Principles To Code By

Designing and Defining for Beyond Today

SMoRES 2.5

NATIONAL INSTRUMENTS

What's in it for me?

- You'll walk away with

    - 5 Core Principles of design

    - Knowledge of how these can be applied

    - Belief in the importance of applying them

    - A bucket full of tips and tricks of how to execute on them
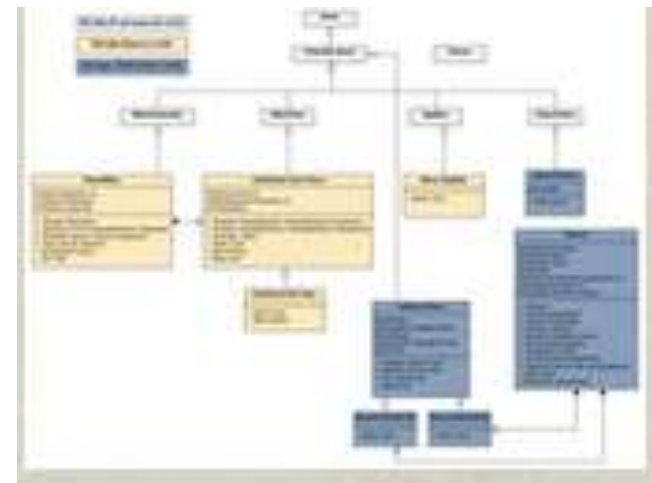   - (that's a metric bucket full…not SI)
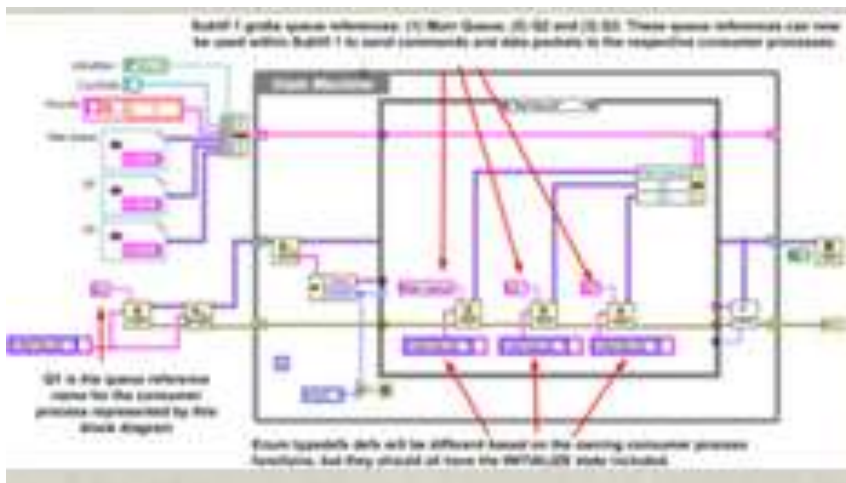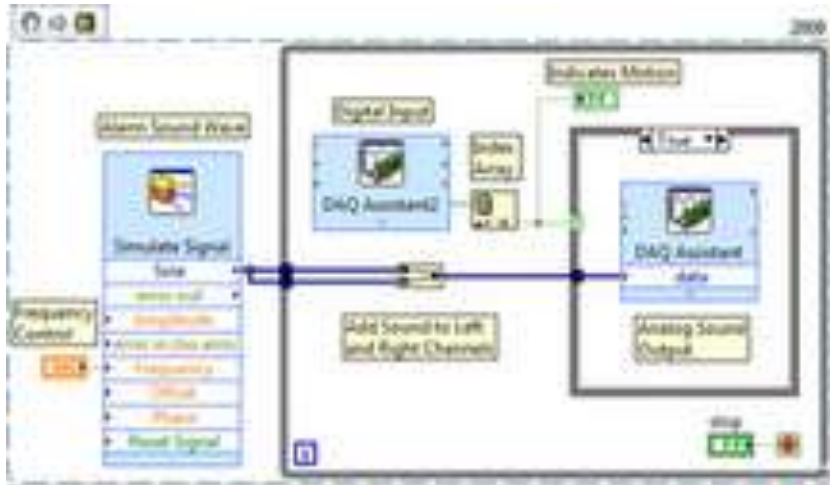
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Houston…..we have a problem

- Just because it runs, doesn't mean it's done

- We're not raising the quality bar

- Coding without vision is wiring in the dark

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What Kind of Programmer Are You?

Start forward engineering….

…. and stop reverse engineering

- Code rarely dies
  - But can turn into a zombie

- Project scope is never static
  - This shouldn't come as a shock

- Progress means forward motion
  - Stop coding yourself (or others) in circles

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Building Flexibility

[Taipei 101 Damper Movement During earthquake](#) - 750 tons

[Visible building movement](#)

NATIONAL INSTRUMENTS

SMoRES??

With every VI, ask yourself, "How can I make this….."

Tim Jones
Father of
SMoReS

- **S**calable
- **M**odular
- **R**eusable
- **E**xtensible
- **S**imple

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Can I make this…..

SMoRES

Scalable

- Going N+1
  - How about N + 50?

- Considerations
  - # of wires / readability
  - time to integrate / refactor
  - User experience

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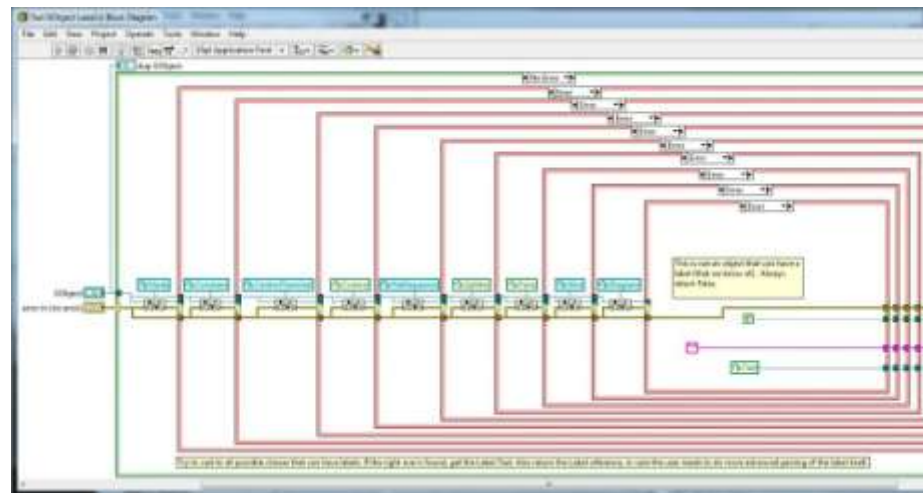
BRAINSTORM

What types of applications should we seriously consider scalability?

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Can I make this…..

Modular

- Functional containment
  - Prevents Play-Doh syndrome

- Considerations
  - What are the logical boundaries
  - How will module fit into other code
  - Ease of use

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BRAINSTORM

What should the MAIN program control?

What tasks have you struggled to make modular?

How do you know when it's time to make a subVI?

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Can I make this…..

Reusable

- Polish up that ol' function and use it again
    - …or reuse the blueprint design

- Considerations
    - One of a (kind, few, most)
    - Big or small, <u>reuse</u> is <u>time saved</u>
    - Think beyond your *immediate* use

NOTE: Just don't take the code from
your last project and call it "Reuse"
It might just be "refuse"

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What functions can your whole team share?

Discussions to have with your team about reuse?

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Extensible

- Implementation planned for future growth
  - Ability to extend a system with lowered level of effort required to implement extension

- Considerations
  - Flexible hooks/ additional inputs
  - Evaluate hot spots of growth
  - Minimize steps

Definition Source: Wikipedia

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How is this different from Scalable?

What are some features we'd want to extend?

What are the "hooks" we need to leave to have this flexibility later?

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Can I make this…..

Simple

- Balance creativity vs. complexity
  - Get creative, then get skeptical

- Considerations
  - How intuitive is design
  - Does problem warrant design
  - Good requirement gathering

Self-Operating Napkin

NOTE: Never put this S first. You'll end up with something else in the end that starts with Sh…..

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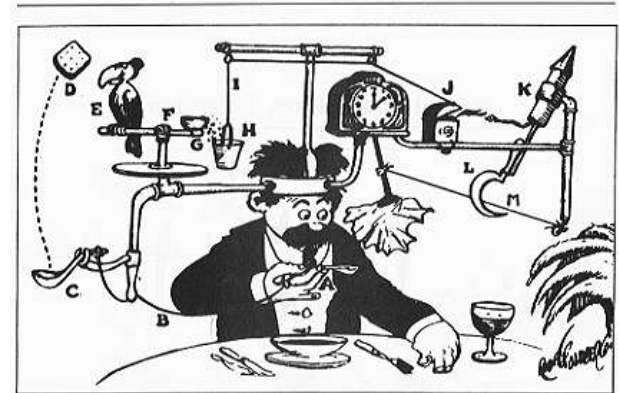
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What tripwires can we use to Keep It Simple …?

Who can we rely on to help us assess simplicity?

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So what?!

You must have wisdom to share it.

You must share wisdom to have it

~,~

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Is change good or bad?

• It is neither good nor bad...

...it is inevitable

and scary

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Process Improvement Isn't a Game

Return on Investment

- Time Needed Now > Time Available

•Time Needed Now + Time for Change >>>>> Available

It's not about how much more you'll make,…

… It's about how much less you'll lose
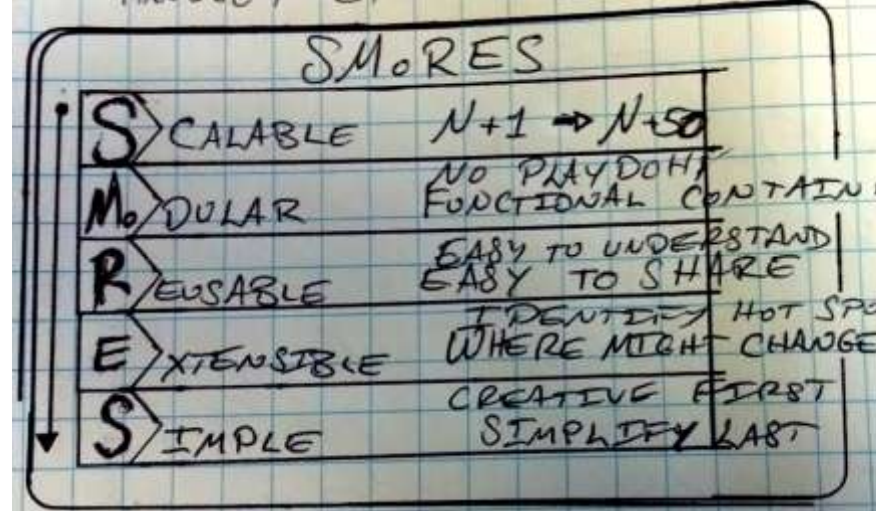
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If you can measure it, you can improve it

- First steps
  - Set a higher bar for all you do and all you see
  - Lower your threshold for pain
  - Start tracking the cost of change
    - Fixing bugs
    - Time spent reviewing code
    - Adding features

- Work towards
  - Mentorship
  - Creating your own tools
  - Becoming the center of excellence in your organization

Questions?

Topics Covered:

Going N+1 : Techniques for scalability

Avoiding Functional Play-Doh : Establishing proper boundaries

Recycling Wires : Creating with 80% recovered material

App Store for your App : Building on the shoulders of your genius

Getting creative, then getting realistic : Polar bears don't need A/C

Making the Dream a Reality : Pulling teeth from a shark

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