Soil Moisture Active Passive Mission

SMAP

Automating Software Engineering
For non-Software Engineers and Scientists

Al Niessner
Jet Propulsion Laboratory, California Institute of Technology
Agenda

- Acknowledgements
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- Original Engineering Workflow
- New Engineering Workflow
- Consequences
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- Editor, Editor, Editor
- Conclusion
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Product Generation Process

- Multiple meanings
- Well defined flow
- Structured software
Original Engineering Workflow

- Chaotic
  - Indirect
  - Error prone
  - Stressful
  - Incoherent
New Engineering Workflow

- **Structured**
  - Direct
  - Error reducing
  - Relaxing
  - Coherent (single source)
Consequences

- **Affirmations**
  - Higher level of abstraction improves productivity
  - DSL was more acceptable than UML to the specification maintainers

- **Beneficial**
  - Improved software interface management
  - Uniform software engineering practices
  - Improved communications
  - Reduced labor force

- **Detrimental**
  - Management lack measures
  - Specification maintainers lack software engineering expertise
  - Reduced labor force
Return on Investment

- Two groups
  - Control
  - Automated

- Development
  - Same
    - Libraries
    - Framework
    - Static analysis
  - Different
    - Science
    - Response to static analysis

- Savings = [(control cost per PGE) – (automated cost per PGE)] * (total PGEs) – (DSM development) = 5 man-year
From detrimental consequences:

- Specification maintainers lack software engineering expertise
- Has to be natural for the maintainer
- Has to hide the computer science elements
Conclusion

- Big win for SMAP even if they do not realize it
- Lots of similar situations waiting for DSM
- Editor is critical!