

# Charting 101 & New Chart Object

PxPlus 2019 (v16)

# Agenda

- Charting prior to PxPlus 2019
  - Options available
  - Limitations
- Intro to new charting object \*OBJ/CHART
- Using the object
  - Nomads/*i*Nomads
  - Printing charts
  - Generating HTML

# Background

## Prior Charting Options

- Five charting options previously existed

Version	Charting Options
ProvideX v5	Built-in Chart for Windows provided by a <a href="#">ProvideX DLL</a>
PxPlus v9.00	<a href="#">Fusion Free Charts</a> and <a href="#">Fusion Charts</a>
PxPlus v9.10	<a href="#">Google</a> charts
PxPlus v9.10	<a href="#">Rgraph</a> charts

# Background

## Prior Charting Options

- All options had their limitations

Charting Option	Limitations
<b>ProvideX DLL</b>	Not very professional looking and could not run on the Web
<b>Fusion Free</b>	Used Flash and no longer supported by manufacturer
<b>Fusion</b>	Same as Fusion Free but also had to be purchased separately
<b>Google</b>	Required Internet access, raised security concerns, and had no 3D charts
<b>Rgraph</b>	We upgraded to v4.68 but still found some bugs. Also, 3D rendering was simply a "skewed" display (including titles/text)

None of the existing charting options could be easily printed

# Addressing the Issues

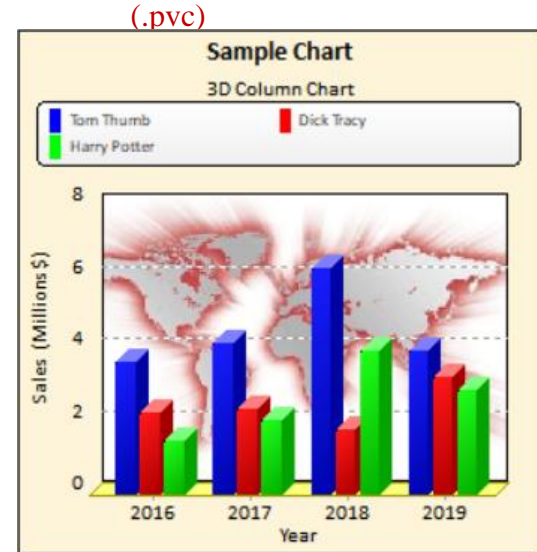
## Charting is Important

- Develop our own charting functionality
  - Requirements for charting
    - Must run in all environments (Windows Desktop and Browser)
    - Ability to output to printers, PDF, bitmap, and generate **responsive** HTML
    - Improve quality of charts especially 3D charts
    - Low overhead (*avoid need to load browser for each instance*)
    - Easily customizable and supportable

# \*OBJ/CHART Created

## A Native PxPlus Object

- Fully written in PxPlus using mnemonics
  - Assures portability
- Meets all the requirements
  - Able to run in all environments
  - Outputs to printers, PDF, bitmap
  - Creates responsive HTML pages
  - Improved quality of output  
*(shading and 3D rendering)*
  - Customizable and easy to support
- Faster with less overhead
  - No requirement to load browser window



**USING \*OBJ/CHART**

# Nomads and *i*Nomads

## Replaces Charting Control

- Define chart type as 'Plus'
  - Default chart type set in `%Nomads'Chart$` (or `%Nomad_chart$`)
  - Applies to both *i*Nomads and Nomads
- Can be set in chart definition on Nomads panel header
  - PxPlus 2019 allows for a different specification on every chart
- *i*Nomads allows charting engine specification on Template
- Used by Chart Web Service to render charts



# Properties

Property	Description
'Animate	When chart displayed on a <b>Web page</b> and set and the chart is first rendered, Bars and Columns grow from the zero line to full size, and all other charts are set to fade in when rendered.
'ColorByPoint	When set and there is only one set of data, the system will draw each point in a different color.
'ConnectorLine	When set on Column or Bar charts, the system will draw lines between the ends of the columns or bars for each point/set in the chart.
'FormatNumberScale	Boolean value indicating whether to display numbers with formatted scale (e.g. 4.5K or 1.2M) or as full numbers (e.g. 45,000 or 1,200,000). Default is to use a formatted scale (1).
'NoUpdate	Can be set, when using object as a control, to disable screen updates while properties are being set/changed.
'PastelPalette	When set, the system will use a different set of pastel colors to display the charts.
'ShowValues	When set, the system will display the actual point values on the chart as follows: <ul style="list-style-type: none"><li>• Column charts - values appear above/below the column</li><li>• Stacked charts - values appear in the segment of the chart</li><li>• Bar charts - values appear to the left/right of the bar</li><li>• Pie/Donut charts - values appear as a percentage inside the pie chart</li><li>• Scatter charts - X/Y values appear above the point</li></ul>

# Printing Using \*OBJ/CHART

## Output to WINPRT or \*PDF\*

- Instantiate object "\*obj/chart"

```
oChart = NEW("*obj'chart")
```

- Load chart type, properties, and values

- Use 'Draw method to output to print file

```
oChart'Draw( Channel, Left, Top, Width, Height )
```

*Internal PDF driver does not provide gradient colors  
Use Windows 10 PDF driver, if these are required*

Parameter	Description
<b>Channel</b>	Channel number of print file (Console, Winprt, or PDF)
<b>Left</b>	Starting column
<b>Top</b>	Starting line
<b>Width</b>	Number of columns
<b>Height</b>	Number of lines

# Generate Image of Chart

## Output BMP, JPG or PNG

- Instantiate object "\*obj/chart"

```
oChart = NEW("*obj'chart")
```

- Load chart type, properties, and values
- Use CreateImage method to make file

```
oChart>CreateImage ( Path$, Width, Height )
```

*Creates file directly on Windows  
Uses Firefox and ImageMagick on Linux to create file*

Parameter	Description
Path\$	Pathname to image file to create (suffix denotes type)
Width	Number of pixels wide
Height	Number of pixels high

# Generating HTML of Chart

## Create Full Page or Section

- Similar to printing but with the following rendering methods

Method	Description
'GetHtml\$(width, height, fontHi, fontWd)	Returns HTML snippet to render chart in specified <i>width</i> and <i>height</i> in pixels  Parameter <i>fontHi</i> is optional and defines the default line height If not present or 0, line height is assumed to be 1/25 of total height  Parameter <i>fontWd</i> is optional and defines the default column width If not present or 0, column width is assumed to be .60 of line height
'GetPage\$(width, height, title\$)	Returns full HTML page to render chart in specified <i>width</i> and <i>height</i> in pixels If both are zero, the page will be created to respond to browser window size  Parameter <i>title\$</i> contains the optional title for the HTML page If omitted or null, the chart title will be used

# Sample Logic

## Four Charting Output Methods

```
print 'CS',"Test charting"  
data$="Fringe Industries=10,12.3,14.3,16.4/"  
data$+="Crimson Computers=2.3,-5.4,2.2,3.6/"  
data$+="WorldWide Wombats=4.8,9.9,11.6,10.9/"  
!  
oChart=new("*obj/chart" for program)  
oChart'Fmt$="3dpie" ! "3dColumn"  
oChart'title1$="My Sales Chart"  
oChart'title2$="Created "+dte(0:"%DI, %MI %D %Y")  
oChart'Sep$=","  
oChart'yAxisTitle$="Sales (In Minions)"  
oChart'xAxisTitle$="Year"  
oChart'border=1  
oChart'Load(data$)  
oChart'PointText$="2016/2017/2018/2019/"
```

```
! -- Draw on the screen (channel 0)  
oChart'Draw(0,5,5,40,15)  
! -- PDF output  
open (hfn)"*.pdf*;view"  
print (lfo)'font'("Tahoma"),  
oChart'Draw(lfo,5,5,60,25)  
close (lfo)  
! -- Image output  
erase "chart.png",err=*next  
oChart'CreateImage("chart.png",800,600)  
system_help pth("chart.png")  
! -- HTML page  
open create purge (hfn)"chart.html"  
write record (lfo) oChart'GetPage$(0,0,"DireXions Demo Page")  
close (lfo)  
system_help pth("chart.html")
```

# Recap

- New \*OBJ/CHART addresses deficiencies in prior charting options
- Object can replace Charting control in Nomads/*i*Nomads
- New capabilities include:
  - Direct printing of Charts
  - Output of charts to image files
  - Generating HTML
    - Snippets to include in web pages
    - Full HTML pages of fixed size or responsive in browser page

More details at [WHAT IS A SMART CHART PDF](#)

# Additional Resources

The help link(s) below refer to the current on-line help pages. The functionality may have been further updated since the PxPlus 2019 (version 16) release.

- [Charting](#)
- [NOMADS Chart Control](#)
- [\\*obj/Chart – Plus Charting Utility](#)