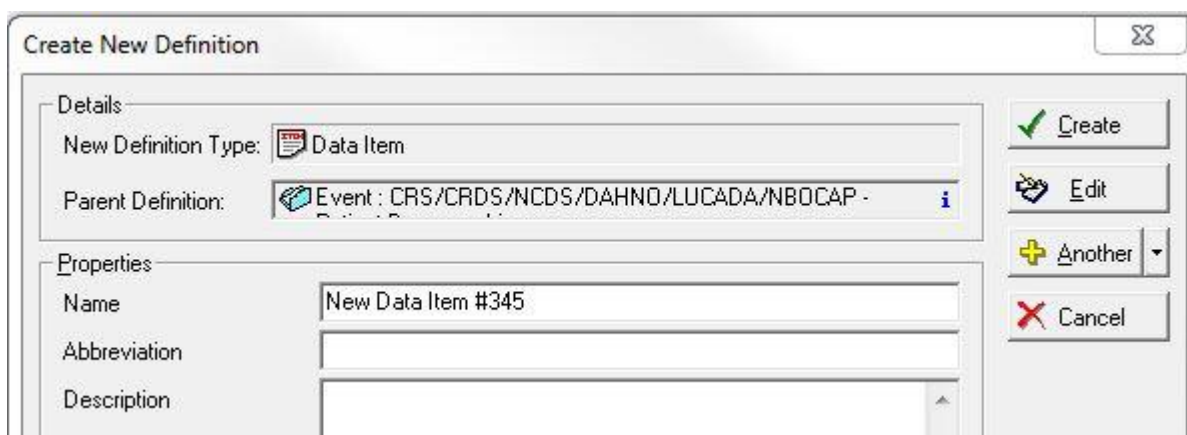
2.1.1 Chart Definition

Carry out the following steps in the Design Management module:

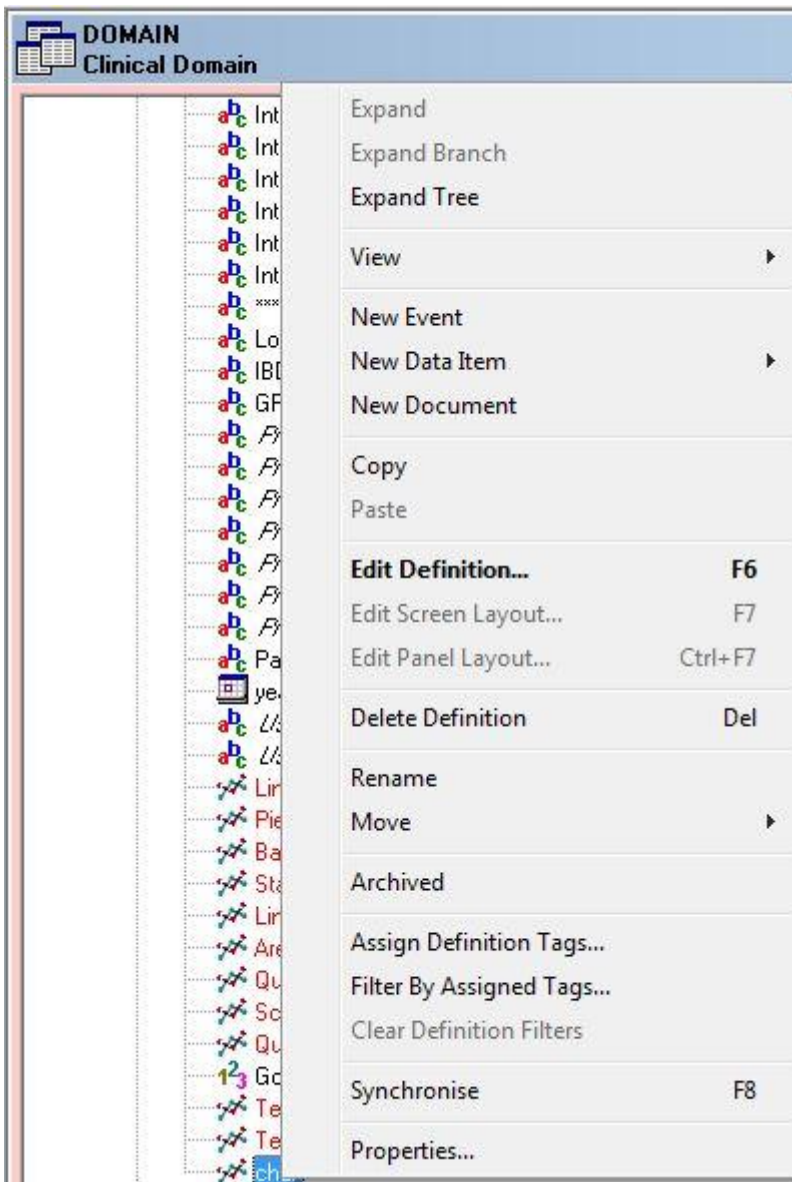
1. Create a new chart item - Go to Definition | New | Data Item | Chart



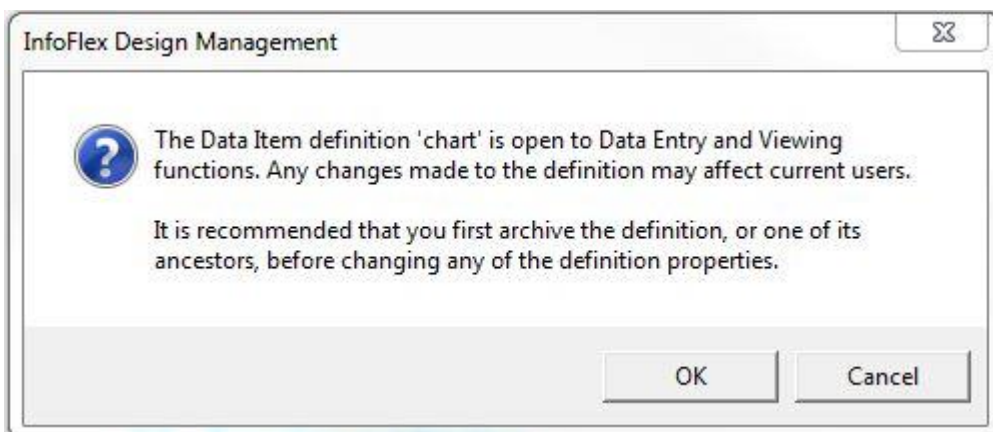
2. Choose a name for the chart item and press the Create button...



3. Select **Edit Definition** from the menu...



4. Press OK and continue.



2.1.2 Edit the Item Definition - Advanced Tab

Select the **Advanced tab** and edit properties. These properties are specific to charts and define the chart type, titles, labels, and data source etc.

| Property | Description | What to enter |
|--------------------|---|---|
| Auto Refresh? | Controls whether to reload the chart automatically after data changes and updates such as additional child events. | Yes or No. (Default is No) |
| Auto Save? | Controls whether to save the chart without prompting. | Yes or No. (Default is No) |
| Display Type | Type of chart to create. | 0 – Bar 1 – Line 2 – Pie 3 - Scatter 4 - Area 5 – Scatter Line |
| Palette Name | Various colour schemes available for the chart itself. | Select from the dropdown list. |
| Background Colour | Colours available for the chart background. | Select from the colour picker. Default is a white background. |
| Chart Title | Title to be displayed on the chart. | Free text. |
| Show Title? | Controls whether the title is shown. | Yes or No. (Default is Yes) |
| Legend Title | Legend title to be displayed on the chart. | Free text. |
| ShowLegend? | | Yes or No. (Default is No) |
| Title Font Name | Font type to be used for the title. | Select from the dropdown list. Default is Arial. |
| Title Font Size | Font size to be used for the title. | Select from the dropdown list. Default is 20. |
| Show Axis Labels? | Controls whether to show labels for the X and Y axes. | Yes or No. (Default is Yes) |
| Stack Option | Stack option for bar charts only. | 0 – Side by Side 1 – Stacked 2 – Stacked Percentage Default is Side by Side. |
| Show Last Updated? | Controls whether to show a last updated time stamp. Useful to verify whether the chart has been updated if the data has been updated. | Yes or No. (Default is Yes) |

| | | |
|----------------------------|---|---|
| Export Format Option | Controls the size of graphic (in pixels) of the exported chart image. | Select from dropdown list. Default is 0 – Auto: which means chart image will be exported at the same size as the chart on the screen. |
| Default X Axis Label | Text for X Axis label | Free Text. |
| Default Y Axis Label | Text for Y Axis label | Free Text. |
| Data Source Type | Controls whether data comes from data items or queries. This setting controls the Data Series Tab (see Step 6 below). | Select from the dropdown list. Default is 0 - Data Items |
| Show Identifiers in Title? | Controls whether to show the patient identifiers from the data view. | Yes or No. (Default is Yes) |
| Show Event in Title? | Controls whether to show the current event in the title. | Yes or No. (Default is No) |
| Show Grid? | Controls whether to show a grid background to the chart. | Yes or No. (Default is No) |
| X Axis Type | Controls whether the X axis is organised as discrete categories or as a date series. | 0 – Categorical Axis 1 – Date Time Axis Default is Categorical Axis. |
| X Axis Date Label Format | Controls the date series level. | Date Format mask, e.g. MM/yy |

For Example:

Edit Data Item Definition

Chart Data Item : Line Chart (weight)

General | **Advanced** | Data Series | Preview | History

Auto Refresh? No

Auto Save? No

Display Type 1 - Line

Palette Name Metro

Background Colour

Chart Title Line Chart - Weight

Show Title? Yes

Legend Title Weight (kg)

Show Legend? Yes

Title Font Name Arial

Title Font Size 10

Legend Font Name Arial

Legend Font Size 9

Show Axis Labels? Yes

Stack Option 0 - Side by Side

Show Last Updated? Yes

Export Format Option 0 - Auto (Default)

Default X Axis Label Weight (kg)

Default Y Axis Label Contact

Data Source Type 0 - Data Items

Show Identifiers In Title? Yes

Show Event In Title? Yes

Show Grid? No

X Axis Type 0 - Categorical Axis

X Axis Date Label Format d

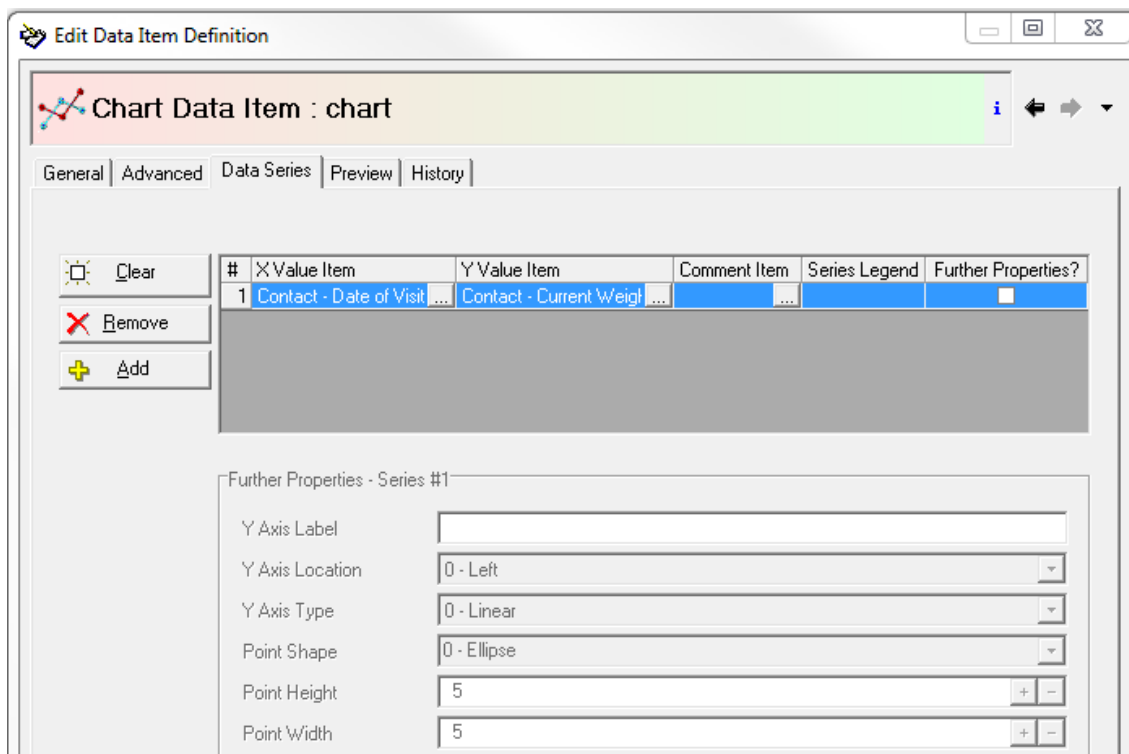
Edit Panel Item Definition Save OK Cancel

2.1.3 Data Series

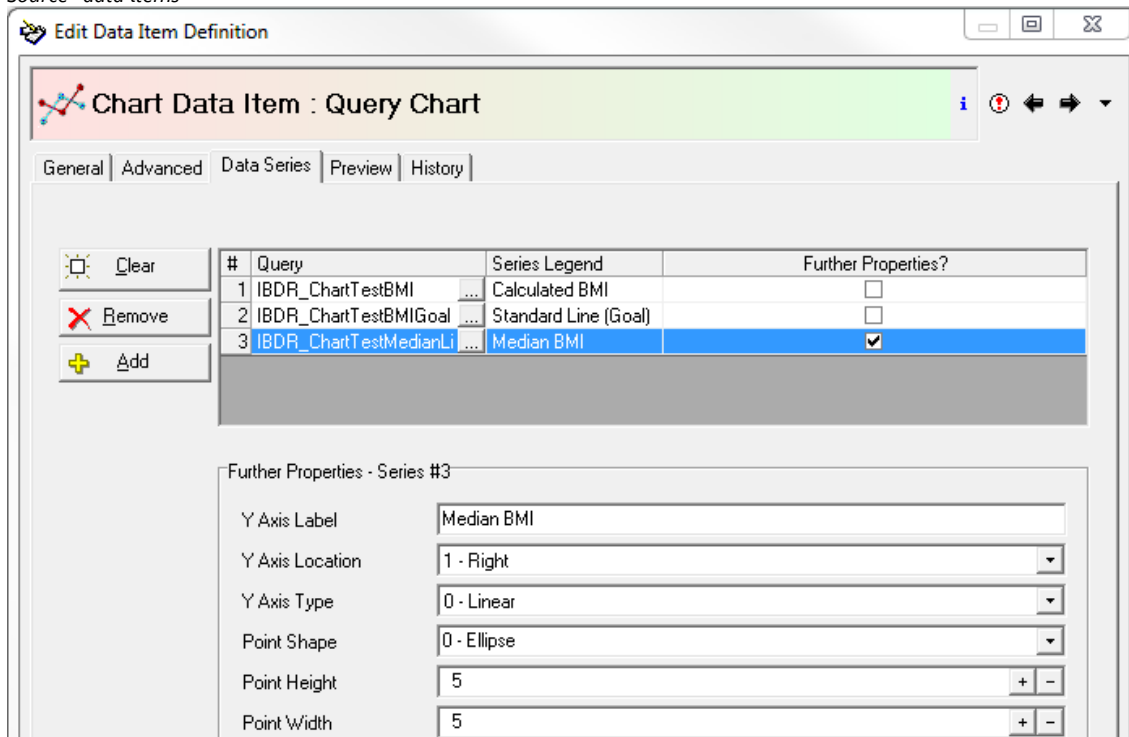
1. Select the **Data Series tab** and select relevant data items for the X and Y axes or select a query depending on your choice of **Data Source Type**. If using a query, the first query field will be the X value and the second query item will be the Y value. Further information on creating charts from queries can be found in section 4.
2. Further data series of the same type as the first can be added or removed from the list.
3. Properties and further properties on the Data Series tab define the X and Y chart data; plus legends, labels and point symbols for when there is more than one data series.

| Property | Description | What to enter |
|---|--|---|
| X Value Item (If Data Source = Data Items) | Data for the X Axis (e.g. appointment date) | Select the data item from the tree. |
| Y Value Item (If Data Source = Data Items) | Data for the Y Axis (e.g. current weight) | Select the data item from the tree. |
| Comment Item (If Data Source = Data Items) | Extra data for a comment if required. (The comment item is displayed when hovering the mouse over a field on the chart) | Select the data item from the tree. |
| Query (If Data Source = Query) | Query returning data for the chart. The first query field will be used for the X value, and the second will be for the Y. See section 4. | Select the query from the tree. Open the Query Design Manager if necessary. |
| Series Legend | Label for the legend if required. | Free Text. |
| Further Properties? | Further properties can be applied to each data series if required. | Tick the box to add an extra Y Axis and point properties. |
| <ul style="list-style-type: none"> Y Axis Label | Label for the Y Axis - can be used when there is more than one data series (Y Axis) | Free Text. |
| <ul style="list-style-type: none"> Y Axis Location | Position of the extra Y Axis. | 0 – Left 1 – Right |
| <ul style="list-style-type: none"> Y Axis Type | Scale type of the extra Y Axis. | 0 – Linear 1 – Logarithmic |
| <ul style="list-style-type: none"> Point Shape | Type of shape representing data points on chart. | 0 – Ellipse 1 – Rectangle |
| <ul style="list-style-type: none"> Point Height | Height (size) of data point. Increments of 1. | Value |
| <ul style="list-style-type: none"> Point Width | Width (size) of data point. Increments of 1. | Value |

For example:



Source- data items

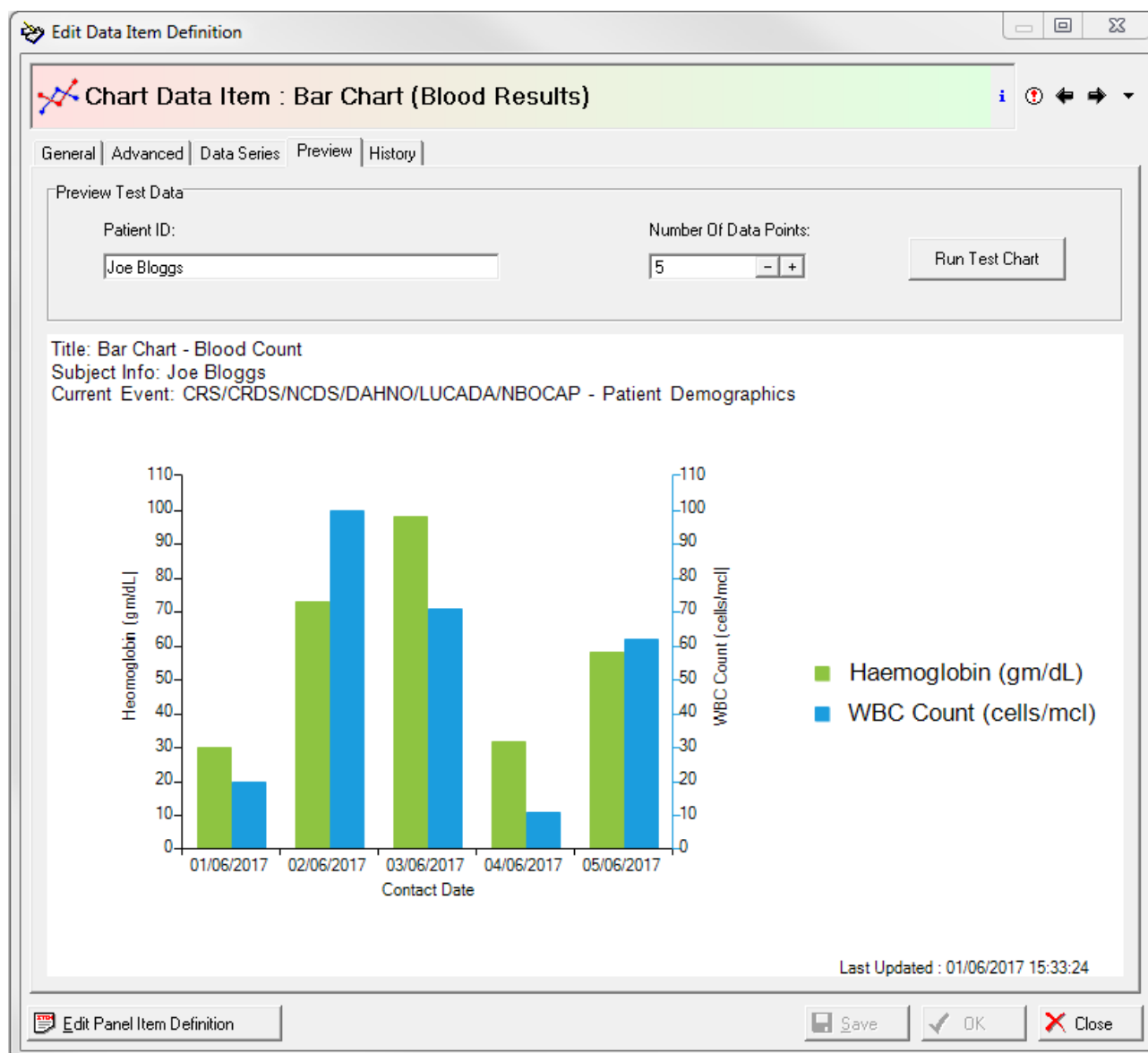


Source- query

2.1.4 Chart Preview

1. Select the **Preview** tab. This tab gives an idea of how the final chart will look (font, colours, labelling etc) with random data. The Run Test Chart button is a preview which uses random data to indicate what the chart may look like – the number of data points can be changed to give a closer representation of the final chart. Visualise the chart with various data series turned on or off by clicking on the legend shown on the preview. The preview helps to indicate if any titles or axes labels have been omitted. If you need to change the chart, edit

the **Advanced** and **Data Series** tabs and changes will be reflected on the **Preview** tab straight away.



2. Click **Save** at any point to save the settings. Click **OK** to finish configuring the chart.

2.2 More on Chart Properties

The following section provides more detail on some of the data property options.

2.2.1 Chart Types

The chart types available are:

- Bar (including stacking options). Charts can be side-by-side or stacked. As with line charts, bar charts can have more than one data series.
- Line, Scatter and Scatter Line (lines representing data points, plots of data points or a series of joined data points). Scatter charts must contain numerical values.
- Pie (circular chart divided into slices to illustrate numerical proportion). For example, these can be used for counts of coded items.

- Area displays graphically quantitative data and is based on a line chart. Usually used for comparing two or more quantities.

Any child (repeating) data items can be used to populate the X and Y axes. If Y is blank (not mapped) then Y will contain a count of events from X.

If another data series is added with a Y Axis on a different scale, a second Y Axis scale can be included on the chart (Line or bar).

A chart from a query (see section 4) can be of any display type with the data derived from one or more queries instead of data items.

2.2.2 Auto Refresh

Auto Refresh reloads the chart data automatically after any changes in the underlying data. This can also be configured ON (Yes) or OFF (No). There is a Data Last Updated time stamp attached to the chart which is a configurable option. The date stamp is useful to help indicate whether the view is of the latest data.

2.2.3 Auto Save

If Auto Save is set to Yes in the **Advanced** tab, it means that InfoFlex won't prompt to save changes to the chart after the underlying data is updated – it just saves the chart. Default is No.

Auto Save is for the chart item not for the whole event. The chart can be saved automatically without affecting other data items.

2.2.4 Export Format Option

The Export Format Option controls the size of the saved bitmap image (in pixels). Note: All charts are saved in bitmap (.bmp) file format.

Select a display resolution from the dropdown list. The default is 0 – Auto, which means that the saved chart image will be the same size as the chart control displayed on the screen – this should be suitable for normal use although may vary according to screen resolution.

The custom screen resolutions refer to the width and height of the saved chart image in pixels. These can have benefits across a series of users as all exported charts will be of the same size and not dependent on each screen resolution. However, if the chart is resized in this way then depending on the size of the original chart and the data points drawn on the control, the image can become distorted.

Export Format Resolution Options:

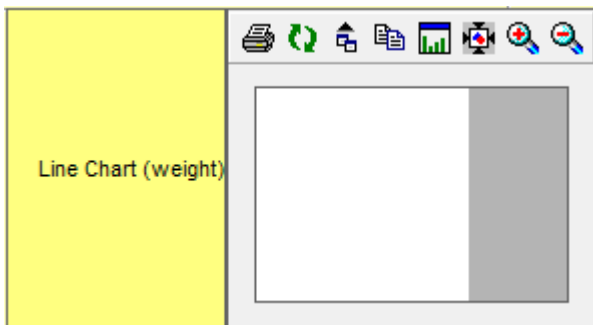
| | |
|----------------------------|--------------------------|
| Export Format Option | 0 - Auto (Default) |
| Default X Axis Label | 0 - Auto (Default) |
| Default Y Axis Label | 1 - VGA (640 x 480) |
| Data Source Type | 2 - SVGA (800 x 600) |
| Show Identifiers In Title? | 3 - WSVGA (1024 x 600) |
| Show Event In Title? | 4 - XGA (1024 x 768) |
| Show Grid? | 5 - XGA+ (1152 x 864) |
| | 6 - WXGA (1280 x 720) |
| | 7 - UVGA (1280 x 960) |
| | 8 - SXGA (1280 x 1024) |
| | 9 - HD (1360 x 768) |
| | 10 - SXGA+ (1400 x 1050) |
| | 11 - WXGA+ (1440 x 900) |
| | 12 - HD+ (1600 x 900) |
| | 13 - UXGA (1600 x 1200) |
| | 15 - FHD (1920 x 1080) |
| | 16 - WUXGA (1920 x 1200) |

3 USING CHARTS IN DATA ENTRY

3.1 Charts in Panel Layouts

Chart items are added to a data view in the same way as other items in InfoFlex, and can be positioned and resized on the panel layout. See the InfoFlex Chart Designer User Guide for more information on InfoFlex panel design.


The chart panel item contains a chart toolbar and an image of the chart.

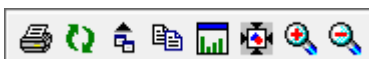


The Chart panel item can be resized so that the chart is clearly displayed in the panel; or the panel item can be kept compact in the design, especially where there are multiple charts and/or many items on the panel. A chart viewer is available to display the chart. The chart image shown on the item is whatever was generated the last time the chart was updated.

3.1.1 Chart Toolbar

The chart toolbar is shown in the panel layout. These tools allow charts to be exported, printed, refreshed, copied to the clipboard and pasted into other applications.

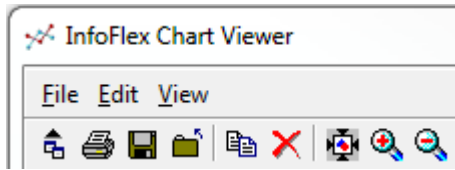
The chart can be opened in a new window or full screen by pressing F4 or clicking '**Update and Show Chart Viewer**' .



1 2 3 4 5 6 7 8

1. Print the chart
2. Reload chart data
3. Export chart to a file
4. Copy chart to clipboard
5. Update and show chart viewer
6. Shrink to fit
7. Zoom in
8. Zoom out

3.2 The Chart Viewer



The menu and toolbar on the chart viewer is very similar to the panel item and offers the same core functions with the addition of saving an updated chart.

3.3 Updating Charts

If the underlying data in the data items is updated then the chart will also be updated. Charts will only be updated automatically if auto refresh is set to Yes. If auto refresh is set to No, then the chart will need to be refreshed manually.

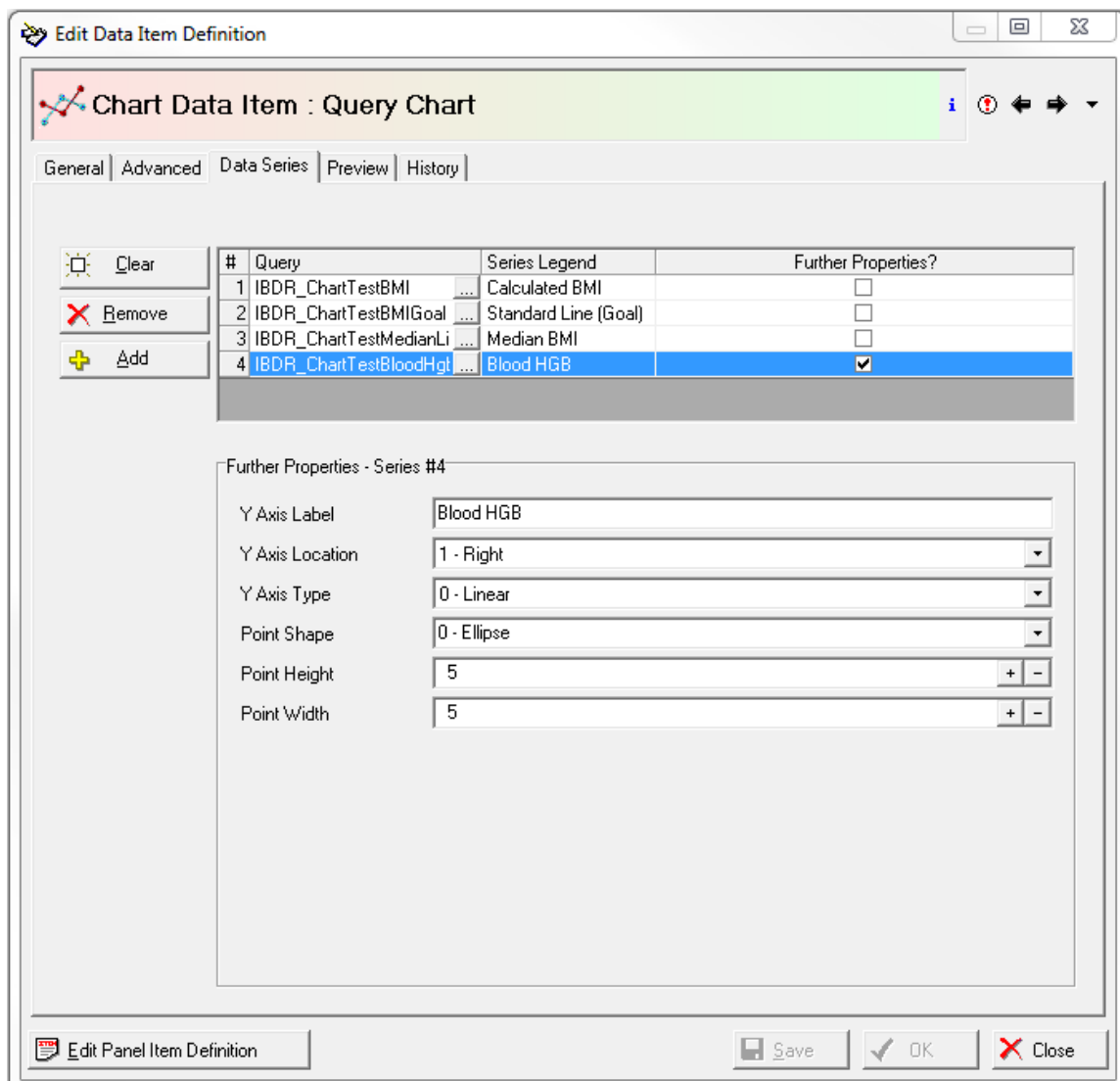
To see the current status of the chart, there is a date stamp on the chart to indicate when it was last updated.

4 CHARTS FROM QUERIES

When using a query as the data source instead of a data item the first item in the query will be plotted as X and the second as Y.

As with data items, further series derived from queries can be added to the same chart. To create charts from a query follow the steps below:

1. Select **1- Query** as the Data Source on the **Advanced** tab.
2. **Add** a new data series on the **Data Series** tab.
3. Click in the query field to select a query - it is possible to launch the **Query Design Manager** from this point in order to define or edit a query.
4. Add a Series Legend and Further Properties where required.
5. **Add** more data series if necessary.
6. Select the **Preview** tab to review the chart.
7. Save and Close.



5 CHARTS IN DOCUMENTS

The chart item has an associated image which can be added to documents in the same way as image items. The chart image is whatever was generated the last time the chart was updated. A chart item can be added to the template, with optional additional syntax controlling the size of the image.

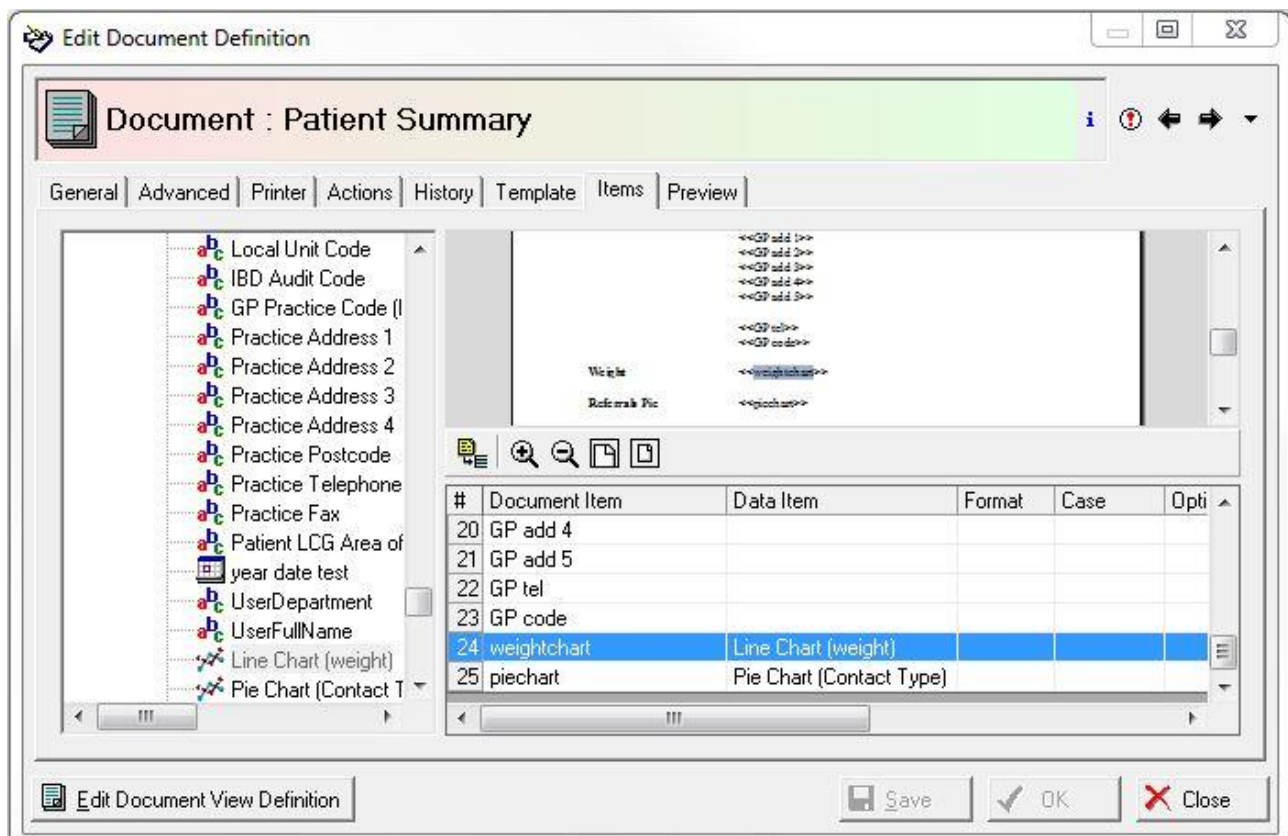
5.1 Adding Chart Items to Document Templates

The chart item should be included in the template in the same way as other document items.

To define chart items in a document template, the following syntax is required:

```
<<chart item name, SCALE=scale, WIDTH=width, HEIGHT=height, MAXWIDTH=maxwidth,
MAXHEIGHT=maxheight>>
```

The chart item name is the document item which maps to the chart image item in the items tab of the document definition in the same way as other items in the template. The syntax options that follow are optional and control the size of the image on the generated document. See below for explanation and examples:



SCALE

Specifies the scaling factor (as an integer percentage, so that 100 = full size)

WIDTH, HEIGHT

Specifies an absolute value (in twips = 1/20th of a point or 1/1440th of an inch) for the image width or height.

MAXWIDTH, MAXHEIGHT

Specifies an absolute value (in twips = 1/20th of a point or 1/1440th of an inch) for the maximum image width or height

Examples:

Original size if possible otherwise limited to maximum width:

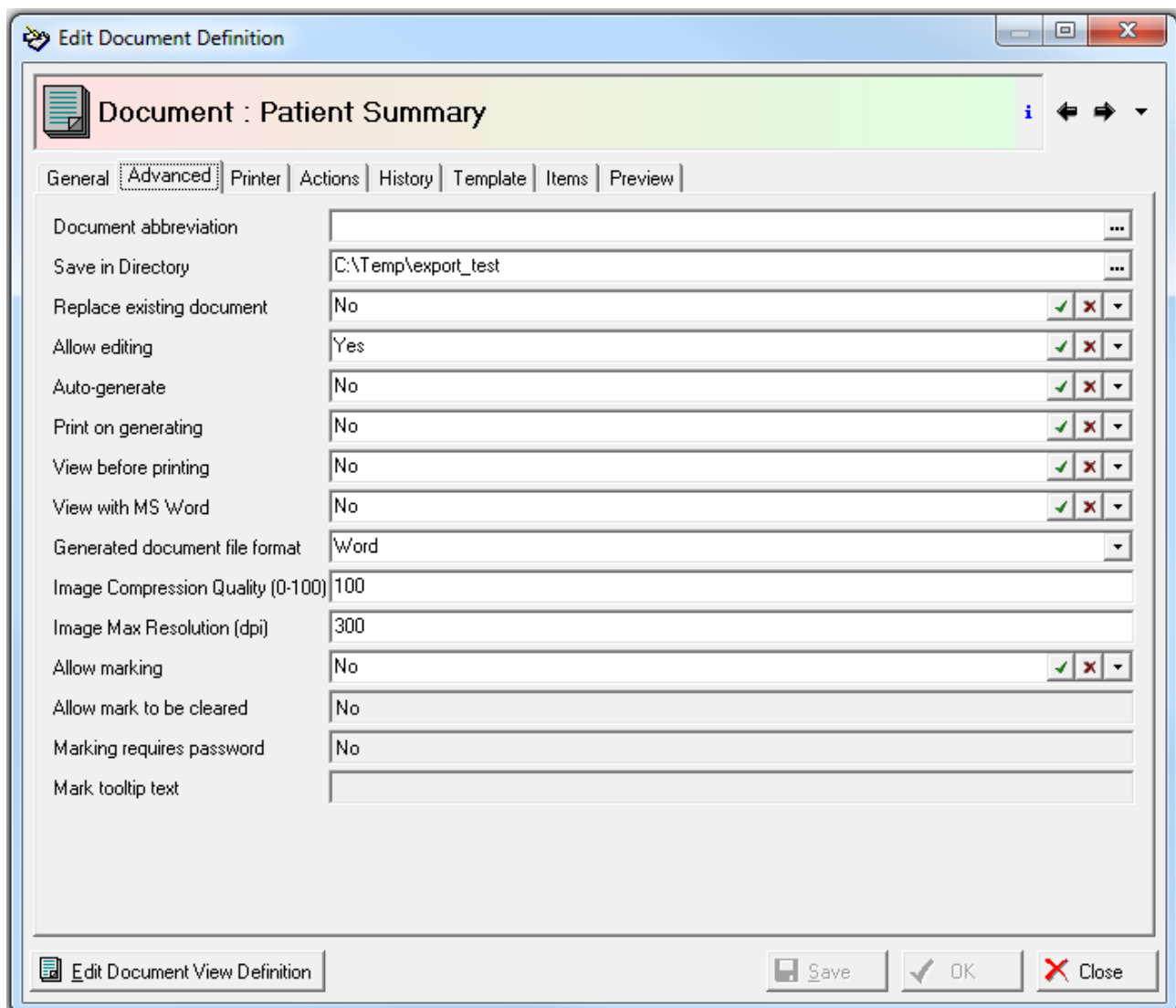
```
<<chart item name, SCALE=100, MAXWIDTH=3000>>
```

Absolute Width:

```
<<chart item name, WIDTH=1000>>
```

5.2 Saving Documents with Chart Images

In order to reduce the size of document files that contain chart images, there is a need to save documents in Word format (rather than RTF format) and allow other image properties to be set. Document definition options for internal InfoFlex documents can be found on the **Advanced** tab of the Document Definition dialog.



Generated document file format:

Set this to Word as RTF doesn't enable the image

compression properties.

Image Compression Quality (0-100): Value from 1 to 100 (best quality). If 0 then uses the internal default (50).

Image Max Resolution (dpi): Dots per inch, default is 300dpi = average printer resolution.

Also note that templates must still be in RTF format.

For more information about document definition and including items from the InfoFlex database in documents, see the InfoFlex Document Definition User Guide.

6 CHARTS IN REPORTS

InfoFlex Report Documents contain data about whole groups of subjects. Queries defined in QDM (Query Design Manager) are used to retrieve the data displayed in the report.

Reports are defined on domains. The process of defining a report is similar to defining a document; however **queries** are mapped into the report rather than individual data items.

Once a report has been defined it is made available in a data view and can be viewed using the InfoFlex Reporting module. For more information about report definition, see the InfoFlex Report Definition User Guide.

To add charts to reports, follow the steps below:

1. Prepare and test the queries required to generate data for the chart. [QDM]
2. Add a chart section containing the chart configuration into a report template. See the chart section below for details of the configuration and examples.
3. Save the template.
4. Map the chart items in the report document definition. [Design Management].
5. Save the report document definition.
6. Note: You may wish to prepare a chart queryConfig if this is going to be used to generate lookup values to populate parts of the chart in the report. This consists of a query returning a single row of values which can be used to dynamically populate chart properties (optional)
7. Generate the report in the Reporting Module.

6.1 How to Add a Chart Section into a Report Template

Add a chart section with chart configuration into the report template. The following is an example configuration:

```
<<$CHART, CHARTITEMS=<<queryConfig1>><<queryItem1>><<queryItem2>>,SCALE=100,
CHARTDEF=
```

```
<ChartDef type="Line" dataSourceType="Query" paletteName="Metro"
backgroundcolor="16777170" titleText="queryConfig1~1" showTitle="true" legendTitleText="Test"
showLegend="true" showAxisLabels="true" showLastUpdated="true" xAxisLabel="x Axis label"
yAxisLabel="Y Axis Label" showGrid="true">
```

```
<ChartDataConfig>
```

```
<ChartDataSeries legendText="Visits" queryKey="queryItem1~/>
```

```
<ChartDataSeries legendText="Referrals by type" queryKey="queryItem2~"
extendedProperties="True" customPointHeight="10" customPointWidth="5"
customPointShape="Ellipse" customYAxisHorizontalLocation="right" customYAxisTitleText="Custom
axis text" customYAxisType="Logarithmic" />
```

```
</ChartDataConfig>
```

```
</ChartDef>
```

```
>>
```

6.2 Explaining Chart Configuration

The following part of the special chart section in the example within the template defines three query document items:

```
CHARTITEMS=<<queryConfig1>><<queryItem1>><<queryItem2>>
```

These document items will be used to populate the data values that will populate the chart's data series.

6.2.1 Chart Properties

```
<ChartDef type="Line" dataSourceType="Query" PaletteName="Metro"
backgroundcolor="16777170" titleText="queryConfig1~1" showTitle="true" legendTitleText="Test"
showLegend="true" showAxisLabels="true" showLastUpdated="true" xAxisLabel="x Axis label"
yAxisLabel="Y Axis Label" showGrid="true">
```

The properties within this section correspond to chart definition properties.

type can be set to "Line", "Bar", "Area", "Pie", "Scatter" and "ScatterLine".

dataSourceType should be set to "Query" for reports.

paletteName can be set to "metro", "Arctic", "Autumn", "Cold", "Flower", "Forest", "Grayscale", "Ground", "Lilac", "Metro", "Natural", "Pastel", "Rainbow", "Spring", "Warm" or "Windows8".

backgroundColor can be either a numeric colour value or one of the string constants - "black", "blue", "cyan", "magenta", "red" or "white".

6.2.2 Dynamic Chart Properties

For a chart property to have a dynamic property (populated from a query) the following syntax is used [PROPERTY_NAME] = [QUERY_NAME] ~ [QUERY_COL_INDEX]

The tilde ~ symbol tells the chart creator that it is a look up value.

So in the example above the title text property of the chart is populated from the document term "queryConfig1"

For this to work the query defined for the configuration will need to return a single row of values.

Within each chart data series section the chart template references the query document item that will populate the chart data points.

```
<ChartDataSeries legendText="Visits" queryKey="queryItem1~/>
```

To add a second customised Y axis on the right of the chart the chart data series configuration is more complex:

```
<ChartDataSeries legendText="Referrals by type" queryKey="queryItem2~"
extendedProperties="True" customPointHeight="10" customPointWidth="5"
customPointShape="Ellipse" customYAxisHorizontalLocation="right" customYAxisTitleText="Custom
axis text" customYAxisType="Logarithmic" />
```

extendedProperties needs to be set to true.

customYAxisType can either be "linear" or "logarithmic".

Note: For scatter and scatter line series both x values and y values need to be numeric values.

6.2.3 List of Chart Properties

The following table is a list of chart definition and data configuration properties:

| Property | Definition (can be set to) |
|---|---|
| Type (ChartDef) | "Line", "Bar", "Area", "Pie", "Scatter" or "ScatterLine". |
| dataSourceType | "Query" |
| paletteName | "Metro", "Arctic", "Autumn", "Cold", "Flower", "Forest", "Grayscale", "Ground", "Lilac", "Metro", "Natural", "Pastel", "Rainbow", "Spring", "Warm" or "Windows8". |
| backgroundColor | A numeric colour value or one of the string constants – "black", "blue", "cyan", "magenta", "red" or "white". |
| titleText | Custom text or a query config dynamic value such as "queryConfig1~1" |
| showTitle | "true" if required |
| legendTitleText | Custom text |
| showLegend | "true" if required |
| legendFontSize | Value e.g. "14" |
| legendFontName | Font type e.g. "Calibri" |
| showAxisLabels | "true" if required |
| showLastUpdated | "true" if required |
| xAxisLabel | Custom text |
| yAxisLabel | Custom text |
| showGrid | "true" if required |
| legendText (ChartDataSeries) | Custom text |
| queryKey (ChartDataSeries) | e.g. "queryItem1~" or "queryItem2~" |
| extendedProperties (ChartDataSeries) | "true" if required |
| customPointHeight (ChartDataSeries) | Value e.g. "10" |
| customPointWidth (ChartDataSeries) | Value e.g. "5" |
| customPointShape (ChartDataSeries) | "Ellipse" or "Rectangle" |
| customYAxisHorizontalLocation (ChartDataSeries) | "right" or "left" |

| | |
|--|---------------------------|
| customYAxisTitleText (ChartDataSeries) | Custom text |
| customYAxisTitleType (ChartDataSeries) | "Linear" or "Logarithmic" |



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