Socially-related Lean Enablers for Managing Engineering Programs

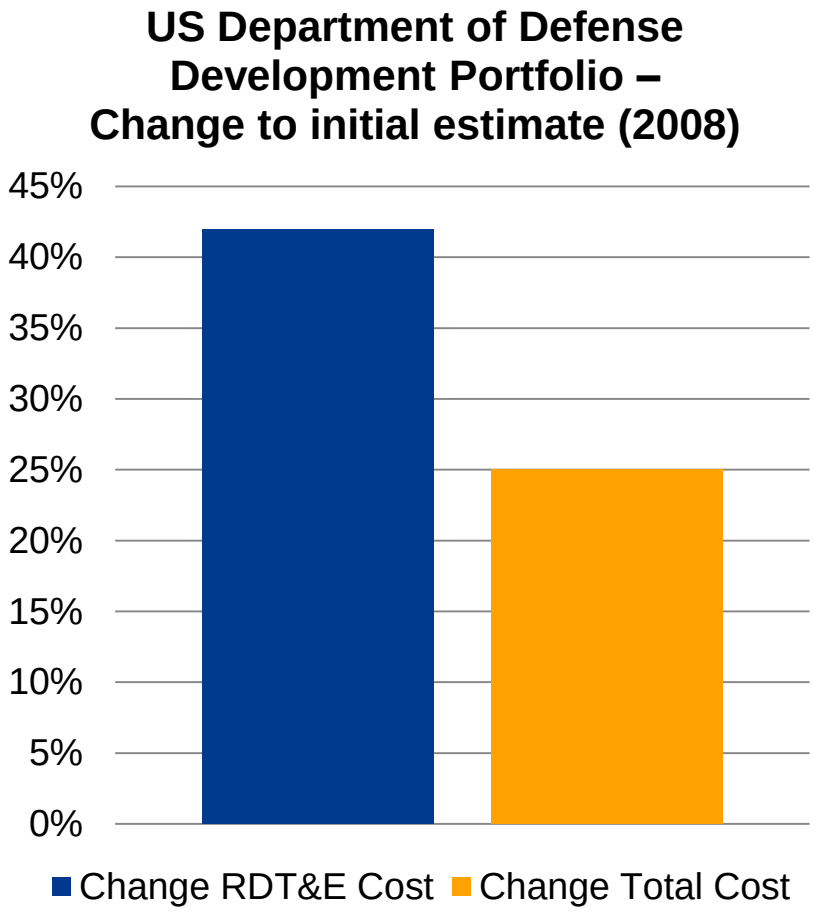
MIT LAI Knowledge Exchange Event – April 10 2012

Dr. Josef Oehmen

Outline

- Context and Motivation: The Lean Enablers for Managing Engineering Programs
- Lean Thinking
- Lean Enablers to Treat People as Your Most Important Asset
- Lean Enablers and Program Success

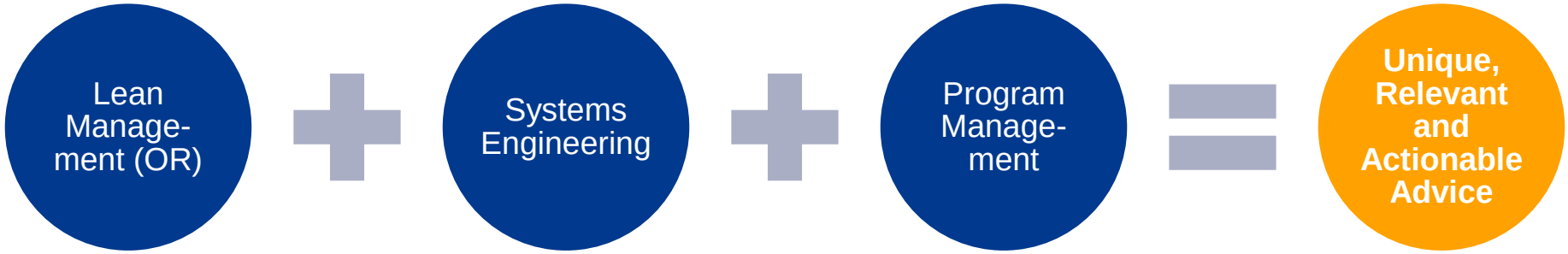
Motivation - Management of Large-Scale Engineering Programs: The US Department of Defense Example



- Total cost overrun: **$296 billion**
- Average schedule overrun: **22 months**
- Similar situation in other industries

Sources: GAO 06-368, Bloomberg, GAO 10-374T

Study Design: Innovation by Bridging Knowledge Domains



Unique	Relevant	Actionable
• Three world-class organizations and thought leaders joined forces • Industry, government and academia participation	• Massive challenges in program execution: Cost and schedule overruns • Integration of knowledge and professional domains • Extensively validated	• Concrete advice • Mapped to known challenges and existing standards • Guidance for implementation

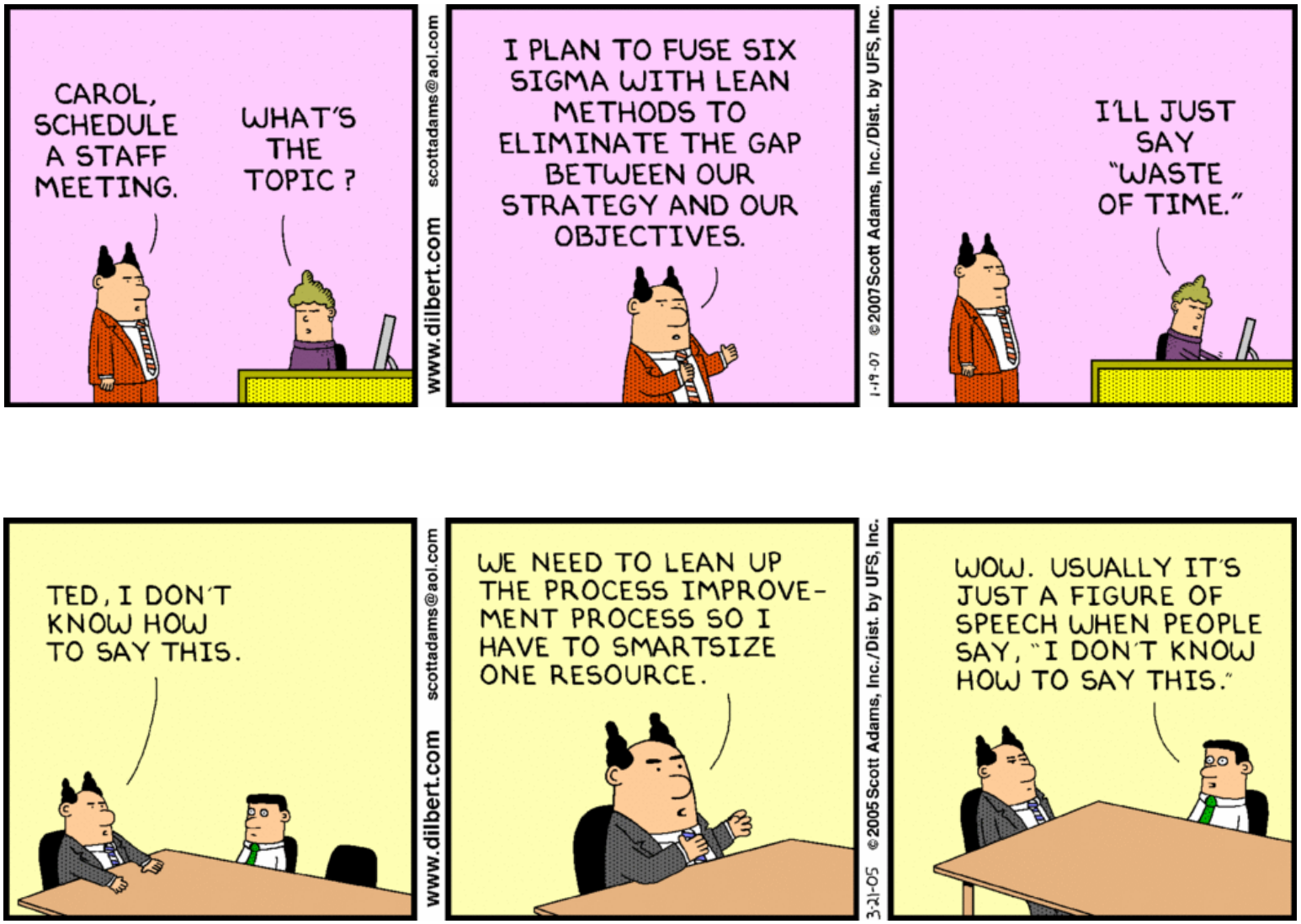
2 Core Results:

- 160 **Program Management Challenges** in 10 Themes
- 300 **Lean Enablers** (= Management Best Practices) in 40 areas

Development Process

- Based on **concrete challenges**, not thin air
- Incorporates **start-of-the-art knowledge** from literature
- Developed by group of 15 **subject matter experts** through year-long, weekly meetings
- Feedback through wider **community of practice** (100+ members)
- Discussed at **4 large and very successful workshops**, involving both PMI and INCOSE members
- Backed-up by **two validation surveys**
- Validated by **content analysis** management practices of highly successful programs

Lean Management: Buzz-Word and Firing People?

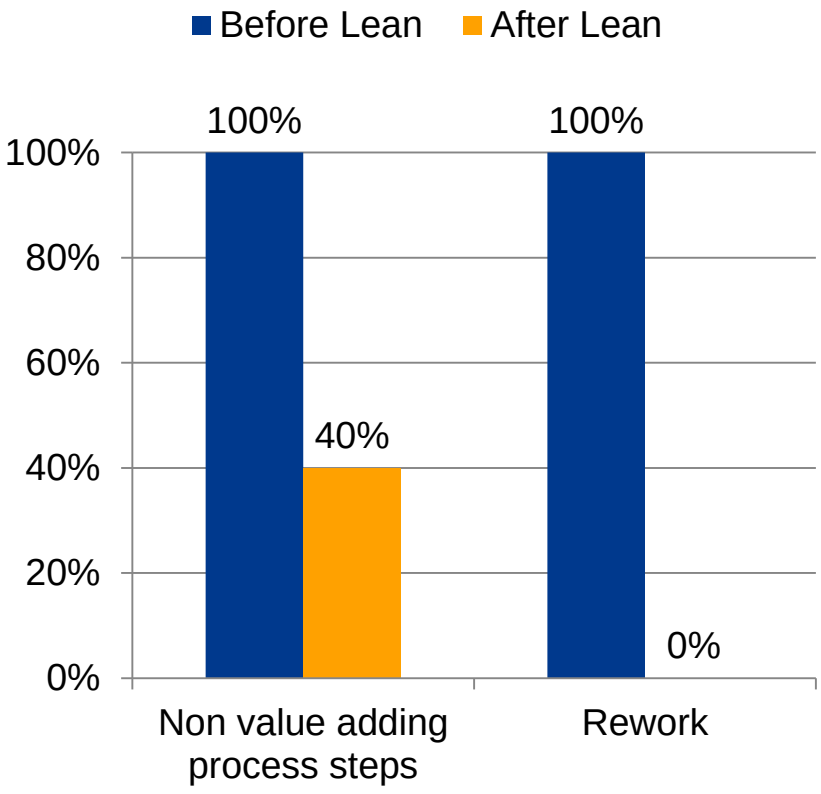


Source: dilbert.com

Lean can do that!

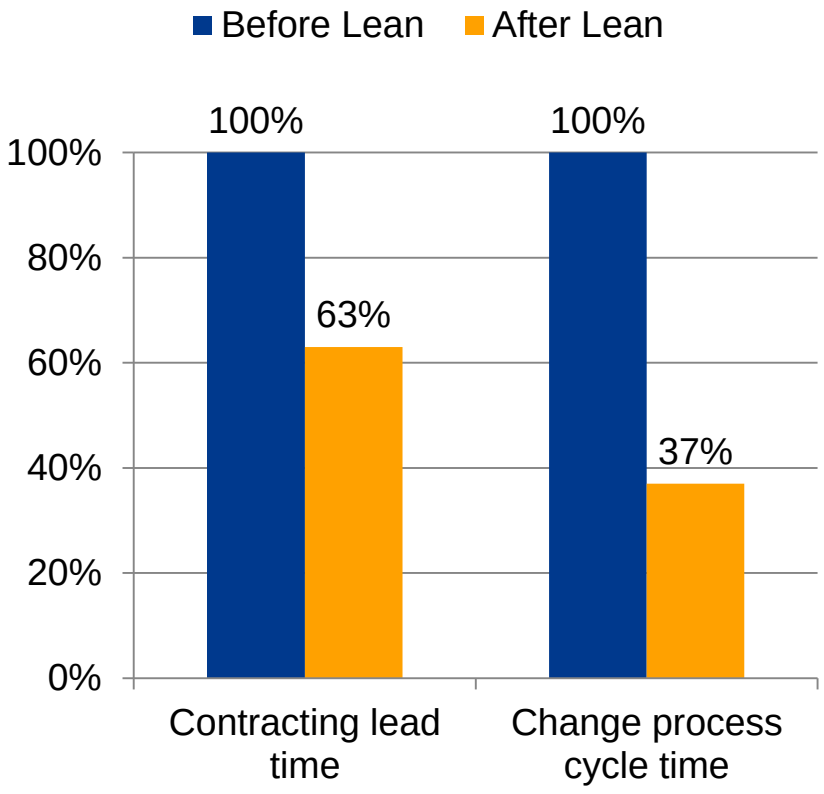
F/A-22 – Op. Flight Program

(relative figures)



Global Hawk Program

(relative figures)



Sources: Oehmen, Rebentisch 2010: Compilation of Lean Now! Project Reports // Pictures: defenseindustrydaily.com
Additional Reading: Murman et al, Lean Enterprise Value

The Strengths of Lean: Value-Focus and Integration

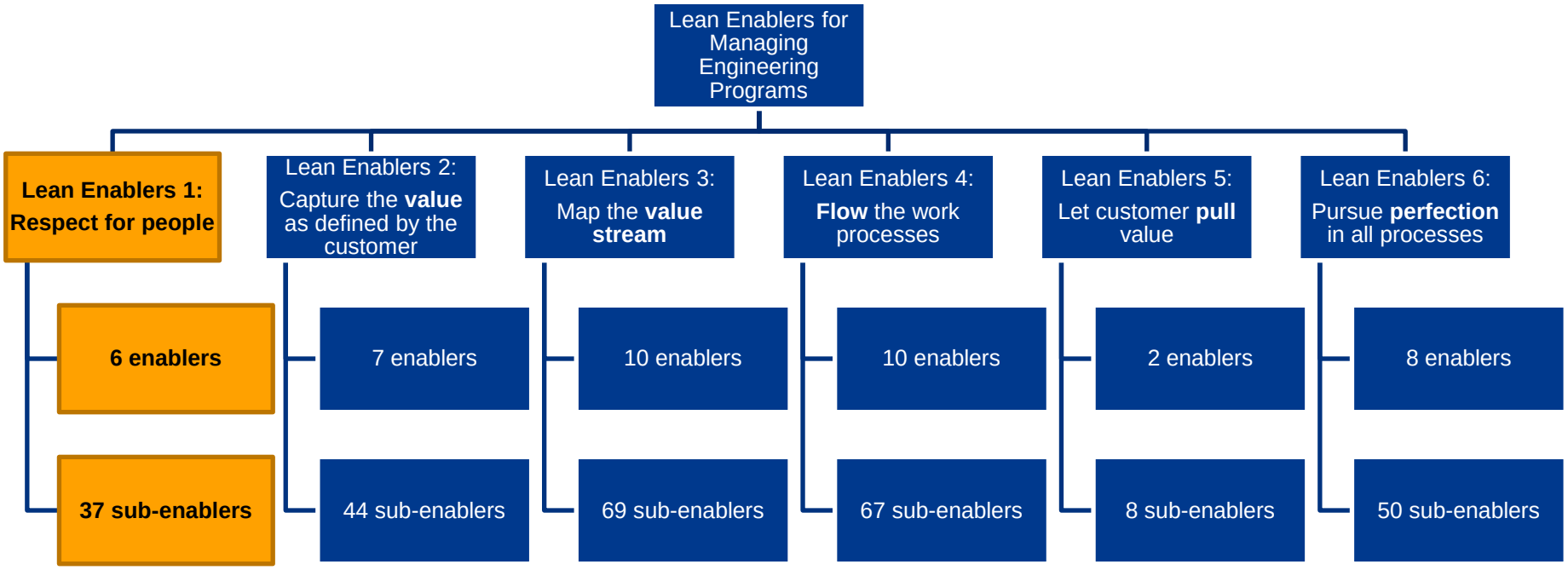
Lean Thinking focusses on 6 Principles:

1. Define **value** to the program stakeholders
2. Plan the **value-adding stream** of work activities during the product lifecycle, from the need to product delivery, until disposal, while eliminating waste
3. Organize the value stream as an uninterrupted **flow** of predictable and robust tasks, proceeding without rework or backflow
4. Organize the **pull** of the work-in-progress as needed and when needed by all receiving tasks
5. Make all imperfections visible and pursue **perfection**, i.e. the process of never ending improvement
6. Base human relations on **respect** for people

Why is Toyota not afraid to show its production shop floor to everyone?

Why do they practically volunteer to explain their processes?

Lean Enablers: 300 Best Practices in 40 Categories



Lean Enablers to Treat People as Your Most Important Asset (Lean Principle 6)

1. Build a program culture based on respect for people

2. Motivate by making the higher purpose of the program and program elements transparent
3. Support an autonomous working style
4. Expect and support people in their strive for professional excellence and promote their careers

Watch Dan Pink at:
http://www.youtube.com/watch?v=u6XAPnuFjJc

5. Promote the ability to rapidly learn and continuously improve
6. Encourage personal networks and interactions

 Source: danpink.com

1.1: Build a Program Culture Based on Respect for People

1. Understand that programs fail or succeed primarily based on people, not process. Treat people as the most valued assets, not as commodities.

2. Invest in people selection and development to address enterprise and program excellence. Ensure that hiring process matches the real needs of the program for talent and skill.
3. Hire people based on passion and "spark in the eye" and broad professional knowledge, not only based on very specific skill needs (hire for talent, train for skills). Do not delegate this critical task to computers scanning for keywords.

4. When staffing the top leadership positions (including the program manager), choose team players and collaboratively-minded individuals over perfect-looking credentials on paper.
5. Program leadership must be a mentor and provide a model for desired behavior in the entire program team, such as trust, respect, honesty, empowerment, teamwork, stability, motivation and drive for excellence.
6. Practice "walk-around management". Do not manage from cubicle; go to the work and see for yourself

7. Reward based upon team performance, and include teaming ability among the criteria for hiring and promotion. Encourage teambuilding and teamwork.
8. Build a culture of mutual trust and support (there is no shame in asking for help).
9. Promote close collaboration and relationship between internal customers and suppliers. Do not allow "lone wolf behavior"
10. When resolving issues, attack the problem, not the people.

1.2: Motivate by making the higher purpose of the program and program elements transparent

1. Create a shared vision which draws out and inspires the best in people
2. Ensure everyone can see how their own contributions contribute to the success of the program vision

 Source: talismancoins.com, fanpop.com

1.3: Support an autonomous working style

1. Use and communicate flow down of Responsibility, Authority and Accountability (RAA) to make decisions at lowest appropriate level
2. Eliminate fear from the work environment: Promote conflict resolution at the lowest level.
3. Allow certain amount of "failure" in a controlled environment at lower levels, so people can take risk and grow by experience
4. Within program policy and within their area of work, empower people to accept responsibility and take action. Promote the motto “rather ask for forgiveness than permission.”
5. Keep management decisions crystal clear while also empowering and rewarding the bottom - up culture of continuous improvement and human creativity and entrepreneurship

1.4 Expect people to and support them in their strive for professional excellence, and support their careers

1. Establish and support Communities of Practice.
2. Invest in Workforce Development.
3. Ensure tailored Lean training for all employees
4. Give leaders at all levels in - depth Lean training.
5. Promote and honor professional meritocracy.
6. Establish a highly experienced core group ("grayhairs") that leads by example and institutionalizes positive behavior
7. Perpetuate professional excellence through mentoring, friendly peer-review, training, continuing education, and other means.

1.5 Promote the ability to rapidly learn and continuously improve

1. Promote and reward continuous learning through education and experiential learning
2. Provide easy access to knowledge experts as resources and for mentoring, including "friendly peer review"
3. Value people for the unconventional ideas they contribute to the program with mutual respect and appreciation
4. Capture and share tacit knowledge to stabilize the program when team members change
5. Develop standards paying attention to human factors, including level of experience and perception abilities
6. Immediately organize quick training in any new standard to ensure buy-in and awareness

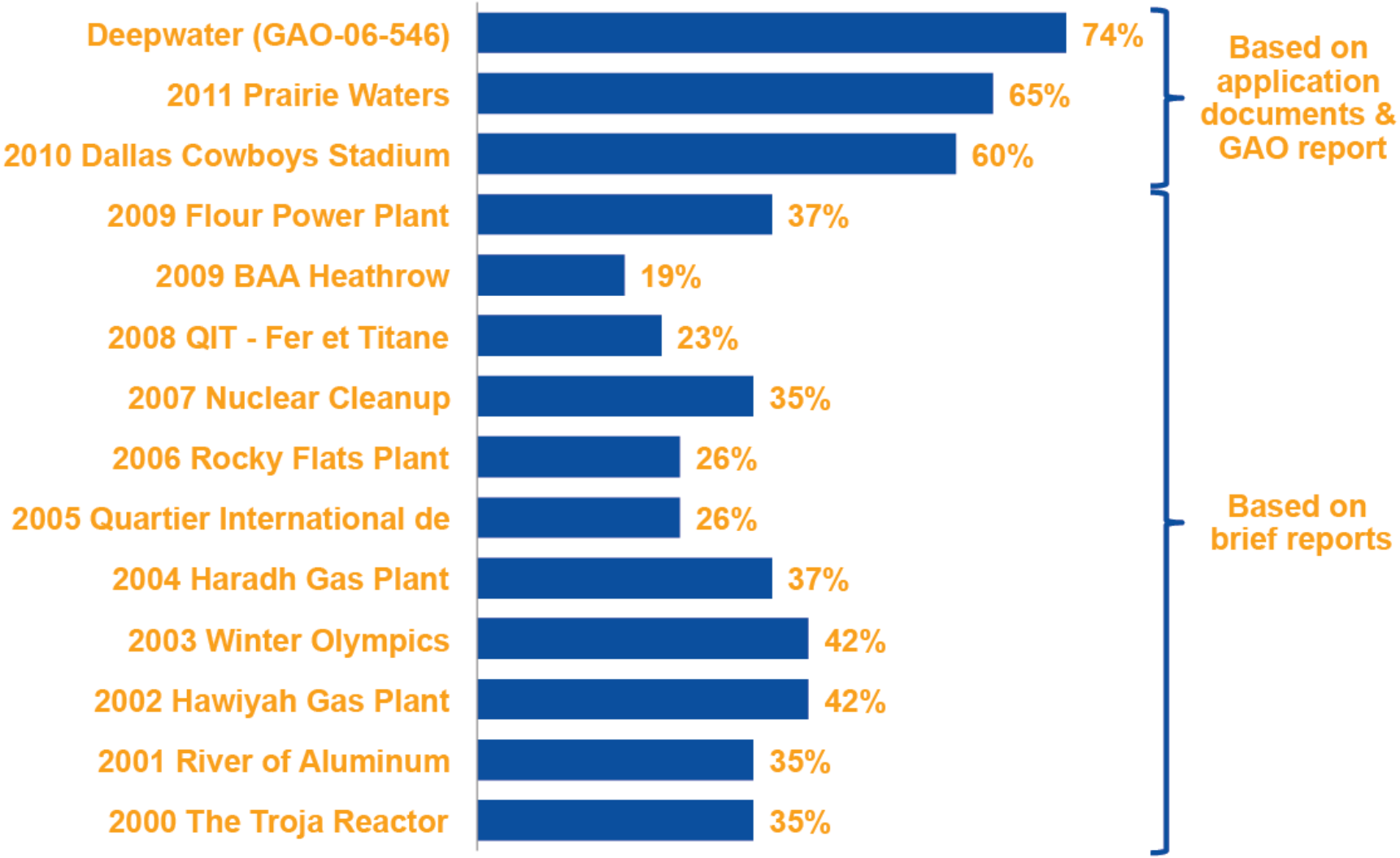
1.6: Encourage personal networks and interaction

1. Prefer physical team co - location to the virtual co - location.
2. For virtually co-located teams, invest time and money up-front to build personal relationship in face-to-face settings
3. Promote direct human communication to build personal relationships

4. Engage in boundary spanning activities across organizations in the enterprise (e.g., value stream mapping)
5. Engage and sustain extensive stakeholder interactions
6. Program manager must have respect and personal relationship with all four main stakeholder groups: customers, superiors, program employees and key contractors/suppliers.

7. Support the development of informal and social networks within the program and to key stakeholders in the program environment
8. Encourage (and document when appropriate) open information sharing within the program

Application of Lean Enablers – The more detailed the reports, the more Enablers we found



Most popular vs rarely used enablers

Almost always found

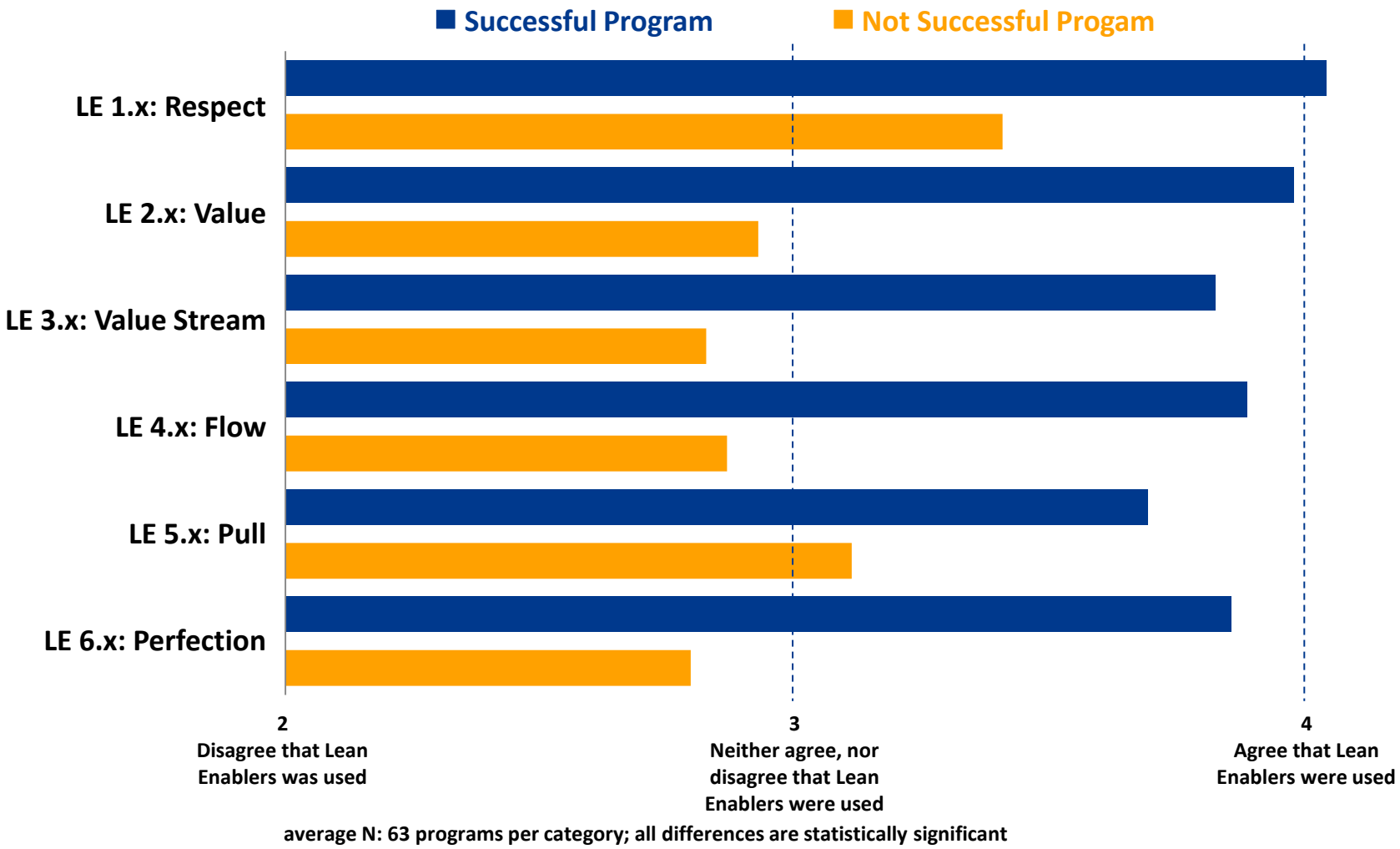
- **Build a program culture based on respect for people**
- For every program, use a program manager role to lead and integrate program from start to finish
- Frequently engage the stakeholders throughout the program lifecycle
- Develop a Communications Plan

Rarely found

- Pull tasks and outputs based on need, and reject others as waste
- Pursue Lean for the long term
- Use probabilistic estimates in program planning

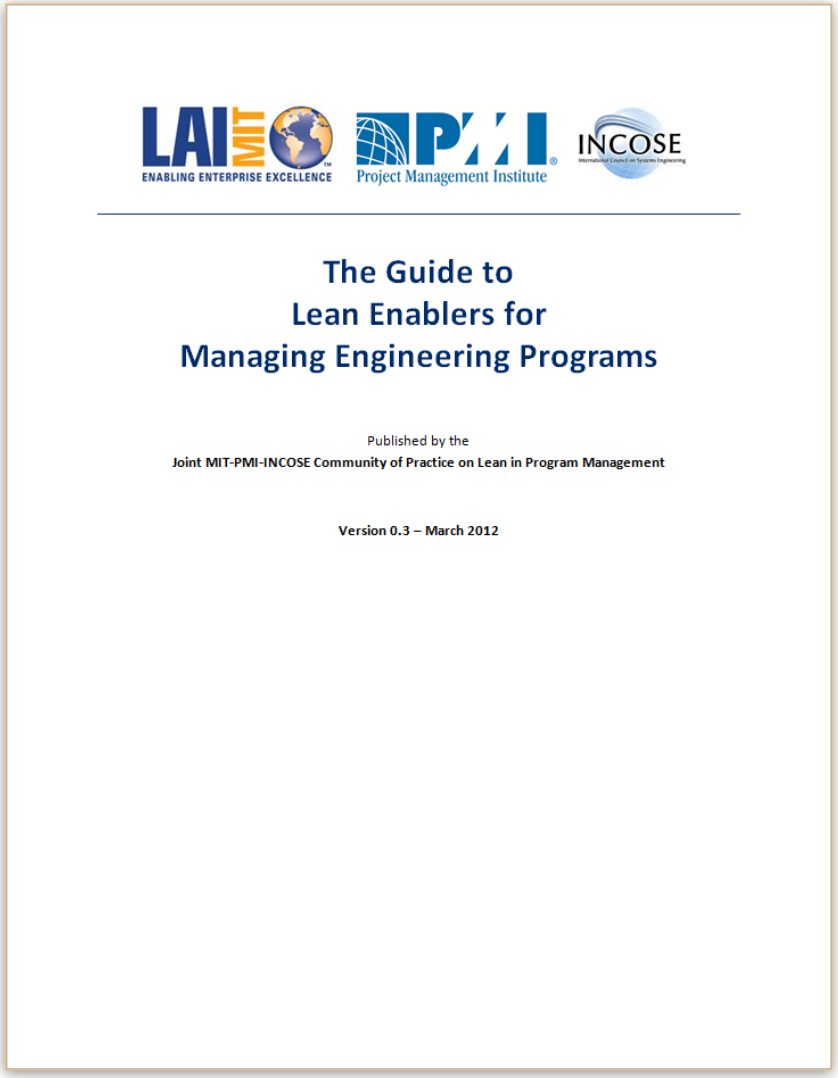
Lean Enabler for Managing Engineering Programs
Lean Principles

Use of Lean Enablers in Successful and Unsuccessful Programs: Level of Agreement of Respondents



average N: 63 programs per category; all differences are statistically significant

Look for it May 1:
"The Guide to Lean Enablers for Managing Engineering Programs"



The Guide to
Lean Enablers for
Managing Engineering Programs

Published by the
Joint MIT-PMI-INCOSE Community of Practice on Lean in Program Management

Version 0.3 – March 2012

- Section 1: Introduction
  - Document overview
  - Motivation and impact
  - Applicability and scope
- Section 2: Overview Lean Thinking
  - Value and waste
  - Six lean principles
- Section 3: Integration of Program Management and SE
  - Relationship program management and SE
  - Introduction to program management and SE
  - Stakeholders and value
- Section 4: Top 10 Challenges
- Section 5: Lean Enablers
  - List of Enablers
  - Mapping to program management, challenges and SE
- Section 6: Complementary improvement approaches
  - Agile, CMMI, and EVM
- Section 7: Implementation recommendations
- Section 8: Barriers to implementation
- Appendix
  - Complementary information sources
  - References
  - Detailed mapping

Thank You!