Model-Based Engineering Session

Software Engineering Institute
Carnegie Mellon University
Pittsburgh, PA 15213

Julien Delange
11/12/2013

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
12 NOV 2014	**N/A**	

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Model-Based Engineering Session	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
Delange /Julien	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)	8. PERFORMING ORGANIZATION REPORT NUMBER
Software Engineering Institute Carnegie Mellon University Pittsburgh, PA 15213	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release, distribution unlimited.

13. SUPPLEMENTARY NOTES
The original document contains color images.

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**SAR**	**9**	

This material is based upon work funded and supported by the Department of Defense under Contract No. FA8721-05-C-0003 with Carnegie Mellon University for the operation of the Software Engineering Institute, a federally funded research and development center.

DM-0001794

Safety-Critical Software, facts

Safety-Critical Systems are becoming software

Today's cars usually contains mor

Application in all domain (av

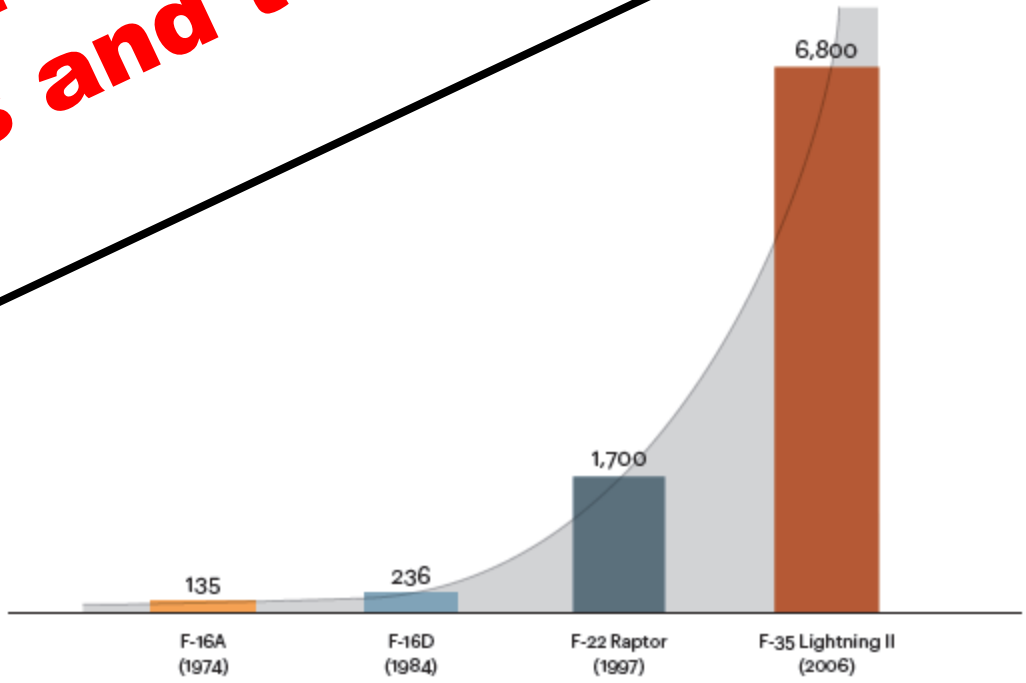
Software size is grow

… but

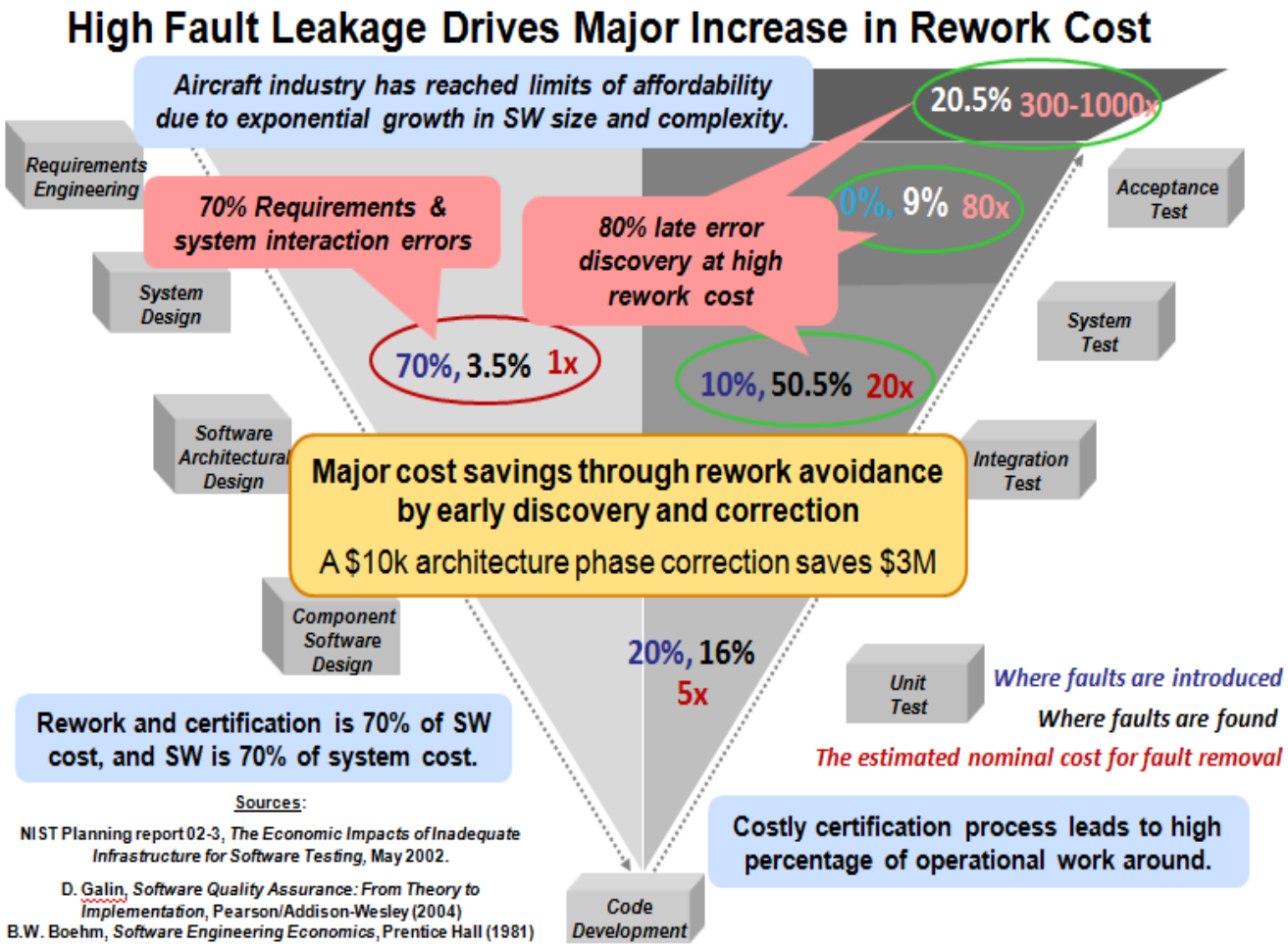
Increase

Le ework

Need to find new development methods and tools



Understanding Actual Software Issues



The Model-Based Approach

Abstract System Representation

- Hide and delegate implementation details to tools
- Highlight Software or System important concerns

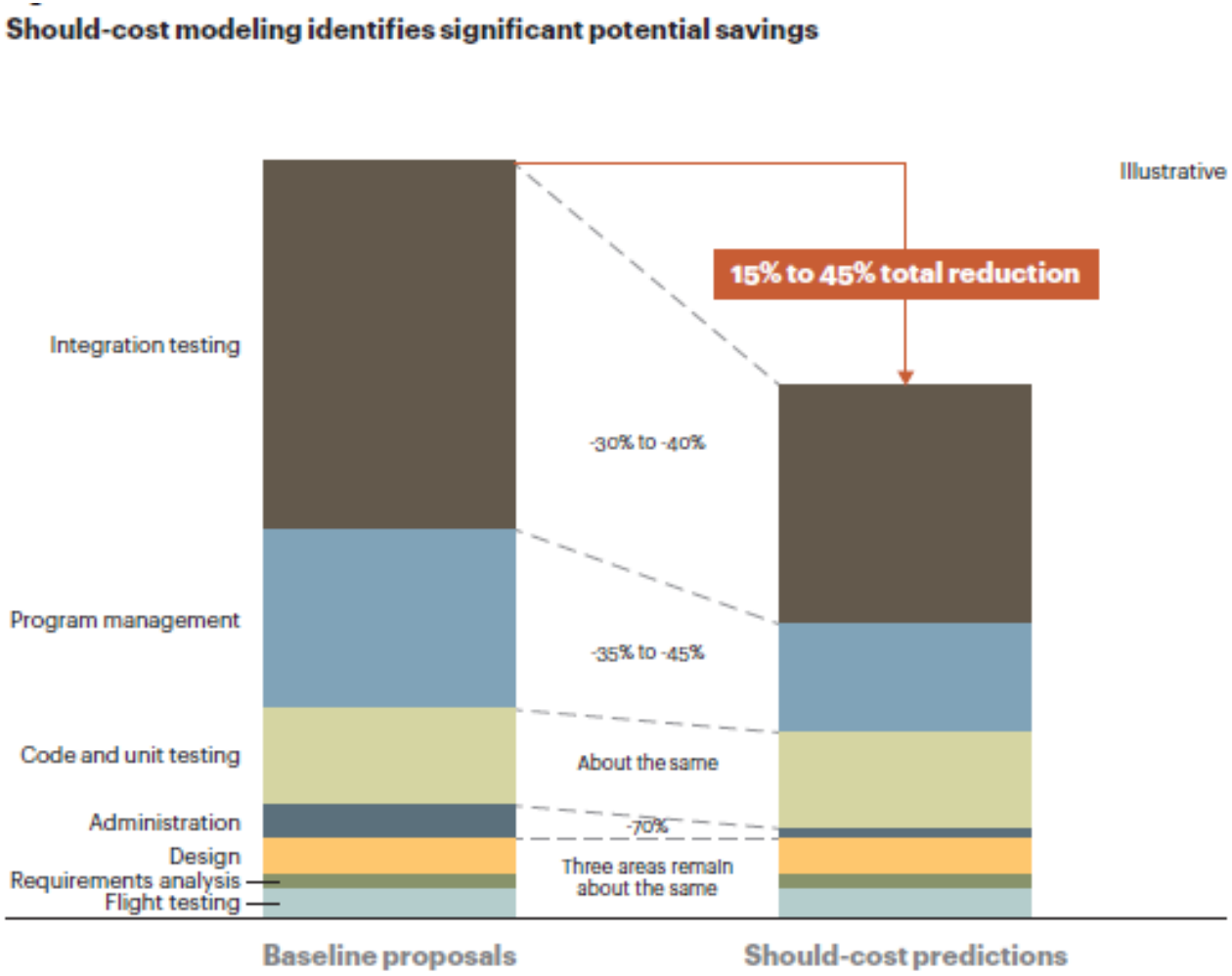
Separate domains of engineering

- Functional models for representing control laws
- Architecture models to validation components deployment

Automate the development process

- Avoid manual efforts (code production, system validation)
- Support each development step (design, development, etc.)

Model-Based Cost Expected Benefits



Model-Based, other benefits

Management of Product Lines

- Components variability
- Reuse of existing certification/validation artifacts

Detect components integration issues

- Before implementation efforts
- Check system requirements enforcement before testing

Facilitate validation/verification/certification activities

- Generation of documentation
- Use of Model-Based Verification

Model-Based Engineering at HILT2014

- *"AADL and Model-Based Engineering"* - **Peter Feiler**
- *"Resolute: An Assurance Case Language for Architecture Models"* – **John Backes**
- **More to come after!**
- **5 papers (almost 50%!) have a focus on Model-Based Engineering**
- **Common objectives with the initial SIGAda conference**

Contact

Julien Delange
Software Engineering Institute
Telephone: +1 412-268-9652
Email: jdelange@sei.cmu.edu

U.S. Mail
Software Engineering Institute
Customer Relations
4500 Fifth Avenue
Pittsburgh, PA 15213-2612
USA

Web
www.sei.cmu.edu
www.sei.cmu.edu/contact.cfm

Customer Relations
Email: info@sei.cmu.edu
Telephone: +1 412-268-5800
SEI Phone: +1 412-268-5800
SEI Fax: +1 412-268-6257