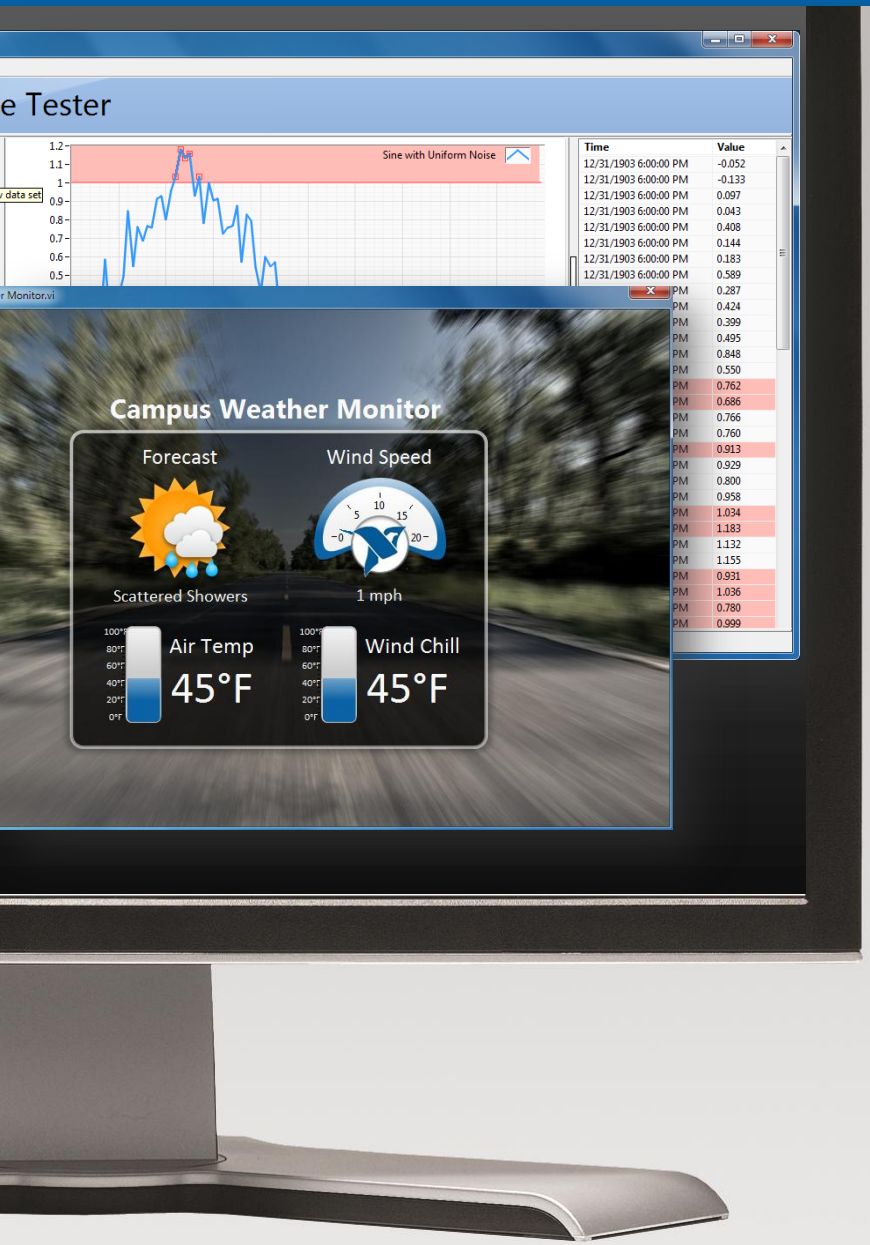


Creating Quality UIs with LabVIEW

NATIONAL INSTRUMENTS

Agenda

1. Definitions, rules and advice

   (not LabVIEW specific, but important)

2. Some cool UI techniques for LabVIEW

   (and why you would consider using them in your application)

3. Where to go to download some reusable components

   (because everybody loves free stuff)

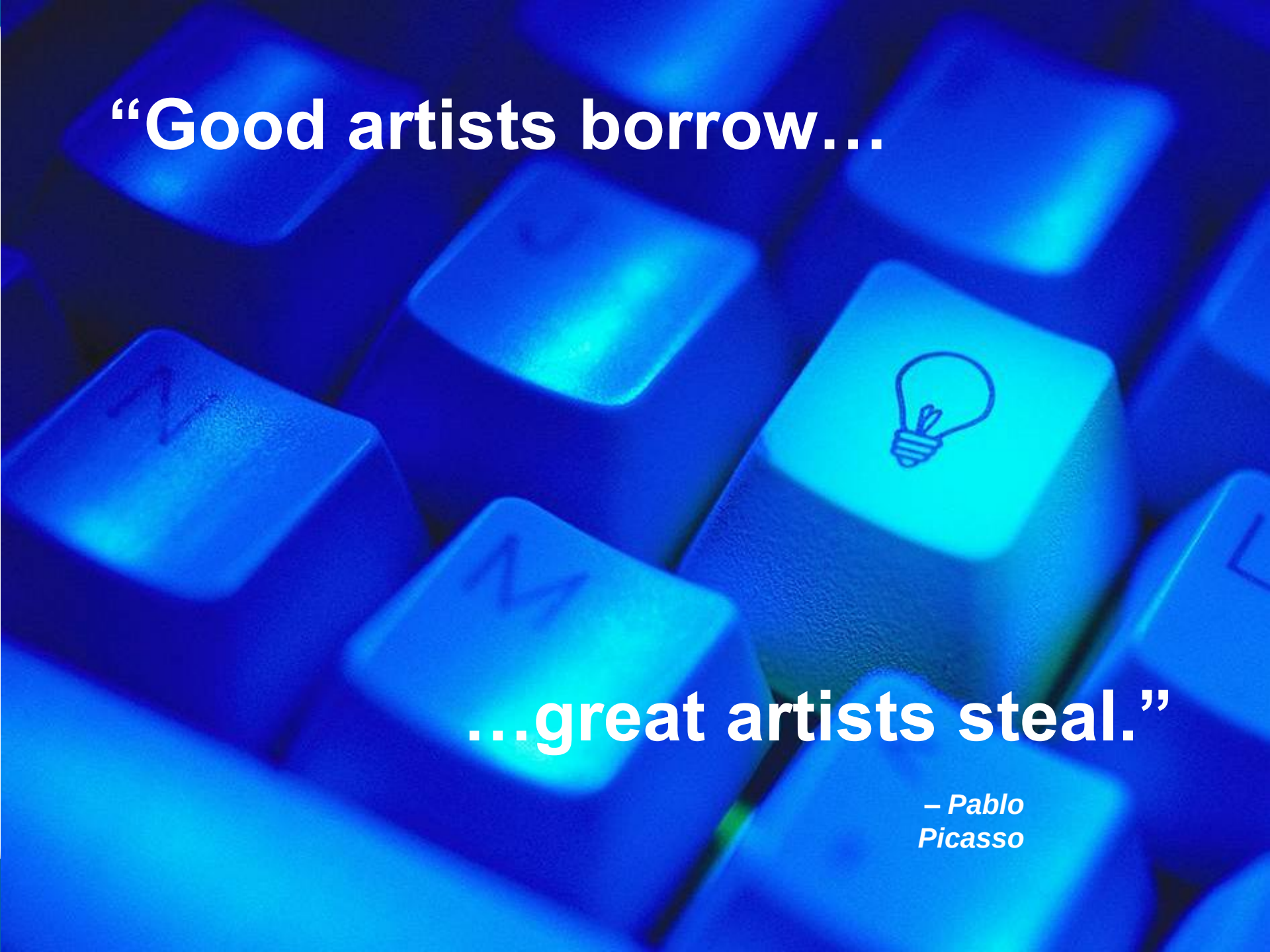
Before we Begin…

- Different tastes exist – our tips may not always apply
- This presentation assumes a Advanced experience level
- Visit (and join) our UI Community Group to find:
  - Downloadable demos and examples
  - LabVIEW users passionate about UI (who share)

decibel.ni.com/content/groups/ui

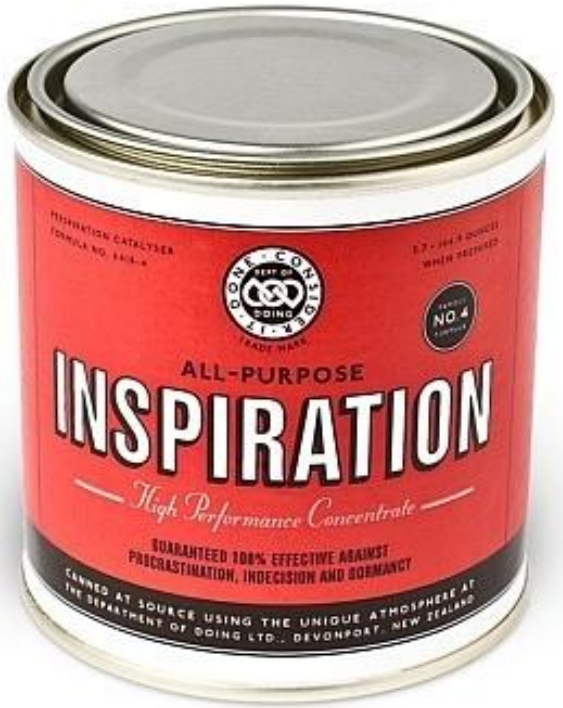
Topics

- Manipulating UI Controls Programmatically
- Giving your UI a Custom Look
- Organization of Complex UIs
- Indicating Progress of Slow Operations


“Good artists borrow…
…great artists steal.”
– Pablo Picasso

Sources of Inspiration

- Apple
- Microsoft Office
- Applications on your own computer
- Icon galleries
- Web design tutorials
- Your corporate design team
- Photography, Art
- Books on:
  - User interface design
  - User interaction design
  - Usability
  - Graphic design
  - Visualization of information



NATIONAL INSTRUMENTS™

Three Commandments from Part One

I. Think About Your User

II. Don’t Be Innovative

III. Less Is More

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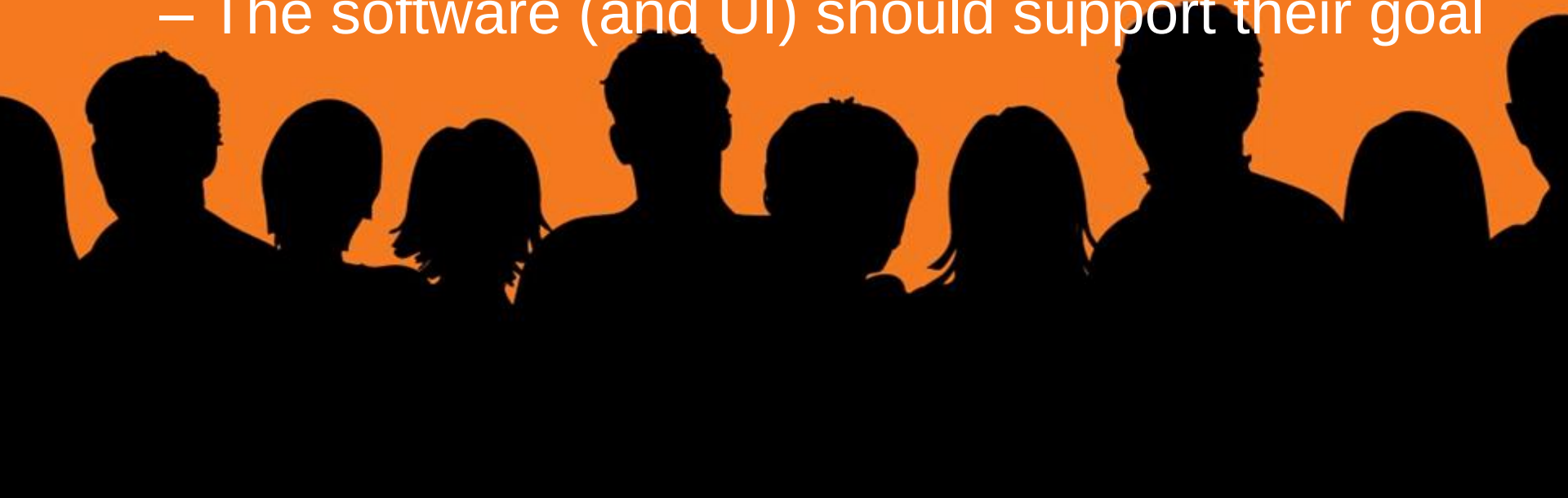
1. Think About Your User

- Do they know as much as you (they never do)?
- How will they interact with the application?
- Why are they using your software?
  - The software (and UI) should support their goal



2. Don’t Be Innovative

Use familiar elements

- Buttons
- Icons
- Terminology
- Dialogs
- Menus

2. Don’t Be Innovative

Still some license for creativity

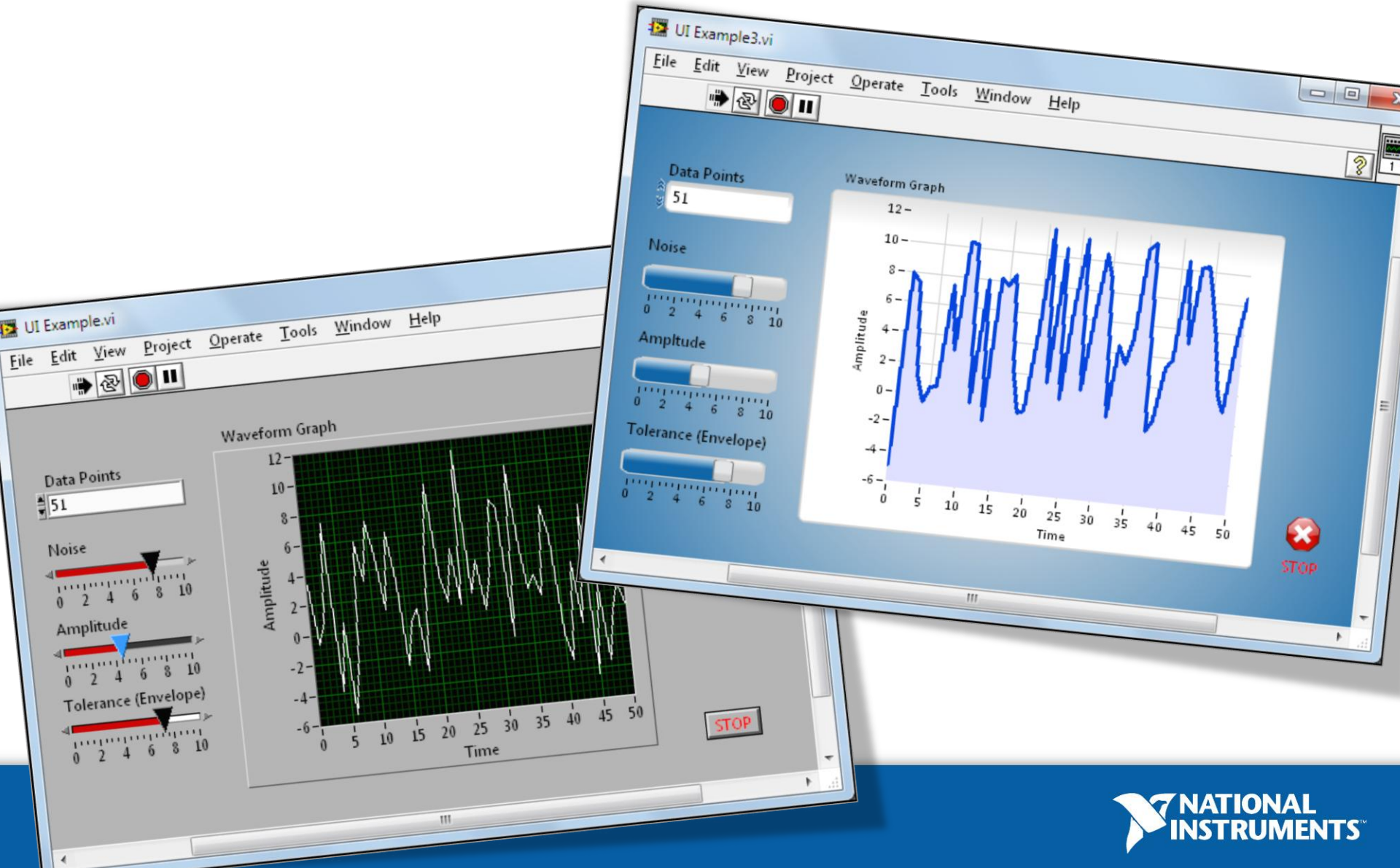
- Don’t change the way similar looking things behave
- Polish, don’t reinvent

III. Less Is More

- Too much at once is distracting; err toward minimalism
- Stick to requirements
  - Don’t do what isn’t necessary
  - You’ll get done sooner
  - It’ll cost you less to own it
- Focus should be on what’s important


“It seems that perfection is attained not when there is nothing more to add, but when there is nothing more to remove.”
– Antoine de Saint-Exupéry

Giving your UI a Custom Look



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UI Customization Techniques

Front Panel Images and Decorations

- Make default controls transparent
- Add an image via menu **Edit » Paste**

Custom Controls

- Use to customize cosmetics of controls and indicators
- Access via front panel right-click context menu **Advanced » Customize**

XControls

- Use to customize the functionality or cosmetics of controls and indicators
- Access via menu **File » New**

Adding an Image to the Front Panel

- As simple as **Copy and Paste**!
- Use an image editor to erase, add transparency
- Populate native LabVIEW controls

Start: PowerPoint Clipart

Finish: Custom LabVIEW UI

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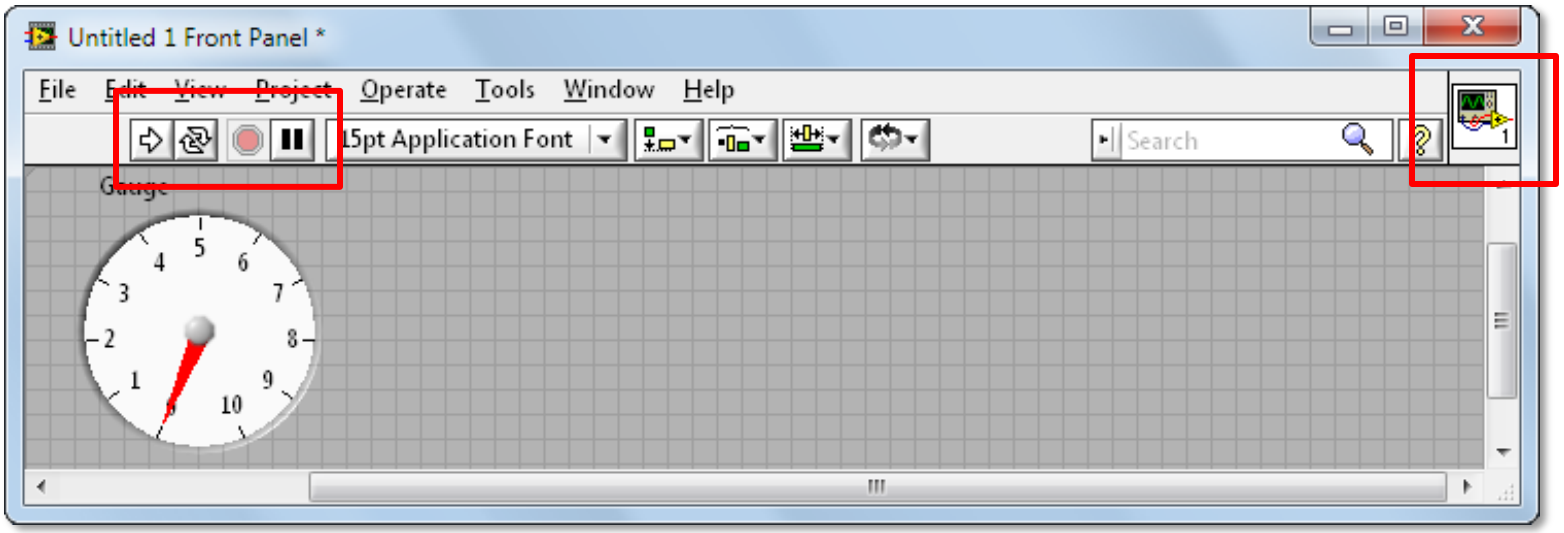
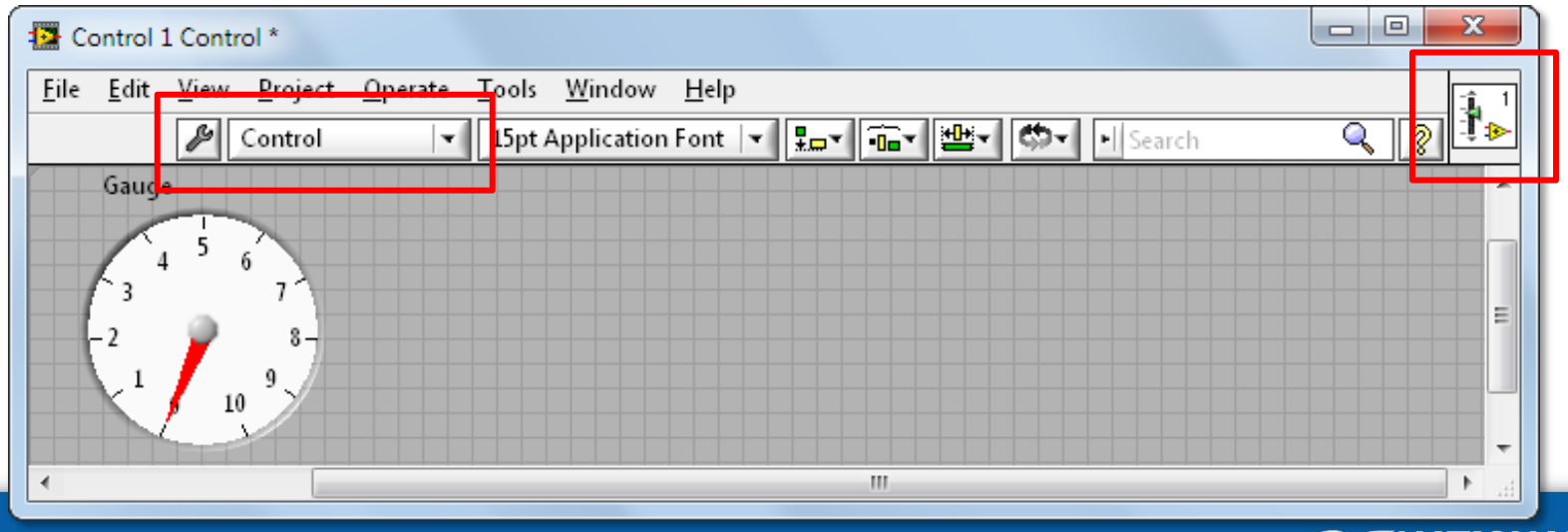
Differences in the Control Editor

Normal Front Panel



Control Editor Window



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When you should use Controls

- To create cosmetically different, reusable controls
- **Example:** resizing a Stop button to make it easier to click

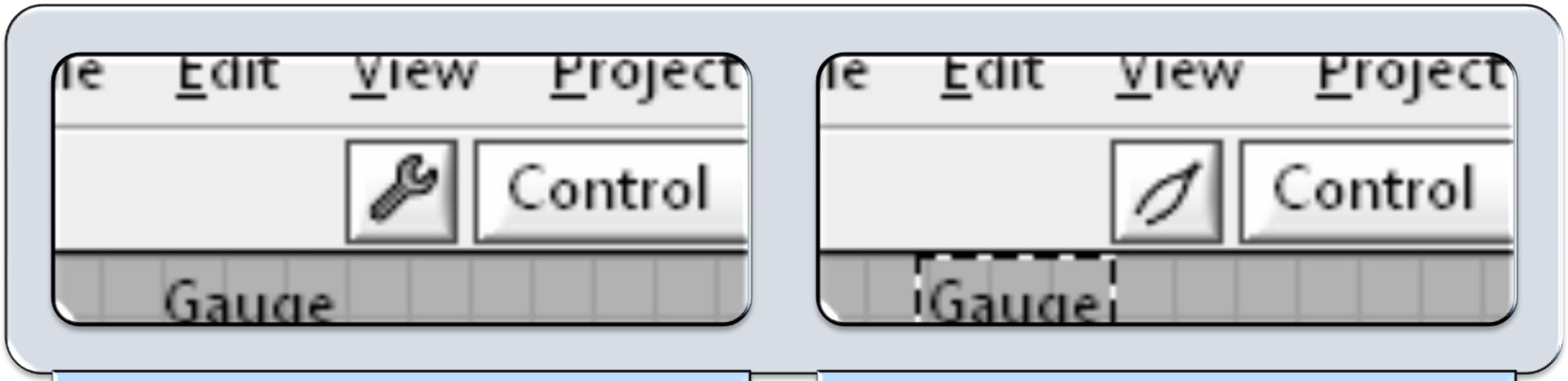
When you should use Type Defs

- To automatically update data type in custom controls
- **Example:** reusing an Enum whose values may change

When you should use Strict Type Defs

- To create reusable controls that are identical copies
- **Example:** propagating changes to Gauge size and color

Edit Mode vs. Customize Mode



Edit Mode

- Change size or color of a control or indicator
- Access a right-click shortcut menu

Customize Mode

- Make extensive changes to controls or indicators
- Change individual parts of a control or indicator

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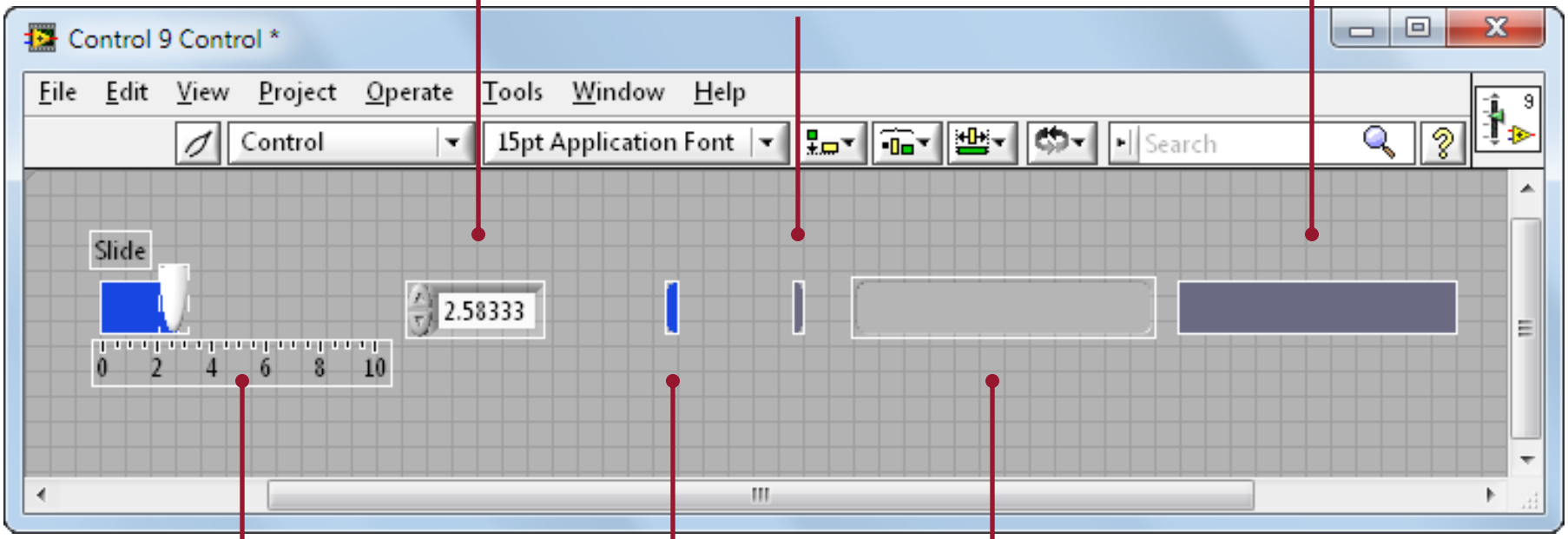
Components of a Control (Slide)



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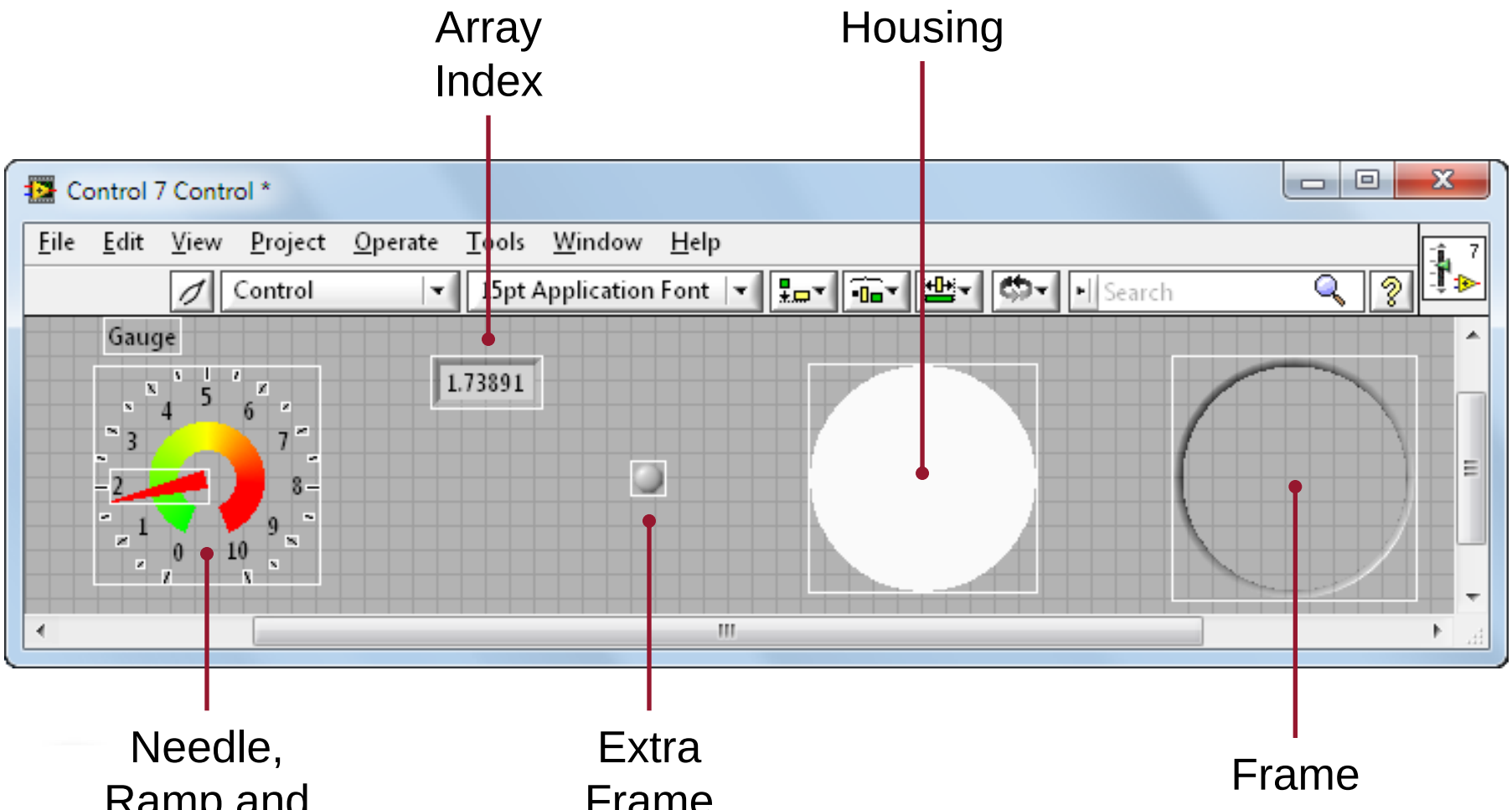
Components of a Control (Gauge)



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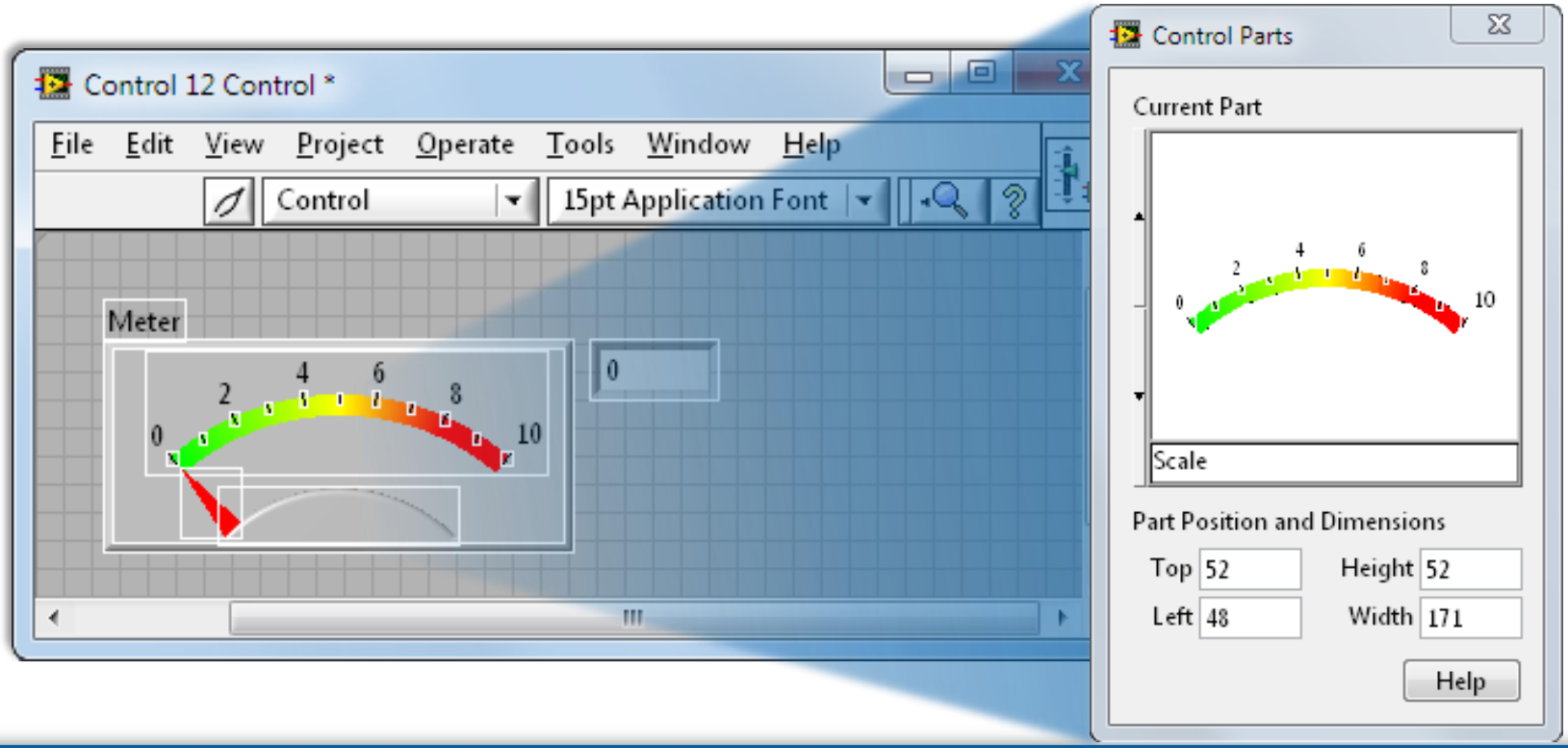
Viewing Control Components

- View individual control components using menu **Window » Show Parts Window**



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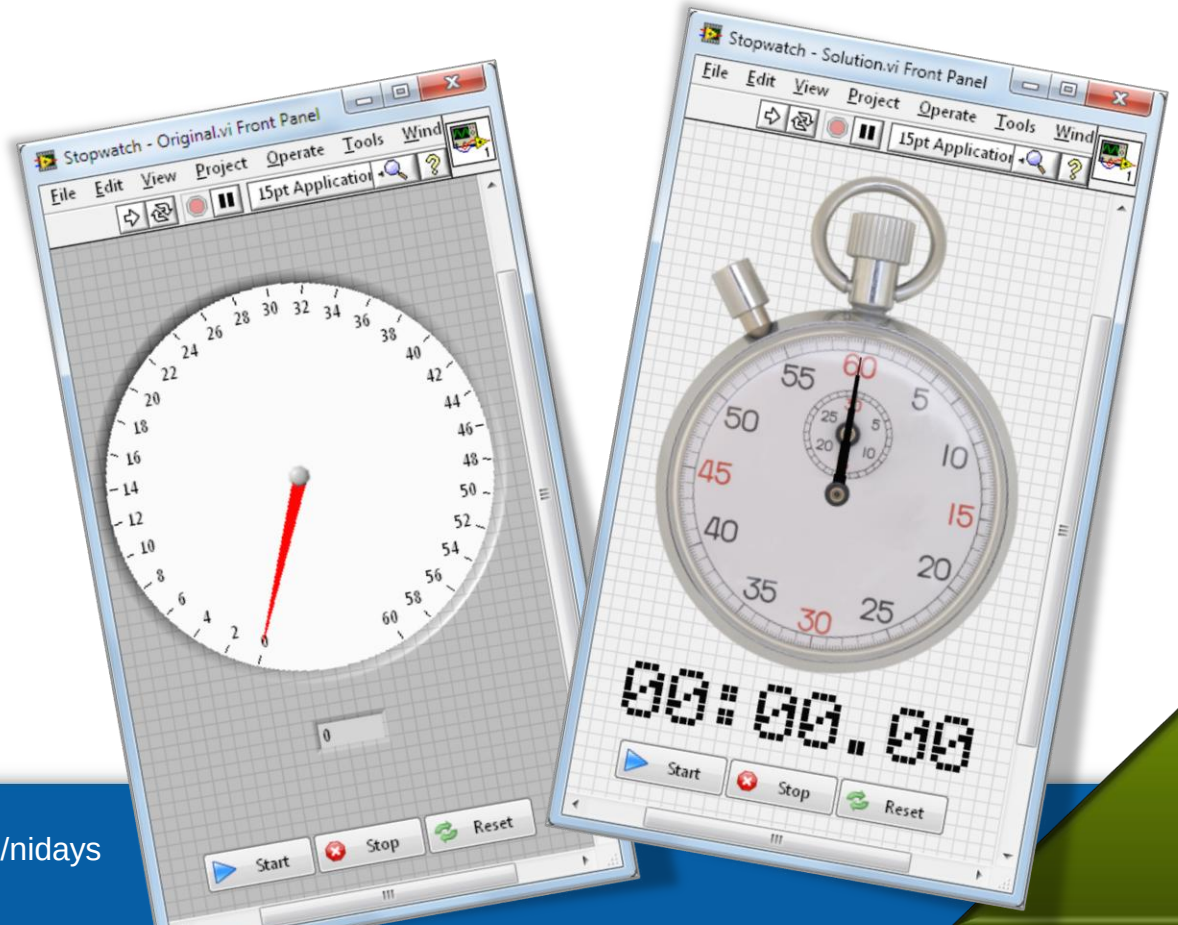
CUSTOMIZING A GAUGE CONTROL

Adding a Decoration and Custom Imagery to a Gauge Control



DEMO

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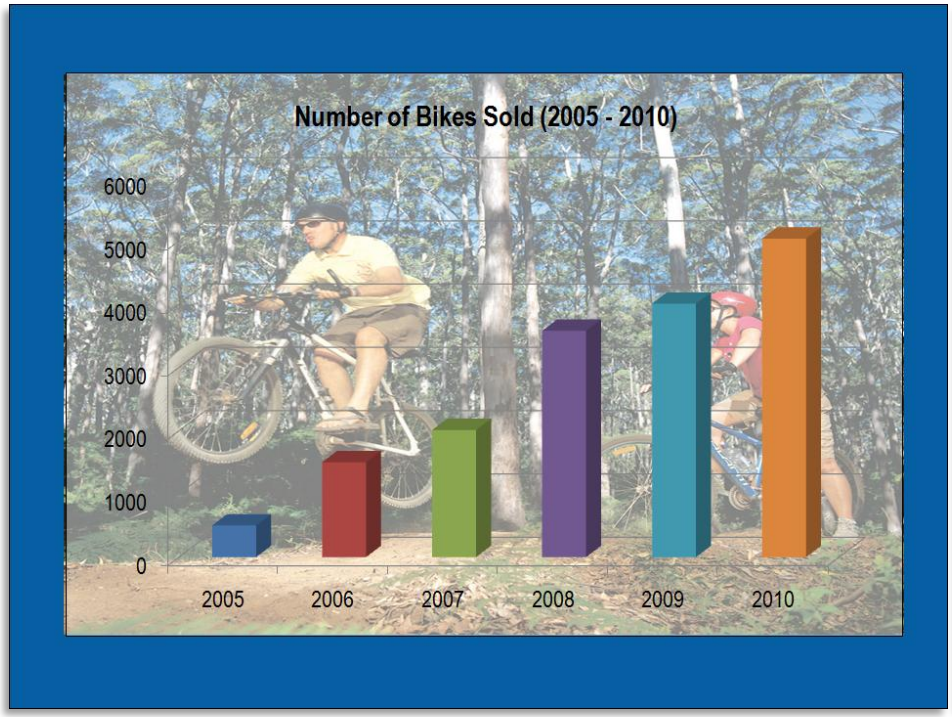
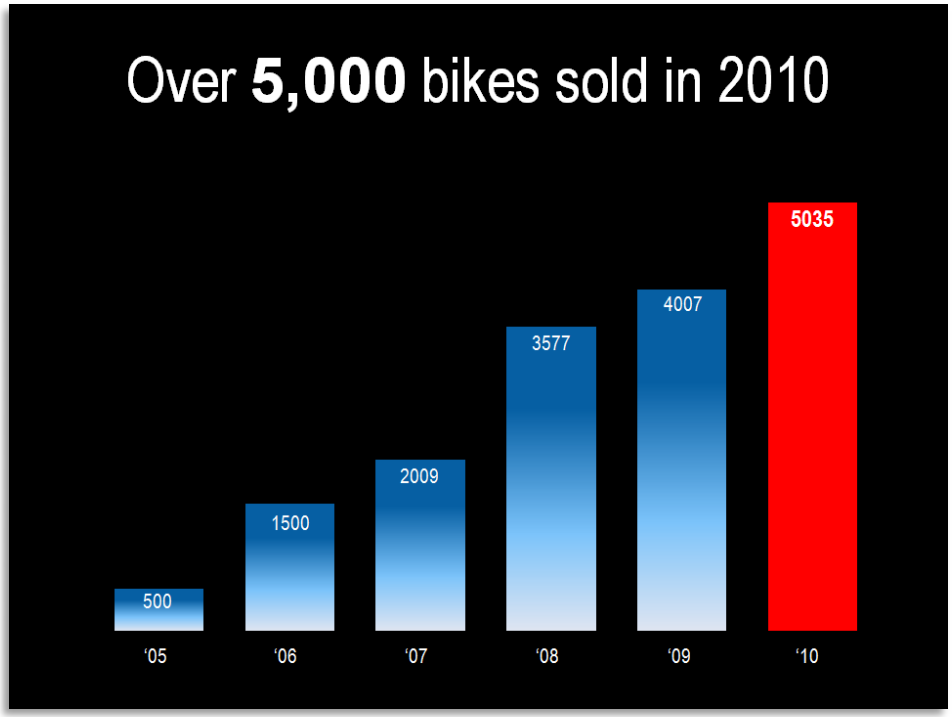
Importance of Visualization Choices

UI “Signal to Noise Ratio:”
Which slide is more effective and why?





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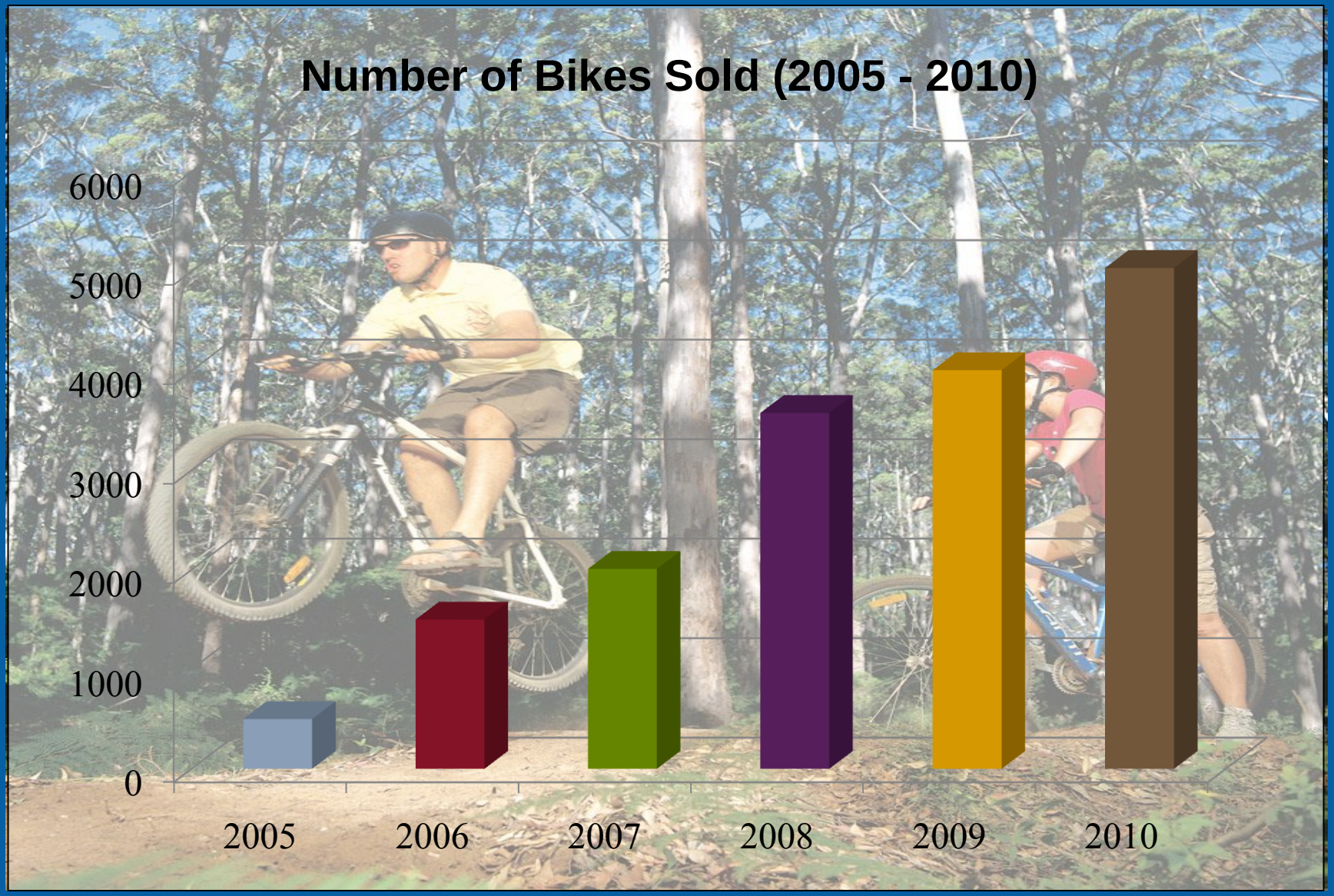
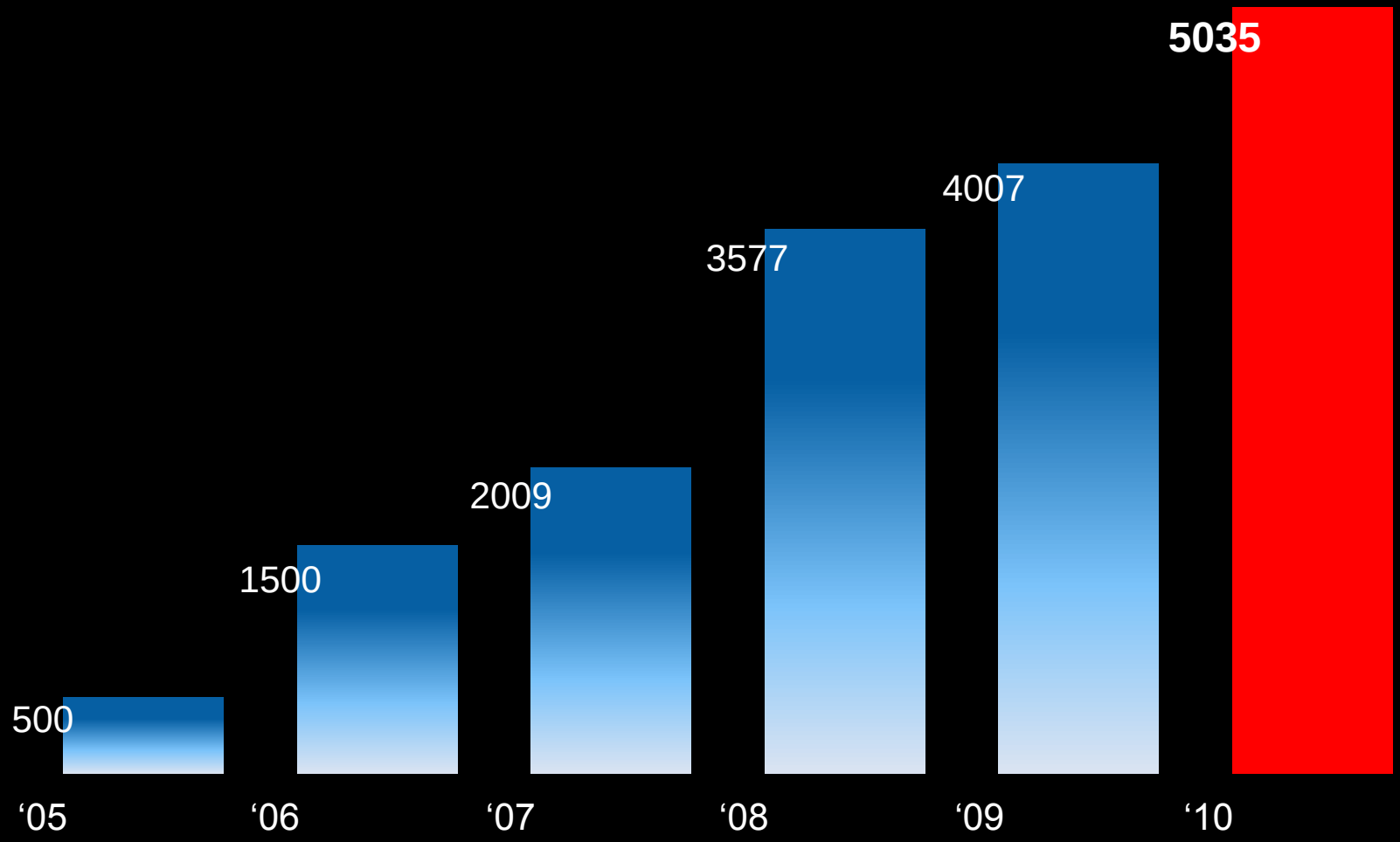

Number of Bikes Sold (2005 - 2010)
6000
5000
4000
3000
2000
1000
0
2005
2006
2007
2008
2009
2010

Over **5,000** bikes sold in 2010



Organization of Complex UIs

Tab Control

- Use when controls don't all have to be visible at once
- Limit to the number of tabs you can gracefully use
- Loads all controls into memory at once

Category and Content View using SubPanels

- Use to dynamically decide which controls to display
- No limit to the number you can gracefully interact with
- You control when the VI is loaded or release from memory

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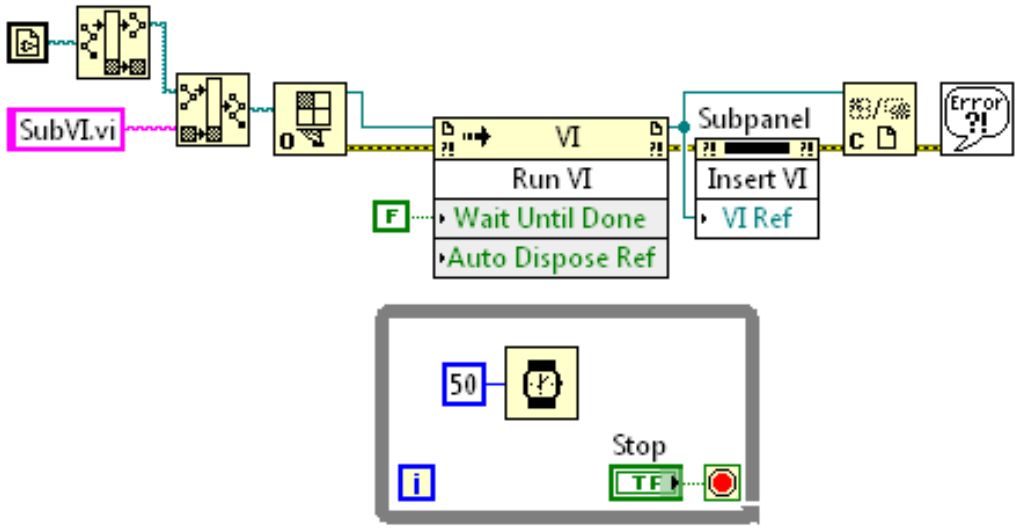
Using a SubPanel

1. Determine higher level VI screen real estate
2. Develop size appropriate, modular SubVIs
3. Dynamically Run SubVI
4. Dynamically insert SubVI into subpanel



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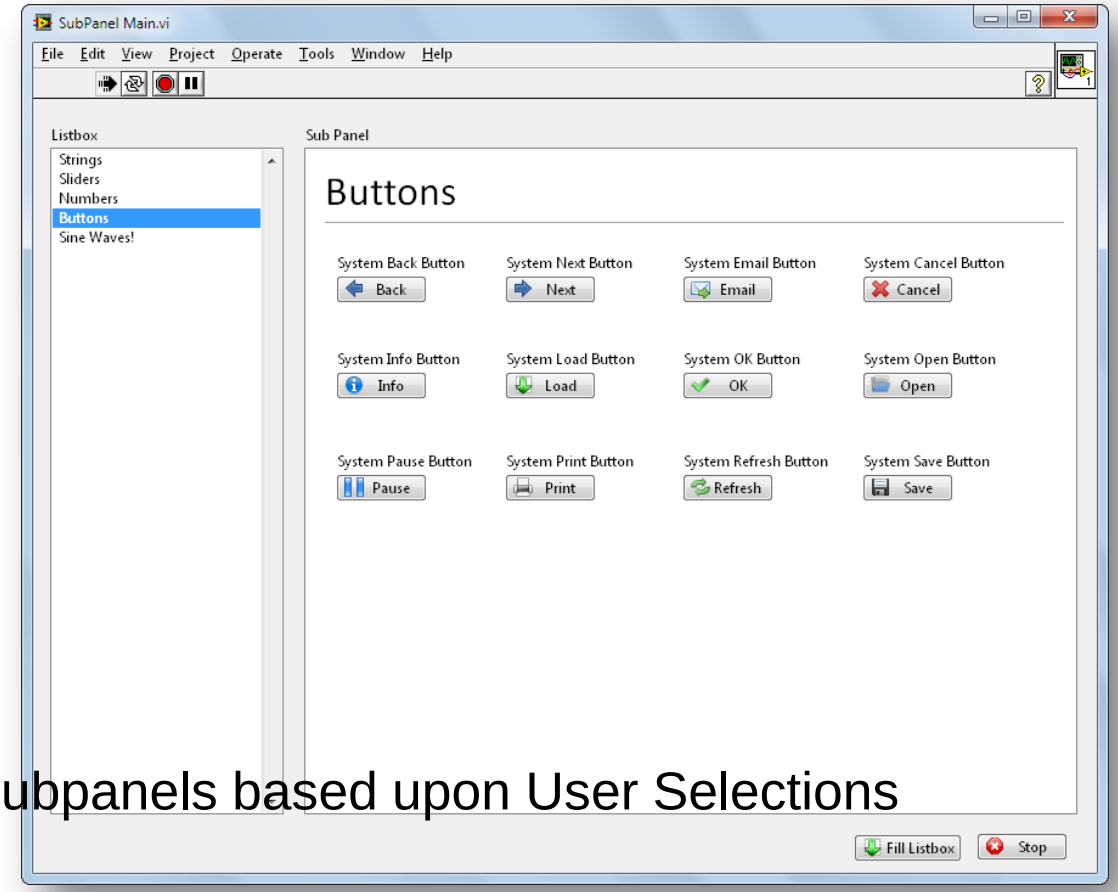

Displaying Subpanels based upon User Selections

SUBPANEL OPTIONS DIALOG

DEMO

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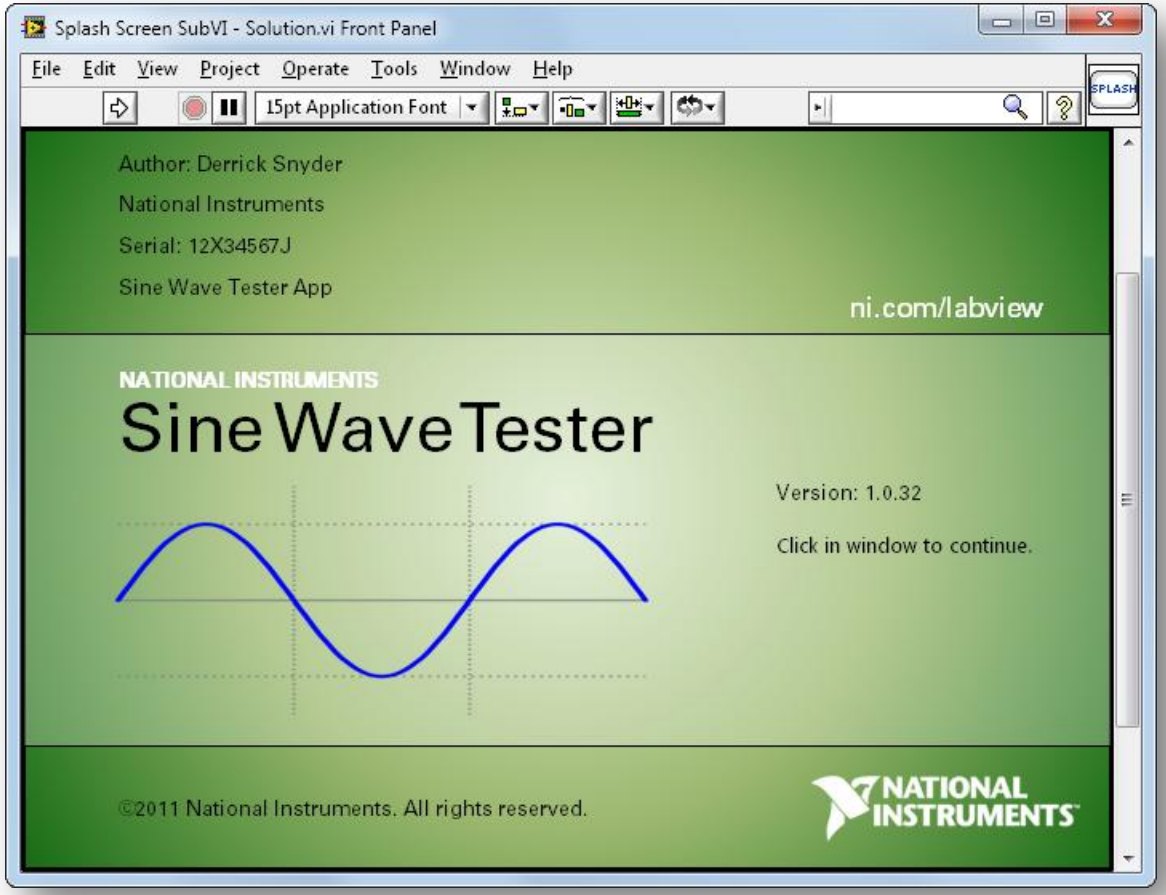
SPLASH SCREEN DEMO

Using an Event Structure to Create a Splash Screen



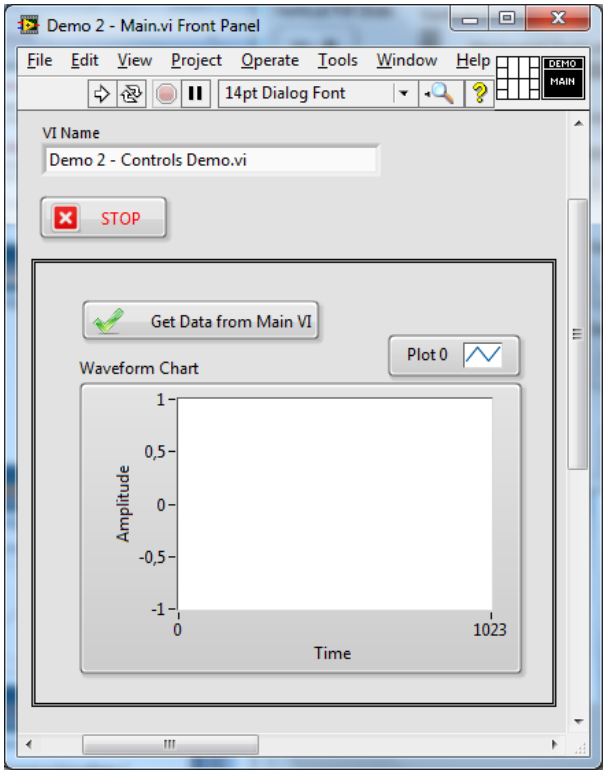
DEMO

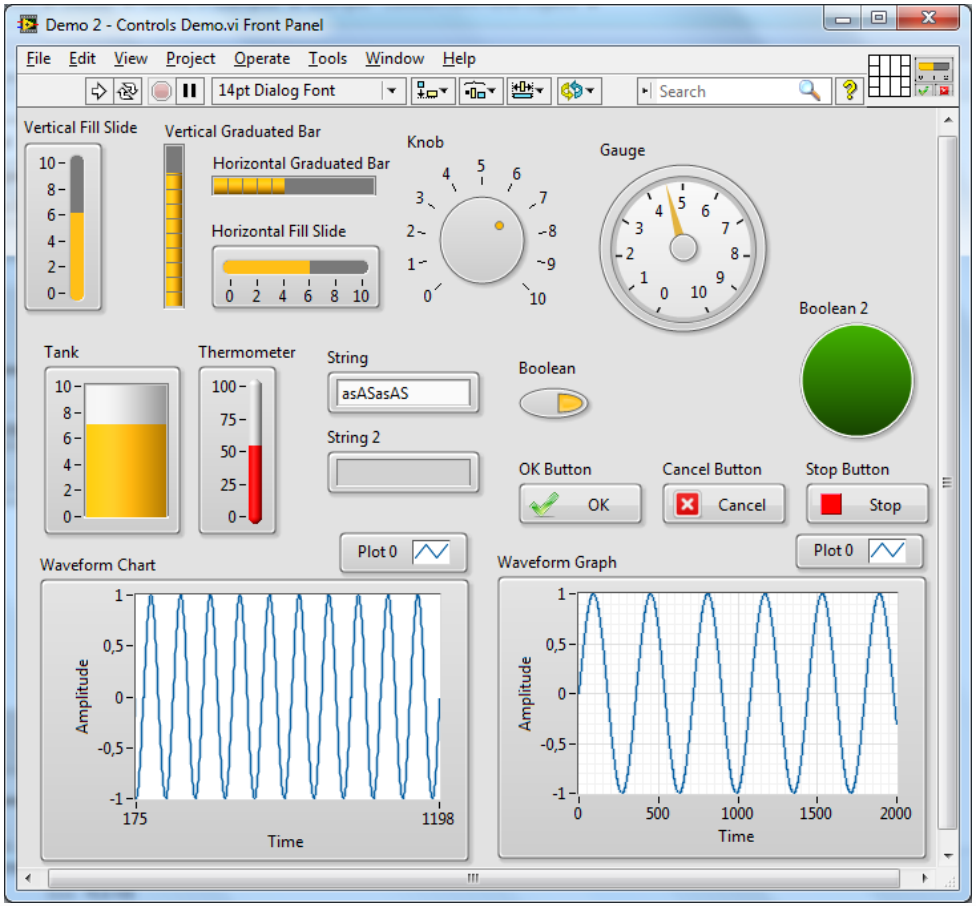
Create Decorations in PowerPoint

DEMO

Gallery of Examples

Control UI objects with a wrapper VI to get all the UI control/indicator references.





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Gallery of Examples

Image Gallery for Touch Screens (works with normal displays too)

Key Takeaways

- Don’t be innovative
- Less is more
- Think about your user
- Customize controls using Control Editor
- Clean up your front panels with tabs, subpanels
- Disguise load times using splash screens

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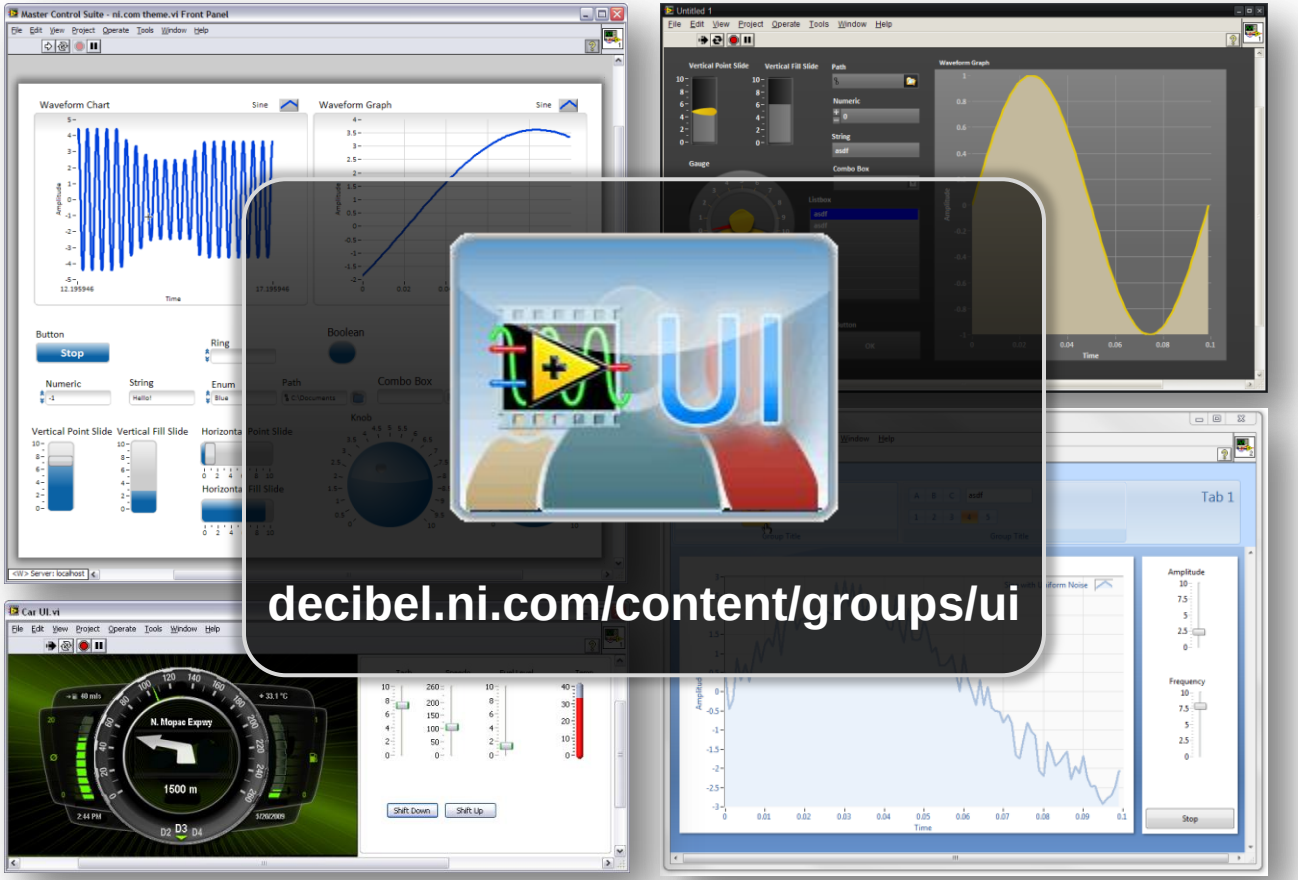
Learn and Share – UI Interest Group
THANK YOU!



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