

Windows
Phone

Building a
Silverlight
Application



7

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Windows Phone 7 Jump Start
Microsoft Corporation

Agenda

Silverlight on Windows Phone 7

Creating our first application

Responding to control events

Windows Phone themes and styles

Customising text input

An introduction to databinding in Silverlight

2

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Silverlight on
Windows Phone 7

Silverlight on Windows Phone 7

- Based on Silverlight 3
 - Some phone-specific additions
- Silverlight runtime optimized to display content on memory-constrained devices
 - Applications hosted on the client device
 - Does not support applications hosted in the browser
- C# only - Visual Basic not supported

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Silverlight Project Types

- Visual Studio offers three project templates
 - Windows Phone Application – a basic, single page application
 - Windows Phone List Application – a working app consisting of a list of data items which goes to a Details page when an item is selected
 - Windows Phone Class Library – a library for shared logic with no pre-built UI
- The starter projects already adopt the look and feel of the Windows Phone platform

5

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Conforming to Metro Design Guidelines

- Your Windows Phone applications should *extend* and *enrich* the platform
 - Look and feel consistent with the built-in apps
 - Seamless for user as they switch between apps
 - Same menu style and similar animations
- Windows Phone developer tools help you with this
- You must also follow advice in the *Windows Phone UI Design and Interaction Guide*
 - Available from <http://developer.windowsphone.com>

6

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Silverlight Controls



- Silverlight control set is rich
- Familiar to existing Silverlight developer
- Some additional features
 - For example, Software Input Panel (SIP) support on TextBox

7

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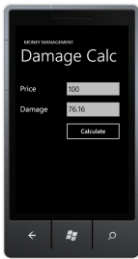


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Creating our First Application

Hello “Damage Calc”

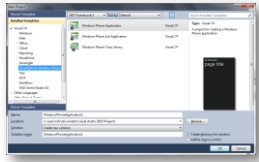
- “Damage Calc” is for use by travellers abroad
- When we see a price in a window we want to know how much “damage” it will do to our bank account
- This includes sales tax and currency conversion
- Damage Calc will do this for us



9

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Creating DamageCalc



- This will be a single page Silverlight application
- We will then add controls and buttons on the page to accept user input and display results
- It can be the basis of a range of simple programs

10

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"Damage Calc Version" 1.0

Demo

Demo 1: Damage Calc with button



11

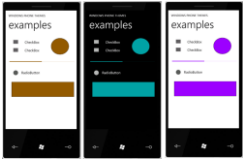
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Windows Phone themes

Windows Phone Themes

- Windows Phone 7 allows users to customize the system theme on their phone
 - Select between Light or Dark background
 - Select from a choice of 10 accent colors
- Silverlight controls are all theme aware
 - Adopt color scheme selected by the user by default
 - Developer can customise control rendering and override any themed properties




13

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Using Style Options

Demo

Demo 2: White Damage Calc



14

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Windows Phone Styles

```
<TextBlock x:Name="PageTitle" Text="Damage Calc" Margin="-3,-8,0,0" Style="{StaticResource PhoneTextTitle1Style}"/>
```

- Silverlight for Windows Phone has a built-in resource dictionary containing standard styles
 - Best practice is to use these styles for sizing text, setting color of brushes – unless you want to develop a custom style
- To see which styles are available, look at `{Program Files}\Microsoft SDKs\Windows Phone\v7.0\Design\ThemeResources.xaml`

15

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Control Templates

- There is also a directory of XAML templates for the standard controls
- You can use this as the basis of any new types of custom control you might wish to make
- You can also find out how the controls are put together
- You can find them at `{Program Files}\Microsoft SDKs\Windows Phone\v7.0\Design\System.Windows.xaml`

16

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“Damage Calc Version” 2.0

Demo

Demo 3: Damage Calc no button



17

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Customising text input

Appropriate keyboards

- On a mobile device there is not enough screen space or touch resolution to display an entire keyboard at all times
- This means that there will be several versions of the keyboard that the user will select between
- It is useful if the application is designed so that the optimum keyboard is displayed from the start

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TextBox InputScope

```
1. <TextBox Height="84" HorizontalAlignment="Left" Margin="286,132,0,0"
   Name="damageTextBox" Text="" VerticalAlignment="Top" Width="248" FontSize="32"
   TextChanged="damageTextBox_TextChanged">
2.   <TextBox.InputScope>
3.     <InputScope>
4.       <InputScopeName NameValue="Digits" />
5.     </InputScope>
6.   </TextBox.InputScope>
7. </TextBox>
```

- InputScope gives a hint to the system which Soft Input Panel layout to use
- Users will appreciate this..



20

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"Damage Calc Version" 3.0

Demo

Demo 4: Damage Calc input scope



21

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An introduction to Databinding

Databinding

- At the moment we have written our own “glue” to link the user input to the data in our programs
- Silverlight will do this for us automatically
- Data content in text boxes can be linked directly to properties in our program
 - User input will fire property changed events
 - Changing the property updates the display

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Databinding in XAML

```
<TextBlock x:Name="ContentText"
  Text="{Binding LineThree, Mode=OneWay}" TextWrapping="Wrap"
  Style="{StaticResource PhoneTextTitle3Style}"/>
```

- Properties of controls can be bound to a public property of a data object
 - Above, the **Text** property of the TextBlock is bound to the **LineThree** property of some data source
- Define the data source by setting
 - The **DataContext** property of any containing FrameworkElement-derived class (a containing control, the page or the Frame)
 - Or the **ItemsSource** property of a List control

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Databinding Modes

```
1. <TextBlock x:Name="ContentText"
   Text="{Binding LineThree, Mode=OneWay}" TextWrapping="Wrap"
   Style="{StaticResource PhoneTextTitle3Style}"/>
```

- Mode property determines how changes are synchronized between target control and data source
 - OneTime – Control property is set once to the data value and any subsequent changes are ignored
 - OneWay – Changes in the data object are synchronized to the control property, but changes in the control are not synchronized back to the data object
 - TwoWay – Changes in the data object are synchronized to the control property and vice-versa

INotifyPropertyChanged

- Data objects that take part in OneWay or TwoWay binding must implement INotifyPropertyChanged

```
1. public class ItemViewModel : INotifyPropertyChanged
2. {
3.     private string lineOne;
4.     public string LineOne
5.     {
6.         get { return lineOne; }
7.         set {
8.             if (value != lineOne) {
9.                 lineOne = value;
10.                 NotifyPropertyChanged("LineOne");
11.             }
12.         }
13.     }
14.     public event PropertyChangedEventHandler PropertyChanged;
15.     private void NotifyPropertyChanged(String propertyName)
16.     {
17.         PropertyChangedEventHandler handler = PropertyChanged;
18.         if (null != handler)
19.             handler(this, new PropertyChangedEventArgs(propertyName));
20.     }
21. }
```

"Damage Calc Version" 4.0

Demo

Demo 5: Damage Calc data binding



Binding to Lists

```
1. <ListBox x:Name="MainListBox" ItemsSource="{Binding Items}">
2. ...
3. </ListBox>
```

- List controls can bind to collections of items
- For oneway or twoway databinding to work, this must be an **ObservableCollection**
- Items inside an ObservableCollection need to implement **INotifyPropertyChanged**
 - Provides event notifications to Silverlight databinding whenever a property on data object in the collection changes, or an item is added to or removed from the collection

28

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Observable Collections

```
1. public class MainViewModel
2. {
3.     public MainViewModel()
4.     {
5.         // Insert some test data into the collection
6.         Items = new ObservableCollection<ItemViewModel>() {
7.             new ItemViewModel() { LineOne = "runtime one",
8.                                   LineTwo = "Maecenas praesent",
9.                                   LineThree = "Facilisi faucibus ", },
10.            new ItemViewModel() { LineOne = "runtime two",
11.                                  LineTwo = "Dictumst eleifend",
12.                                  LineThree = "Suscipit torquent ", },
13.        };
14.     }
15.     public ObservableCollection<ItemViewModel> Items {
16.         get; private set; }
17. }
```

29

DesignTime and RunTime Data

```
1. <phone:PhoneApplicationPage
2.     x:Class="WindowsPhoneListApplication4.DetailsPage"
3.     ...
4.     xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
5.     d:DataContext="{d:DesignData SampleData/MainViewModelSampleData.xaml}"
6.     ... shell:SystemTray.IsVisible="True">
7.
8.     <!--Data context is set to sample data above and first item in sample data
9.         collection below and LayoutRoot contains the root grid where all other page
10.        content is placed-->
11.     <Grid x:Name="LayoutRoot" Background="Transparent" d:DataContext="{Binding
12.         Items[0]}">
13.         ...
14.     </Grid>
```

```
1. protected override void OnNavigatedTo(NavigationEventArgs e)
2. {
3.     base.OnNavigatedTo(e);
4.     ...
5.     DataContext = App.ViewModel.Items[index];
6. }
```

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Advanced DataBinding

Demo

Demo 6: Binding to a list

31

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Lab 2 – Complete After Session
Before Thursday Morning Session

Hello Windows Phone 7

- <http://channel9.msdn.com/learn/courses/WP7TrainingKit/WP7GettingStarted/HelloPhoneWP7Lab/>
- Complete Exercise 1 Tasks 3 and 4
- Advanced Users can complete Task 5

We'll hold office hours tomorrow from 1-4 pm PST in the BTL Forum – if you have any questions or need support while doing your labs

32

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Review

Windows Phone Silverlight is based on Silverlight 3.0

You have to create your XAML text using the Notepad editor

Silverlight components cannot generate events

You can customise the keyboard displayed for text input

Silverlight components automatically adapt to the display settings

You can only read information from components using data binding

33

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34

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35

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36

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37

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38

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39

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Coming Up Next...

Creating a Silverlight user interface

Windows Phone game development

40

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14