

KISS – Keep it Simple, Smart, and Sustainable: Agile Process Improvement

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Terma North America

Our Heritage

Leading Danish
Supplier of Aerospace
Technology
And
Defense Products

Headquartered in
Lystrup, Denmark
Revenues \$200+ million
1,700+ Employees
Worldwide



Terma North America

What we do



Aerostructures

Composite airframe & structural components



Airborne Systems

Supporting pilots



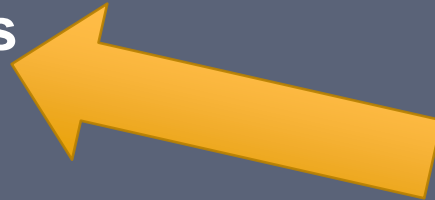
Integrated Systems

Air defense, Electronic warfare
Combat management, Communication



Radar Systems

Airborne and Maritime Systems





Terma North America

Airborne Systems

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Software Engineering Context

- Customized, embedded software
- Integrated with hardware at systems level
- Standards certification required
- Heavy DOD documentation requirements

- 1-2 developers per project
- Highly experienced electrical engineers

Drivers for Process Improvement

Customer bids and contracts:

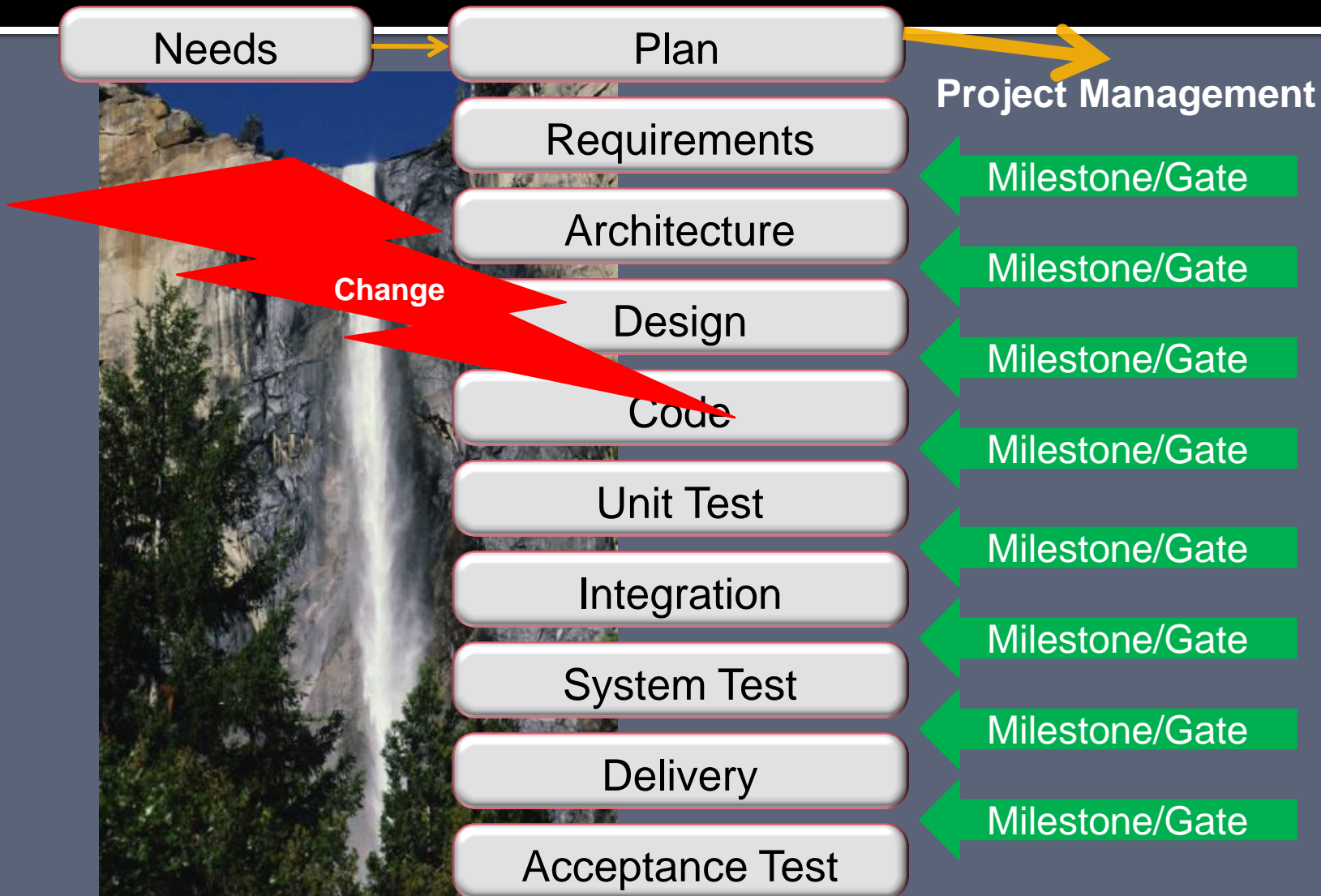
“Software development process must be CMMI[®] for Development Maturity Level 3”

Functional group “stovepipes”

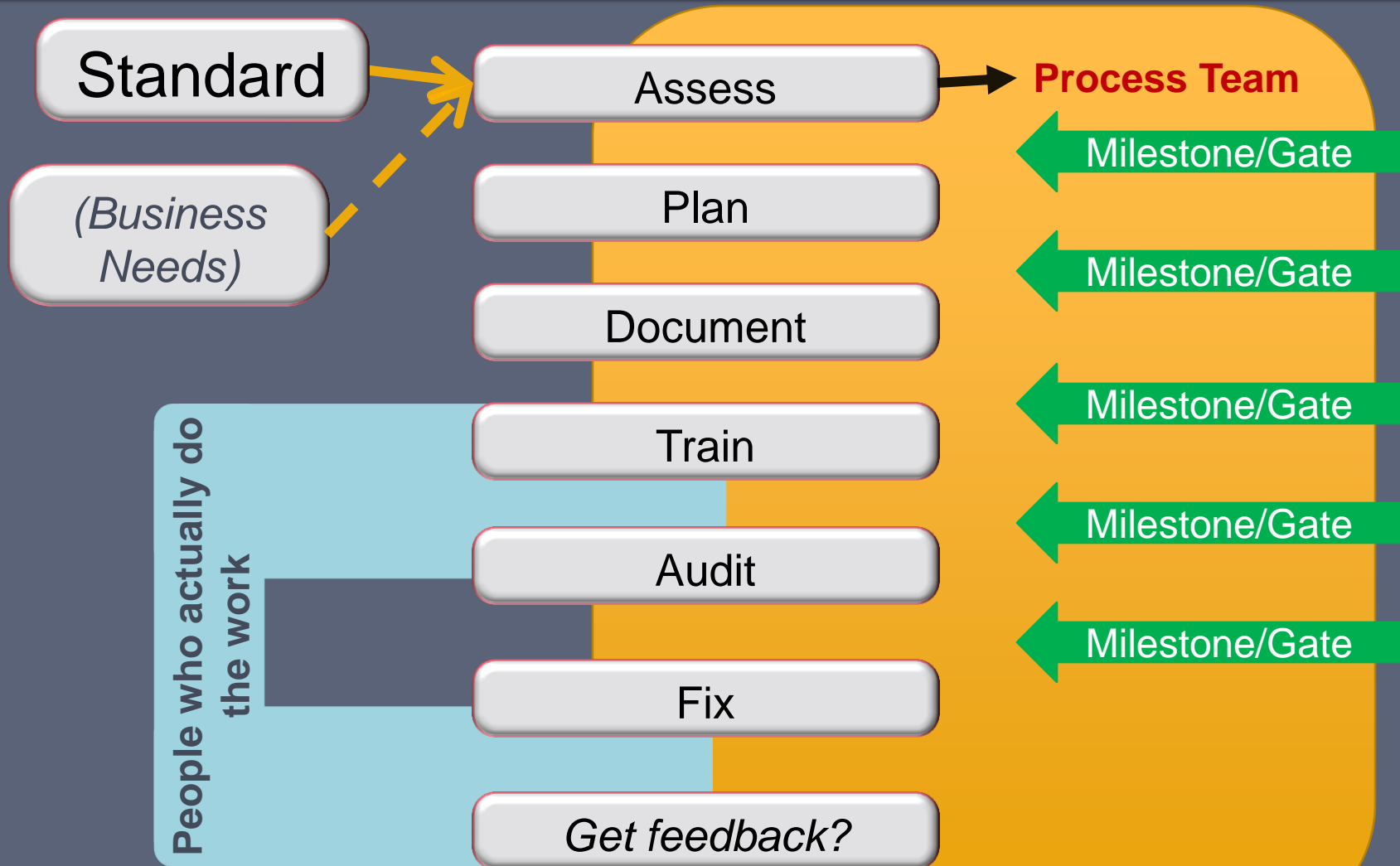
Opportunities for increased process effectiveness

[®] CMMI is registered in the U.S. Patent and Trademark Office by Carnegie Mellon University.
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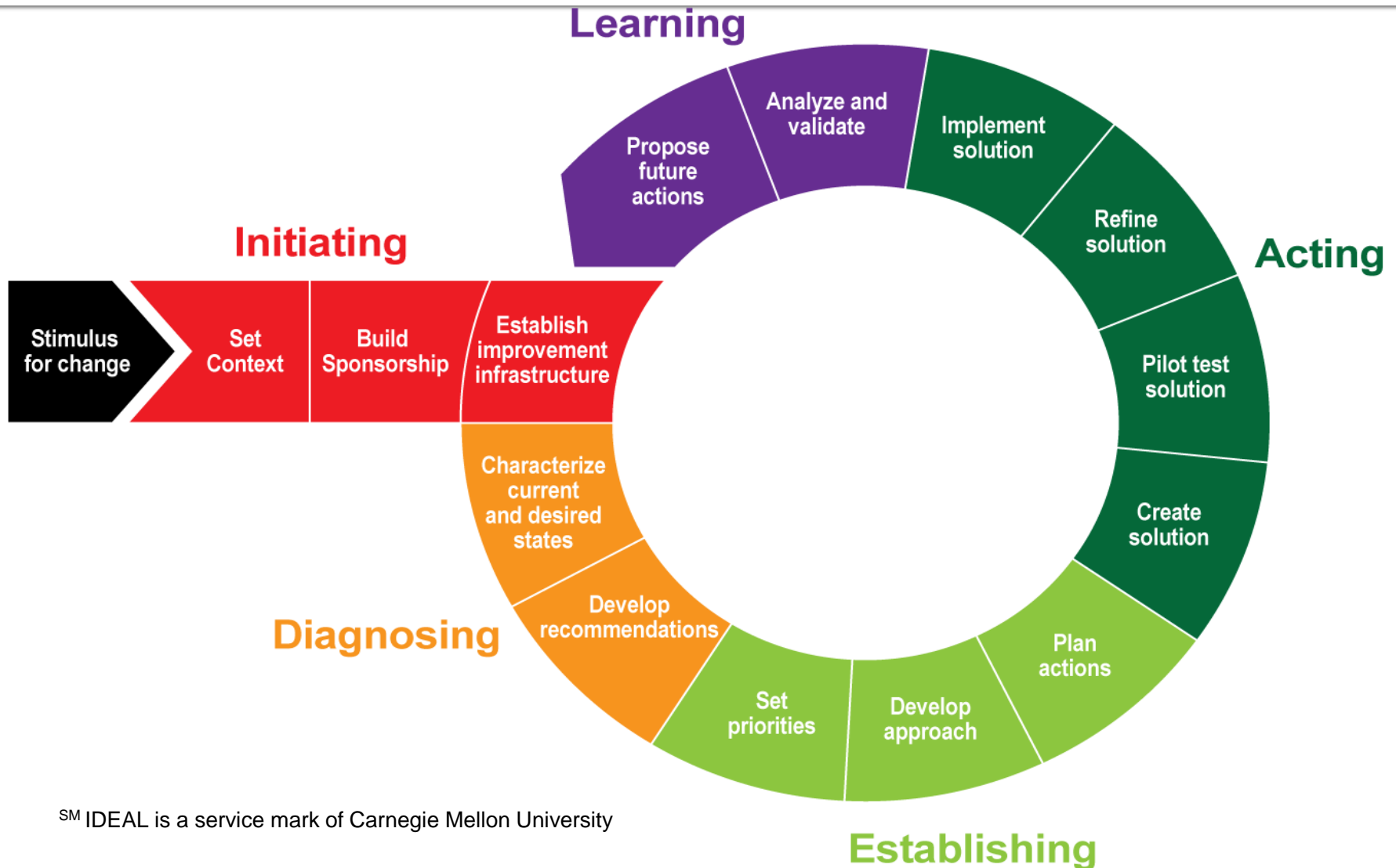
Waterfall Development Lifecycle



Process Improvement – Using Waterfall Lifecycle



SEI IDEALSM Model



SM IDEAL is a service mark of Carnegie Mellon University

Our experience with waterfall process improvement lifecycle

- **Expensive** – Costs kept growing, final cost twice as much as current agile process improvement implementation
- **Slow** - Took more than a year and didn't see any results until the end
- **Quality** - 400 non-compliances, team members negative toward process
- **Scope** - Did not achieve CMMI ML2 rating

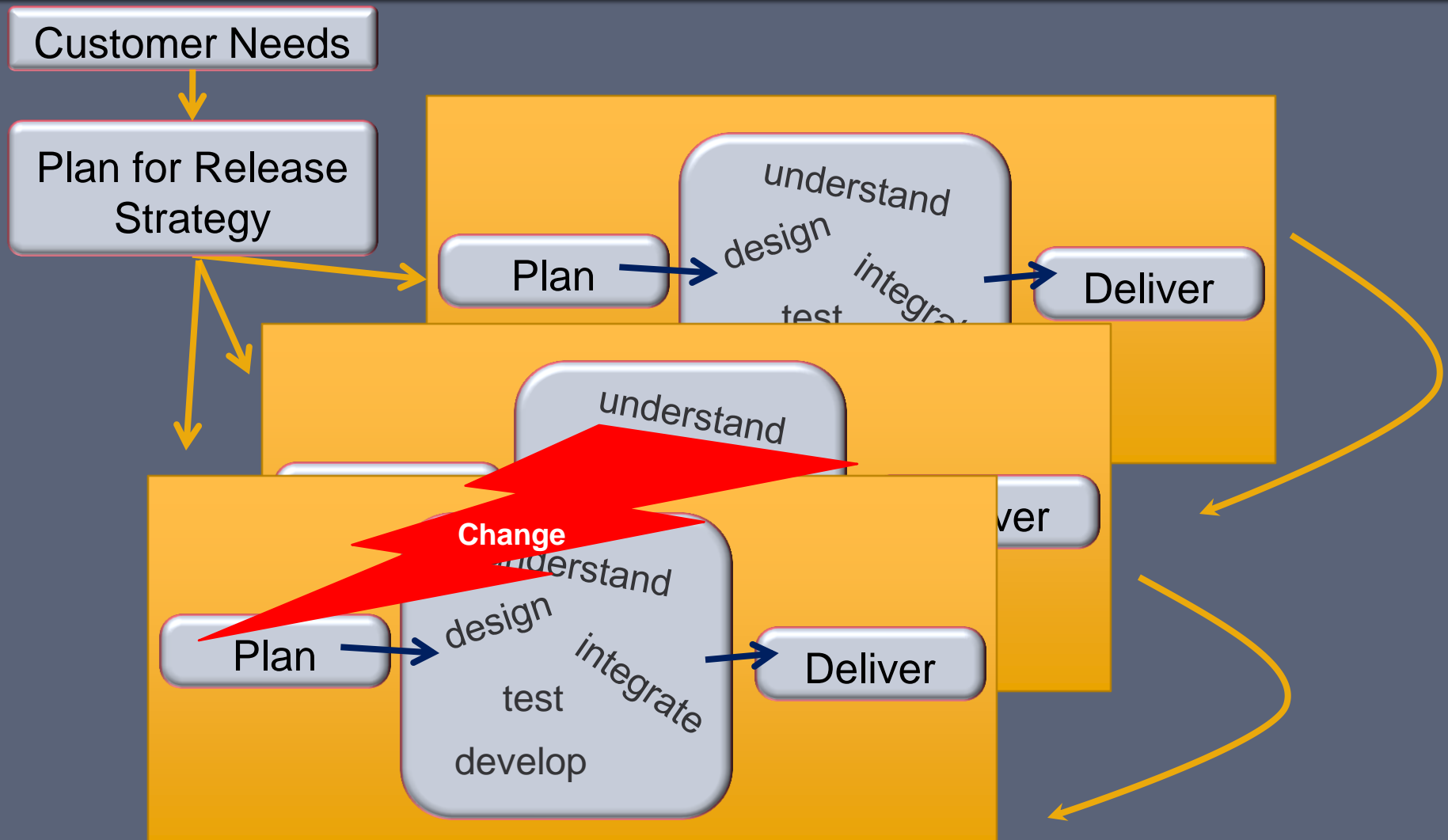
“Agile”

NOT
AD-HOC



Moving quickly and easily; nimbleness; quickness of motion;
e.g. strength, speed, and *agility* of body.

Agile Process Improvement??



Agile Manifesto – 2011

Process Improvement

We are uncovering better ways of *improving processes* by *doing them and helping others do them*.

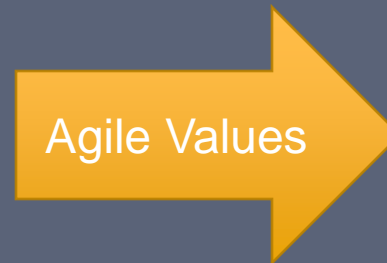
Through this work we have come to value:

- *Individuals and interactions* over processes and tools
- *Working process assets* over comprehensive documentation
 - *Cross-team collaboration* over negotiation
 - *Responding to change* over following a plan

That is, while there is value in the items on *the right*, we value the items on the left *more*.

Our Story

- How we stopped treating “process stuff” as overhead by applying Agile values and principles
- Lessons learned
 - Our perspective
 - Consultant’s view



Applying Agile Principles to Process Improvement

Agile Principle #1

Our highest
priority is to
satisfy the
customer
through **early
and continuous
delivery of
valuable
software.**

OURSELVES AND OUR TEAM



PROCESS ASSETS

Agile Principle #2

Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.


OUR COMPANY'S

Risks / Issues: New Item


Attach File | Spelling... * indicates a required field

Project # * 40105

Risk or Issue? *


If... * 

If "x" happens...
(Something that COULD impact the project, but HAS NOT happened yet)

Then... * 

If "x" happens, then how will impact the project?
(What will happen if the Risk happens?)

Title *

Submitted By 

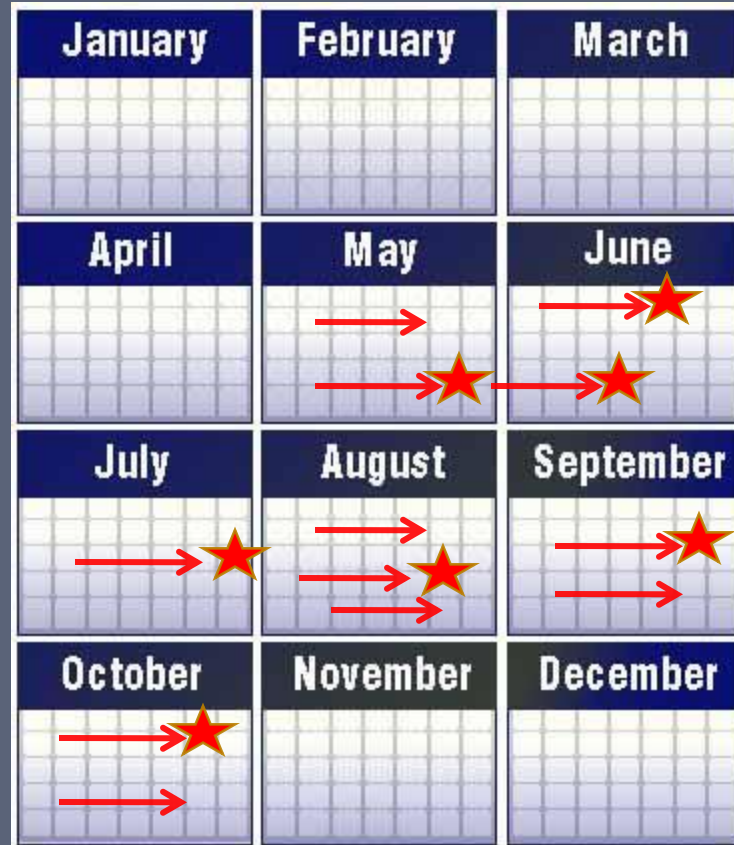
Status

Probability *
The value must be between 1 and 5
(What is the probability that the risk will occur?)

Impact *
The value must be between 1 and 5
(What is the impact on the project if the risk occurs?)

Agile Principle #3

Deliver working software ~~are~~ frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale



PROCESS ASSETS

Agile Principle #4

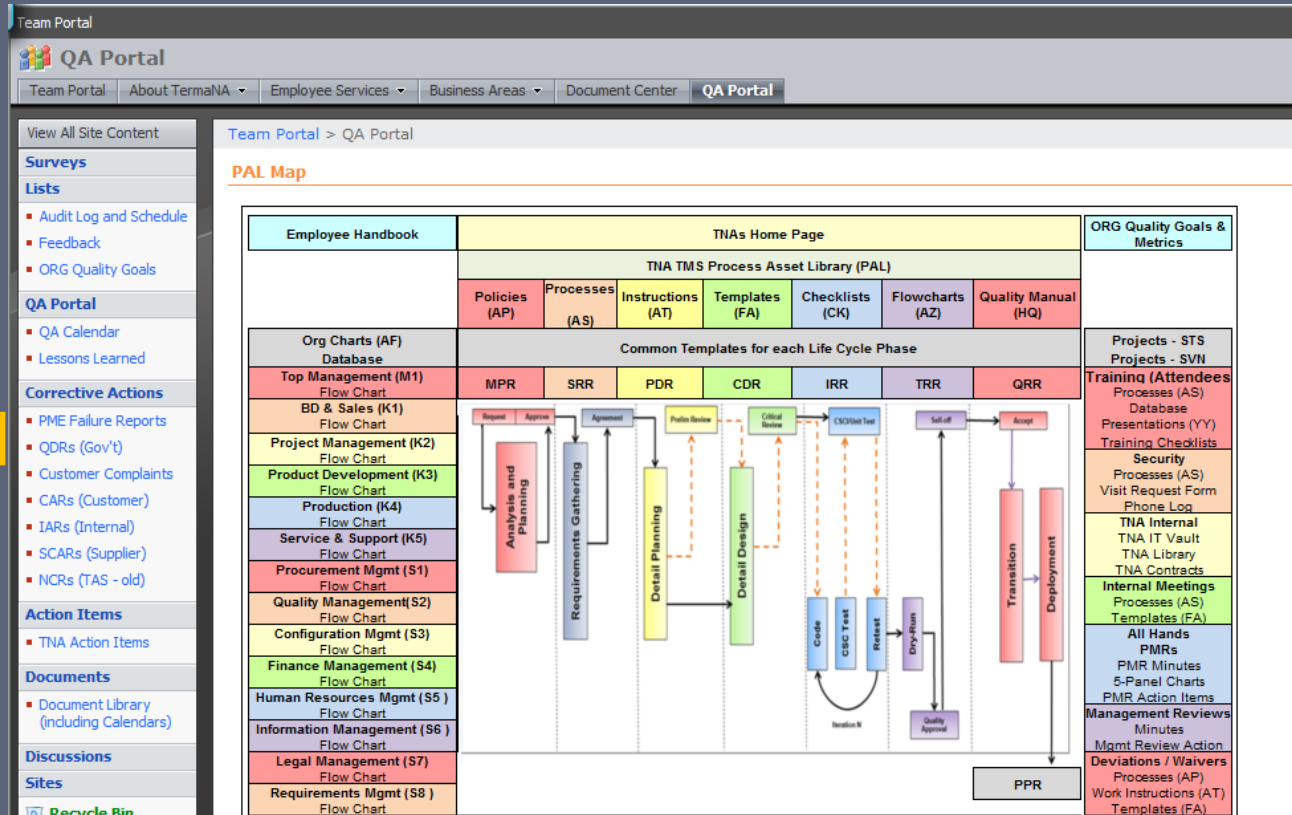
Business people
and developers
must **work**
together daily
throughout the
project.



ALL FUNCTIONAL GROUPS

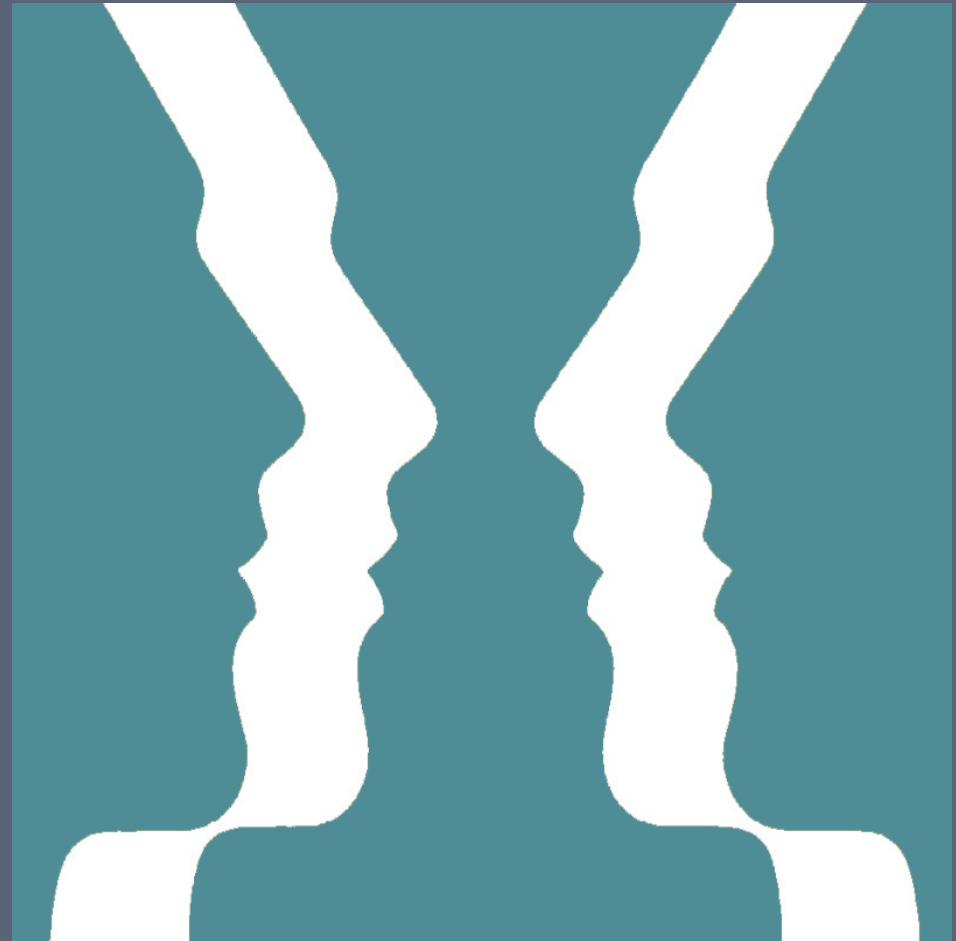
Agile Principle #5

Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.



Agile Principle #6

The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.



PROCESS IMPROVEMENT TEAM

Agile Principle #7

Working software is the primary measure of progress.

USEFUL AND USABLE PROCESS ASSETS

TERMA Template no: 400701-CK Rev. P **Internal Milestone Review Checklist**

Kick-Off Review - Entrance Criteria for the Project Planning Phase

Project Name:
 Project Number:
 Project Type:
 Purpose: Evaluate if the project is ready to be planned
 Review Authority: Director of Programs

INIT Review Information:					
DoP Director of Programs: Harold Falkner	Signature Required:	Date of Review:			
LOM Quality Manager: Christie Jensen	Signature Required:	Review Decision (circle one): Approved / Approved with actions / Rejected - new review needed			
CT Chief Technologist: Brian Hood		Comments:			
DoE Director of Engineering: Walt Soderman	Signature Required:	Other Participants: PM Name: PLE Name: PCM Name: PQR Name:			Other Attendees:

#	Required documentation	Project Type	Started	Not Started	N/A	Comment
1	High-level Project Schedule	All				
2	Work Breakdown Structure (WBS)	All				
3	Proposal	All				
4	Proposal Basis of Estimate (BOE) from ProPricer	All				
5	Reviewed SOW / Spec	All				

#	Checkpoint	Responsible	Project Type	Approver	Yes	No	N/A	Comment
1	Proposal project transition topics:	PM						
a.	Has management accepted the contract by the signing the contract/PO and returning to the customer?	All	DoP					
b.	Has the Director of Programs assigned a project manager?	All	DoP					
c.	Has the PM sent finance a copy of the PO/Contract?	All	DoP					
d.	Has the PM placed the PO/Contract documents to Contracts folder in SVN?	All	DoP					
e.	Finance assigned a project number and established a project planning charge code?	All	PM					
2	PM facilitates the discussion on each topic below and records minutes in the comment area.	PM						
a.	Review the SOW	All	DoP					
b.	Review the SPEC (if applicable)	All	DoP					
c.	WBS - initial plan	All	DoP					
d.	Budget - proposal-based	All	DoP					
e.	BOE - from proposal	All	DoP					
f.	Schedule - high level milestone view	All	DoP					
g.	Initial Risks and Issues	All	DoP					
h.	MPR checklist for overview of planning work to be performed.	All	DoP					
3	Assign resources to create (or provide inputs for):	PM						
a.	MAP	All	DoP					
b.	STS Project Portal	All	LOM					
c.	QAP	All	LOM					
d.	CMP	All	LOM					
e.	SVN Folder Structure	All	LOM					
f.	Supplier SOW (if applicable)	All	DoP					
4	Planning for the next phase:	PM						
a.	Have Kick-off Lessons Learned been captured and	All	LOM					
b.	Review 'MPR' and 'All Phases' Lessons Learned. Did any	All	LOM					
c.	Are resources available for the next phase?	All	DoE					
d.	Assign responsibilities and due dates for MPR Phase	All	LOM					
	Enter Actions Items (AIs) in Project AIs Database							# Entered
	<Enter link for AIs Location>							
	Enter Risks in Project Risk Database							# Entered
	<Enter link for Risks Location>							
	Enter Issues in Project Issue Database							# Entered
	<Enter link for Issues Location>							
	Enter Lessons Learned in Database							# Entered
	http://eamportal/QA/Lists/Lessons%20Learned/AllItems.aspx							

Agile Principle #8

Agile processes promote sustainable development.

The sponsors, developers, and users should be able to maintain a constant pace indefinitely.



PROCESS IMPROVEMENT

Agile Principle #9

Continuous attention to **technical excellence** and **good design** enhances agility.



interfaces



-ilities

PROCESS ARCHITECTURE AND PROCESS ASSETS

Agile Principle #10

Simplicity--the art of maximizing the amount of work not done--is essential.

9 Organizational Process Focus		Initial Audit			Date:	First Reaudit			Date:
	Practice Text	Actual Evidence Found	Comments	Non-Compliance	Resolution Needed	Actual Evidence Found	Comments	Non-Compliance	
10									
11	Organizational Process Focus								
12	SG 2 Improvements are planned and implemented, organizational process assets are deployed, and process-related experiences are incorporated into								
13	SP 1.1	Establish and maintain the description of the process needs and objectives for the organization.							
14	SP 1.2	Appraise the processes of the organization periodically and as needed to maintain an understanding of their strengths and weaknesses.							
15	SP 1.3	Identify improvements to the organization's processes and process assets.							
16	SG 2 Improvements are planned and implemented, organizational process assets are deployed, and process-related experiences are incorporated into								
	SP 2.1	Establish and maintain process action plans to							

#	Checkpoint	Responsible	Project Type	Approver	Pass	Fail	N/A	Comment
1	Proposal project transition topics:	PM						
a	Has management accepted the contract by the signing the contract/PO and returning to the customer?	All	DoP					
b	Has the Director of Programs assigned a project manager?	All	DoP					
c	Has the PM sent finance a copy of the PO/Contract?	All	DoP					
d	Has the PM placed the PO/Contract documents to Contracts folder in SVN?	All	DoP					
e	Finance assigned a project number and established a project planning charge code?	All	PM					
2	PM facilitates the discussion on each topic below and records minutes in the comment area	PM						
a	Review the SOW	All	DoP					
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3	Assign resources to create (or provide inputs for):	PM						
a	MAP?	All	DoP					
b	STS Project Portal	All	LOM					
c	OAP	All	LOM					
d	CMP	All	LOM					
e	SVN Folder Structure	All	LOM					
f	Supplier SOW (if applicable)	All	DoP					
4	Planning for the next phase:	PM						
a	Have Kick-off Lessons Learned been captured and	All	LOM					
b	Review MPR and All Phases' Lessons Learned. Did any	All	LOM					
c	Are resources available for the next phase?	DEV	DoE					
d	Assign responsibilities and due dates for MPR Phase	All	LOM					

Agile Principle #11

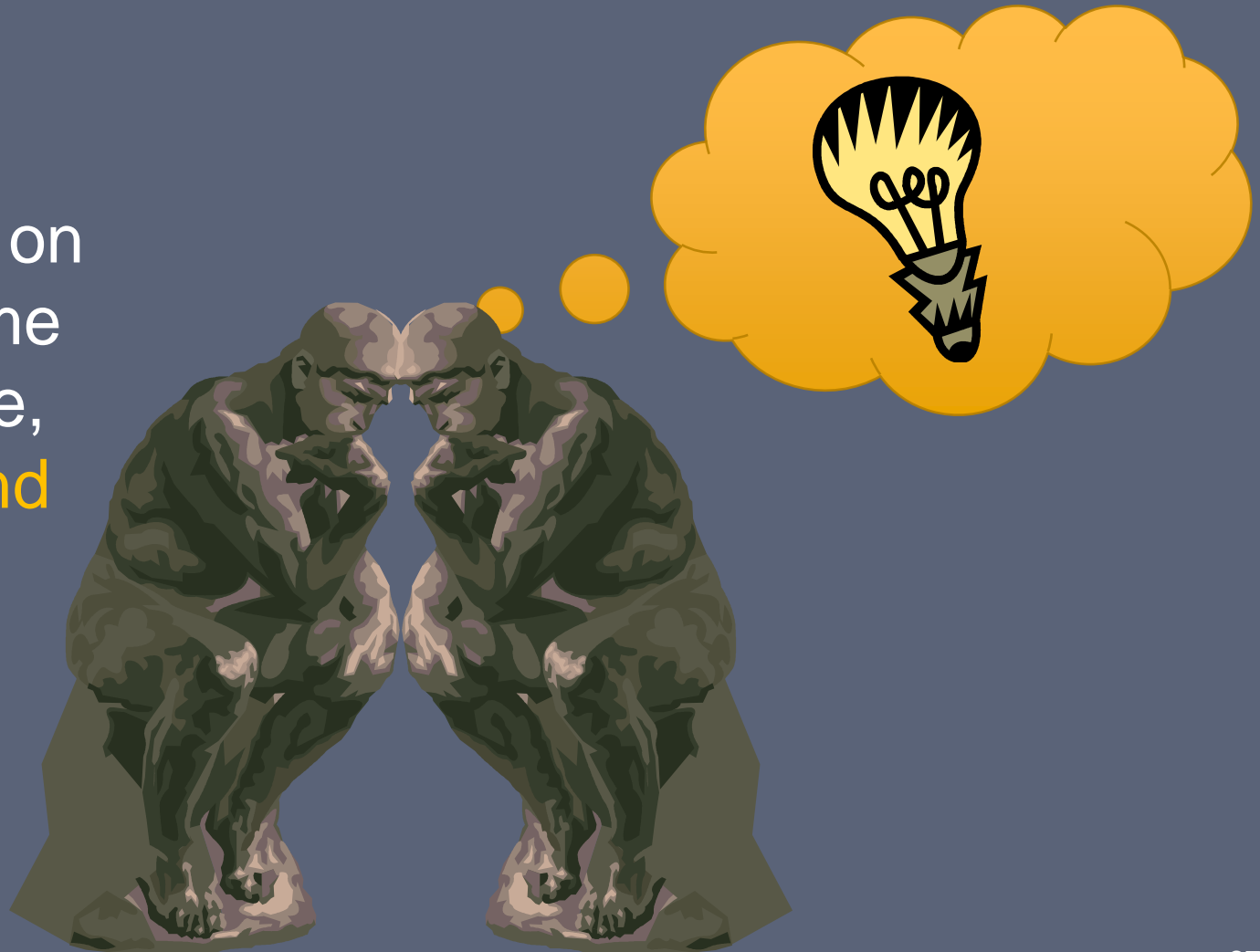
The best architectures, requirements, and designs emerge from self-organizing teams.



FOR USEFUL AND USABLE PROCESSES AND RELATED ASSETS

Agile Principle #12

At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.



Some Agile Practices

Which Ones Apply To Us?

Visibility

Clear the path

Incremental & iterative releases

Eliminate waste

Continuous Integration

Test Driven Design

Refactoring

Pair programming



TERMA NA

Our Experience with Agile Process Improvement

- **Cost effective** – Stayed within budget (half of waterfall implementation)
- **Faster** – Less than a year, useful process improvements within two months.
- **Quality** – QA focused on process business value, rather than non-compliance; team members involved and enthusiastic
- **Scope** – we are on track to achieve CMMI ML2 rating within the next few weeks (stay tuned)

Bottom Line

- We stopped treating “Process Stuff” as wasteful overhead by applying agile values, principles, and techniques to process improvement.
- Our processes became leaner and more effective and still implemented all of the necessary CMMI goals and practices.



This changed both our attitude toward CMMI and our success in implementing Maturity Level 2 practices.

Questions?



Contact Information

TERMA[®]



Oppenheimer Partners

Making CMMI Work For You

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SEIPartner

Brian Hood – BIO

Brian Hood is CTO and a founding member of the Terma North American International Group Location.

He is an Electrical Engineer with 12 years experience in airborne electronic warfare integration and embedded systems design. He has led multiple teams and projects from research and development to standard DOD acquisition programs.

Although he is known for directly leading development teams, he is currently focusing on the development of engineering capability infrastructure and organizational growth management. Using agile methodologies along with the CMMI model for lightweight, but robust processes has been key to extraordinary growth within our sector.

Heather Oppenheimer – BIO

Heather Oppenheimer is a Senior Partner in Oppenheimer Partners, LLC, a process improvement consulting company.

She is a Certified ScrumMaster and certified CMMI® instructor/SCAMPISM Lead Appraiser, with 20+ years experience in all areas of product development, service delivery, and software engineering. She is a member of the team that developed the new 3 day Introduction to CMMI-SVC course and corresponding Development Supplement.

Although she is known for her work with large, globally distributed development projects, she is currently focusing on the process improvement needs of very small service delivery and embedded software development organizations, applying agile methodologies along with the CMMI model for lightweight, but robust processes.

She has co-chaired workshops for the International Conference on Systems Engineering, reviews software engineering journals, and referees grants for the Natural Sciences and Engineering Research Council of Canada.