

Beyond Process

A Challenge for SPINs

SPICON

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CISQ

Consortium for IT Software Quality

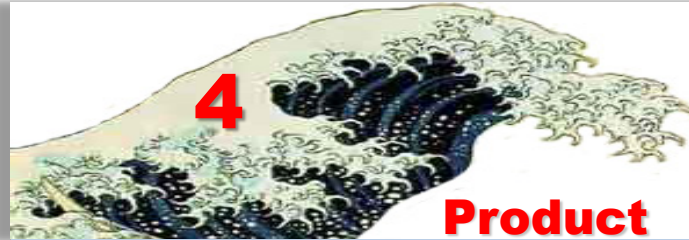
International Standards for
Automating Software Size and
Structural Quality Measurement



5th Wave in Software Engineering



What: Industrialize, DevOps, Value chain
When: 2015→
Why: Increase efficiency, speed of delivery



What: Architecture, Structural measures, Reuse
When: 2002→
Why: Improve engineering of software products



What: CMM, ITIL, PMBOK, Agile
When: 1990-2002
Why: Improve software management and discipline

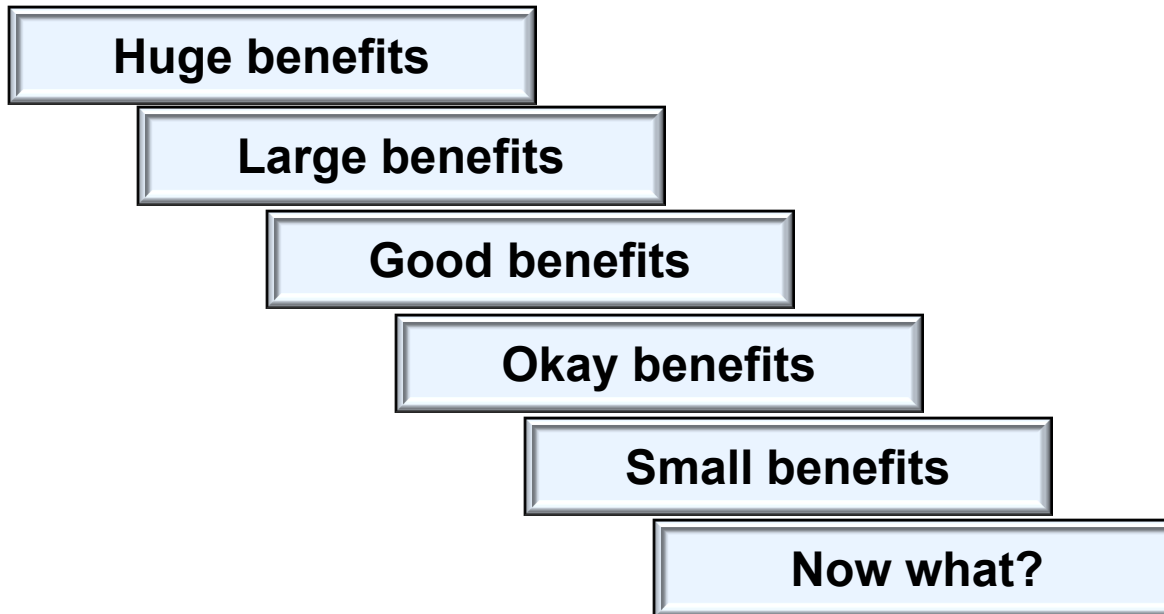


What: Design methods, CASE tools
When: 1980-1990
Why: Give developers better aids to construct systems



What: 3rd & 4th generation languages, structured programming
When: 1965-1980
Why: Give developers greater power for expressing programs

Six Sigma projects must have significant benefits

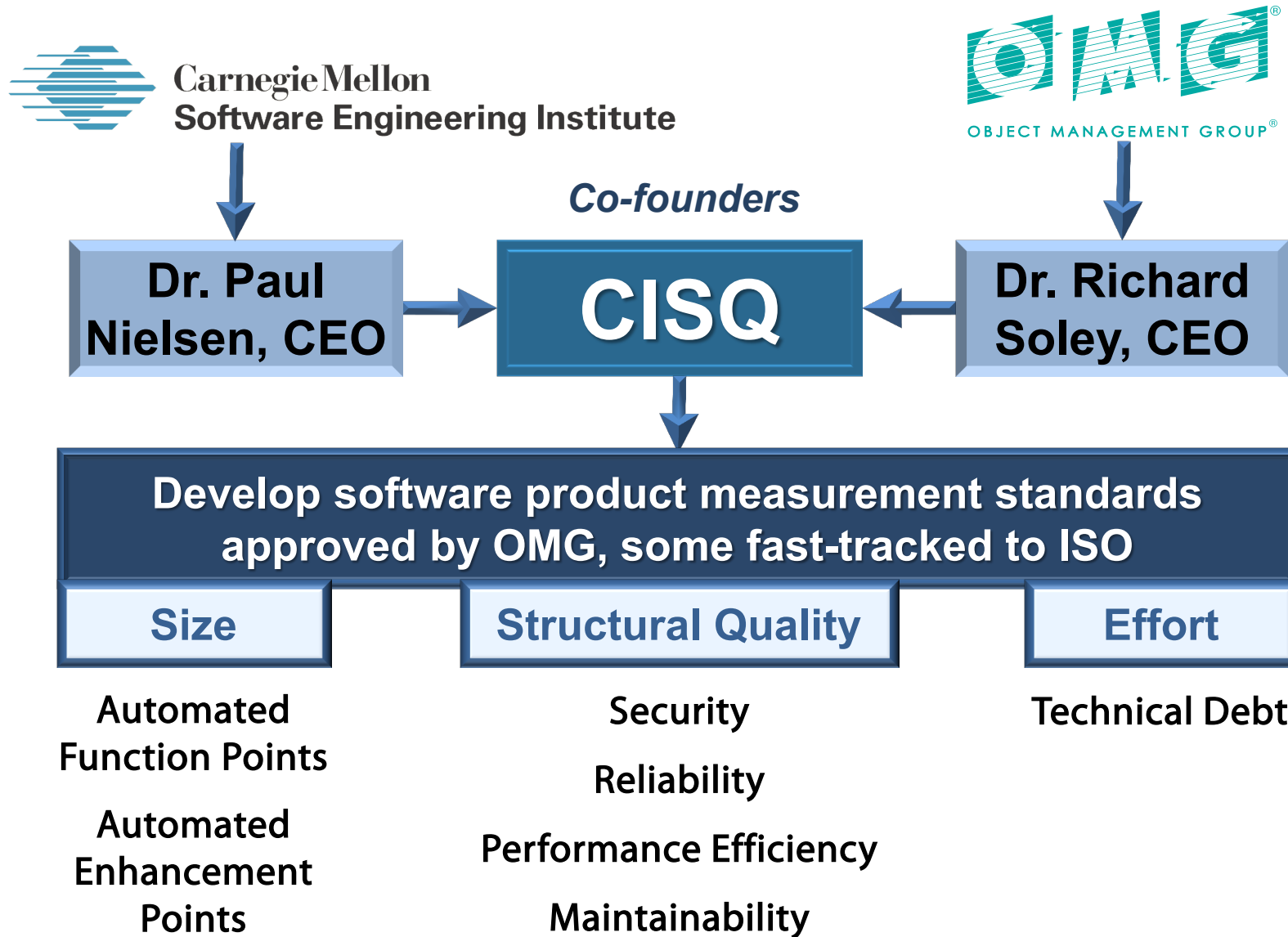


Ultimately we run out of projects with enough benefits to continue the program....

How do we continue improvement?

Process focus – process improvement – *Six Sigma*

Product focus – product improvement – *Design for 6σ*



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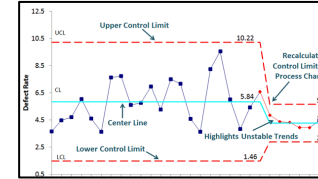
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CISQ Structural Quality Measures

Security

- **SQL injection**
- **Cross-site scripting**
- **Buffer overflow**

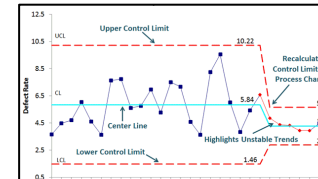


$$\hat{Y} = \mathbf{a}_1 \mathbf{x}_1 = \mathbf{a}_2 \mathbf{x}_2 + \varepsilon$$

DPMO Hotspots

Reliability

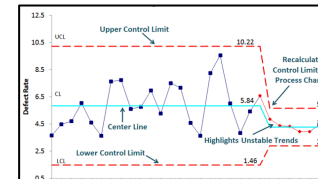
- Empty exception block
- Unreleased resources
- Circular dependency



$$\hat{Y} = \underset{\text{DPMO}}{a_1 x_1} = \underset{\text{Hotspots}}{a_2 x_2} + \varepsilon$$

Performance Efficiency

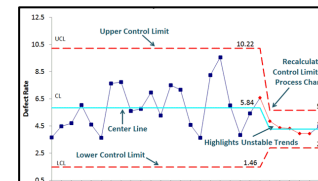
- **Expensive loop operation**
- **Un-indexed data access**
- **Unreleased memory**



$$\hat{Y} = \underset{\text{DPMO}}{a_1 x_1} = \underset{\text{Hotspots}}{a_2 x_2} + \varepsilon$$

Maintainability

- **Excessive coupling**
- **Dead code**
- **Hard-coded literals**



$$\hat{Y} = \mathbf{a}_1 \mathbf{x}_1 = \mathbf{a}_2 \mathbf{x}_2 + \varepsilon$$

DPMO Hotspots

TRUSTWORTHY SYSTEMS MANIFESTO

We hold these truths to be self-evident

1. Engineering discipline in product and process
2. Quality assurance to risk tolerance thresholds
3. Traceable properties of system components
4. Proactive defense of the system and its data
5. Resilient and safe operations

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