



Simplifying Development of Complex Applications

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Intro

- Introduction
 - Using LabVIEW professionally for 25 years
 - Manage team of developers
 - Range of skill levels during development
 - Providing support / updates for legacy projects
 - May be different developers involved



#OurGiantsAreFemale



Margaret Granger



Audience

- Audience
 - Architects
 - Preaching to the converted
 - Generate some discussion
 - Developers
 - Stimulate some thought about your next project
 - Get thinking about current development methodologies
 - New Users
 - Think about style and building simple applications
 - Complex architectures can come later



Typical Complex Project

- What does our typical “Complex” project look like
 - Production Station
 - Test Station
 - Large applications with a number of interfaces
- What are the project needs
 - Rapid development
 - Formal release procedure
 - Length of project
 - Development, Integration and Support



Choice of Architecture

- This presentation is about development methodologies
 - Promote code that's easy to develop and easy to support
 - Business needs (quick and efficient to develop)
 - Customer needs (quality)
 - Future needs (support / upgrades)
- Choose an appropriate architecture
 - Fit for purpose
 - Comfortable in using



Infrastructure

- We use a discrete set of tools to help with our development
 - VIPM
 - Manage our reuse libraries
 - Build and distribute our own packages
 - Runs off the palette
 - Can provide to customers as required
 - OpenG
 - Invaluable resource
 - Tend to avoid 3rd party tools
- General Software Tools
 - BitBucket
 - JIRA
 - Confluence

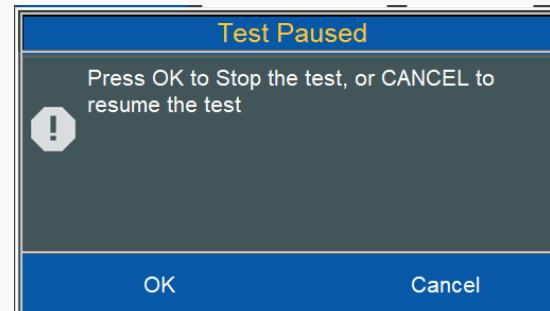


Common Code

- Log Files
- Error Handling
 - Custom Error Codes
- Dialogs
 - Windows Buttons
- Vision Modules
- Database Modules
- Application Templates
 - Dynamic Menu Template
 - Vision Template
 - Touchscreen Template
 - Desktop Template

```
App: Bondi.exe (Run Time System)
O/S: Windows NT 10.0
Port: 3363
Directory: C:\Program Files (x86)\Bondi
Lang: en
Disp: 1920 x 1040
LV Version: 18.0.1f5
User: user
Group: Administrators
IP: 192.168.13.111
ID: DESKTOP-D0IU9TP
App Version: 1.0.0.66

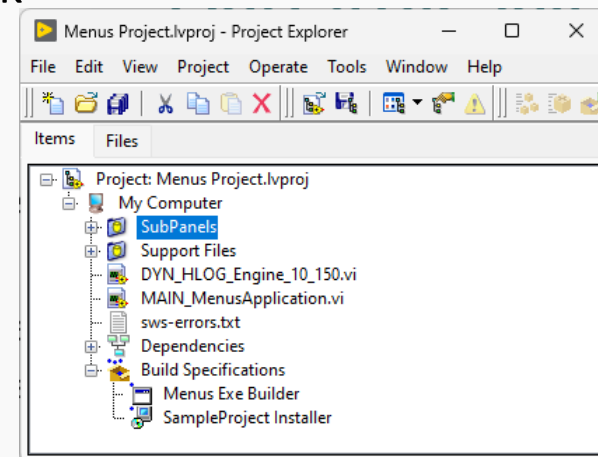
27/09/2023 09:12:03.776 Support files set to: C:\Program Files (x86)\Bondi\Support Files
27/09/2023 09:12:03.776 Resetting: C:\Program Files (x86)\Bondi\Support Files\Configuration\Bondi.cfg
27/09/2023 09:12:03.777 MAIN_Bondi.vi
27/09/2023 09:12:04.910 Loading SubPanels\SUB_MultiView_2_Systems.vi - OK
27/09/2023 09:12:05.577 Loading SubPanels\SUB_Plasma_1.vi - OK
27/09/2023 09:12:05.628 Loading SubPanels\SUB_Plasma_2.vi - OK
27/09/2023 09:12:05.772 Loading SubPanels\Sub_EthernetIP.vi - OK
27/09/2023 09:12:05.773 Loading Surf References
27/09/2023 09:12:05.808 Opening Bondi Main
27/09/2023 09:12:05.808 Opening C:\Program Files (x86)\Bondi\Bondi.exe\MAIN_Bondi.vi
27/09/2023 09:12:06.158 Bondi - Run top level
27/09/2023 09:12:06.171 SUB_Plasma_1.vi
27/09/2023 09:12:06.171 SUB_Plasma_2.vi
27/09/2023 09:12:06.171 PLCComms Log: Starting new session and settings updated: ("Network Path": "192.168.0.210,1,0", "Timeout (ms)": 1000)
27/09/2023 09:12:06.171 Top Level VI
27/09/2023 09:12:06.172 Backup Config File used?: FALSE
27/09/2023 09:12:06.172 Front Plasma running
27/09/2023 09:12:06.177 Backup Config File used?: FALSE
27/09/2023 09:12:06.177 Rear Plasma running
27/09/2023 09:12:06.187 Panel Home state: Run top level
27/09/2023 09:12:06.195 From Q -> Plasma - Initialise
```





Dynamic Menus

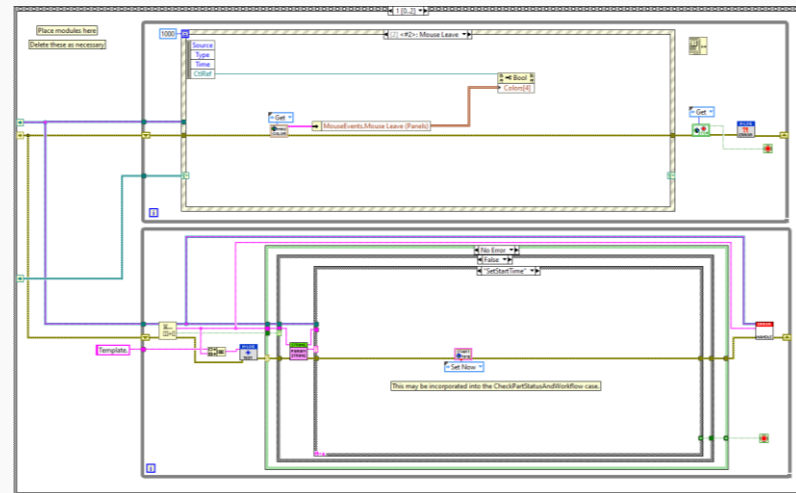
- Gmail Template
- Use this for over half of our applications
- Note the following
 - Menu Project.proj already exists
 - Top Level Application is basic producer / consumer
 - Lot of re-use code already included
 - Sub-panels do most of the project work
 - Show link to buttons on left
- Demo





Why?

- Why Subpanels
 - Split up tasks
 - Derive from same template
 - Style should be similar
 - Independent development
 - Debug in real-time
- Why Producer Consumer
 - Teach anyone pretty quickly
 - Standardised
- Why VIPM Packages
 - Using same code throughout application



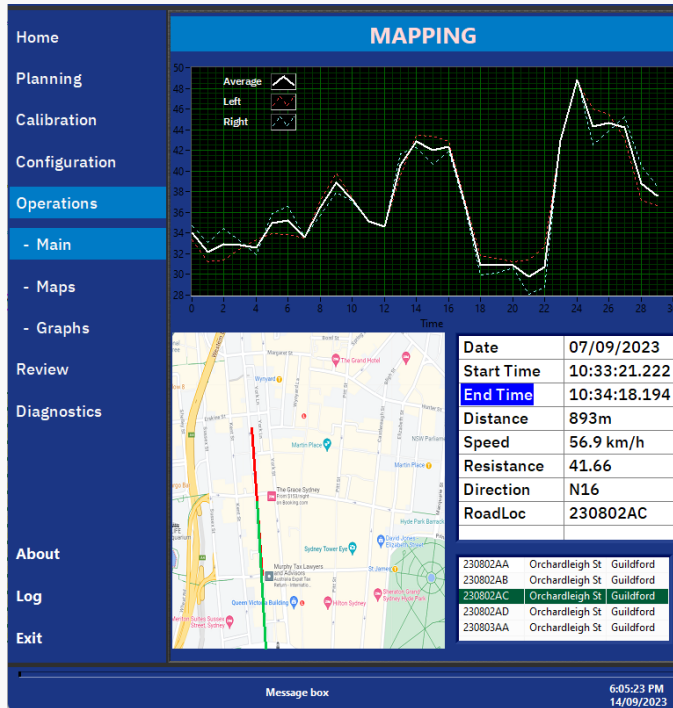


What Else

- Encourage documentation
 - SubVIs
 - Block Diagrams (case statement / while loops)
 - Git Commits
 - Release notes
- Everyone involved in integration / testing
 - Understand issues across application
- Split up “Application” and “Package” development
- Get the basics right
- Allow creativity



Examples



RF Spin Tester
Powered by Epiroc

SCRIPTS

Operate
Script
Settings
About
Log
Exit

Test 1.stp

```

Home
Wait 5
TestStart
Speed 120
Move 90 120
Wait 1
Move -90 120
Wait 1
Repeat 2 h
  
```

Time: 15 Min

APPLY CANCEL

11:19 AM
04/09/23

PLASMA
CLOUDBREAK

Operate
Plasma
- Main
- Graph
- Recipe
Toolpath
Configuration
Calibration
Diagnostics
About
Log File
Exit

X: 0.000 mm
Y: 0.000 mm
Z: 0.000 mm

Camera Run
CB_Coneysr.stp
Tutting (Sequencing)

Recipe = 4 LIN: 350W AR-02
P = 349.9 W, I = 59.4 deg
Ar = 24.0, O2 = 0.06 L/min

Forward Power: 348.78
Reflected Power: 7.33

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Complex Project Example

- Requirements
 - Production Systems to be deployed to a number of sites (globally)
 - Strong interaction with hardware, similar configuration
 - Motion / Vision / Mature Process
 - Some customisations likely
 - Client to provide 'first level support'
 - Customers buying for a decade



Demo

- Surfx Cloudbreak Application





QUESTIONS

