

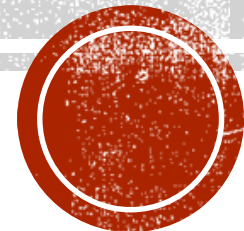
DEVELOPING BETTER BUSINESS-APPLICATIONS WITH GUI-CONTROL-SUITES

Robert Walter

INdotNET – Ingolstädter .NET User Group

www.indot.net

10/2017 - 12/2017



by use of WPF

A BRIEF INTRODUCTION

**The Challenge:
Which GUI-Control
producer is the best one?**



The basic GUI-Components in Windows Forms, WPF, and ASP.NET are often kept too simple and sometimes lack power. As soon as Microsoft has created a set of GUI-Controls for a User Interface Technology, they won't be extended any more. Since the dawn of the PC, that's the reason why third parties offer comprehensive and simply better .NET-Controls.




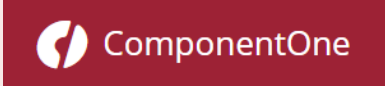



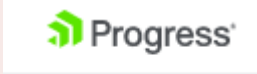

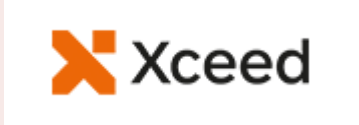
We'll examine GUI-Suites of different producers and how they deal with popular problems either more or less elegant. For example:

- *Is it possible to present one million rows fast and fluid?*
- *How to arrange forms as fast a possible?*
- *Is it possible to prevent applications from freezing in a simple way?*
- *Can a Combobox be extended with more information?*
- *Can we provide a search on multiple fields without extra programming?*



GUI-CONTROL-SUITE PRODUCERS

(A-Z)

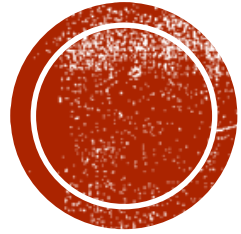
<p>actipro www.actiprosoftware.com</p> 	<p>DevExpress www.devexpress.com</p> 	<p>GrapeCity / ComponentOne www.grapecity.com</p>  	<p>INFRAGISTICS www.infragistics.com</p> 
<p>Nevron www.nevron.com</p> 	<p>Syncfusion www.syncfusion.com</p> 	<p>Progress / Telerik www.telerik.com</p>  	<p>Xceed www.xceed.com</p> 

content of this presentation:

analysis conducted

technical issues





THE WPF-DATAGRID



DAS WPF-DATAGRID

No	First Name	Last Name	Date of Birth	...
1	Mr.	.NET	01.01.2001	...
2	Mrs.	Millenium	01.01.2000	...

Facts:

- The Datagrid presents the most information out from a list. It's essential for Business Applications – and one of the most complex Controls!
- In the initial version of WPF, there was no DataGrid at all – Statement: Use a ListView... What to do, if that's not sufficient enough? Finally the DataGrid has been added at a later point...
- Even in 2017(!) WPF-DataGrid is still being updated by Third Parties (e.g: performance optimizations)
- Many Third Party DataGrid architectures were not powerful enough, so that in the meantime there are multiple DataGrid-Controls offered by a single producer!



PROBLEM: WPF-DATAGRID PERFORMANCE

A famous example:

1. Start a new WPF-Project
2. Add a DataGrid
3. Load 2,000 Objects with 20 columns
4. Scroll the Scrollbar up and down

Nummer	String1	String2	String3	Preis	IsTrue	String4	String5
1	String 1	012345678910111213141516171	0,621631760439964-0,870251818499645	291.01	<input checked="" type="checkbox"/>	String 1	012345678910
2	String 2	012345678	0,373336678079021-0,917082117366177	566.53	<input type="checkbox"/>	String 2	012345678
3	String 3	012345678910111213141516171	0,584165975723493-0,0240762797296402	80.56	<input type="checkbox"/>	String 3	012345678910
4	String 4	012345678910111213141516171	0,106324951213936-0,815570040054419	711.81	<input checked="" type="checkbox"/>	String 4	012345678910
5	String 5	012345678910111213141516171	0,985320804633815-0,278246732092577	719.28	<input checked="" type="checkbox"/>	String 5	012345678910
6	String 6	012345678910111213141516171	0,218752895118088-0,892813560968644	247.85	<input type="checkbox"/>	String 6	012345678910
7	String 7	012345	0,0360425873827388-0,313887281023845	180.50	<input type="checkbox"/>	String 7	012345
8	String 8	012345678910111213141516171	0,0370554635473785-0,382227954167047	887.74	<input checked="" type="checkbox"/>	String 8	012345678910
9	String 9	012345678910111213141516171	0,454944455276683-0,989851186978561	404.30	<input type="checkbox"/>	String 9	012345678910
10	String 10	012345678910111213141516171	0,381725168964698-0,316542762944728	741.14	<input checked="" type="checkbox"/>	String 10	012345678910
11	String 11	012345678910111213141516171	0,455491341396929-0,547984961209812	986.93	<input type="checkbox"/>	String 11	012345678910
12	String 12	01234567891011	0,343385028347087-0,150975464913517	484.25	<input checked="" type="checkbox"/>	String 12	012345678910
13	String 13	0123456	0,480523117110377-0,669235564148629	426.33	<input type="checkbox"/>	String 13	0123456
14	String 14	012345678910111213141516171	0,270278694699648-0,843578220737902	878.28	<input type="checkbox"/>	String 14	012345678910
15	String 15	012345678910111213141516171	0,724096997046888-0,927829612012873	819.98	<input type="checkbox"/>	String 15	012345678910
16	String 16	01234567891011	0,995469617655254-0,873951618035301	561.69	<input type="checkbox"/>	String 16	012345678910
17	String 17	0123456789101112131415	0,90221013217336-0,151675490267424	552.03	<input checked="" type="checkbox"/>	String 17	012345678910
18	String 18	012345678910111213141516171	0,488057626172927-0,326958968922011	842.42	<input type="checkbox"/>	String 18	012345678910
19	String 19	012345678910111213141516171	0,886079998633862-0,897981288795351	948.76	<input checked="" type="checkbox"/>	String 19	012345678910
20	String 20	012345678910111213141516171	0,785708891128054-0,563520616182834	991.23	<input type="checkbox"/>	String 20	012345678910
21	String 21	012345678910111213141516171	0,538146948226796-0,438258168025994	564.03	<input type="checkbox"/>	String 21	012345678910

→ The DataGrid is slow, lags, and has delays, until you see your target rows!



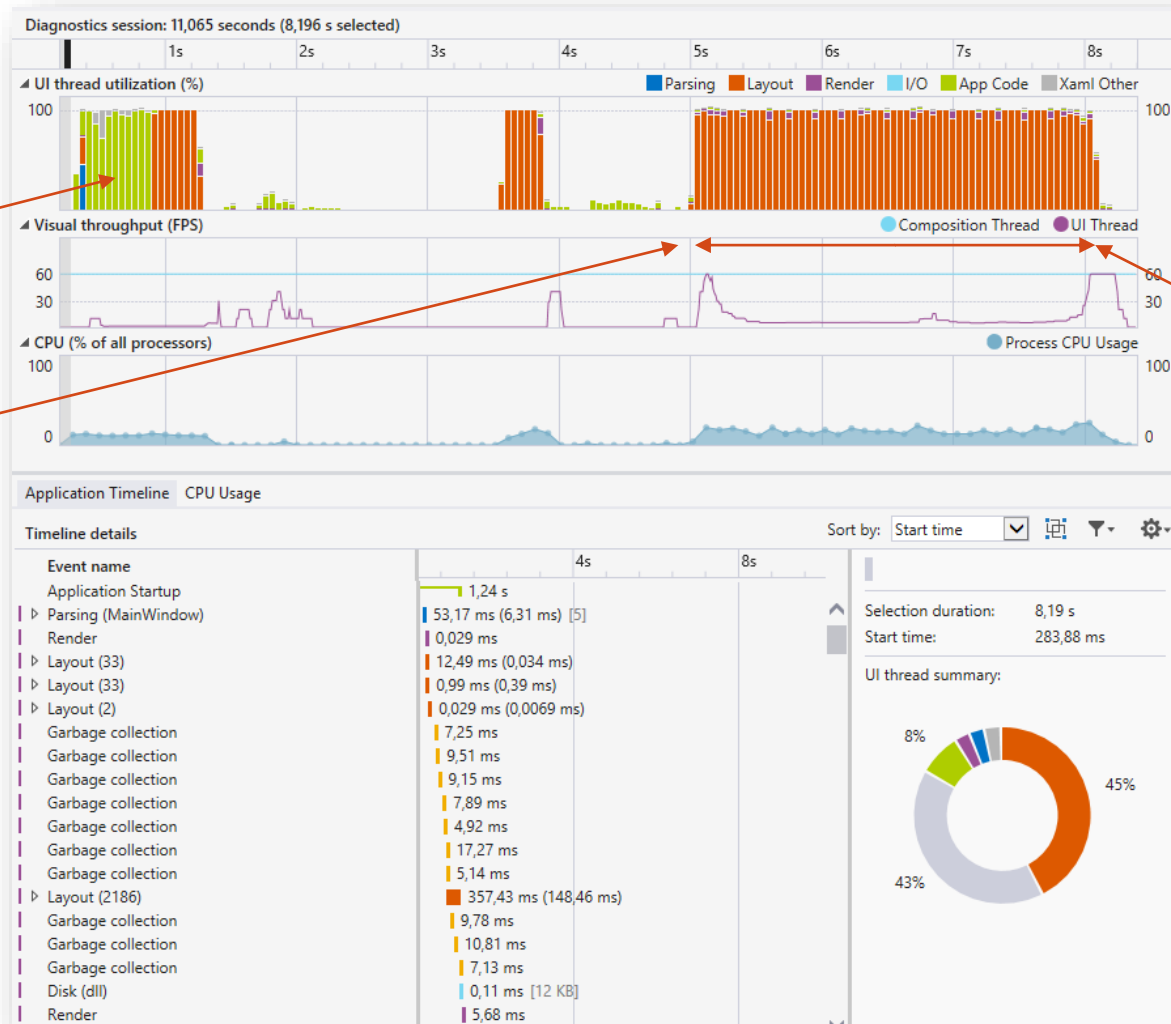
5. Appendix: Set an initial sorting via Code.
→ the sorting-indicator will not be displayed!



ANALYSIS: WPF STANDARD DATAGRID PERFORMANCE

Generate data

Scroll



98% Layout
~ 1% Render!!



ANALYSIS: WPF THIRD PARTY DATAGRID PERFORMANCE

Generate data

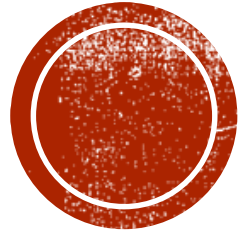
Scroll



55% Layout
~ 1% Render!!

→ Third Party producers master this problem!





MORE POPULAR GUI-CONCEPT- & WPF-PROBLEMS

PROBLEM: NUMBER-TEXTBOX

A TextBox has to be restricted to accept only Integers.

Common approach:

- a) Implement `IDataErrorInfo` to generate warnings.
- b) Host a `System.Windows.Forms.MaskedTextBox` with `WindowsFormsHost`.
(also possible with a Windows Forms TextBox! BUT: Invalid Input in combination with DataBinding don't let you leave the field!)

→ Third Party solution: **MaskedTextBox** or **typed TextBox**.

Read data type or DataAnnotation to provide the best Control.



PROBLEM: FLEXIBLE SEARCH IN DATAGRID

We need a basic search for all fields in a DataGrid.

Common approach:

- a) Develop the whole search form by yourself.
- b) Provide some fields with limited search options.

→ Third Party solution: **Automatically integrated filter in the DataGrid**

An Excel-like filter could be shown up because of the data type.



PROBLEM: COMBOBOX LACKING INFORMATION

A ComboBox offers not enough information to find the right data row quickly. For example at the form: Order-ComboBox: Employee (FirstName, LastName, No, ...)

Common approach:

- a) Remain at the default ComboBox
- b) Develop multi-column ComboBoxes including a search box by yourself
- c) Switch to a subform to view depending data

→ Third Party solution: **Lookup-ComboBox**

Configurable custom Control with integrated DataGrid.



PROBLEM: FORMULAR LAYOUTING

Place 20 fields on a detail form carefully one aside each other!

☹️
|Label 1 - |Textbox 1
| Label 2 |- Textbox 2
| Label 3 -|Textbox3

Common approach:

- a) Arrange fields with the Visual Studio-Designer snapping function.
- b) Generate a Grid Container with two columns and place a Control in each row.

→ Third Party solution: **Form-Layout-Manager**

Labels and Controls have to be added consecutively, so the position will be set automatically.



PROBLEM: APPLICATION FREEZES

☹ *Long running code in UI-Thread blocks the GUI. The application freezes.*

Common approach:

- a) Background-Worker
- b) Threads and SynchronizationContext
- c) use async-await

What most developers forget– UI feedback!

→ Loading Data...

→ 65% completed

→ Third Party solution: **Progress-Indicator-Control**

Control cross-fades everything and shows animated feedback – so the application runs smoothly.



PROBLEM: APPEALING, EXTRAORDINARY DESIGN

☹ Many developers aren't able to build a beautiful Design.

Common approach:

- a) Design? Don't care for it anyway!
- b) Try and fail.
- c) Use Frameworks with design included

→ Third Party solution: **Theming**

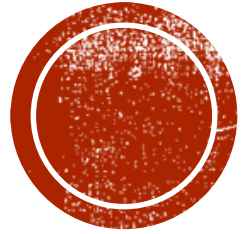
- **PROBLEM:** Not all developers can provide 100% Theming!
SOLUTION: Crucial Point: The Window – it has to be changed to an custom Window, but it isn't offered by all producers.
- **PROBLEM:** Not all producers offer all Controls! (e.g. Label, TreeView, etc.)
SOLUTION: All producers overwrite the style of WPF standard controls with Theming.
- **PROBLEM:** Some particular standard designs are delivered, but can't be customized.
SOLUTION: Custom Theming can be accomplished by inhouse Tools. But they are not supported by all producers.



PROBLEM: APPEALING, EXTRAORDINARY DESIGN

Producer	Window-Theming	Standard-Controls-Theming	Custom Theming
actipro	-	-	-
DevExpress	X	X	X (DevExpress WPF Theme Designer)
GrapeCity / ComponentOne	-	X	○ (Microsoft Expression Blend)
INFRAGISTICS	-	X	○ (Microsoft Expression Blend)
Nevron	-	X	-
Syncfusion	X	X	X (Syncfusion Theme Studio)
Progress / Telerik	○ (no standard Window, just modal one)	X	X (Telerik Color Theme Generator)
Xceed	-	?	-





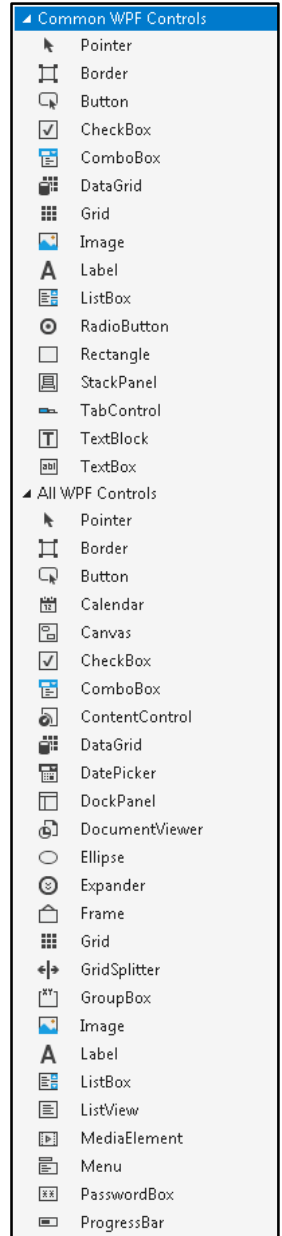
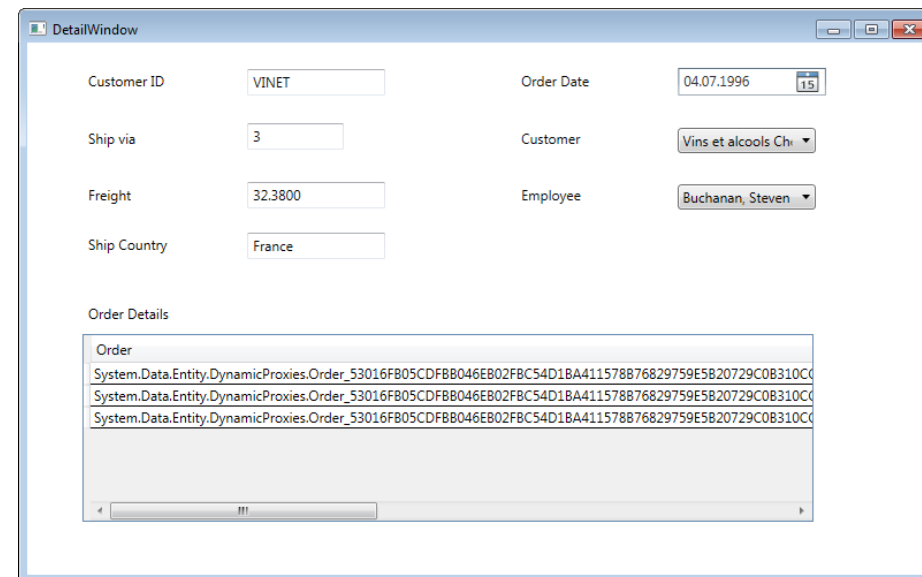
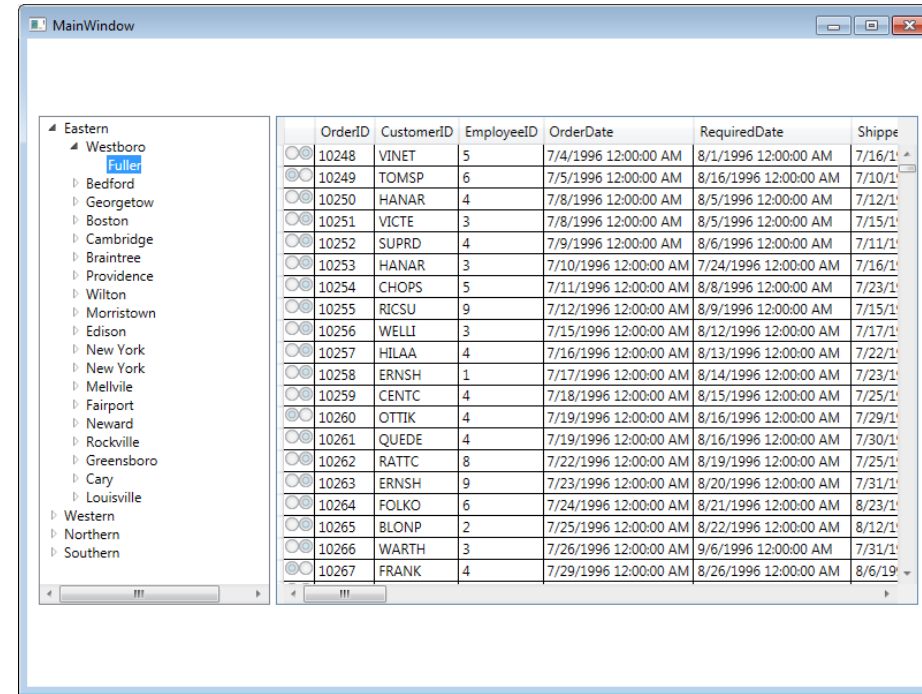
COMPARING APPLICATION NORTHWIND GUI

STANDARD-CONTROLS

Compare of the Controls by use of the WPF demo application: **NorthwindGUI**

Basic requirements:

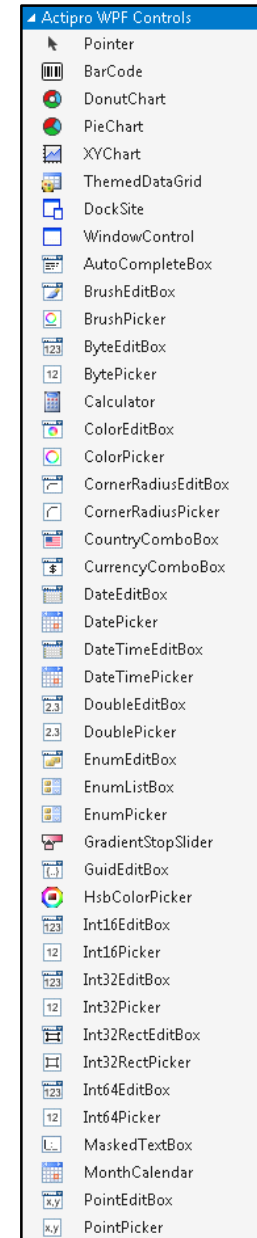
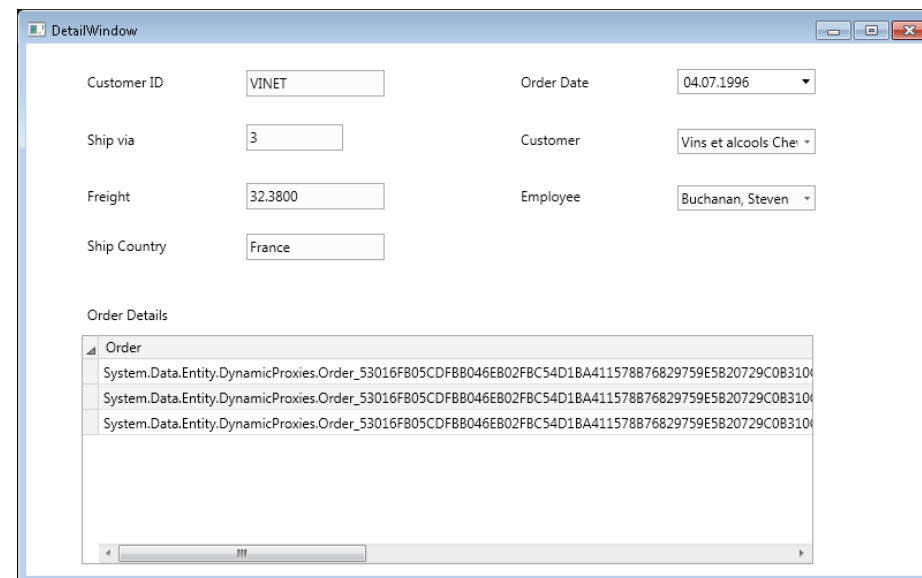
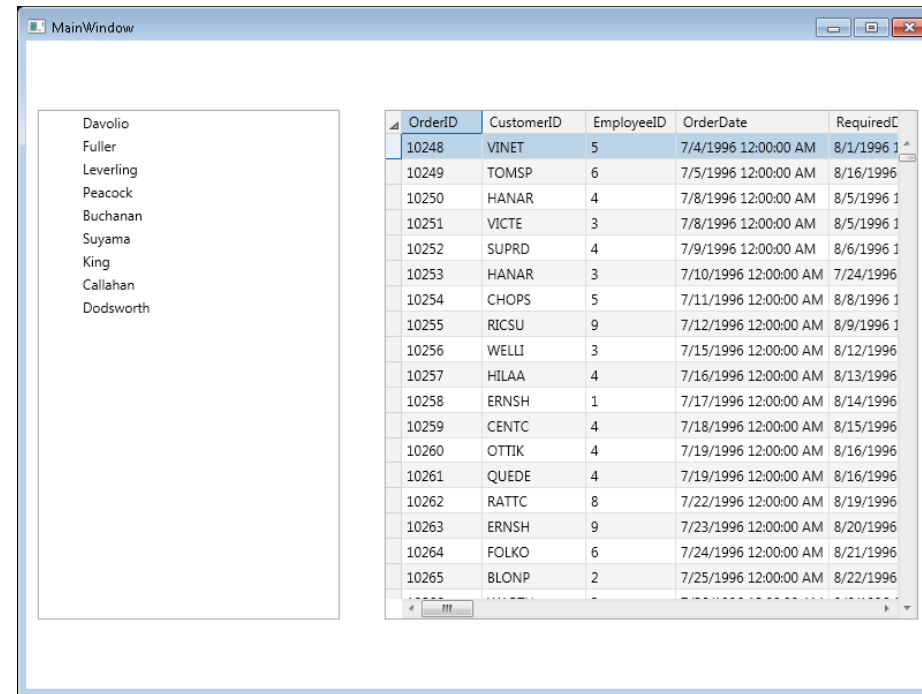
- Load data from the database
- TreeView of Employees with Filtering in the DataGrid
- Displaying of Orders in the DataGrid (830 rows) including TemplateColumn
- Double click on a row opens detail view
- Detail view with DatePicker, ComboBox, ComboBox with Template and sub table



ACTIPRO

www.actiprosoftware.com

- **Pro:**
 - Many Controls
- **Cons:**
 - Partially not enough documentation (ThemedDataGrid)
 - TreeView-alternative: ,TreeListBox' not compliant to standards (*Error: Do not set the ItemsSource property on this control. Set the RootItem property instead.*)
 - How to implement multiple levels in TreeListBox isn't apparent



DEVEXPRESS

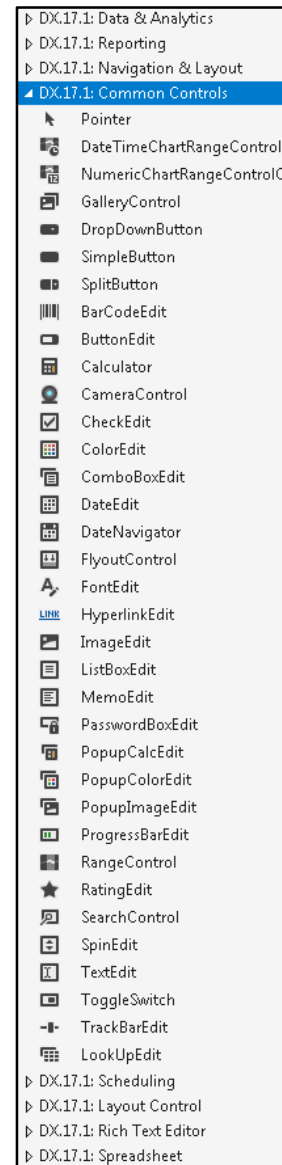
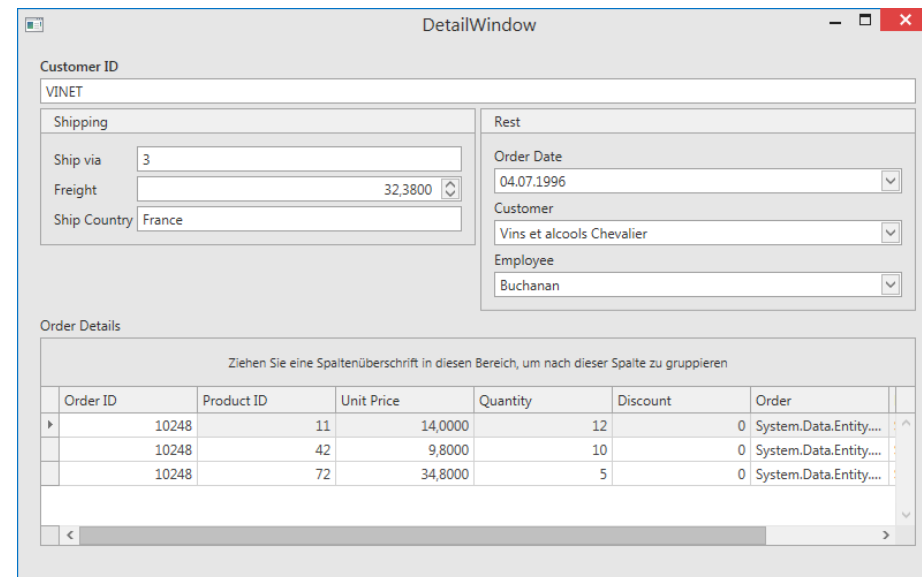
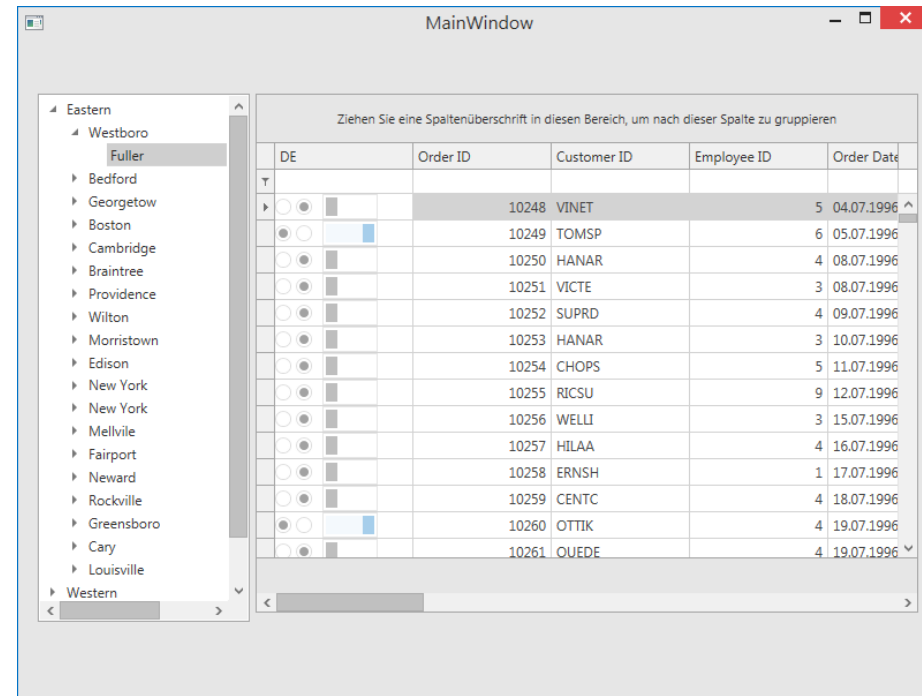
www.devexpress.com

Pros:

- Really good Designer-SmartTags
- Standard compliant programming model (e.g. DataGrid supports CellTemplates)
- Detailed documentation with many examples
- Support is filled up with useful solutions

Cons:

- No own TreeView-Control (use Navigation Bar instead)
- No loading-indicator-Control
- Paging in DataGrid not included



GRAPECITY / COMPONENTONE

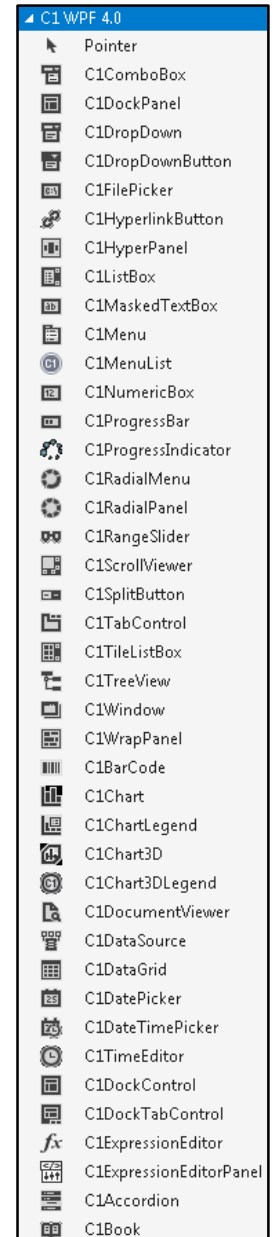
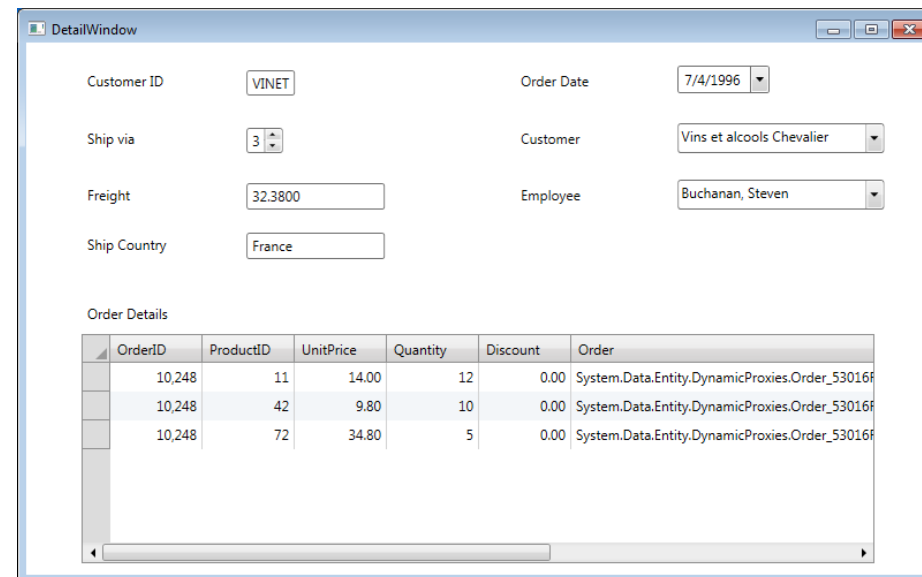
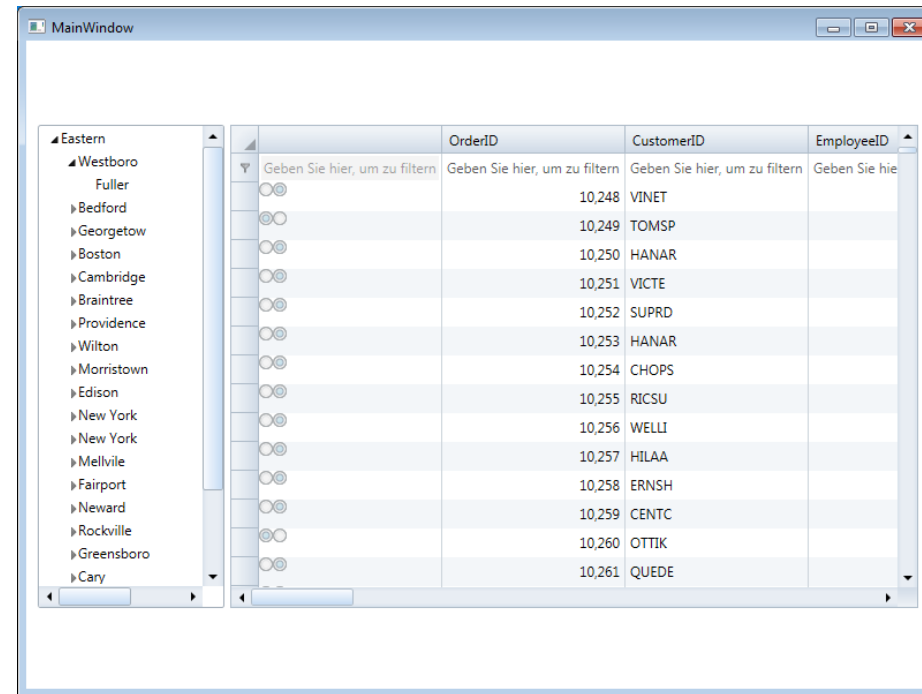
www.grapecity.com

Pros:

- Standard compliant programming model (e.g. DataGrid supports CellTemplates)
- Distinct naming (C1ComboBox, C1NumericBox, C1DataGrid)
- Hidden AutoLookup-Feature (resolves e.g. Employee automatically in the C1DataGrid)

Cons:

- No Designer-SmartTags
- Lack of answers in discussion board
- Documentation is too slim – but can be balanced by sample Code
- Sometimes faulty mix-up of WPF and Silverlight in the documentation (example: Global Theming)
- Unsolved, but popular ComboBox-Bug (only when ItemTemplate is set): While selecting a bound object, you only see the ToString-output



INFRAGISTICS

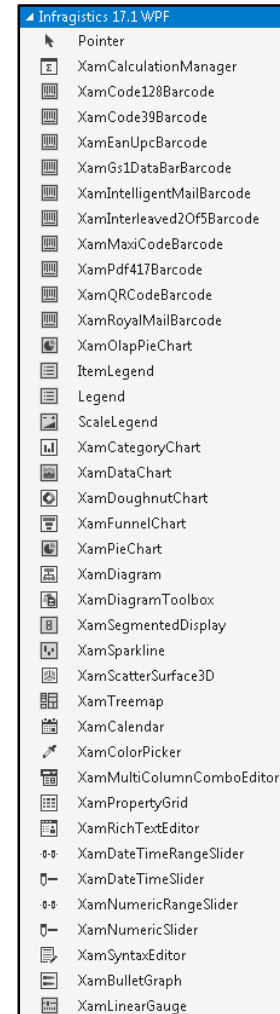
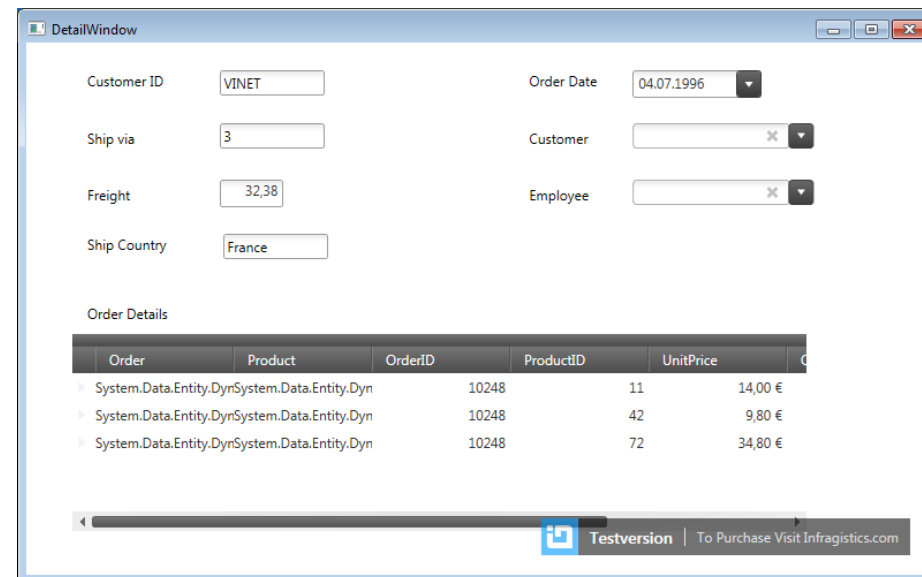
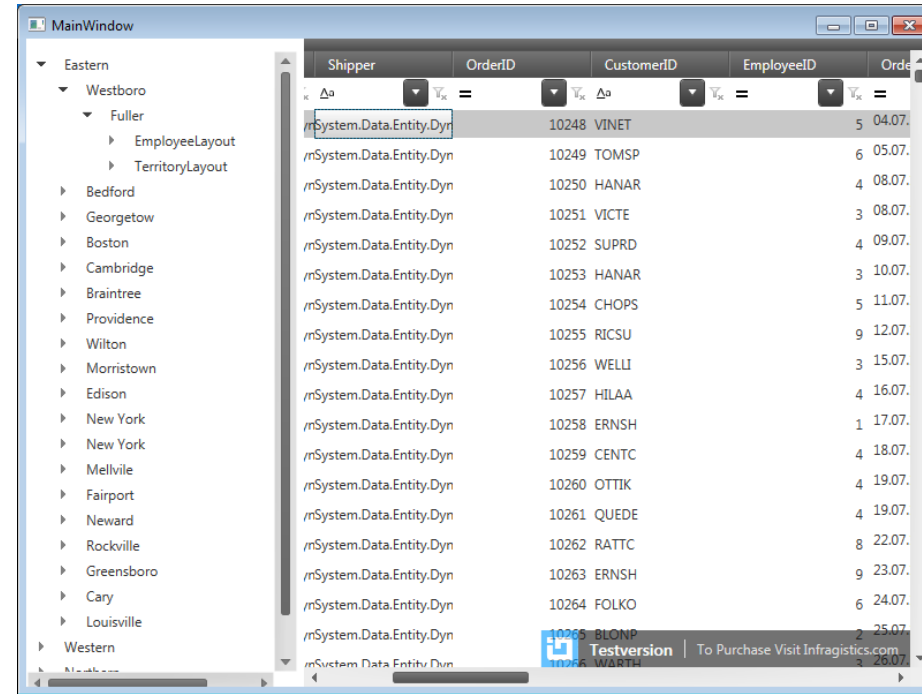
www.infragistics.com

Pros:

- Many Controls
- Sometimes comprehensive SmartTag-Designer
- INFRAGISTICS-object-model fits itself (e.g. Value instead of Text)

Cons:

- No DataBinding Designer-Dialog
- Documentation kept too minimalistic
- Confusing at first glance due to two DataGrids (xamGrid, xamDataGrid)
- INFRAGISTICS-object-model not compliant with standards (e.g. DataSource instead of ItemsSource, Value instead of Text)
- Example: xamDataGrid:
 - No standards for naming (Columns – Fields)
 - CellTemplate not possible (gets ignored)
 - Scrollbar doesn't scroll data, but shows only Tooltip



NEVRON

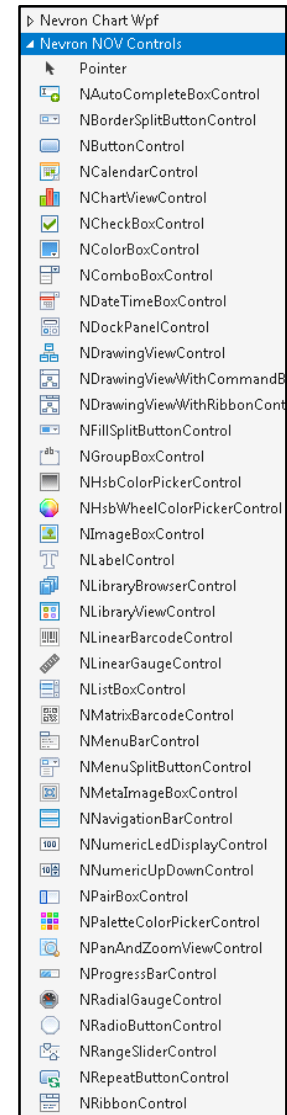
www.nevron.com

- **Pro:**
 - Unique and interesting Cross-Platform approach (unfortunately only as Code without Designer support)

- **Note to failed test:**
 1. Error: MessageBox text, that implies that a new reference has been added. Despite having a reference, the dialog reappears.
Appendix: The ItemsSource-Property is not available!
 2. Reported bug to Nevron
 3. Nevron response:
Bug in their tools, appearing since Visual Studio 2015 – working to solve the problem
 4. Suggestion by Nevron:
Use Code-only Cross-Platform approach until the bug is fixed!



*not tested yet –
technical issues
with Designer in
Visual Studio 2017*



SYNCFUSION

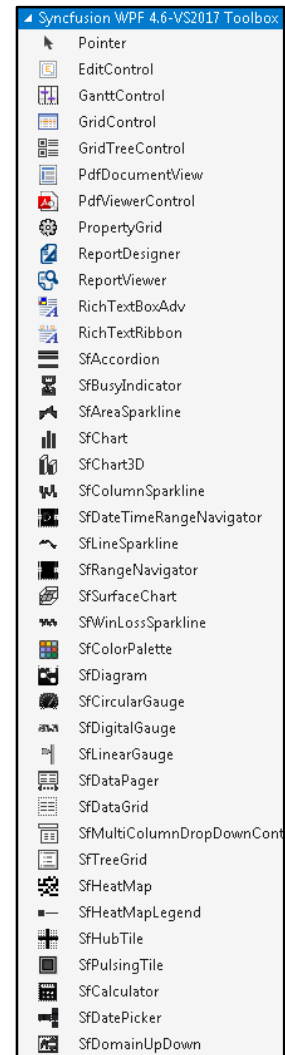
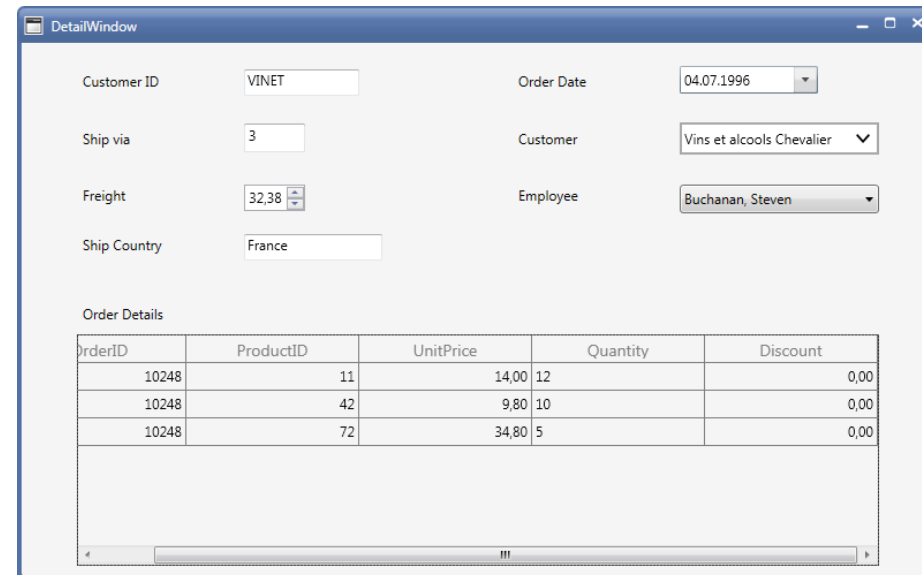
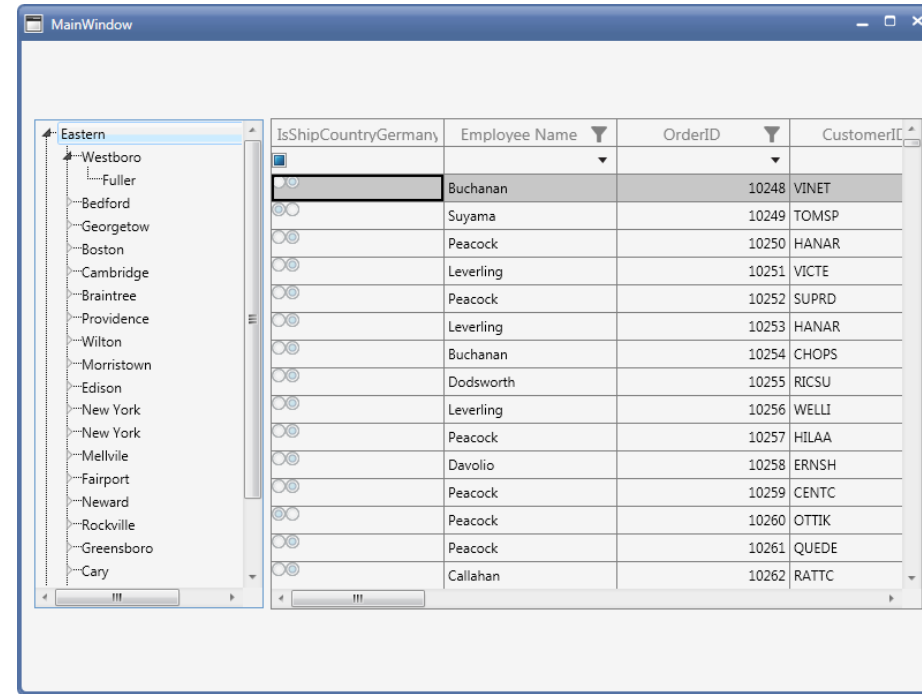
www.syncfusion.com

Pros:

- Basic Designer-SmartTags
- Standard compliant programming model (e. g. DataGrid supports CellTemplates)
- Comprehensive documentation

Cons:

- Obfuscating Control naming (TreeViewAdv, SfDataGrid, GridControl, SfTextBoxExt)
- Difficult Control choice (TextBox vs. SfTextBoxExt, UpDown vs. IntegerTextBox)
- No solution or simple manual to set a specific global theme.



TELERIK

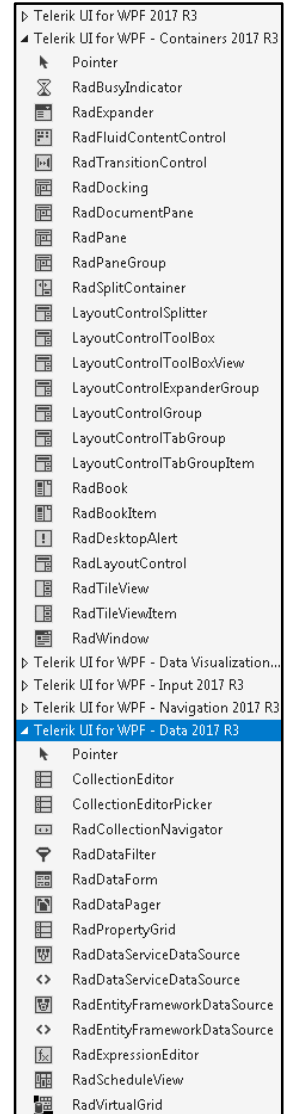
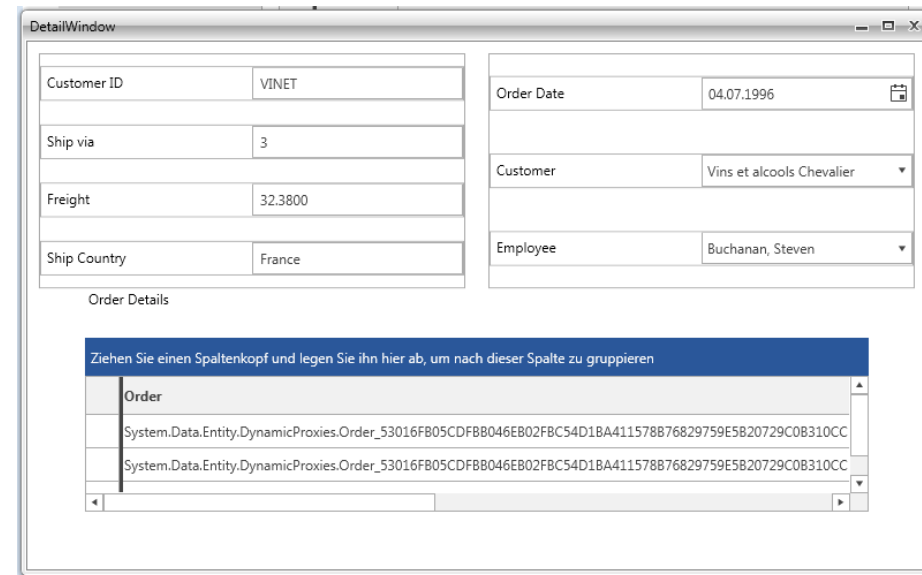
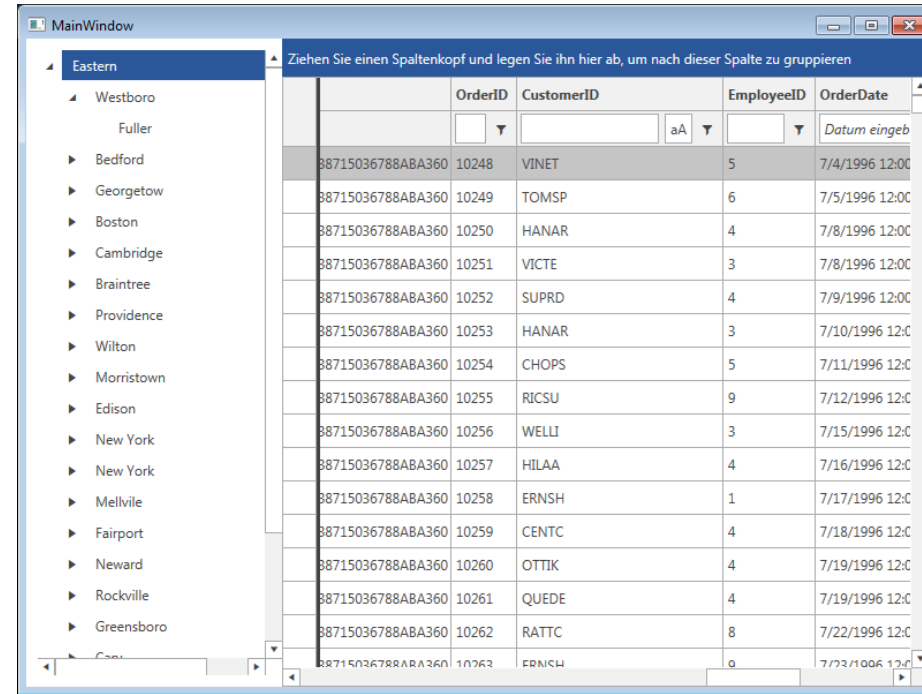
www.telerik.com

Pros:

- Mostly standard compliant programming model
- Extraordinary Design
- Common animations included

Cons:

- SmartTags without content (just online links)
- In the meantime acquired by Progress – personal impression: support & user group sponsorship got worse
- Huge enforcement to be online (Installation, Samples, SmartTags)
- WPF Project-model is faulty (e.g. No active build for solution, lack of Designer-Namespace, and more)
- Styling a simple Window isn't possible (RadWindow is only for modal windows!)



XCEED

www.xceed.com

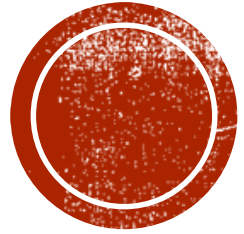
- **Pros:**
 - Special focus on powerful and comprehensive DataGrid

- **Note to failed test:**
 1. Toolbox in Visual Studio 2017 Enterprise doesn't contain Xceed Controls
 2. Reported bug to Xceed
 3. Xceed response:
Bug only with VS 2017 Enterprise - works in VS 2017 Professional.
 4. Suggestion by Xceed:
Add Toolbox items at Customize Toolbox by yourself for now



*not tested yet –
Designer-Toolbox in
Visual Studio 2017
Enterprise is empty*













CONCLUSION

CONCLUSION

by use of WPF

Rank	Producer	Scope of Package	Documentation / Samples / Support	Visual Studio Designer Integration / Rapid Application Development	Standard Compliance	Style / Theming	Score
1	DevExpress	★ 4	★ 4	★ 4	★ 3	★ 3	18 
2	Syncfusion	★ 4	★ 4	★ 2	★ 2	★ 3	15 
3	Progress / Telerik	★ 4	★ 2	★ 2	★ 3	★ 3	14 
4	Infragistics	★ 3	★ 2	★ 3	-	★ 2	10 
4	GrapeCity / ComponentOne	★ 3	★ 2	★ 1	★ 2	★ 2	10 
5	Actipro	★ 2	★ 1	★ 1	★ 2	★ 1	7 
6	Nevron	★ 3	-	-	-	★ 1	4 
-	Xceed	-	-	-	-	-	0 

Note:

This ranking is based on the criteria named on top and reflect the personal experience of the contributor . Switching to different criteria and changing the emphasis on them might conclude to a different ranking. For example: If the Visual Studio Designer isn't important for you or one specific unique Control is required, the producers which have a low ranking rise to the top ranks. So the scores get mixed totally new.

