MVVM

Introduction

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Agenda

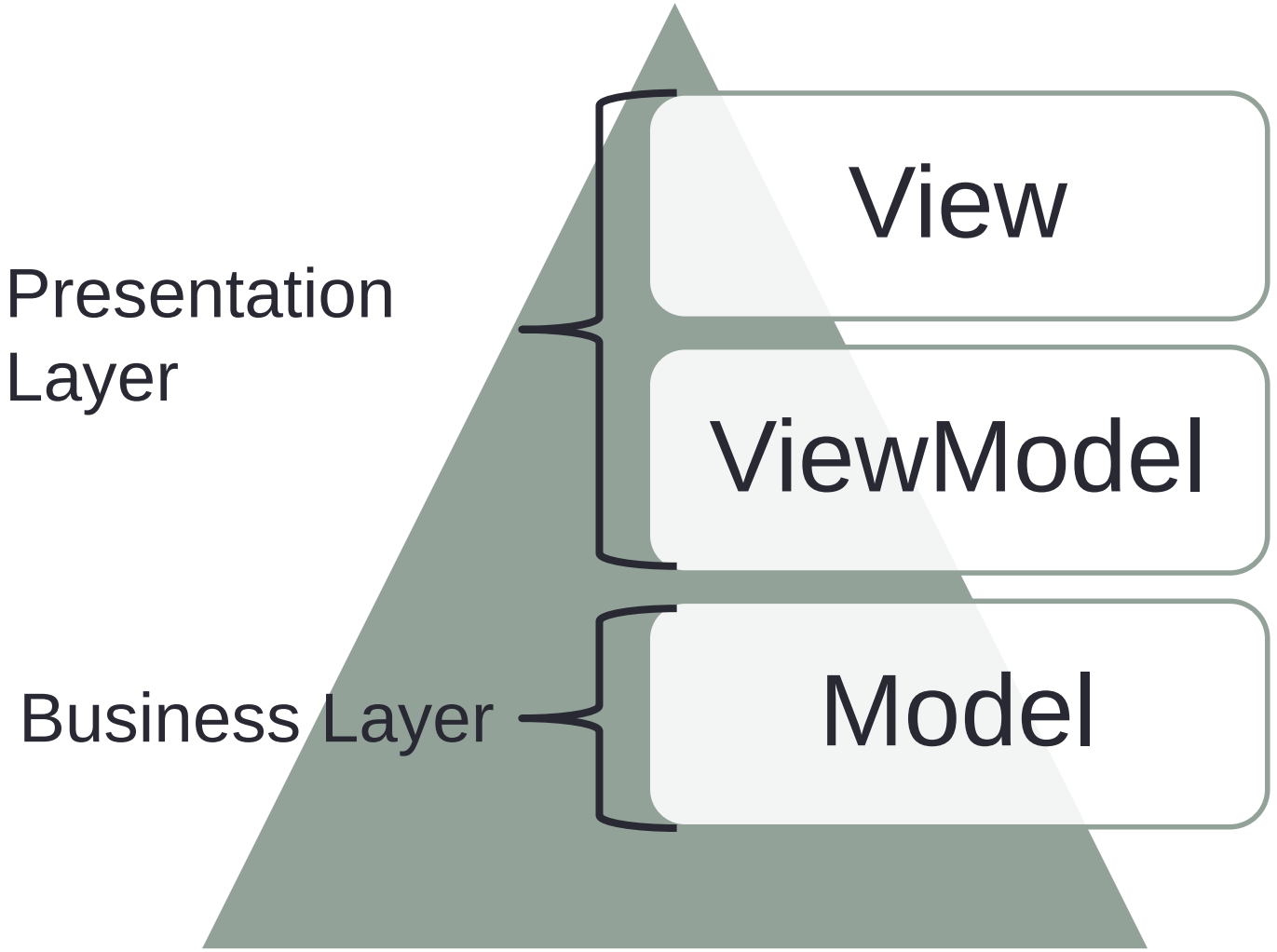
1. Overview
2. Preconditions
3. Model
4. ViewModel
5. View
6. Let’s morph our application

OVERVIEW

MVVM Generals

- Presented in 2005
- Supported UI technologies
  - WPF
  - Silverlight
  - Windows 8
- More then 20 frameworks listed on wikipedia

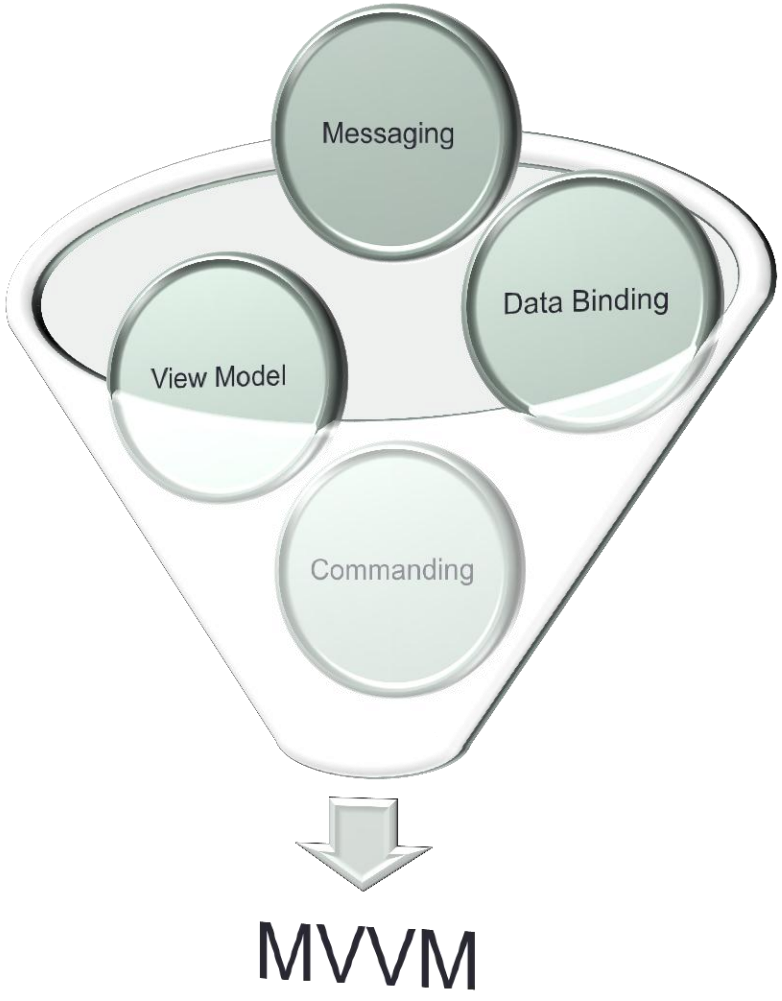
MVVM Structure



MVVM Benefits

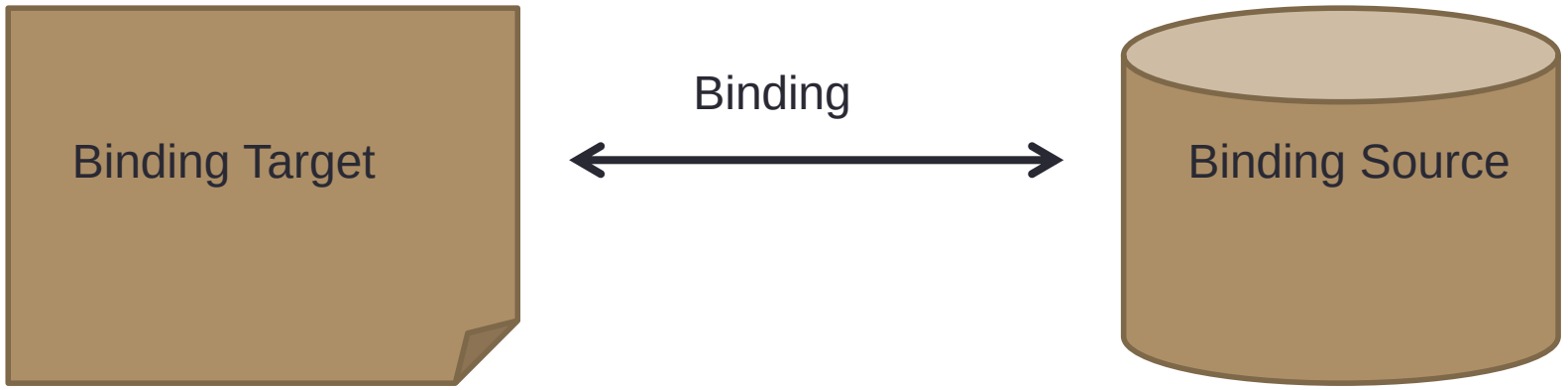
- Separation of Concerns
- Better Testability
- More reusable Code

MVVM Elements



HOW DOES IT WORK

DataBinding



INotifyPropertyChanged

```
public interface INotifyPropertyChanged
{
        event PropertyChangedEventHandler PropertyChanged;
}

void XXX_PropertyChanged(object sender, PropertyChangedEventArgs e)
{
        // e.PropertyName;
}
```

Commanding

- Event Handling

- Commanding

ButtonBase

```
public abstract class ButtonBase : ContentControl
{
        public ICommand Command { get; set; }
        public object CommandParameter { get; set; }
}
```

ICommand

```
public interface ICommand
{
        event EventHandler CanExecuteChanged;
        bool CanExecute(object parameter);
        void Execute(object parameter);
}
```

Using Commanding

```
<Window.CommandBindings>
<CommandBinding Command="Close„
        Executed="CommandBinding_Executed„
        CanExecute="CommandBinding_CanExecute"/>
</Window.CommandBindings>
<Button Command="Close">Klick mich</Button>

private void CB_Executed(object sender, ExecutedRoutedEventArgs e)
{
        // execute here
}

private void CB_CanExecute(object sender, CanExecuteRoutedEventArgs e)
{
        e.CanExecute = true;
}
```

InvokeCommandAction Behavior

- Command functionality for non ButtonBase based controls
- Located in System.Windows.Interactivity.dll

```
<Window
xmlns:i="http://schemas.microsoft.com/expression/2010/interactivity">
  <i:Interaction.Triggers>
    <i:EventTrigger EventName="Loaded">
      <i:InvokeCommandAction Command="Close"/>
    </i:EventTrigger>
  </i:Interaction.Triggers>
</Window>
```

MODEL

Model

- Don‘t change if you don‘t need to

VIEWMODEL

ViewModel Class

- Implement INotifyPropertyChanged
- Create Property for Model
- Create Additional Properties

VIEW

What to avoid in the View

- Don‘t use Name or x:Name
- Don‘t use Eventhandler

- Decide between IValueConverter and additional Properties

Connecting ViewModel and View

- Bind ViewModel to a View
  - Declaratively in XAML
  - In Code behind
  - Using advanced approaches

Binding the ViewModel declaratively

```
<Window x:Class="MvvmSample...nWindow"
xmlns=http://schemas.micros...m/winfx/2006/xaml/presentation
xmlns:x="http://schemas.micr...soft.co...winfx/2006/xaml"
xmlns:vm="clr-namespace:MvvmS...le.ViewM...dels">
<Window.Resources>
        <vm:MainViewModel x:Key="vm"/>
</Window.Resources>
        <Grid DataContext="{Binding Source={StaticResource vm}}">
                ...
        </Grid>
</Window>
```

Binding the ViewModel in Code

```
void MainPage_Loaded(object sender, RoutedEventArgs e)
{
        MainPageViewModel vm = new MainPageViewModel();
        this.DataContext = vm;
}
```

Questions

Let‘s transform an application