Hands On:
Code Review Best Practices

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Agenda

- A little background
- Group review of a VI
- Demo of some tools
- Independent review of a couple of VIs
- Discussion

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What is a Code Review?

Code review — A systematic examination of source code with the intent of finding and fixing mistakes that were overlooked during development.
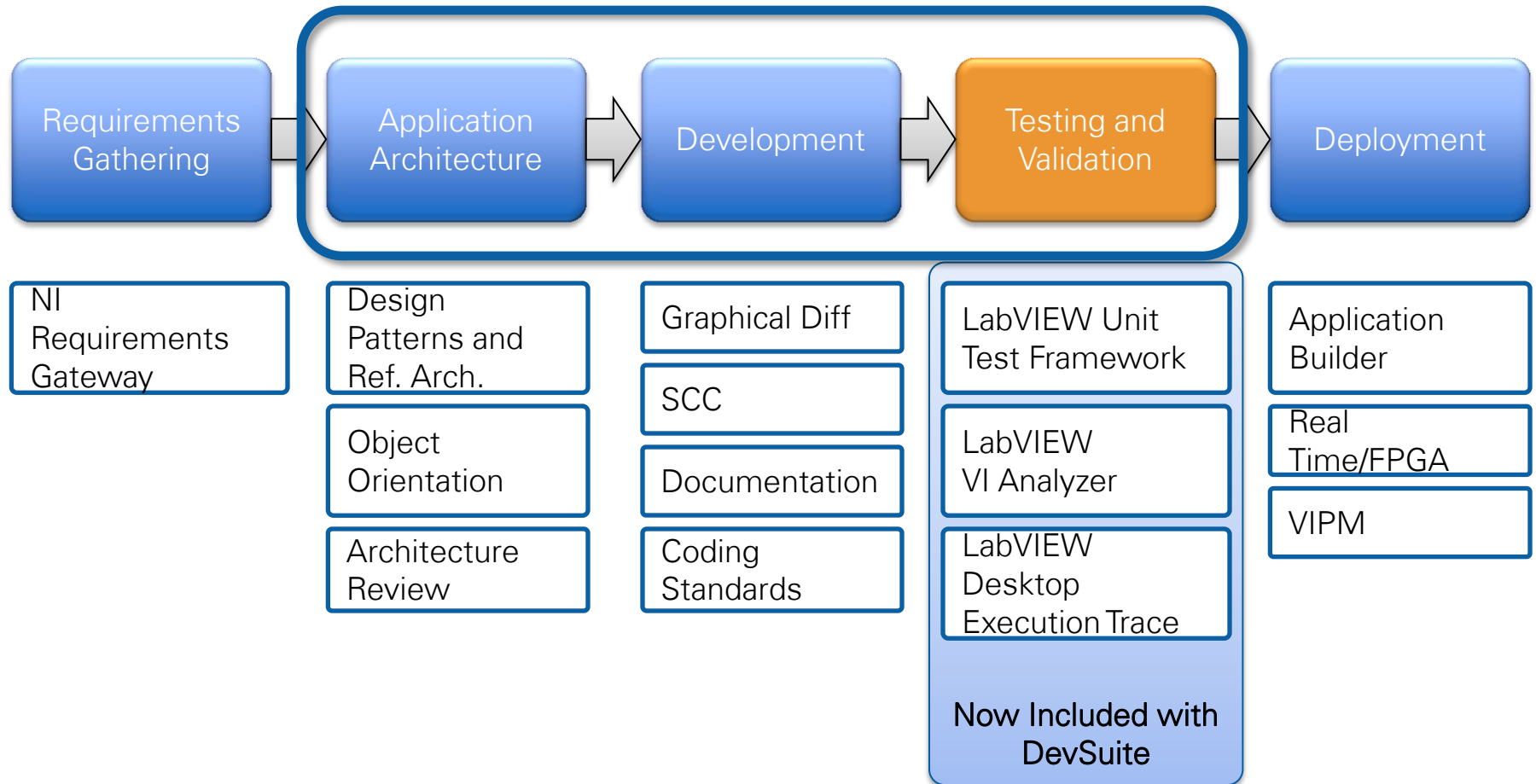
- Take others on a tour of your code

- "The best code reviews are the ones that actually get done."

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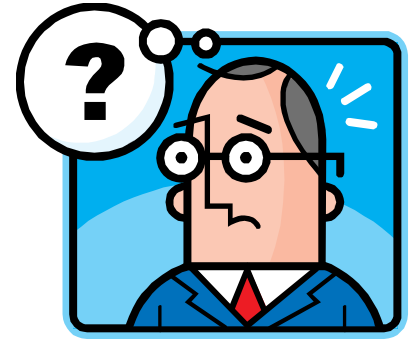
Design vs. Code Reviews

- Design reviews are done before much code is written
- Code reviews are done after the code is "done"
  - At least the part you're reviewing

- Code reviews are sometimes called "implementation reviews"

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LabVIEW and The Software Engineering Process

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┌──────────────┐    ┌──────────────┐    ┌──────────────┐    ┌──────────────┐    ┌──────────────┐
│ Requirements │ => │ Application  │ => │ Development  │ => │ Testing and  │ => │ Deployment   │
│ Gathering    │    │ Architecture │    │              │    │ Validation   │    │              │
└──────────────┘    └──────────────┘    └──────────────┘    └──────────────┘    └──────────────┘
```

NI Requirements Gateway	Design Patterns and Ref. Arch.	Graphical Diff	LabVIEW Unit Test Framework	Application Builder
	Object Orientation	SCC	LabVIEW VI Analyzer	Real Time/FPGA
	Architecture Review	Documentation	LabVIEW Desktop Execution Trace	VIPM
		Coding Standards		

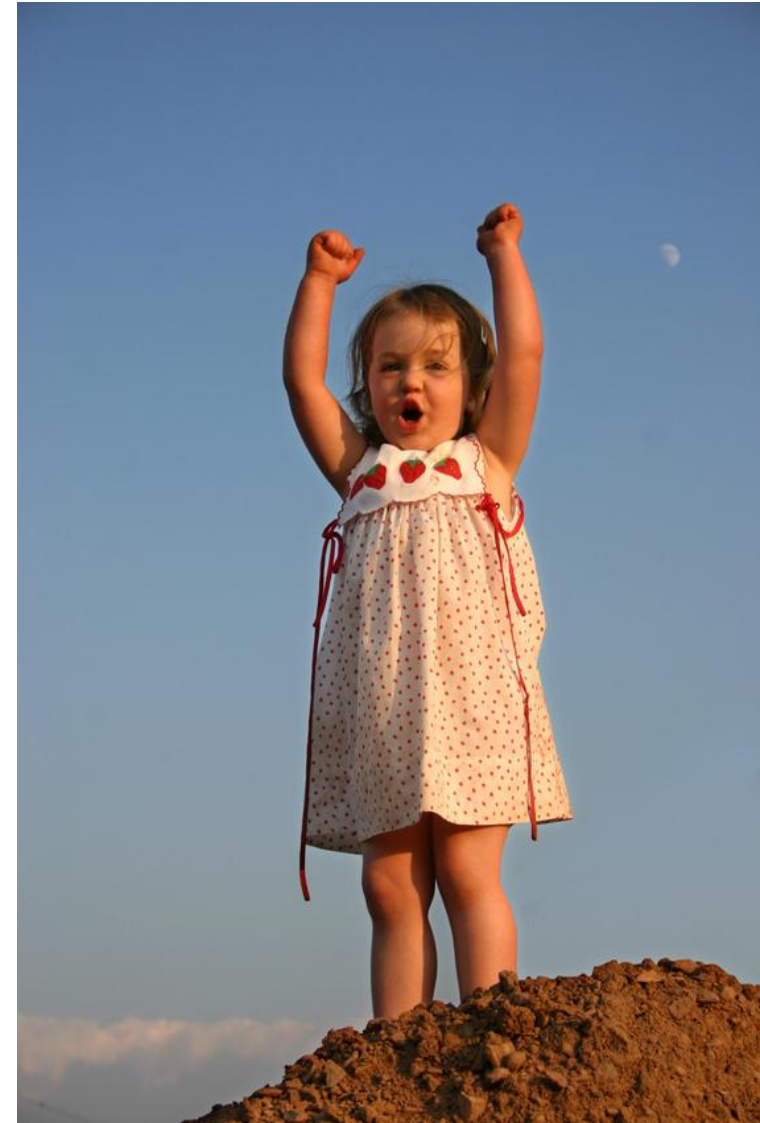**Now Included with DevSuite**

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Why even have a code review?

- Improve quality
- Force you to really look at your code
- Educate others who might need to support your code
- Share programming knowledge and techniques

Goals of Code Review

- The items to examine during a code review include the following:
    - Correctness of implementation
    - Interaction with other components
    - Robustness and error handling
    - Conformance to group's coding standards/practices
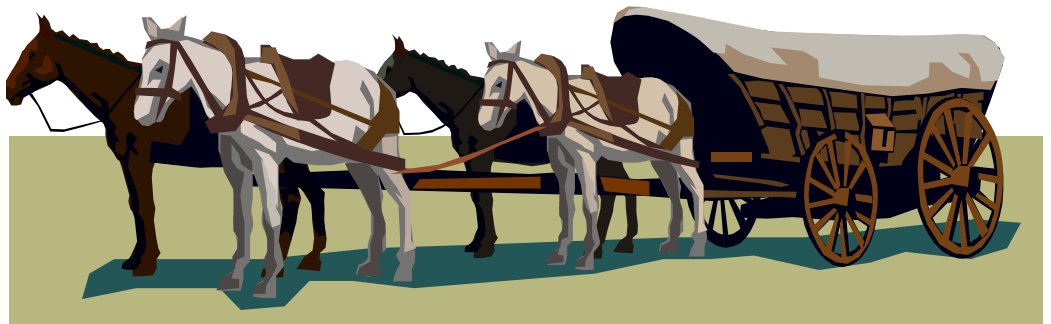   - Readability
    - Completeness

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The Code Review Process

- Prepare!
    - Make sure the code works (meets requirements)
    - Make sure the code is worthy of review
        - Documented
        - Conforms to style guidelines
        - Etc.
    - Run the VI Analyzer (and fix issues)
    - Let others review in advance offline
- Review
    - Raise issues, don't resolve them
    - Capture action items
    - Don't waste peoples' time
- Follow up
    - Address every action item
    - Consider a followup review

Review Team

- Why have a team versus a single person?
- Number of people?
  - Keep cost in mind: 2Hx5Dx5Px$100? = $5,000?
- Types of people?
  - Vested interest – tech lead, back up people, future owners
  - Wide angle view
  - Narrow view

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Some Dos and Don'ts

- Do discuss the architecture and code
- Don't review the coder
- Do discuss relevant, interesting, difficult code
- Don't discuss simple, common code
- Do make notes of things to check into
- Don't check into them during the review
- Do make notes of code to fix
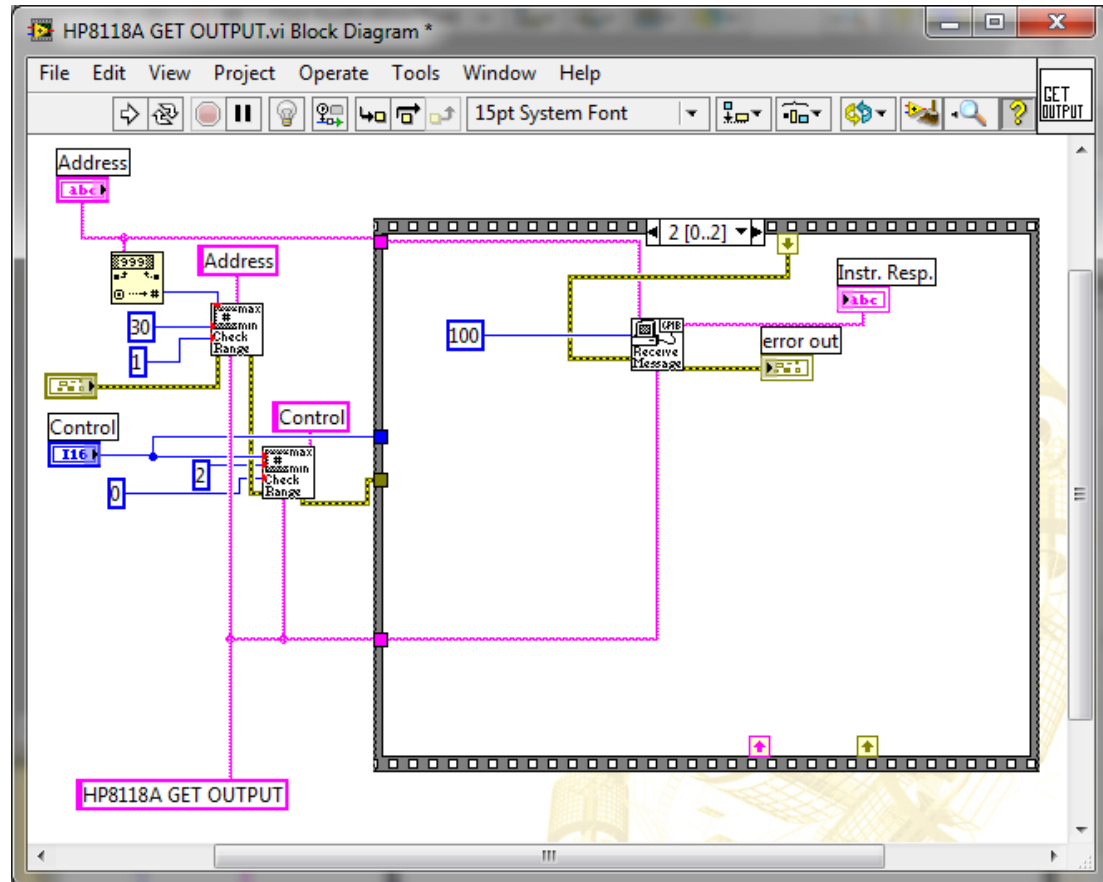- Don't edit code during the review

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Capturing Issues

- Issue tracking spreadsheet…

http://labviewjournal.com

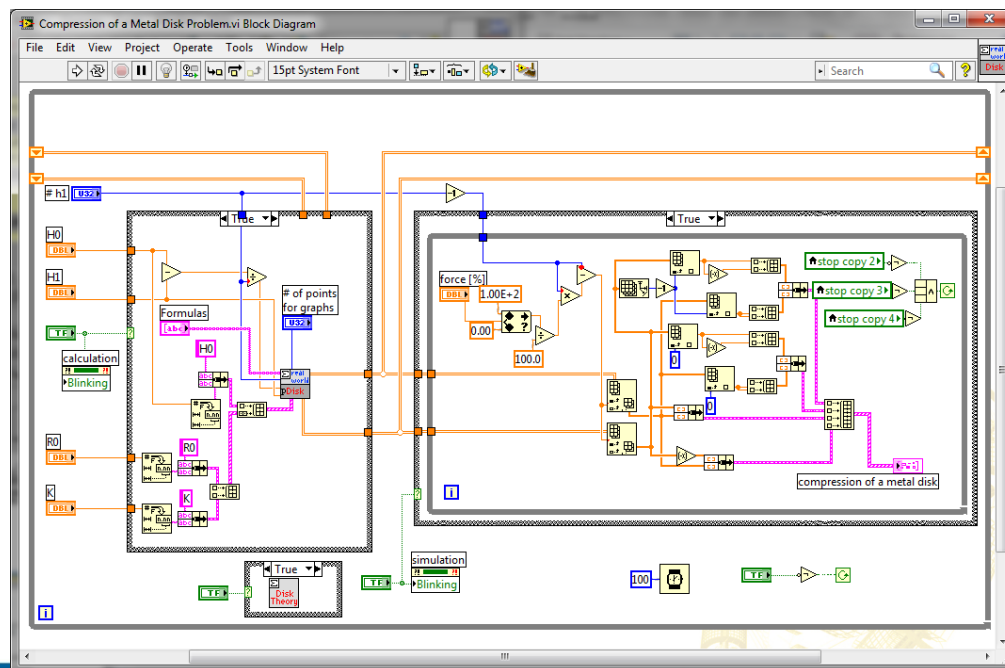|		Complete During the Review					Complete While Investigating			Complete When Issue is Resolved			
Issue ID	Issue	Issue Location	Identified By	Date Added	Issue Details	Priority	Potential Resolution	Owner	Status	Issue Resolution	Date Resolved	Reviewed By	Comments
1	Refnum Tunnels on For Loop	Display Loop	JK	7/30/1967	Need to account for potential of For Loop running 0 times.	High	Change to shift registers	NJH	Done	--	7/31/1967	BP	
2	Inconsistent use of transparency for labels	Main.vi	JK	7/30/1967		Low	Update BD Minion.vi then make changes.	NJH	Active	--			
3	Duplicate code for timing several processes	Measure Loop	JK	7/30/1967	Code was cut & pasted for timing several actions. This should be moved to library	High	Roll code into an Action Engine	NJH	Done	Needed more than one timer, so code was rolled into a DVR Library	8/7/1967	BP	
4													

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Let's Review Some Code

- Hewlett-Packard 8118A Pulse Generator Instrument Driver
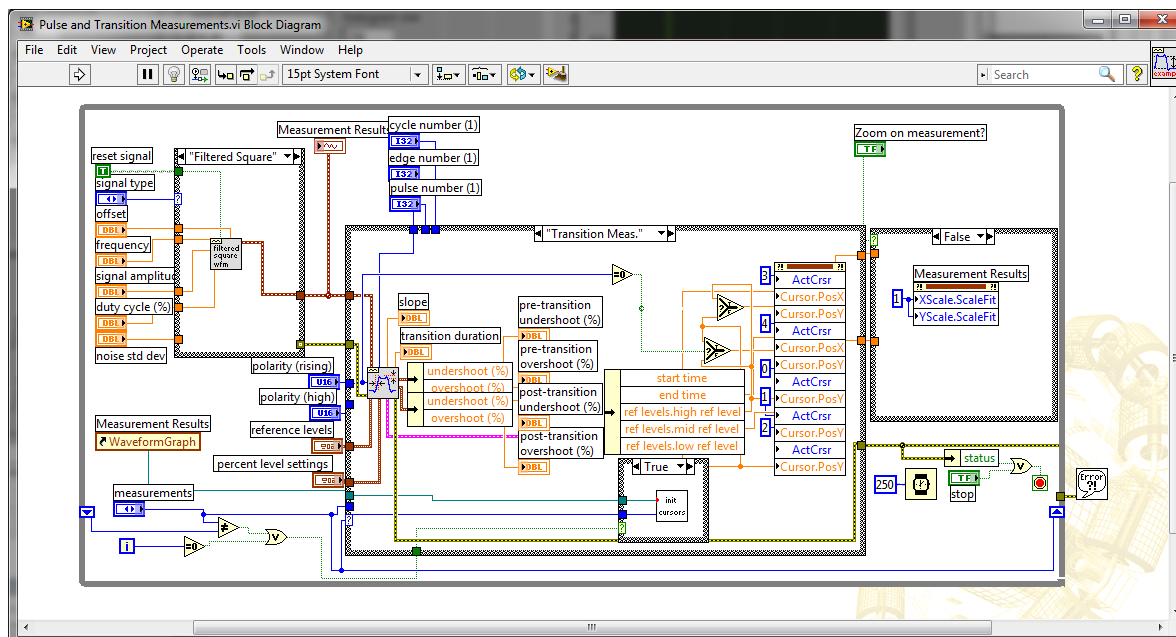
Exercise 1: Review "Compression of a Metal Disc Problem.vi"

- Help >> Find Examples
- C:\Program Files (x86)
  \National Instruments\LabVIEW 2012
  \examples\math\mechanix.llb\
  Compression of a Metal Disk Problem.vi

Exercise 2: Review "Pulse and Transition Measurements.vi"

- Help >> Find Examples
- `C:\Program Files (x86)`
  `\National Instruments\LabVIEW 2012`
  `\examples\measure\maxmpl.llb`
  `\Pulse and Transition Measurements.vi`

When You Get Home…

- Set up your style guidelines.
- Define a code review process and
  START REVIEWING YOUR CODE!

- Keep up with your skills
  - Stay current with your training. Consider intermediate and advanced courses.
  - Take advantage of NI and LAVA forums.
  - Attend user groups, CLD and CLA Summits.

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Upcoming blog post, download slides and checklist at

labviewjournal.com

Thank you!

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