Custom WPF apps: “Adding custom functionality for the WPF Dep”

Pre-Conference Session, IBUC 2018

Agenda

- Why Custom DEPs?

- WPF DEP
  - Basic architecture
  - Samples, samples and more samples
    - Countdown clock
    - Time zones
    - Menu
    - Other programming language(s)
    - Signature
Why Custom DEPs?

– Special processing
  - Validation

– Non-standard control
  - Better visual feedback
  - Animation
  - Ink
  - Speech

WPF DEP Basic Architecture

```
loadbalancer.RequestServerPark
```

```
ServerParkObtained event
```

```
dataentrymanager.GetDataEntryController(e.Park, this, gridname)
```

add extra event handlers

```
dataentrycontroller.StartInterview(guid, instrument-name, runtime-options, culture-id, width, height)
```
Countdown (1)

Show a countdown clock on each page

- identify which control to replace on the page by using a custom property or do it by name or a combination thereof

- wire up the OnCreateActionsControl event handler
  - `m_controller1.ControlFactory.OnCreateActionsControl += ControlFactory_OnCreateActionsControl;`

Countdown (2)

- In the eventhandler, replace the control with a custom control

```csharp
if ((e.ControlDefinition.Kind == "HyperLink") &&
    (HasCustomProperties(e.ControlDefinition)))
{
    //if no custom control has been created yet, create one now
    if (e.CustomControl == null) // can also use e.ControlAction (Create or Update)
    {
        ClockU_ticktockH = new ClockU(this.EndTime) { ID = e.ControlDefinition.ID };
        e.CustomControl = _ticktockH;
    }
    else
    {
        e.IsHandled = true;
    }
}
```
Countdown (3)

- Implement the HasCustomProperties method
  ```csharp
  private bool HasCustomProperties(IBaseControlDefinition definition)
  {
  }
  ```

- Provide a way of specifying `this.EndTime`
  - via commandline parameter with hard-coded fallback

- Run the program

Interoperability

- Can write the custom DEP in different languages

- Proviso:
  - must be able to access items created on one thread from other threads (Invoke), or
  - must operate on one thread

- IronPython example is shipped in examples
Timezones

- Not limited to one custom control
- Can use custom properties to pass information
  - Place (string) – Honolulu
  - TimeZone (string) – Hawaiian Standard Time
    - these values are read via e.ControlDefinition.CustomProperties, saved and then passed through to the instance of the custom control before it is passed back to Blaise
- Times are converted using standard .Net calls
- The hands on the clock are positioned by assigning the Angle on a RotateTransform inside the corresponding Rectangle.RenderTransform (standard WPF)

Text to speech

- Uses the .Net speech synthesizer routines
- Speaks various items
- Is specific
  - not all controls are handled
  - if you have your own control, you need to program it in
  - expects certain texts to be provided (e.g. text for enumerations)
- Some layouts work better than others
- Utilizes the speech packs in Windows languages
  - no speech pack – no proper pronunciation
- Is shipped in examples
Menu

- Came about after having read that we didn’t have a B5 version of this item
- Implemented as a custom control
- Works with the installed instrument and the session database
- Implements most of the B4 menu as appropriate in B5
  - see the speech demo for how to recite things
  - some stuff left as an exercise for the reader