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

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Airborne Systems

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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
Customer bids and contracts:
“Software development process must be CMMI® for Development Maturity Level 3”

Functional group “stovepipes”

Opportunities for increased process effectiveness
Waterfall Development Lifecycle

1. Needs
2. Plan
3. Requirements
4. Architecture
5. Design
6. Code
7. Unit Test
8. Integration
9. System Test
10. Delivery
11. Acceptance Test

Change

Project Management

- Milestone/Gate
- Milestone/Gate
- Milestone/Gate
- Milestone/Gate
- Milestone/Gate
- Milestone/Gate
- Milestone/Gate
- Milestone/Gate

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Process Improvement – Using Waterfall Lifecycle

People who actually do the work

Standard

Assess

Plan

Document

Train

Audit

Fix

Get feedback?

Process Team

Milestone/Gate

Milestone/Gate

Milestone/Gate

Milestone/Gate

Milestone/Gate

Milestone/Gate

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SEI IDEAL™ Model

**Initiating**
- Stimulus for change
- Set Context
- Build Sponsorship
- Establish improvement infrastructure

**Diagnosing**
- Characterize current and desired states
- Develop recommendations
- Set priorities

**Learning**
- Propose future actions
- Analyze and validate
- Implement solution

**Establishing**
- Refine solution
- Pilot test solution
- Create solution
- Plan actions
- Develop approach

**Acting**

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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”

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

NOT AD-HOC
Agile Process Improvement??

Customer Needs

Plan for Release Strategy

Plan

understand design integrate

design test integrate

test develop

Plan

Deliver

Deliver

Change

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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

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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

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Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
Agile Principle #3

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

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PROCESS ASSETS

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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.
Agile Principle #7

Working software is the primary measure of progress.

USEFUL AND USABLE PROCESS ASSETS
Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
Agile Principle #9

Continuous attention to technical excellence and good design enhances agility.

PROCESS ARCHITECTURE AND PROCESS ASSETS

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Agile Principle #10

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

Visibility
Clear the path
Incremental & iterative releases
Eliminate waste
Continuous Integration
Test Driven Design
Refactoring
Pair programming

Which Ones Apply To Us?
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)
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

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

She is a Certified ScrumMaster and certified CMMI® instructor/SCAMPI SM 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.