# Scaling Agile Methods for Major Defense Programs: Frameworks and Methods in Use Today

Will Hayes – SEI

Mary Ann Lapham – SEI

**Software Solutions Conference 2015**

November 16–18, 2015

© 2015 Carnegie Mellon University



Distribution Statement A: Approved for Public Release; Distribution is Unlimited

Copyright 2015 Carnegie Mellon University

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.

References herein to any specific commercial product, process, or service by trade name, trade mark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by Carnegie Mellon University or its Software Engineering Institute.

NO WARRANTY. THIS CARNEGIE MELLON UNIVERSITY AND SOFTWARE ENGINEERING INSTITUTE MATERIAL IS FURNISHED ON AN “AS-IS” BASIS. CARNEGIE MELLON UNIVERSITY MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED, AS TO ANY MATTER INCLUDING, BUT NOT LIMITED TO, WARRANTY OF FITNESS FOR PURPOSE OR MERCHANTABILITY, EXCLUSIVITY, OR RESULTS OBTAINED FROM USE OF THE MATERIAL. CARNEGIE MELLON UNIVERSITY DOES NOT MAKE ANY WARRANTY OF ANY KIND WITH RESPECT TO FREEDOM FROM PATENT, TRADEMARK, OR COPYRIGHT INFRINGEMENT.

This material has been approved for public release and unlimited distribution except as restricted below.

This material may be reproduced in its entirety, without modification, and freely distributed in written or electronic form without requesting formal permission. Permission is required for any other use. Requests for permission should be directed to the Software Engineering Institute at permission@sei.cmu.edu.

DM-0002751

# Agenda

**Agile Methods**

**What Does “Scaling” Mean?**

**Frameworks Available**

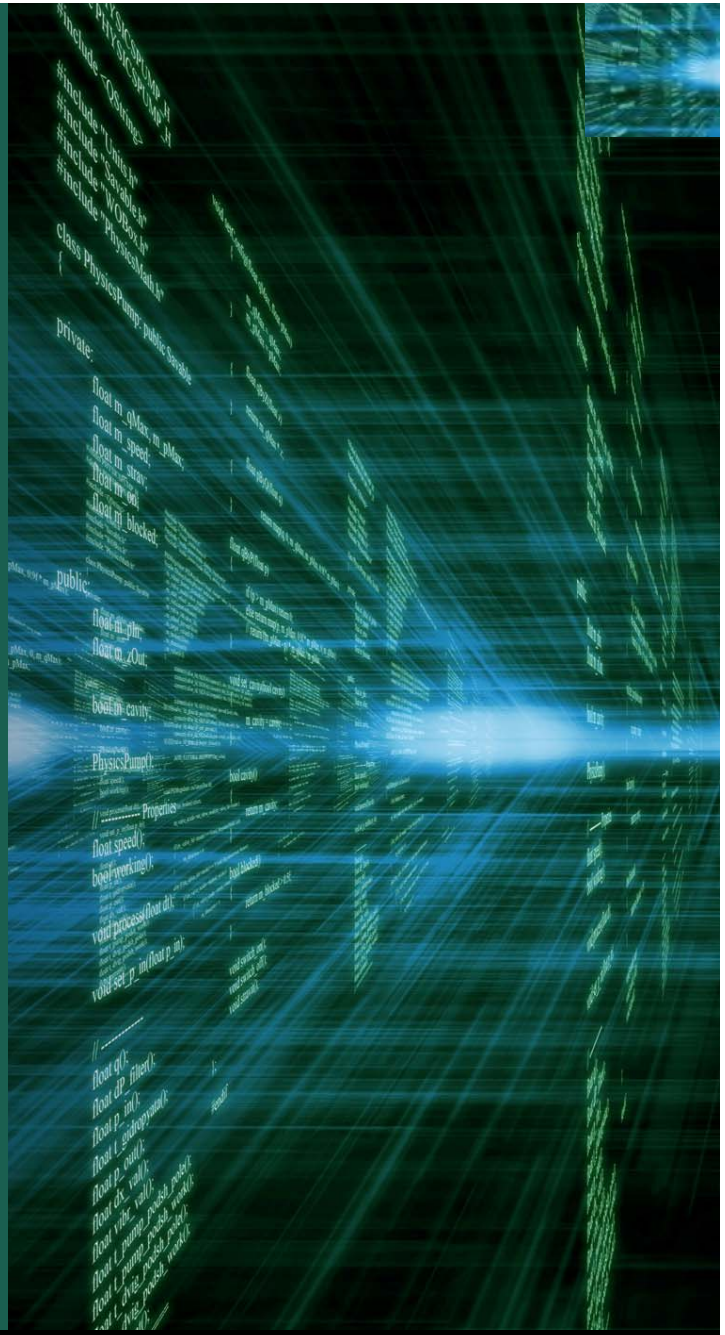
**Summary**


© 2015 Carnegie Mellon University

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

Background

# Agile Methods





© 2015 Carnegie Mellon University

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

# Agile Manifesto-Source of Agile Concepts

Through this work we have come to value:

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

http://www.agilemanifesto.org/

Common myth:

The manifesto is often misinterpreted to mean:

- no documentation,
- no process, and
- no plan!


© 2015 Carnegie Mellon University

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

# Agile Principles-1

1. Highest priority is satisfy the customer through early and continuous delivery of software.
2. Welcome changing requirements, even late in development…
3. Deliver working software frequently, from a couple of weeks to a couple of months...
4. Business people and developers must work together daily throughout the project.
5. Build projects around motivated individuals. Provide environment and support they need…
6. The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.


© 2015 Carnegie Mellon University

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

# Agile Principles – 2

7. Working software is the primary measure of progress.
8. Agile processes promote sustainable development…a constant pace indefinitely.
9. Continuous attention to technical excellence and good design enhances agility.
10. Simplicity—the art of maximizing the amount of work not done—is essential.
11. The best architectures, requirements, and designs emerge from self-organizing teams.
12. At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

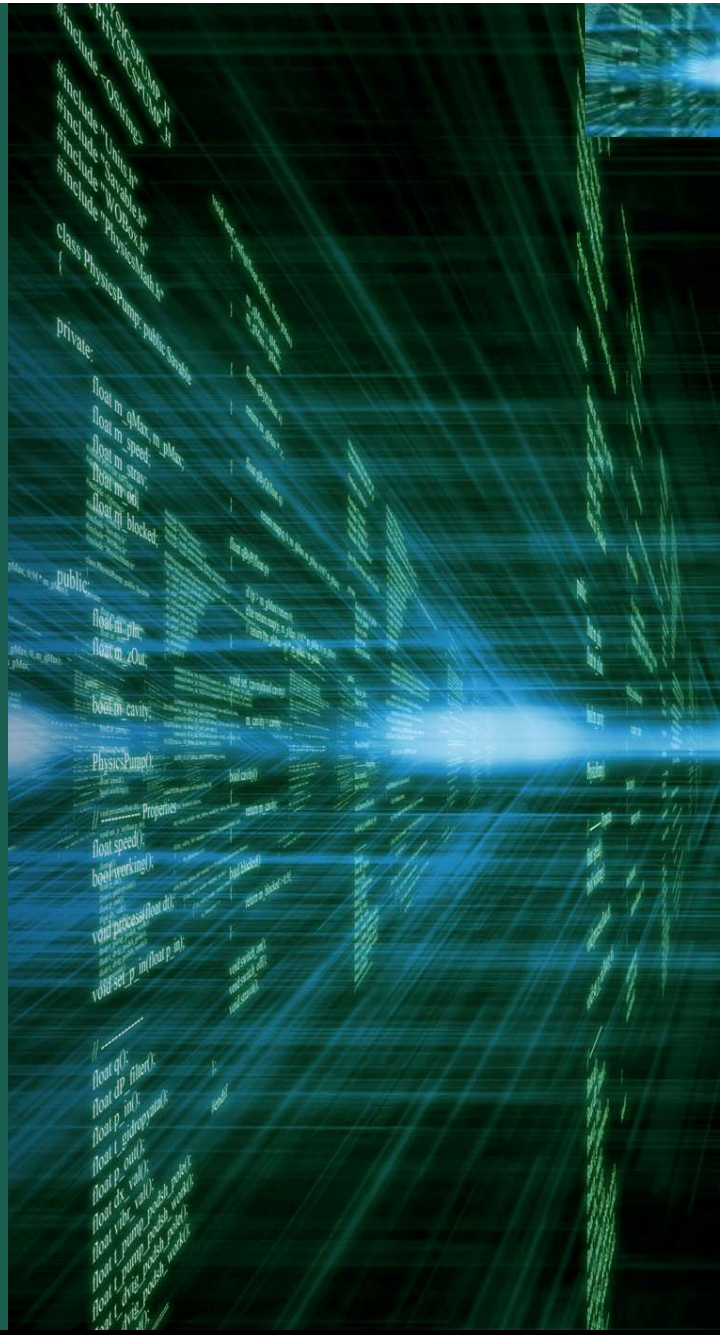
**Adapted from http://agilemanifesto.org/principles.html**


© 2015 Carnegie Mellon University

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

New Focus

# Scaling Agile Methods





© 2015 Carnegie Mellon University

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

# A Physical Example

$$P = \frac{2St}{D}$$

where

$P$ = pressure

$S$ = allowable stress

$t$ = wall thickness

$D$ = outside diameter

Barlow's Formula

- Relates the internal pressure that a pipe can withstand to its dimensions and the strength of its material.

  https://en.wikipedia.org/wiki/Barlow's_formula

- Provides a time-tested basis for designing hydraulic systems that operate under pressure

- Not simply a way to 'scale-up' something that works in the small


© 2015 Carnegie Mellon University

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

# If only it were that simple…

Software (and System) Engineering is:

- Knowledge-intensive work done by people
- An enabler of unprecedented capability
- Exceedingly difficult to predict…

However, a number of striking similarities are observed among agile scaling methods/frameworks

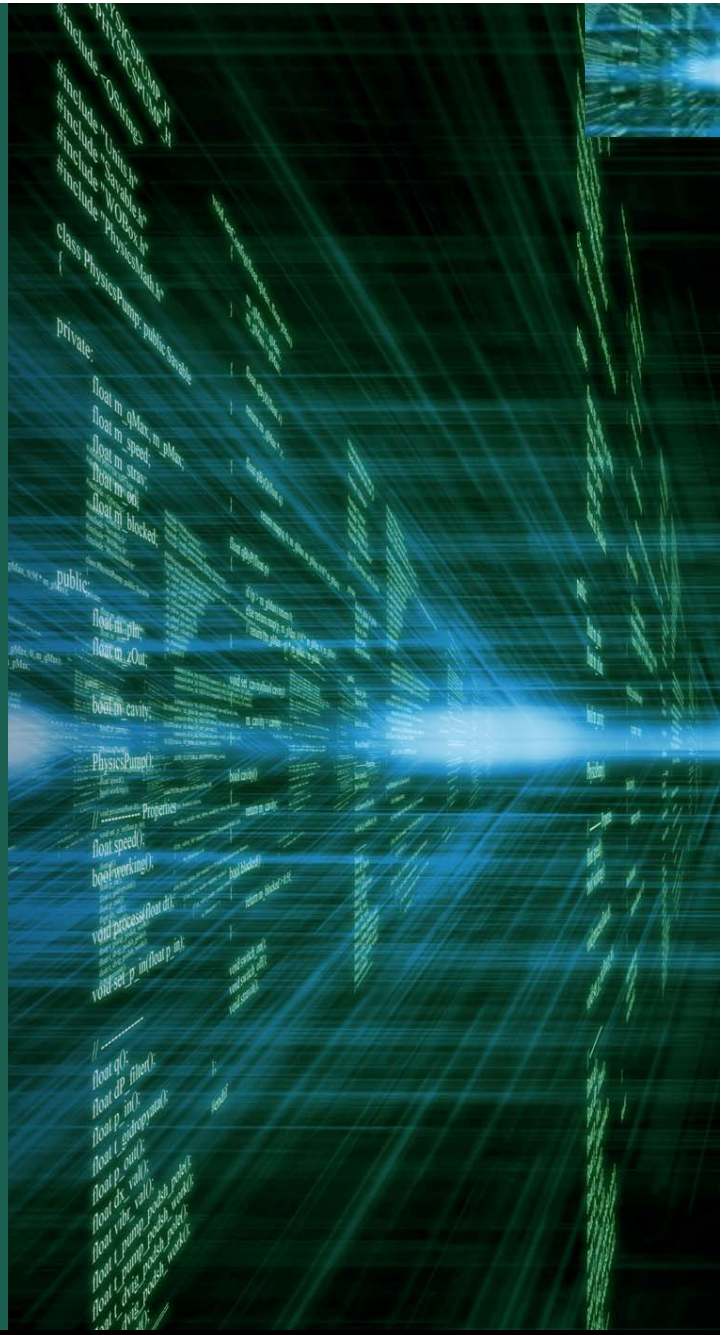
- Small teams
- Short iterations
- Consistent cadence
- Roles: scrum master, product owner, user


© 2015 Carnegie Mellon University

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

Brief Overview

# Frameworks Available

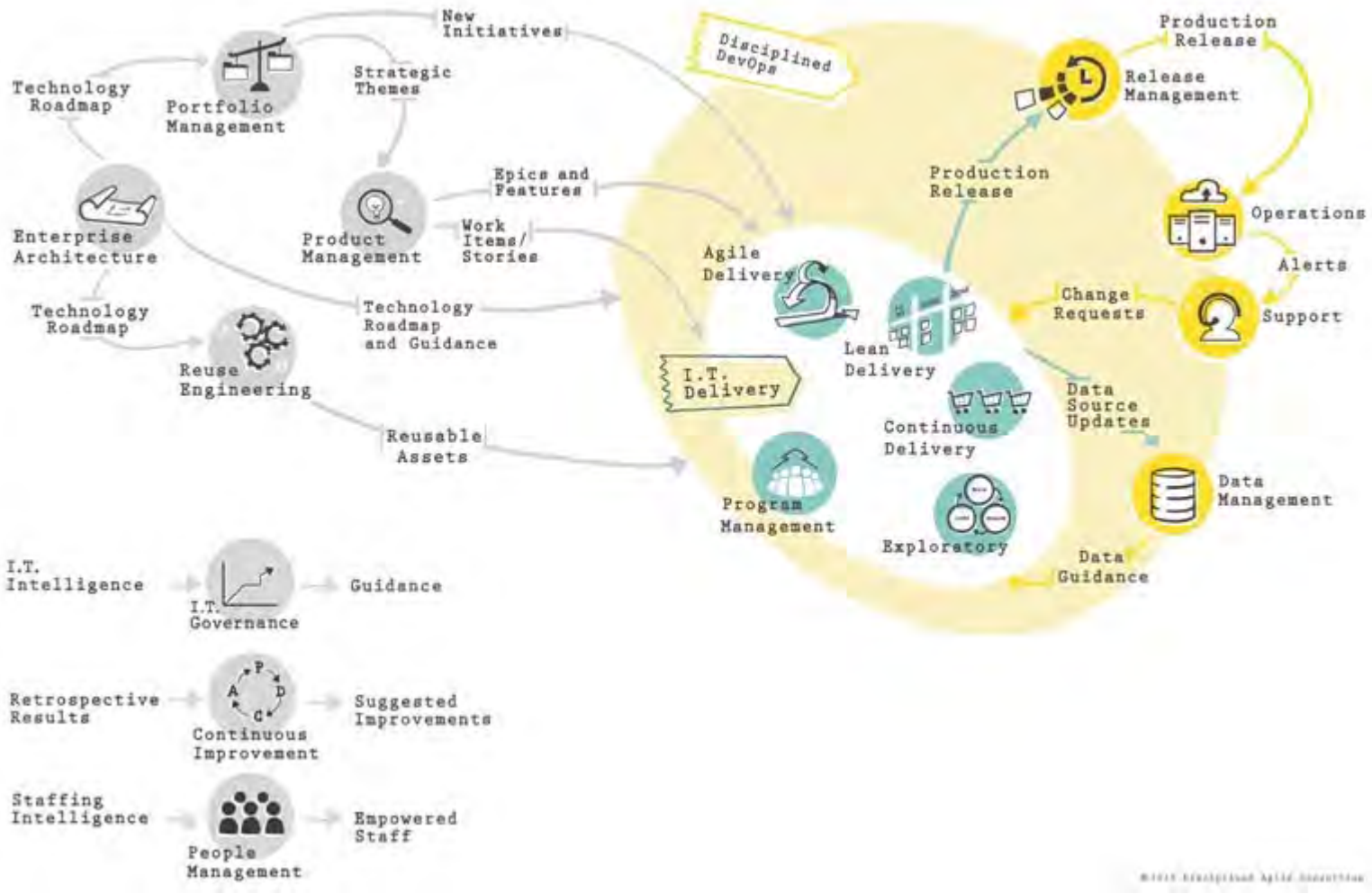




© 2015 Carnegie Mellon University

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

# Disciplined Agile Delivery (DAD) -1

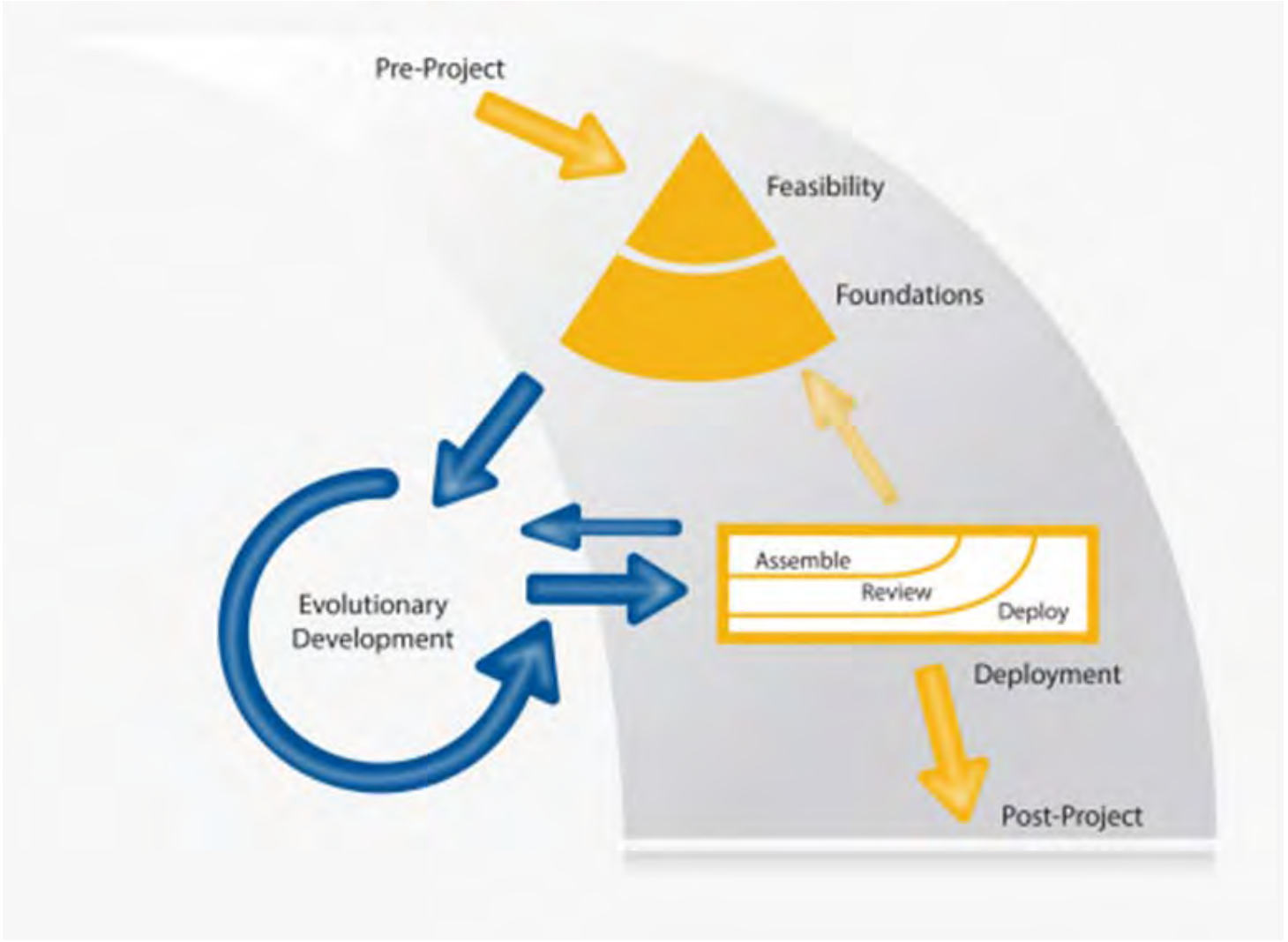



[www.disciplinedagiledelivery.com](http://www.disciplinedagiledelivery.com)


© 2015 Carnegie Mellon University

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

# Dynamic Systems Development Method (DSDM)

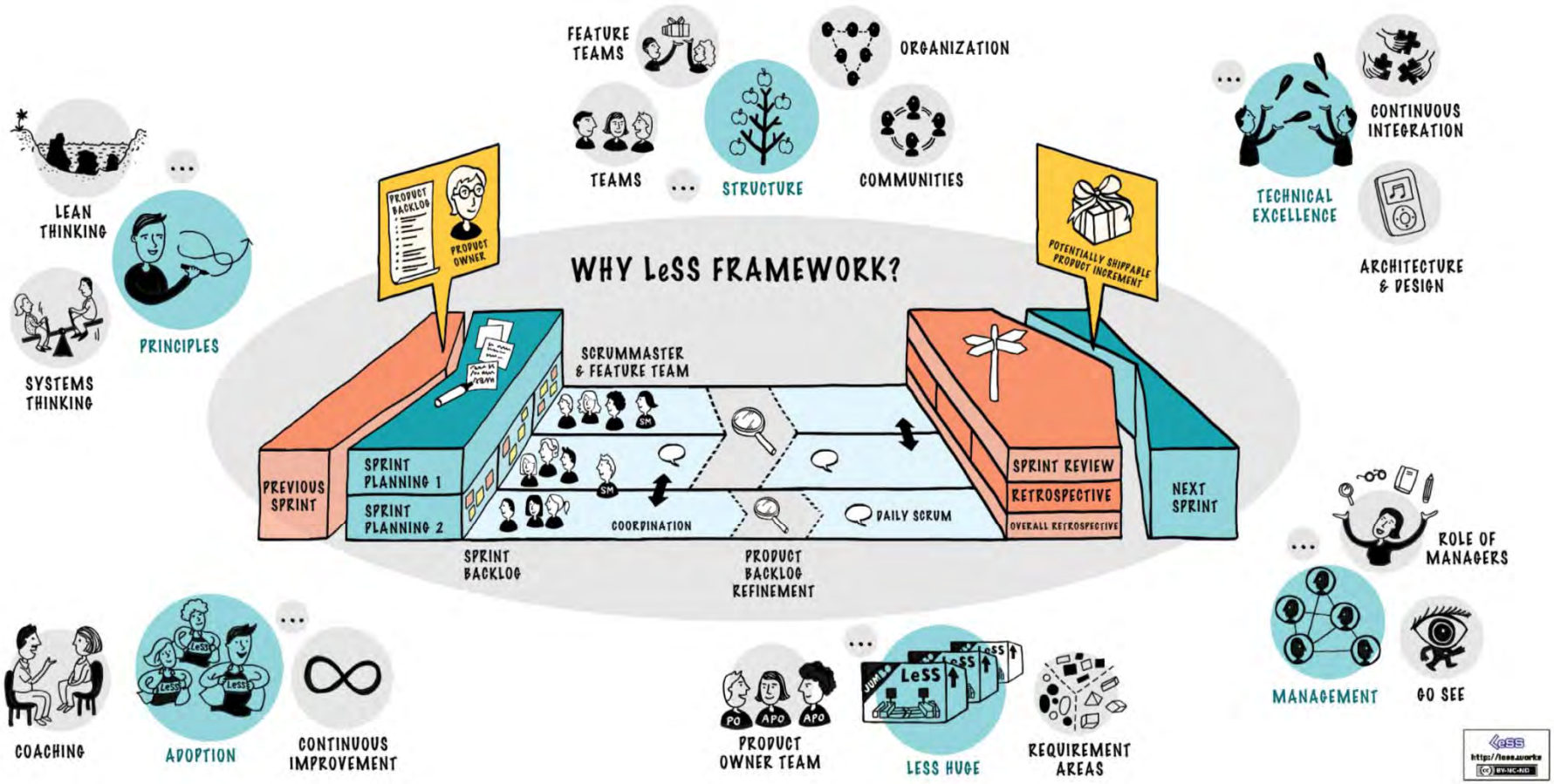



www.dsdm.org


© 2015 Carnegie Mellon University

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

# Large Scale Scrum (LeSS)

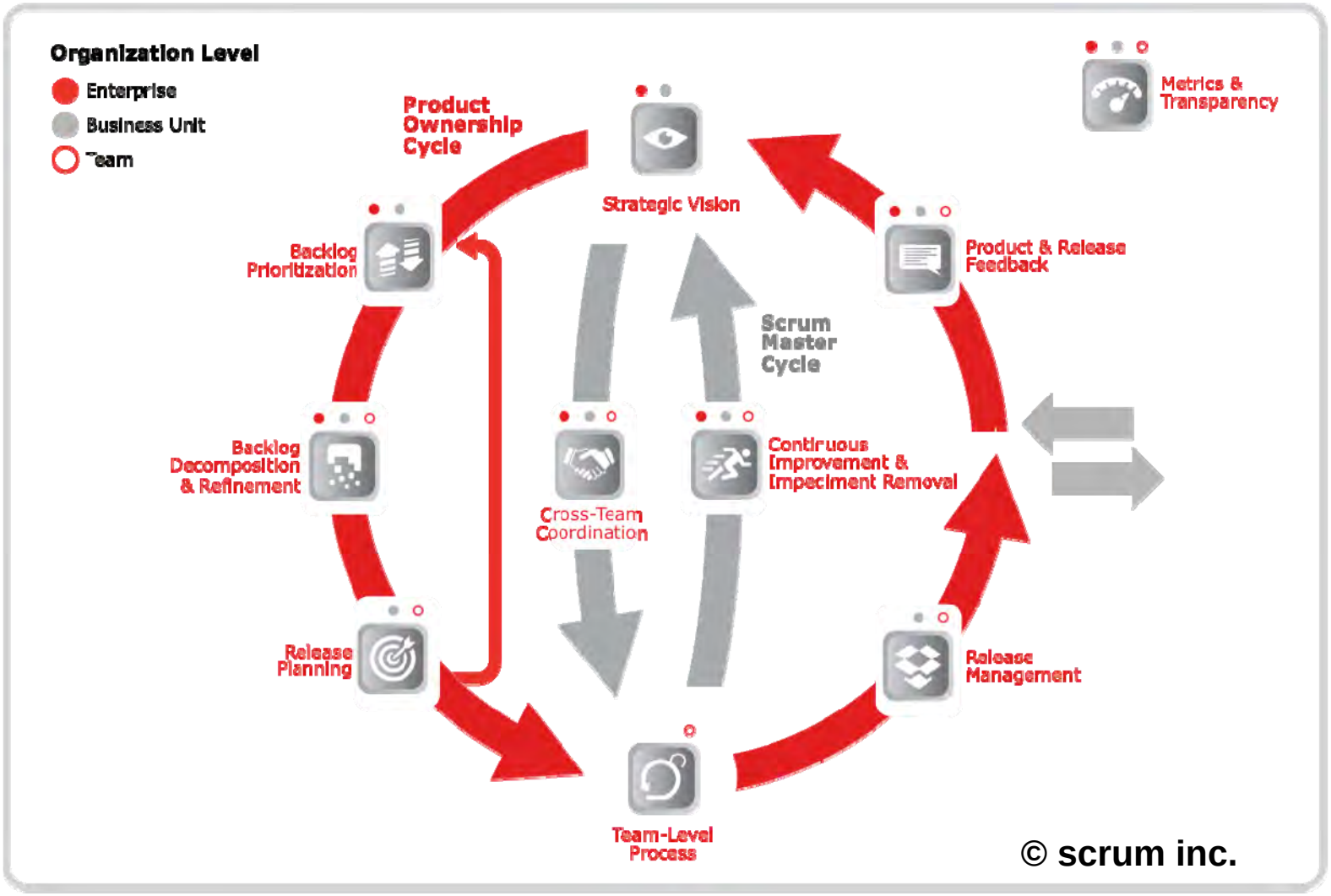



[less.works/img/less-overview-diagram.pdf](less.works/img/less-overview-diagram.pdf)


© 2015 Carnegie Mellon University

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

# Modular Framework for Scaling Scrum




[www.scruminc.com/scrum-at-scale-part-1/](www.scruminc.com/scrum-at-scale-part-1/)

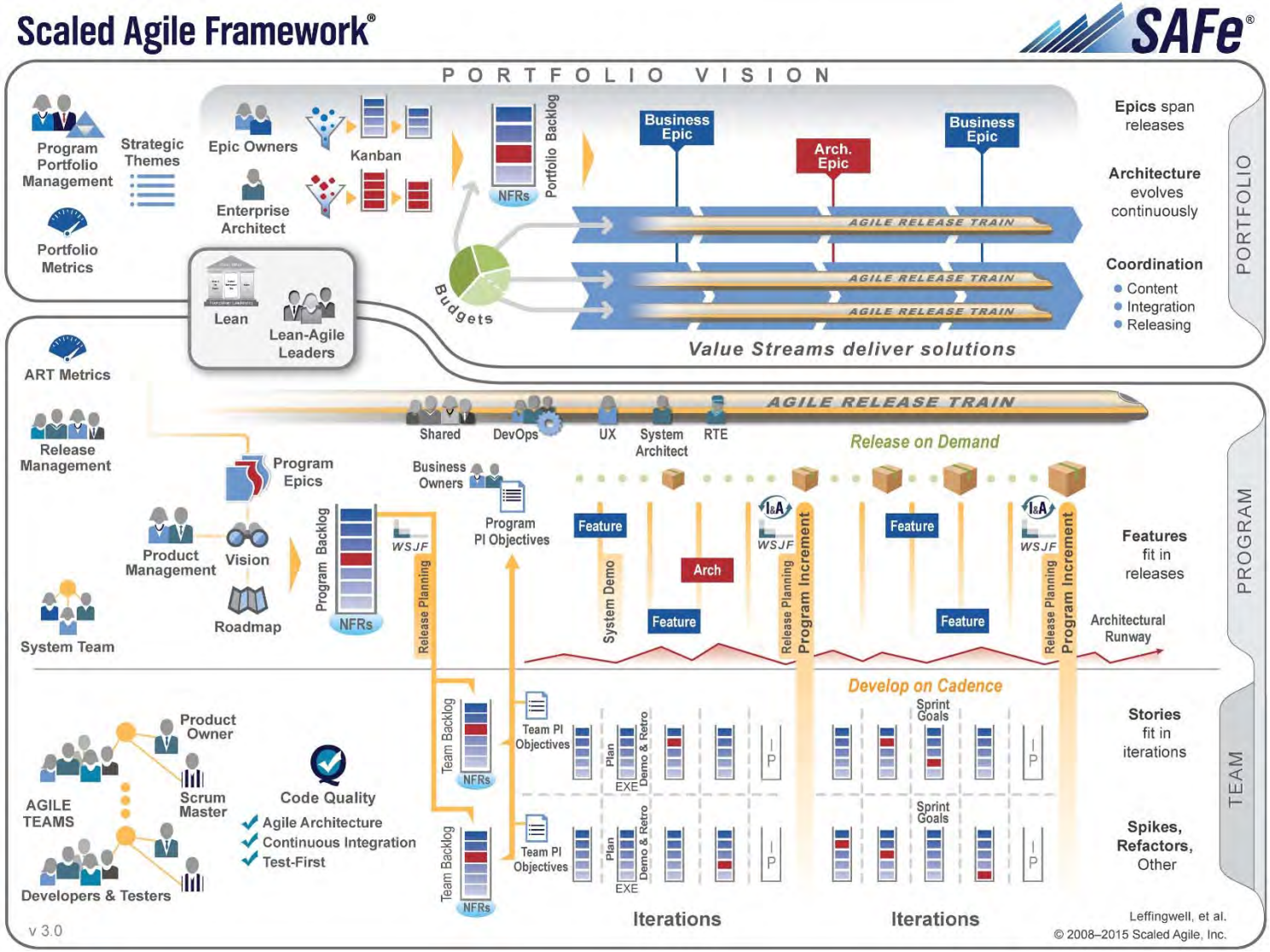


© 2015 Carnegie Mellon University



Distribution Statement A: Approved for Public Release; Distribution is Unlimited

# Scaled Agile Framework (SAFe)




[scaledagileframework.com](scaledagileframework.com)

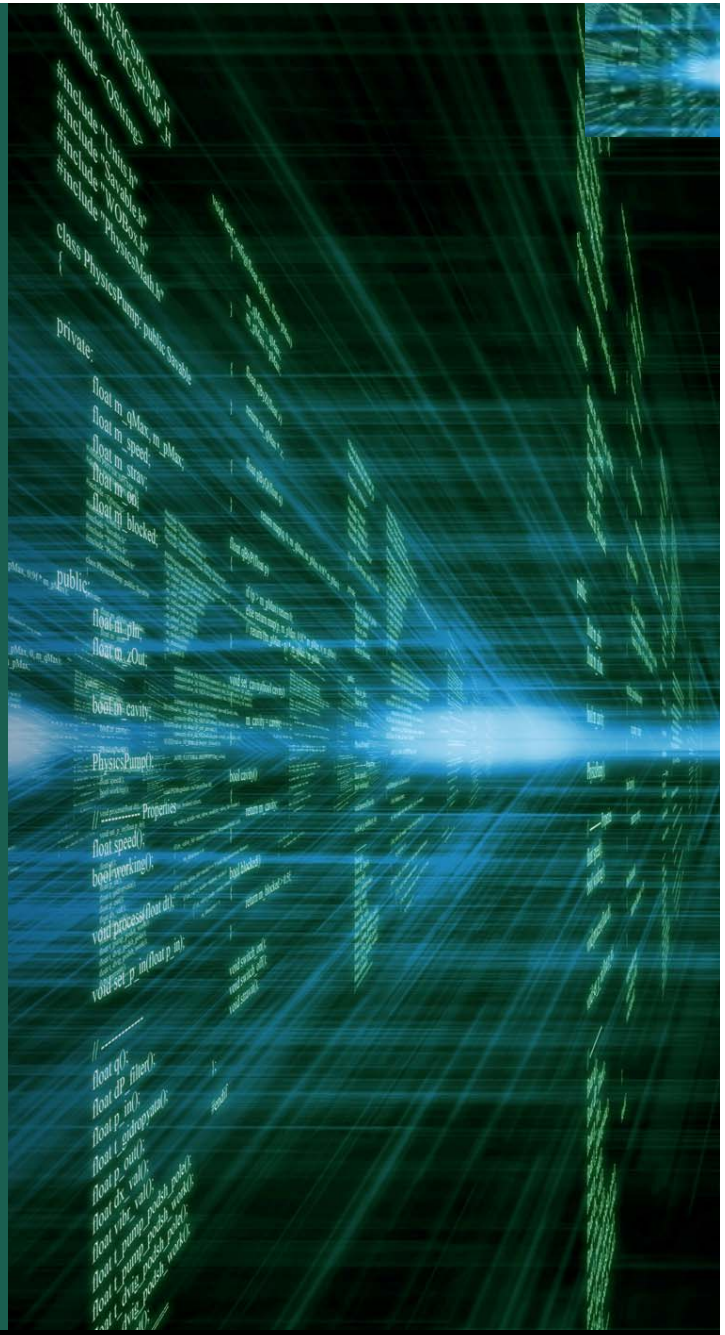


© 2015 Carnegie Mellon University



Distribution Statement A: Approved for Public Release; Distribution is Unlimited

# Summary





© 2015 Carnegie Mellon University

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

# Common Attributes

Each of the scaling frameworks/methods discussed today:

- Embrace lean principles and associated logic
- Espouse strong connection to the agile manifesto
- Compatible with (if not predicated on) scrum at team level
- Offer training and certification to practitioners and consultants
- Address (in one way or another) the work an organization must undertake to make agile work in their setting

- Are not focused *merely* on how to make agile concepts work with larger groups of people.


© 2015 Carnegie Mellon University

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

# Differentiators

Methods/frameworks differ from others in the extent to which they:

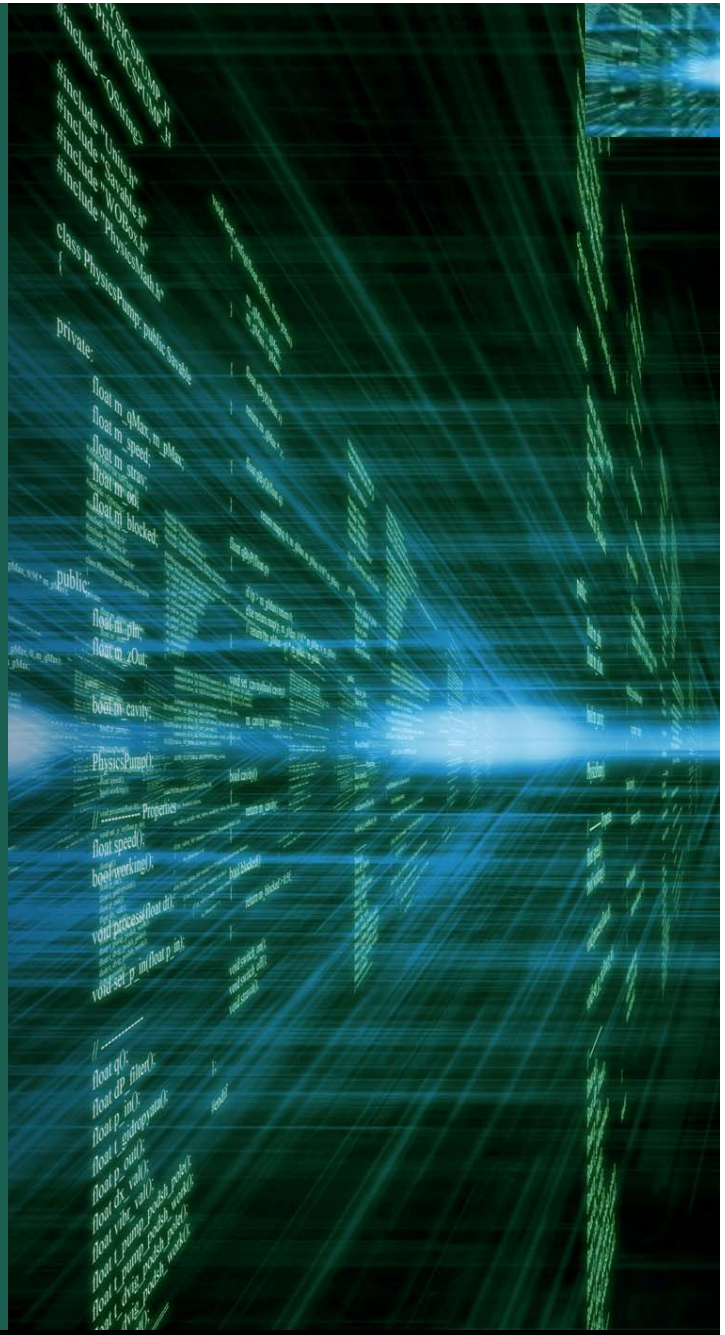
- provide a ‘default setting’ for things like iteration lengths, role assignments and tools & templates available for use
- describe the end-state or structure of the agile organization
- explicitly call for other parts of the organization (beyond the development team) to address specific roles and responsibilities

- offer selectable options that depend on the engineering discipline involved or magnitude of the product to be fielded


© 2015 Carnegie Mellon University

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

# Questions?





© 2015 Carnegie Mellon University

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

# Contact Information

**Presenters**

Will Hayes
Client Technical Solutions Division
Telephone: +1 412.268.6398
Email: wh@sei.cmu.edu

Mary Ann Lapham
Client Technical Solutions Divisions
Telephone: + 1 412.268.5498
Email: mlapham@sei.cmu.edu


© 2015 Carnegie Mellon University

Distribution Statement A: Approved for Public Release; Distribution is Unlimited