

# Building an end-to-end Silverlight 4 application

Write your Christmas cards with Silverlight!



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# About myself...

- Gill Cleeren
- Microsoft Regional Director
- MVP ASP.NET
- .NET Architect @Ordina ([www.ordina.be](http://www.ordina.be))
- Speaker (TechDays, DevDays, NDC Norway, Spring Conference UK, SQL Server Saturday Switzerland, TechEd Berlin, SDC...)
- Visug user group lead ([www.visug.be](http://www.visug.be))
- Author (Silverlight 4 Data and services cookbook)
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## Microsoft Silverlight 4 Data and Services Cookbook

Over 85 practical recipes for creating rich, data-driven business applications in Silverlight

# Announcing...



**.NET SHOW**  
with Gill Cleeren  
Katrien De Graeve

.NET Show

[www.dotnetshow.be](http://www.dotnetshow.be)

The Belgian podcast for .NET developers



**THE SCENARIO FOR TODAY:  
TURTLE DOOR-TO-DOOR**

# Turtle Door-to-Door (TDD)



- TDD ships packages around the globe in 48 hours
- TDD wants more consumers to use their service during end-of-year holidays

# Turtle Door-to-Door (TDD)



- TDD decided to go for an online campaign
- An e-cards application with webcam support built in Silverlight 4

# Agenda

- Building the wireframe
- Setting up the navigation
- Creating the designer interface
- Controls
- Accessing data
- Binding data
- Refactoring to MVVM
- Taking things out-of-browser
- Exporting to Excel

Demo

# THE FINISHED APPLICATION



**LET'S BUILD THE APP!**



Building the wireframe

**SKETCHFLOW**

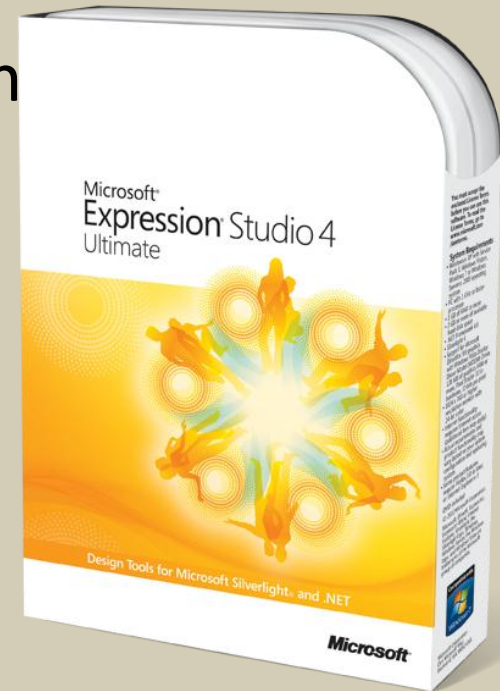


Project 10  
 SketchFlow 13  
 Controls 44  
 Styles  
 Behaviors 20  
 Shapes 18  
 Effects 16  
 Media 4  
 Categories 369  
 Locations 655

Accordion  
 AutoCompleteBox  
 Border  
 BusyIndicator  
 Button  
 Calendar  
 Chart  
 CheckBox  
 ComboBox  
 ContentPresenter  
 DataField  
 DataForm

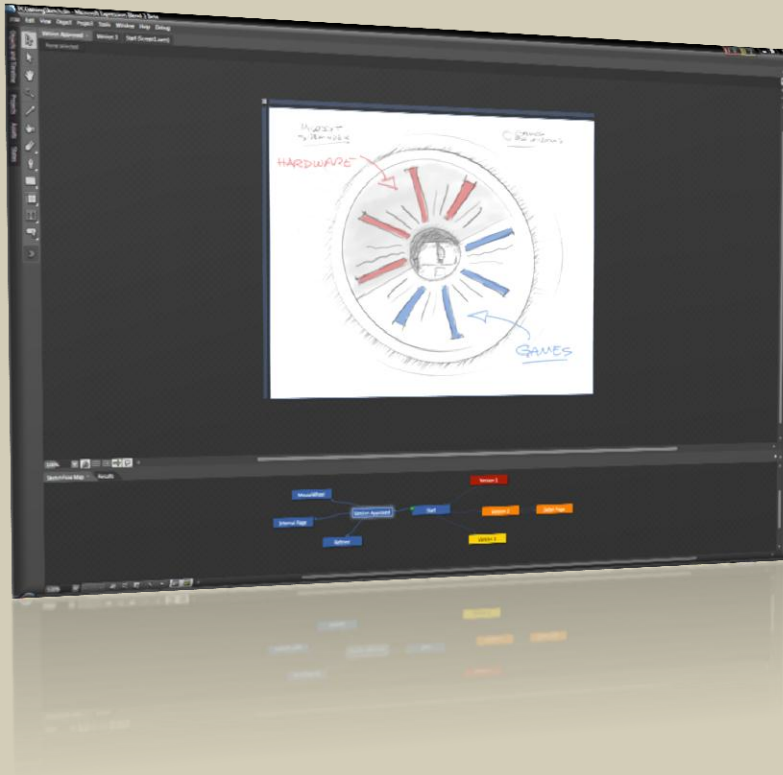
# Nice to meet you, SketchFlow

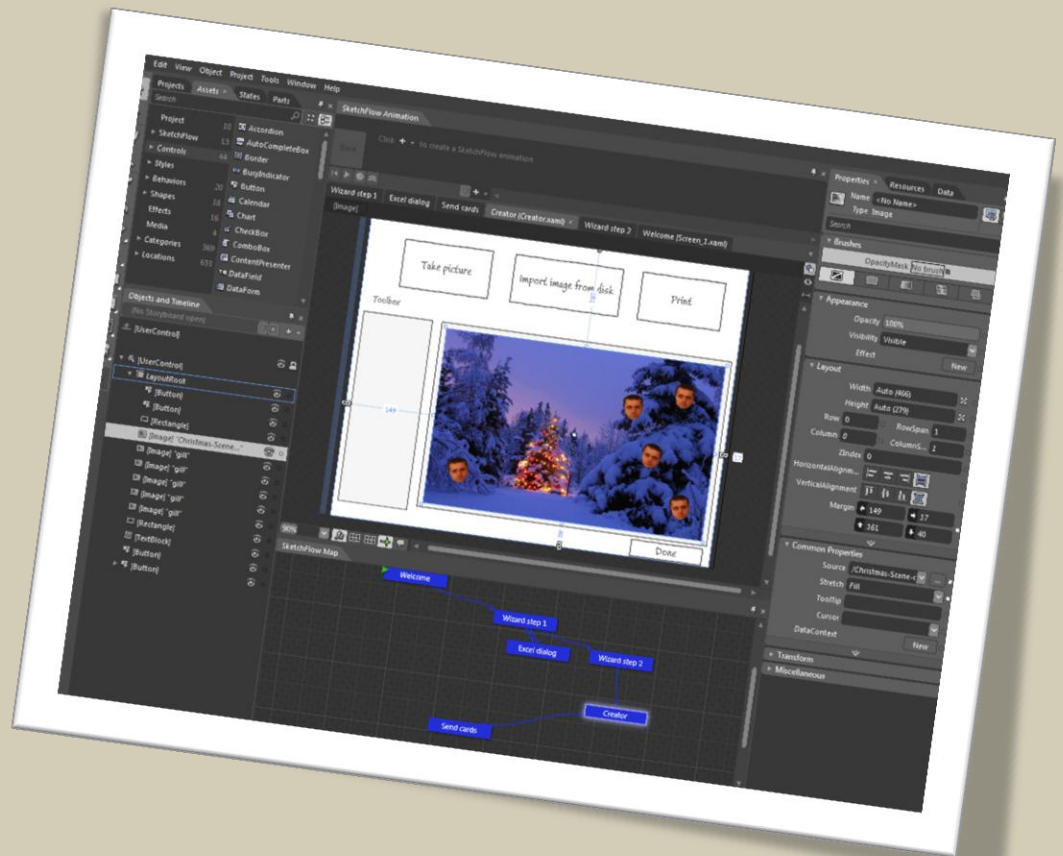
- Comes with Expression Blend 4
- Why SketchFlow?
  - Quick and natural interface design
  - Interactive
  - Build up flow of your app
  - “Sketchy” drawing
  - Involves everyone in the design



# Nice to meet you, SketchFlow

- Features
  - SketchFlow Map
  - Allows importing assets
  - Sketch styles
  - Navigation
  - Annotations
  - Document generation
  - Integration with TFS and SharePoint





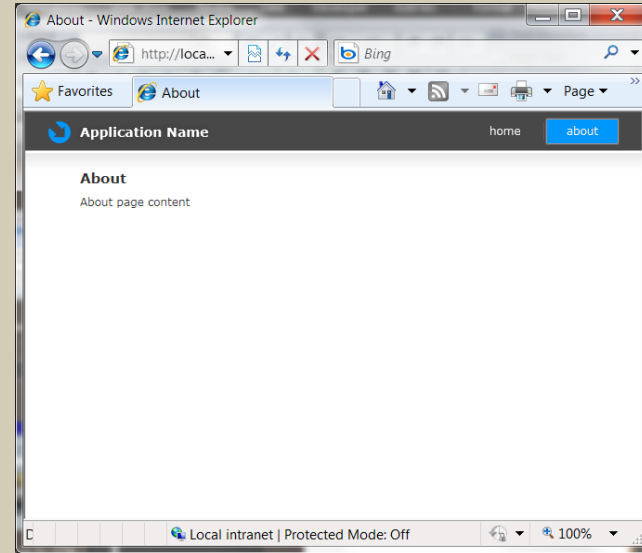
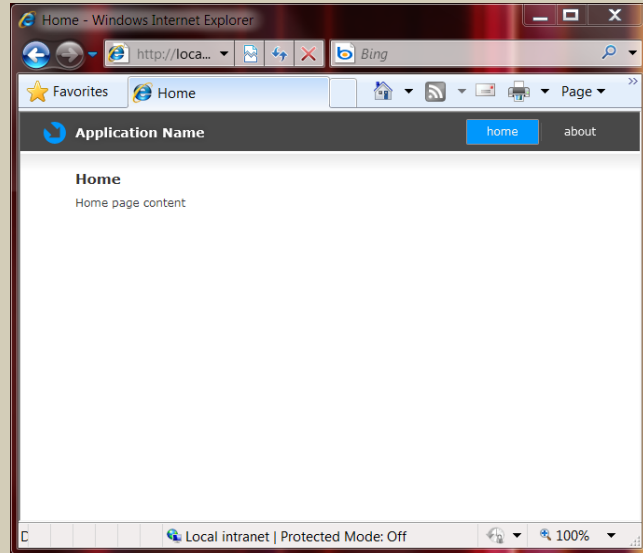
Demo

# CREATING THE WIREFRAME

**SETTING UP THE NAVIGATION**



# From A to B



- Based on Frame and pages
  - Content becomes URI-addressable
  - Integrates with browser navigation
  - NavigationService / NavigationContext
  - UriMapper



Demo

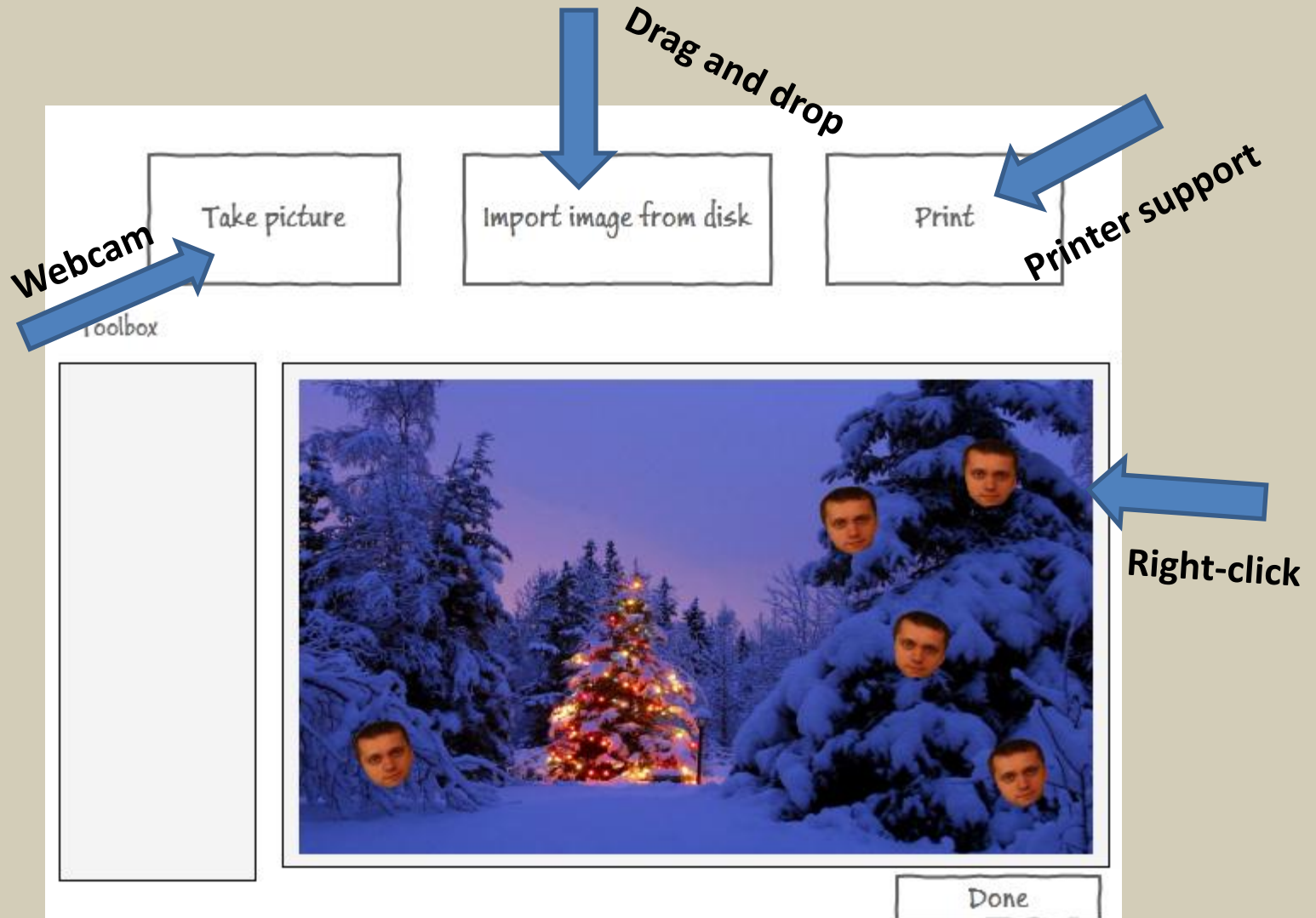
# SETTING UP THE NAVIGATION



# CREATING THE DESIGNER INTERFACE



# Creating the interface designer



# Smile, you're on camera!

## Designer requirements

*Webcam*

Drag and drop

Printing

Right-click

- Silverlight has access to webcam and microphones
  - Available after prompt, selection can be saved
- API supports device selection
- Access to raw stream of bytes
- Has capture support to make pictures

# Dragging on and on

## Designer requirements

Webcam

*Drag and drop*

Printing

Right-click

- SL4 app can be drop target for an external drag operation
  - Drag file(s) onto Silverlight app, not supported for folders
  - Silverlight gets read-access to these files
  - Works on Mac as well

# Print that for me, will you?

## Designer requirements

Webcam

Drag and drop

*Printing*

Right-click

- Printing was a big miss in SL2 and SL3
  - More or less possible in SL3 via WriteableBitmap API
- SL4 has PrintDocument class
  - Part of System.Windows.Printing
- Control over what to print
  - Entire SL control
  - Specific control
  - Dynamic tree
- Possible to use in reporting scenarios
  - Combined with chart controls

# Right clickety-click

## Designer requirements

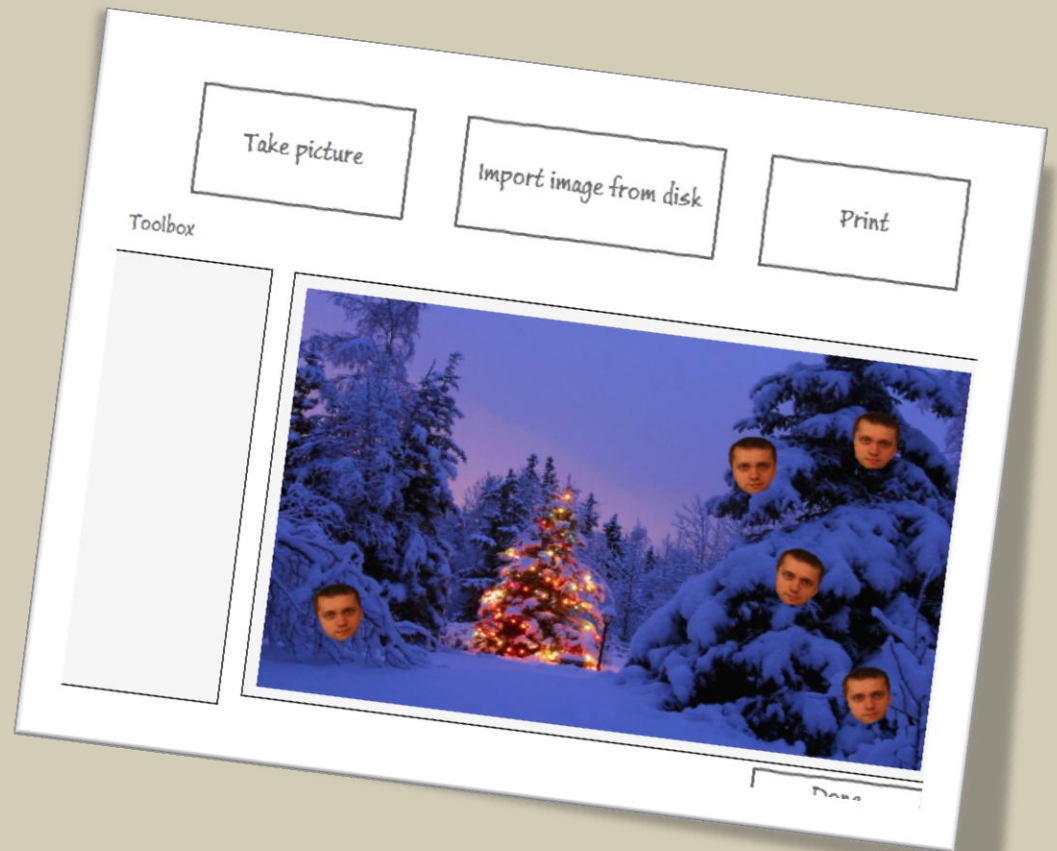
Webcam

Drag and drop

Printing

*Right-click*

- UIElement now has MouseRightButtonDown and MouseRightButtonUp
- SL menu is still the default
  - Must be overridden
- Best use: context menu



Demo

# CREATING THE DESIGNER INTERFACE





**RICH CONTROLS**

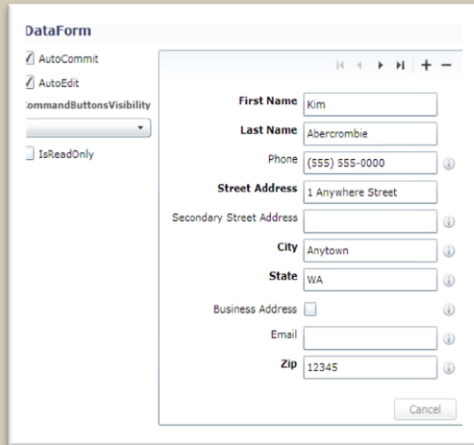


HyperlinkButton RepeatButton  
PasswordBox  
RadioButton ValidationSummary  
MultiScaleImage Slider  
ScrollViewer DatePicker TreeView  
Calendar AutoCompleteBox NotificationWindow  
RichTextArea TextBlock ToolTip  
Image  

# You want to be in control?

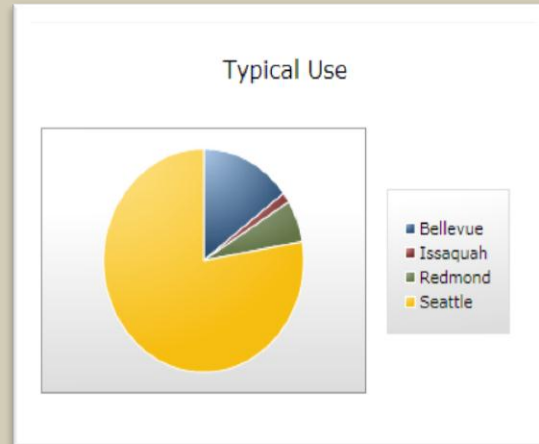
  
Frame ViewBox  
TabControl Button  
CheckBox  
MediaElement GridSplitter  
ToggleButton DescriptionViewer  
ListBox Label  
WebBrowser  
DataPager DataGrid  
ComboBox ChildWindow

# Not what you need?

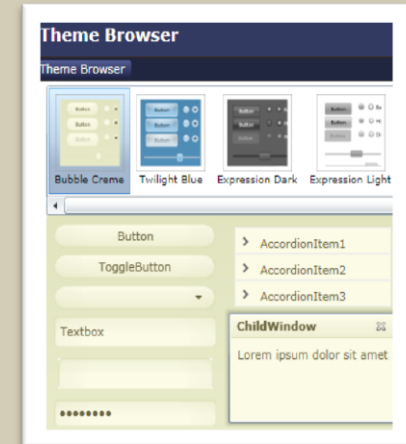


The screenshot shows a 'DataForm' control with a sidebar on the left containing options like 'AutoCommit', 'AutoEdit', 'CommandButtonsVisibility', and 'IsReadOnly'. The main area contains a form with the following fields: First Name (Kim), Last Name (Abercrombie), Phone ((555) 555-0000), Street Address (1 Anywhere Street), Secondary Street Address, City (Anytown), State (WA), Business Address (checkbox), Email, and Zip (12345). A 'Cancel' button is at the bottom right.

DataForm



Charting



Theming

- Download the Silverlight Toolkit from CodePlex

— <http://silverlight.codeplex.com/>

## 'Layout'

Accordion

LayoutTransformer

TransitioningContentControl

Expander

BusyIndicator

## Panels

DockPanel

WrapPanel

## Misc

ButtonSpinner

UpDown Controls

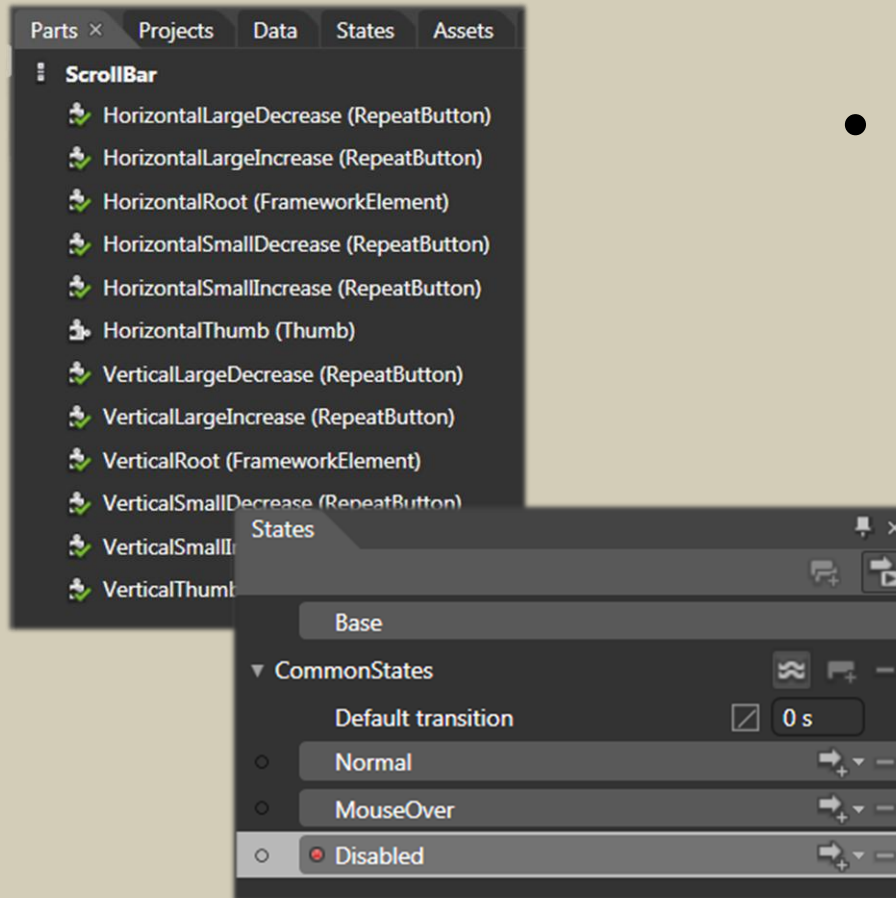
Rating

TimePicker

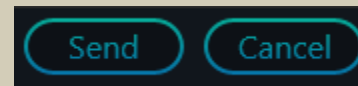
Drag/Drop

GlobalCalender

# Still not what you need?



- Controls can be templated via Parts & States model
  - Parts define working parts of control
  - States define in what state a control can be
  - Supported by Blend



Demo

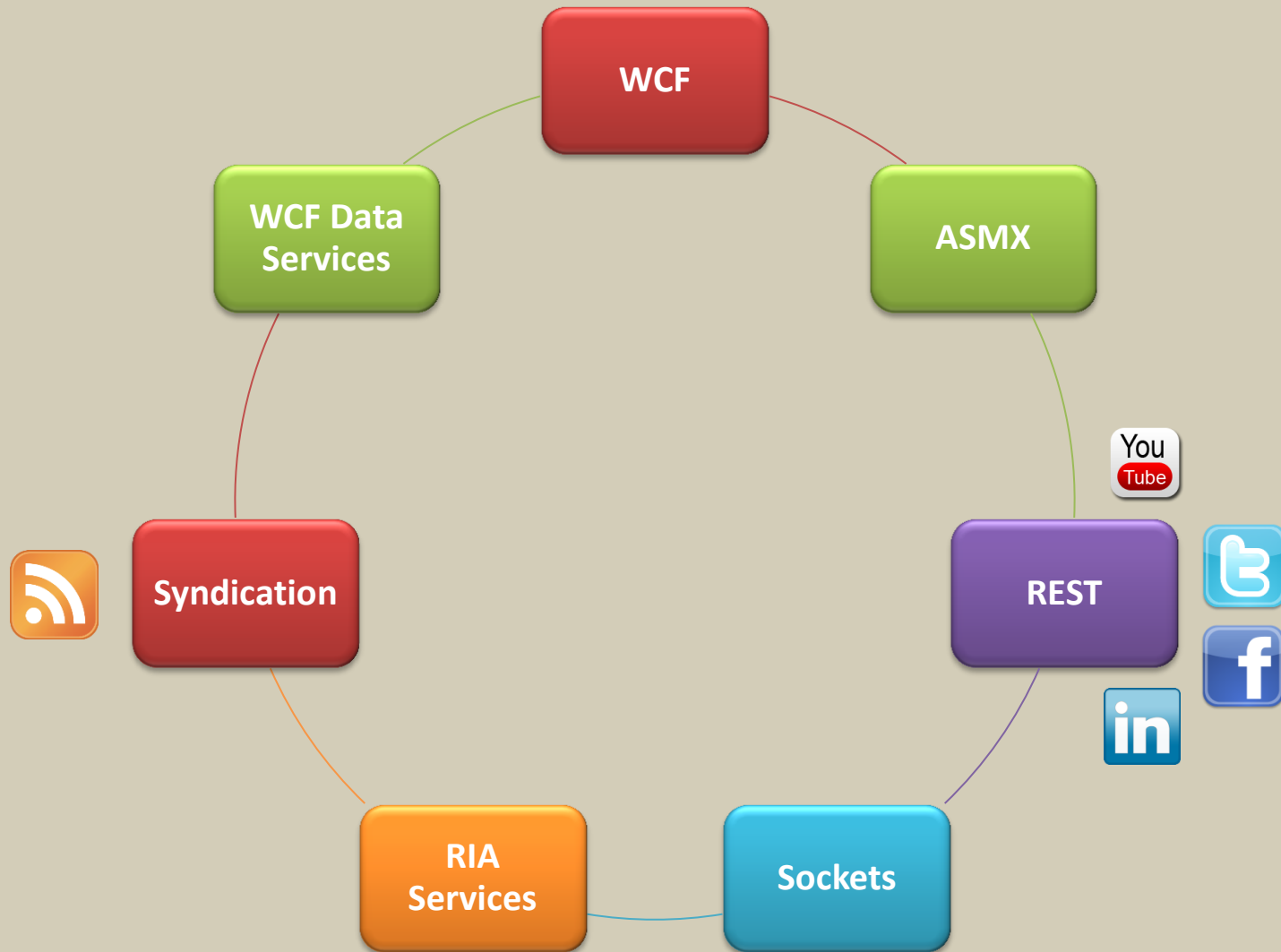
**RICH CONTROLS**



**ACCESSING DATA**



# So many options



# Basic service access

- Silverlight supports connecting with standard web services
  - WCF, ASMX
  - WCF RIA Services is built on top of WCF
  - WCF is preferred
    - Supports binary XML
    - Support for duplex communication



# Connect me please!

- Steps to connect to a WCF service
  - Create service
    - Silverlight-enabled WCF service
    - “Regular” WCF service
  - Implement service code
  - Create WCF proxy inside Silverlight
  - Write code to communicate with service

# ALERT!



- All communication with *any* service is asynchronous!
- If accessing a service in a different domain, you need a cross-domain file
  - Not if running as Trusted OOB

Demo

# ACCESSING DATA

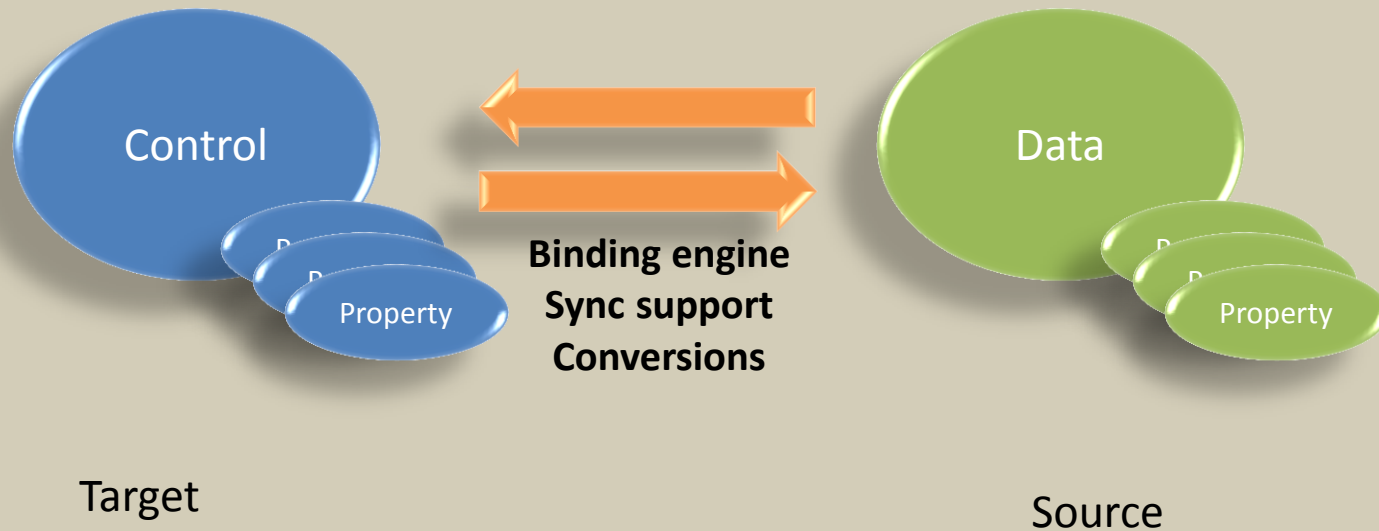


**BINDING DATA**



# What is data binding?

- Infrastructure that links properties of data objects to properties of controls



- Exists in WinForms, ASP.NET
  - SL is loosely coupled

Yes, that's a new verb!

# Let's XAML a data binding!

Target control

Property on source object

```
<TextBlock Text="{Binding FirstName}"></TextBlock>
```



- Source can be set
  - mostly through use of DataContext
  - with an Element binding
  - with the Source
- Data can flow
  - OneWay
  - TwoWay
  - OneTime

# Let's XAML a data binding!

Target control

Property on source object

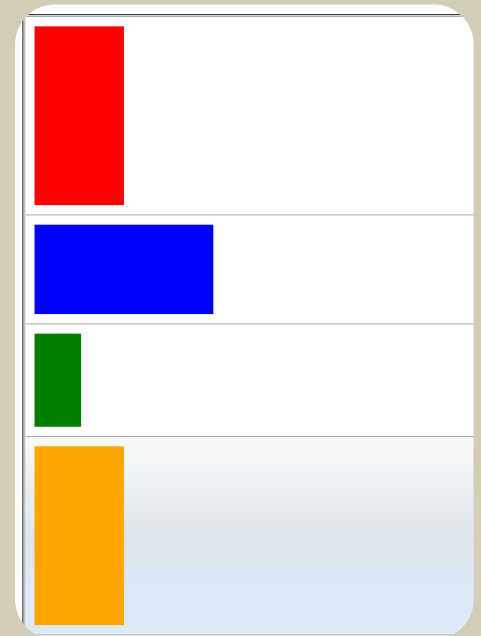
```
<TextBlock Text="{Binding FirstName}"></TextBlock>
```

- Synchronization support
  - Single object with `INotifyPropertyChanged`
  - Collections with `INotifyCollectionChanged`
- Hook in the binding process through converters
  - Class that implements `IValueConverter`
- Validation support
  - `ValidatesOnExceptions`, `ValidatesOnErrors`, `ValidatesOnNotifyErrors`

# Those templates again

- Data templates can help achieve great effects

```
<ListBox ItemsSource="{Binding}">
  <ListBox.ItemTemplate>
    <DataTemplate>
      <Rectangle
        Width="{Binding Width}"
        Height="{Binding Height}"
        Fill="{Binding Colour}"/>
    </DataTemplate>
  </ListBox.ItemTemplate>
</ListBox>
```





Demo

# BINDING DATA



**REFACTORING TO MVVM**



# What's all the hype about?

- MVVM is

An architectural pattern  
(John Gossman/WPF)

I like WPF!



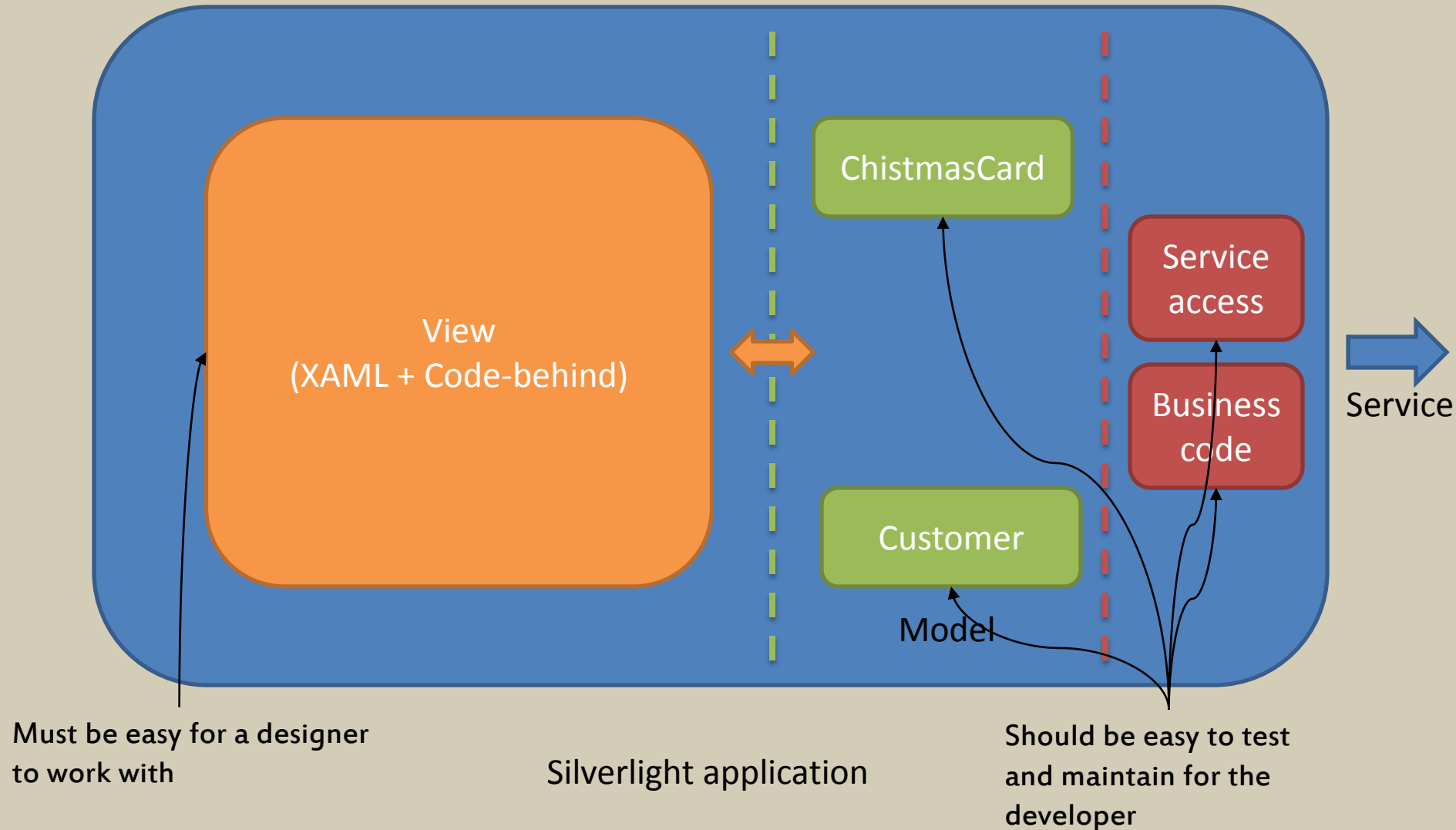
A variation of the MVC pattern  
and similar to the  
PresentationModel (Fowler)

I like to write  
complex stuff!

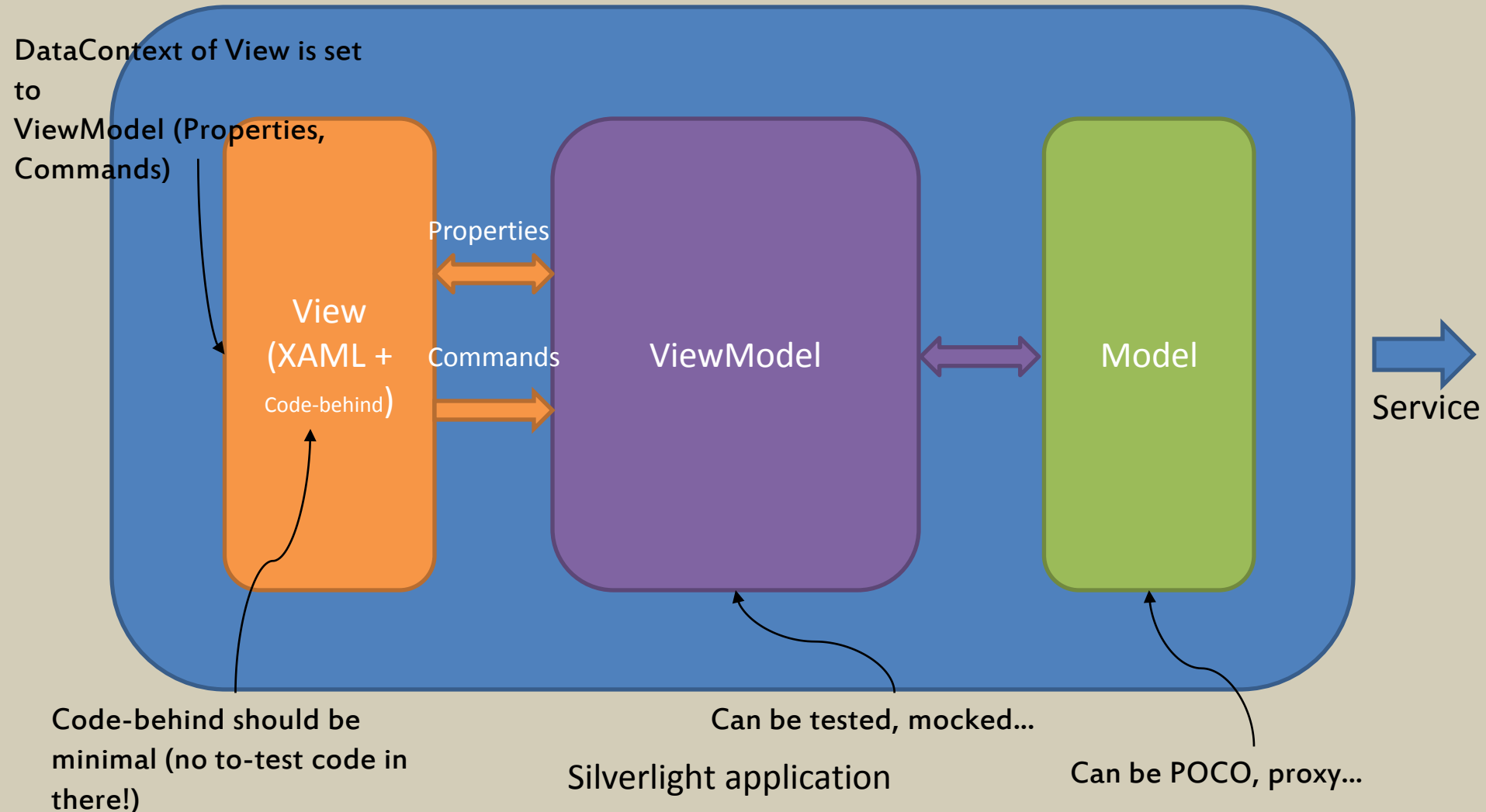


Heavily based on concepts of  
data binding, commands and  
DataContext

# What we all do (and just did again...)



# Doing it the MVVM way

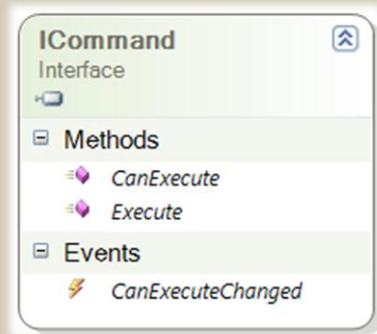


# Why and why not?

- Why?
  - Better SOC
  - Code is easier to test and maintain (unit test the ViewModels)
  - Framework supports it
- Why not?
  - No clear message to the community (yet)
  - Can be overkill for small apps
  - More code has to be written

# Captain Command

- ICommand allows separating UI from functionality



Look ma, no Click event handler!

```
<Button Command="{Binding SelectUserCommand}"  
CommandParameter="{Binding ElementName=UserNameTextBox,  
Path=Text}">
```

- Only supported on ButtonBase
  - Can be solved using a Blend behavior

# I'm convinced, where do I begin?

- Read
  - Josh Smith articles on MSDN/Advanced MVVM book
  - Laurent Bugnion's site ([www.galasoft.ch](http://www.galasoft.ch))
  - Cinch ([cinch.codeplex.com](http://cinch.codeplex.com))
- Play
  - MVVM Light Toolkit
  - Prism
  - Caliburn





Demo

# MVVM'ING THE WIZARD SCREENS



**TAKING THINGS OUT-OF-BROWSER**



# Leaving Las Browser



- SL4 has enhanced OOB mode
  - SL4 gives more control over the window
  - Support for toasts
  - Possible to browse the web inside SL
- SL4 supports Trusted SL applications
  - App gets more permissions on system
  - In turn, user must trust the app
    - Certificate support

# Leaving Las Browser



- Trusted apps can
  - talk with a service without check for cross-domain file
  - accept keyboard in full screen
  - access local files
    - My \* folders
  - work with COM components

Demo

# TAKING THINGS OUT-OF-BROWSER

**ACCESSING EXCEL**



# COM interop

- Unlimited possibilities
  - Office integration (Word, Outlook)
  - Text-to-speech
  - Access to other hardware such as scanners
- COM component can't be part of the SL app
  - Must be installed on the system

Demo

**EXPORTING TO EXCEL**





**CAN WE MOVE THIS TO THE CLOUD?**



**THANKS!**

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Write those Christmas cards with Silverlight!



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