

Agile Model-Based Systems Engineering (aMBSE) Keynote

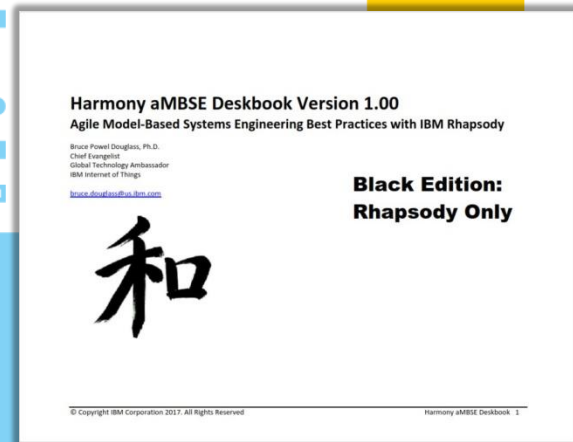
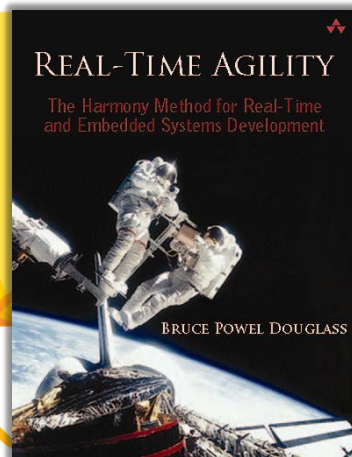
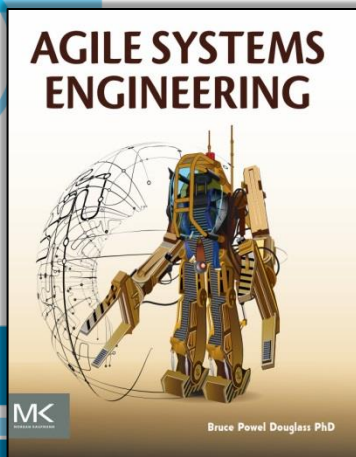
Bruce Powel Douglass, Ph.D.

Chief Evangelist, Global Technology Ambassador
IBM Internet of Things

Bruce.Douglass@us.ibm.com

Twitter: @IronmanBruce

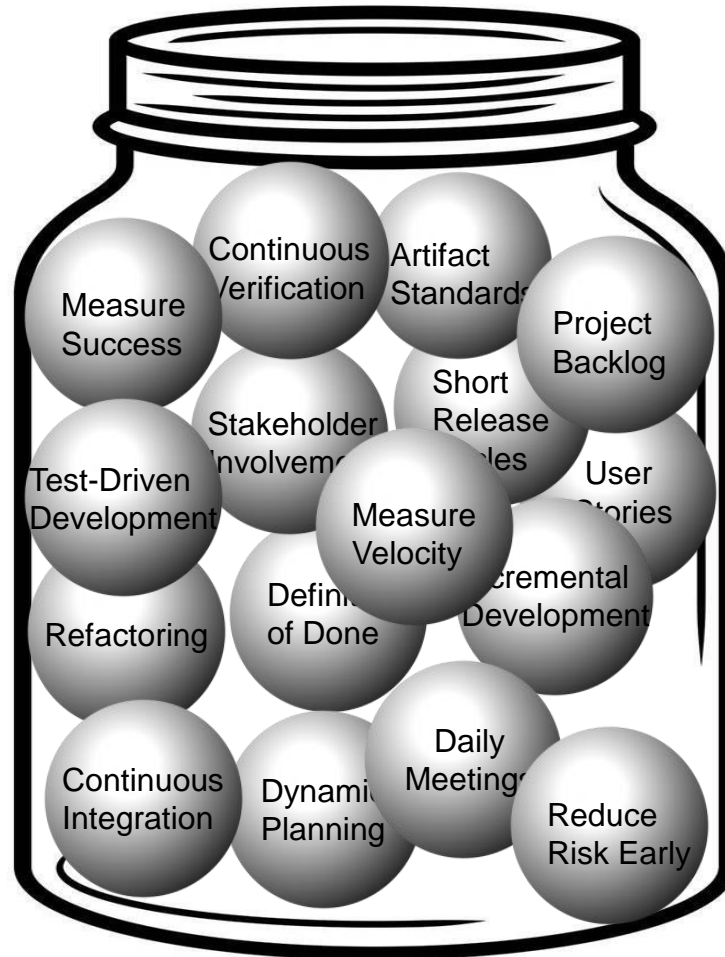
www.bruce-douglass.com



*“Dance like nobody is watching,
Sing like you’re alone in the shower,
Engineer like you’re a passenger
hurtling through space in a speeding
tube of death that you designed.”*

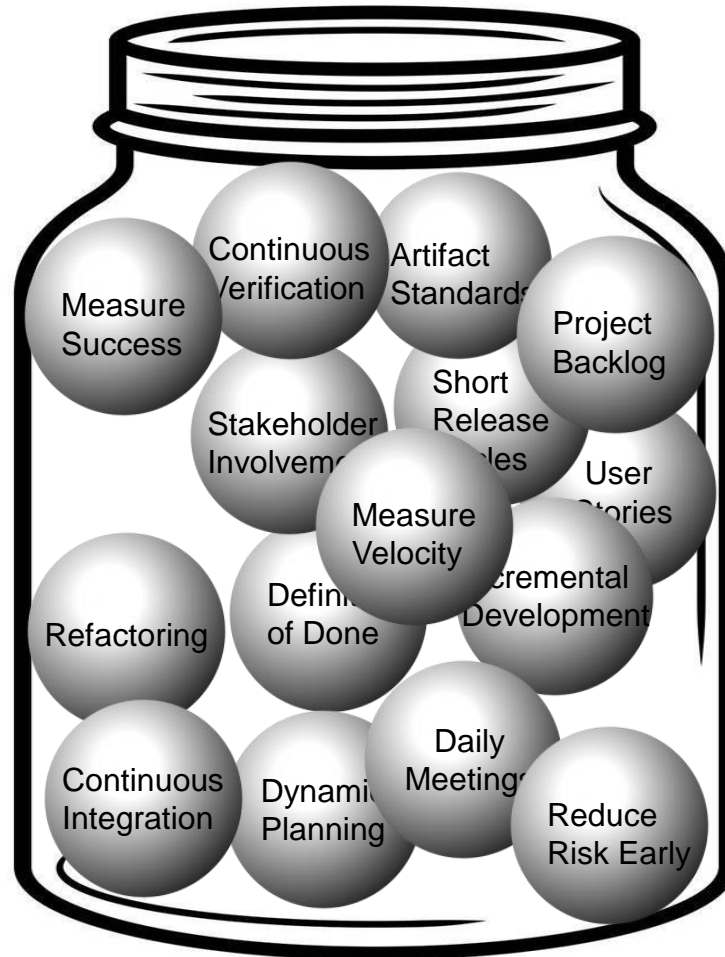
Law of Douglass # 135

Agile Practices

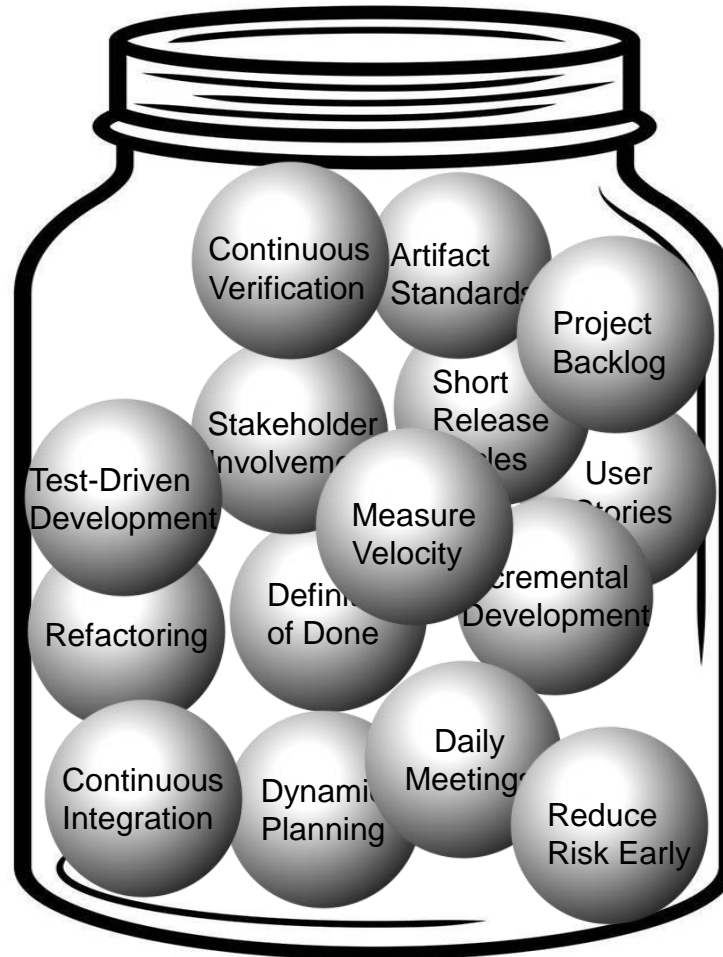


Agile Practices

Create and apply
test cases as you
develop the product,
not after the fact

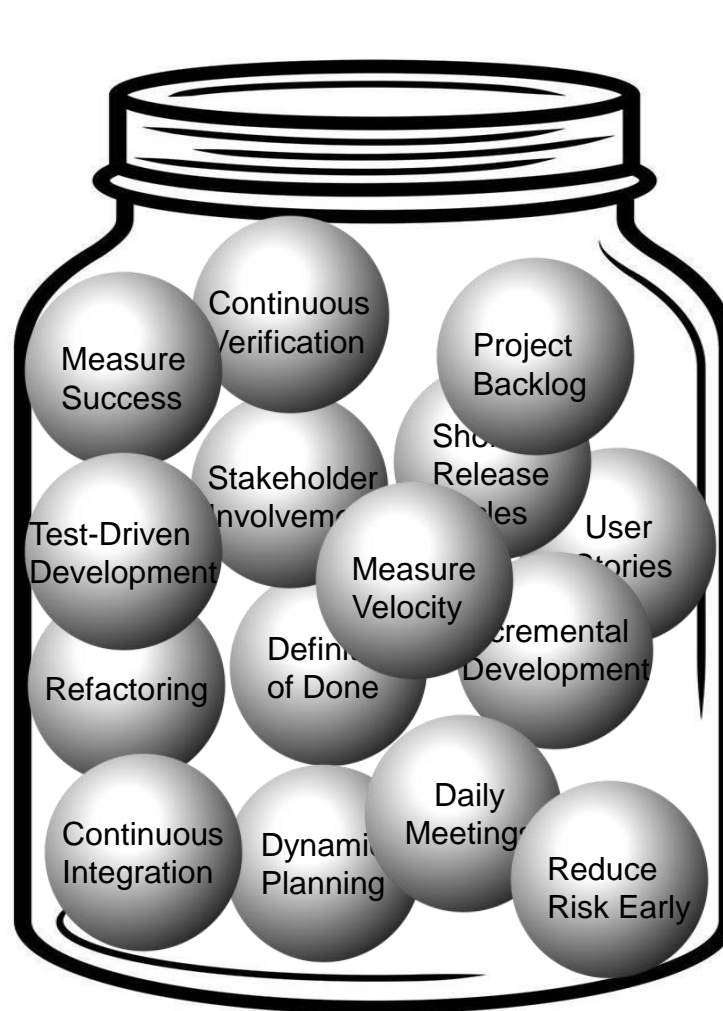


Agile Practices



Continuously verify
the correctness of
your engineering
data

Agile Practices

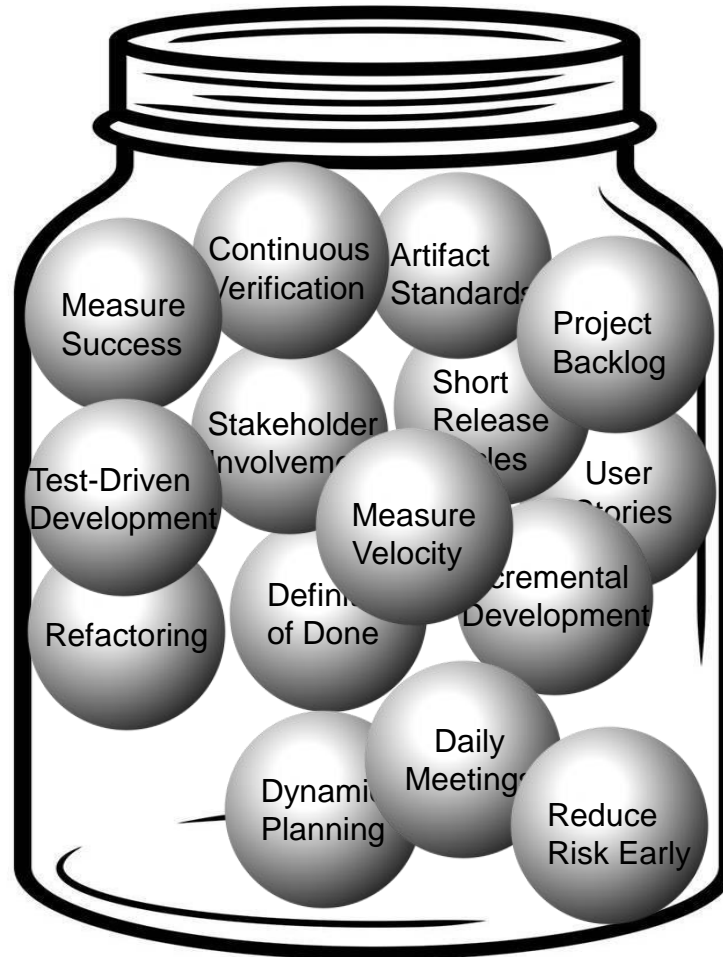


Ensure work products have the right form and content

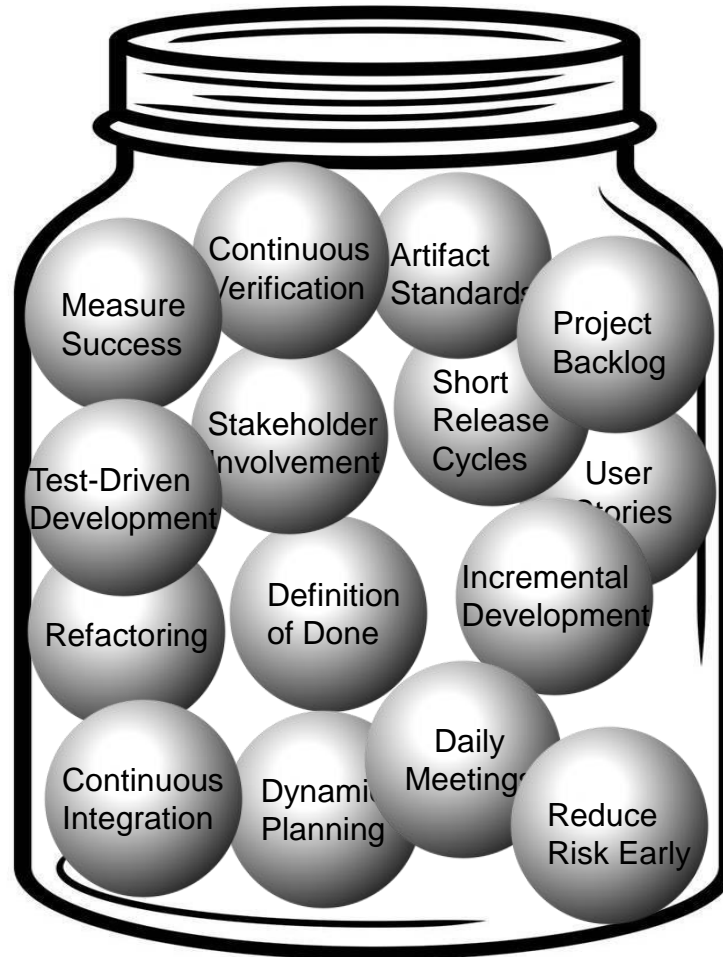
Agile Practices

Continuous
Integration

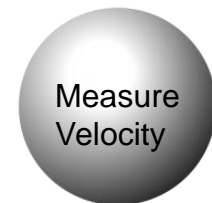
Continuously
integrate work
product components
to ensure on-going
consistency



Agile Practices



Measure progress
against plan

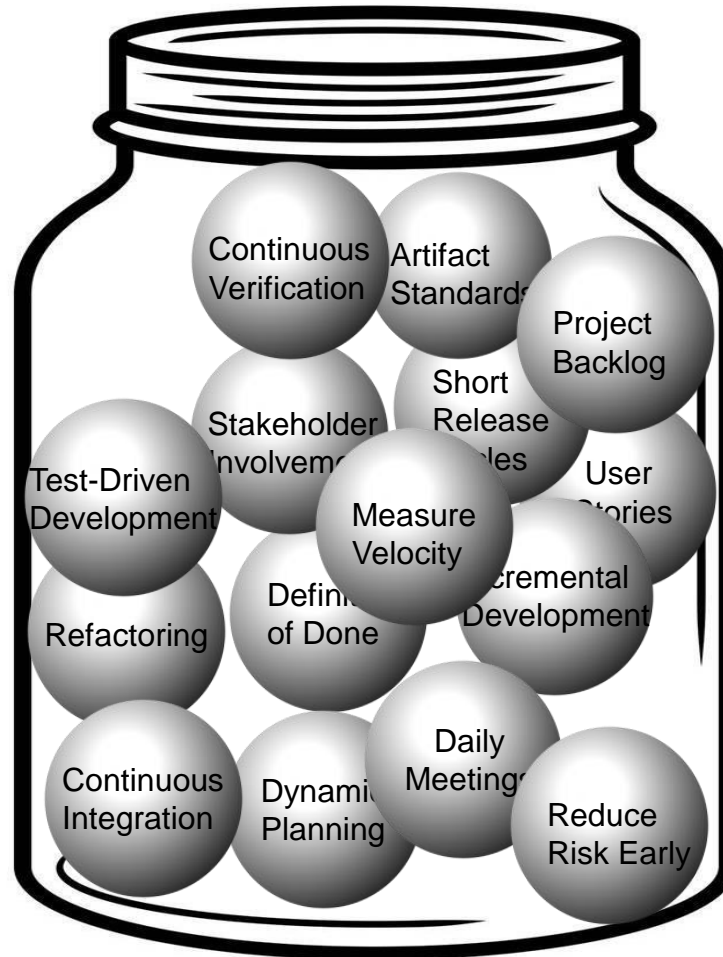


Agile Practices



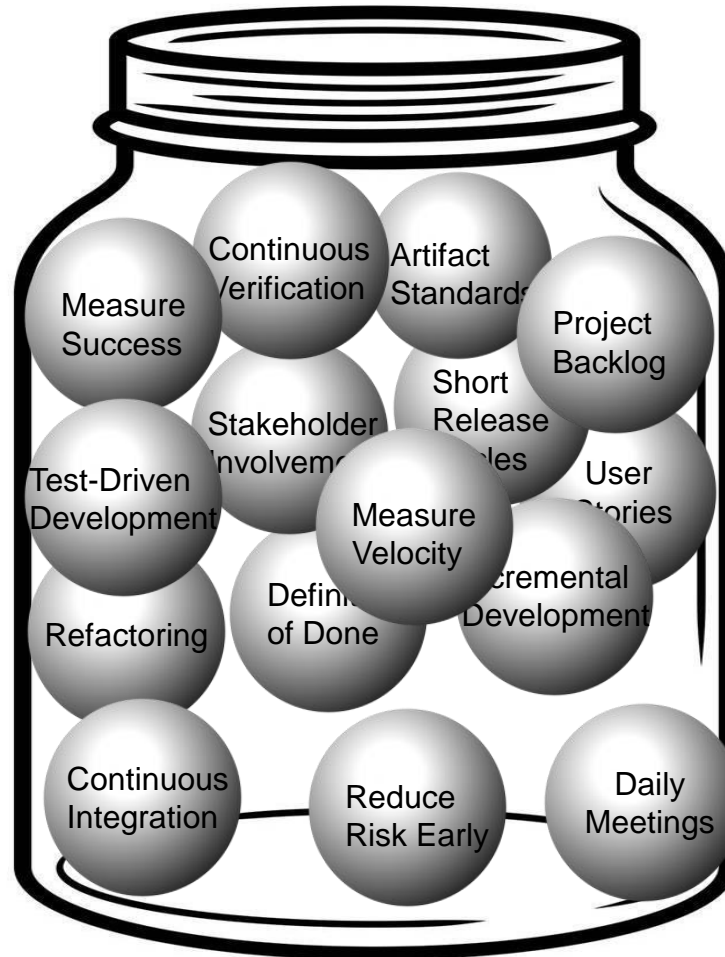
Constantly measure your progress against goals and objectives with metrics, such as

- Velocity
- Deviation from plan
- Burn down rate
- Remaining risk
- Defect rate
- Defects remaining
- Requirements churn
- Test coverage

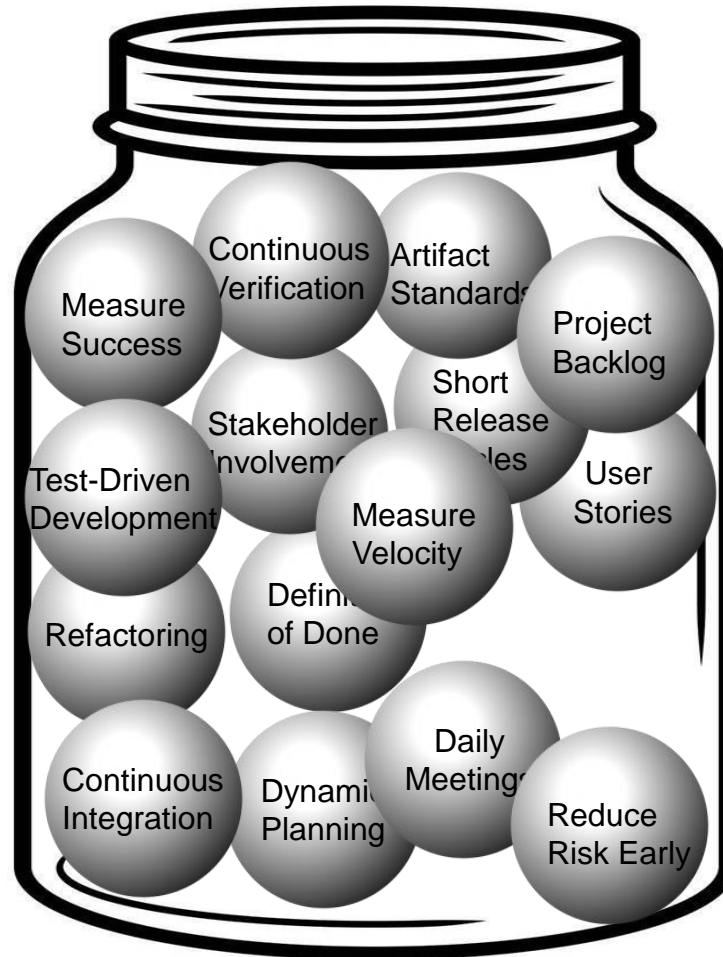


Agile Practices

Plan to the best of your information, but plan to replan as you learn more about the product and project



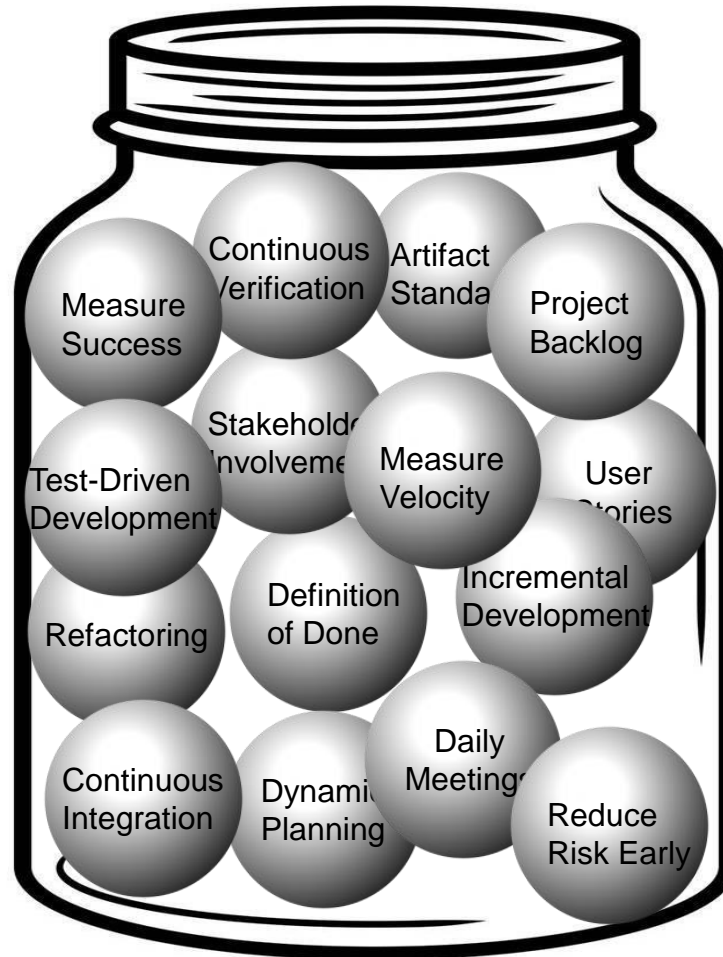
Agile Practices



Develop the work products in small increments verifying their correctness as you go



Agile Practices



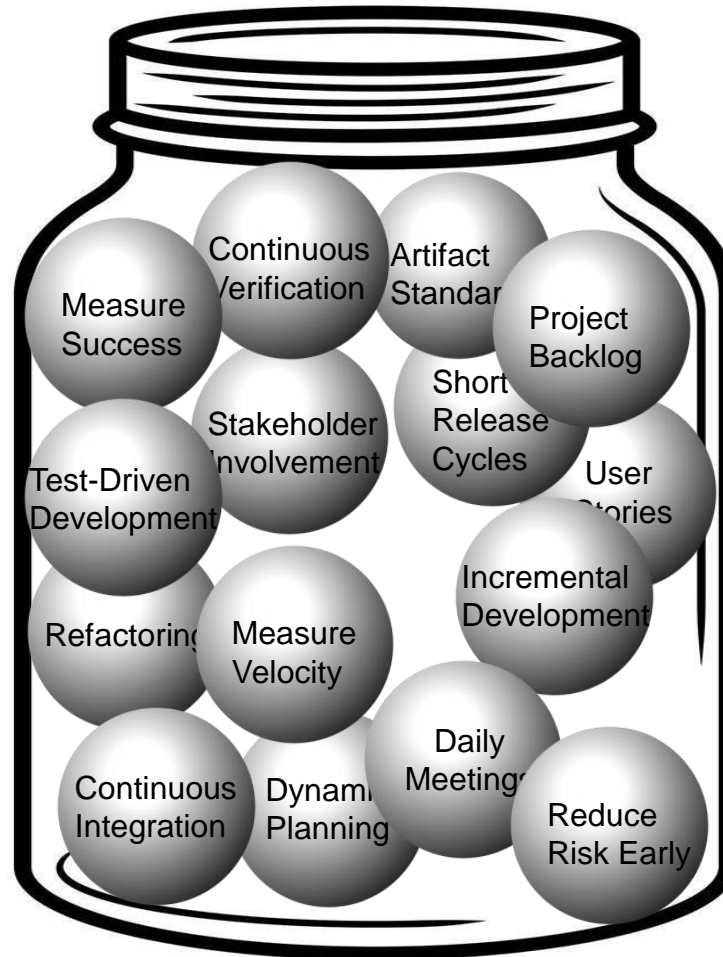
Increments should be small in degree of change and short in duration



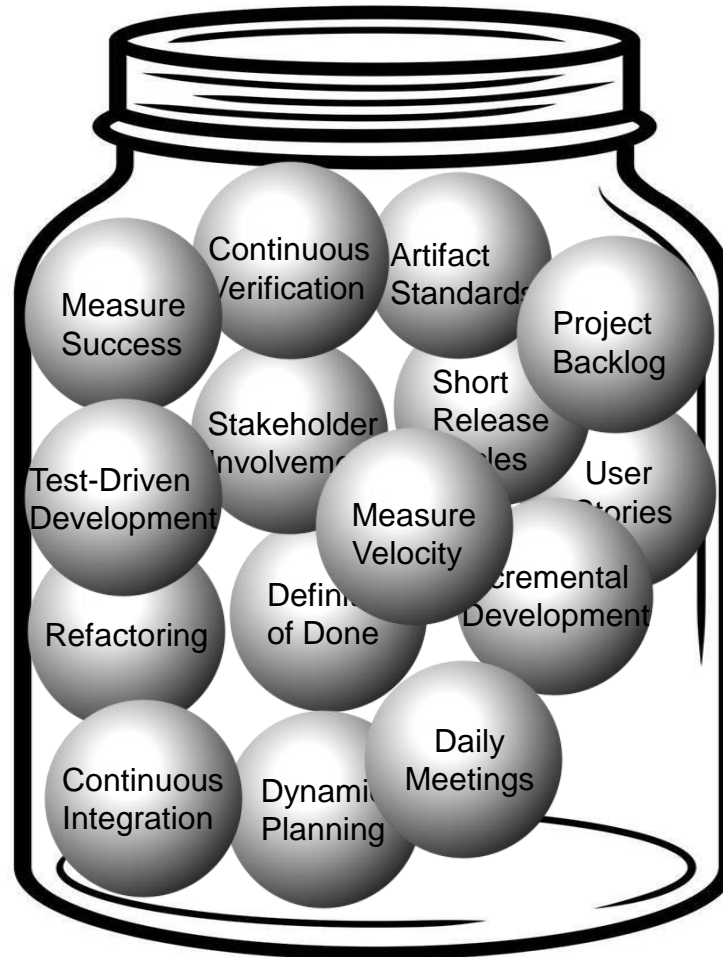
Agile Practices



Be clear on what it means to have successfully and fully reached the objectives of the task or increment and verify that you have done so



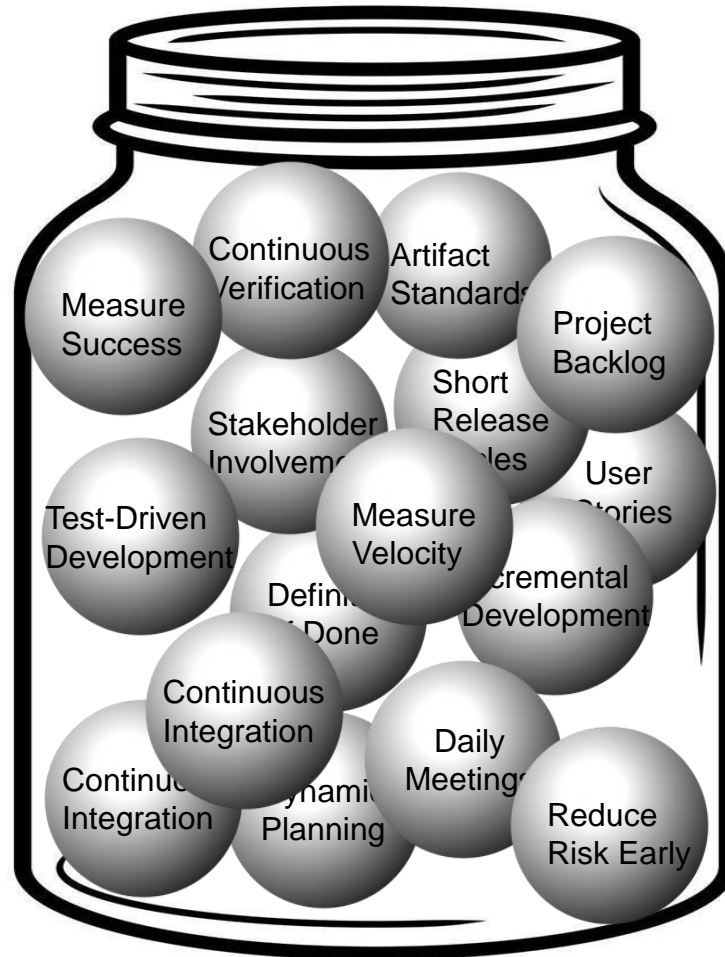
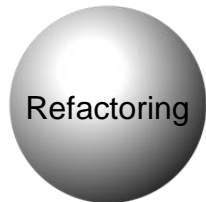
Agile Practices



Identify risk to success, plan *spikes* to address them, and execute them within the increments

Agile Practices

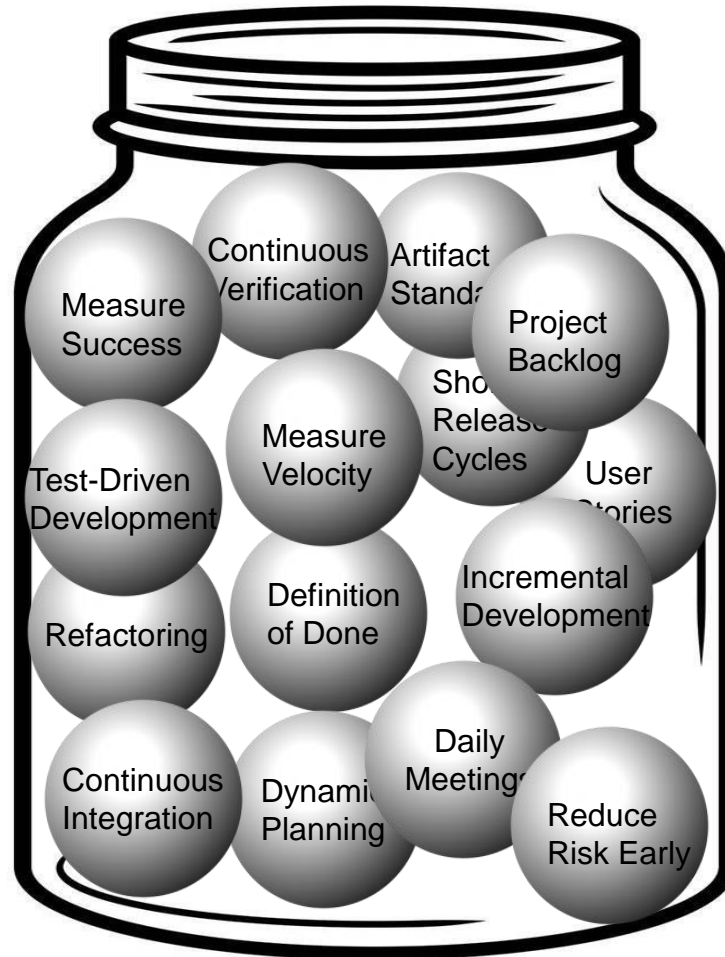
Incremental development is predicated on the idea that change is growth and refactoring is reorganization as more information becomes known



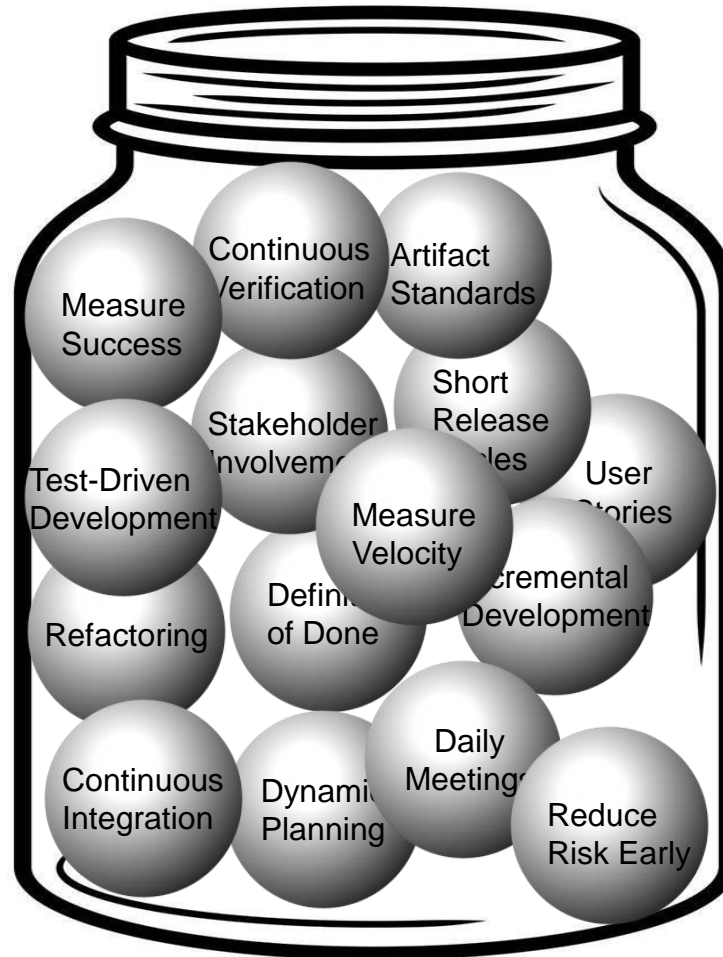
Agile Practices



Incrementally
validate the product
with the stakeholder
to ensure it meets
their needs

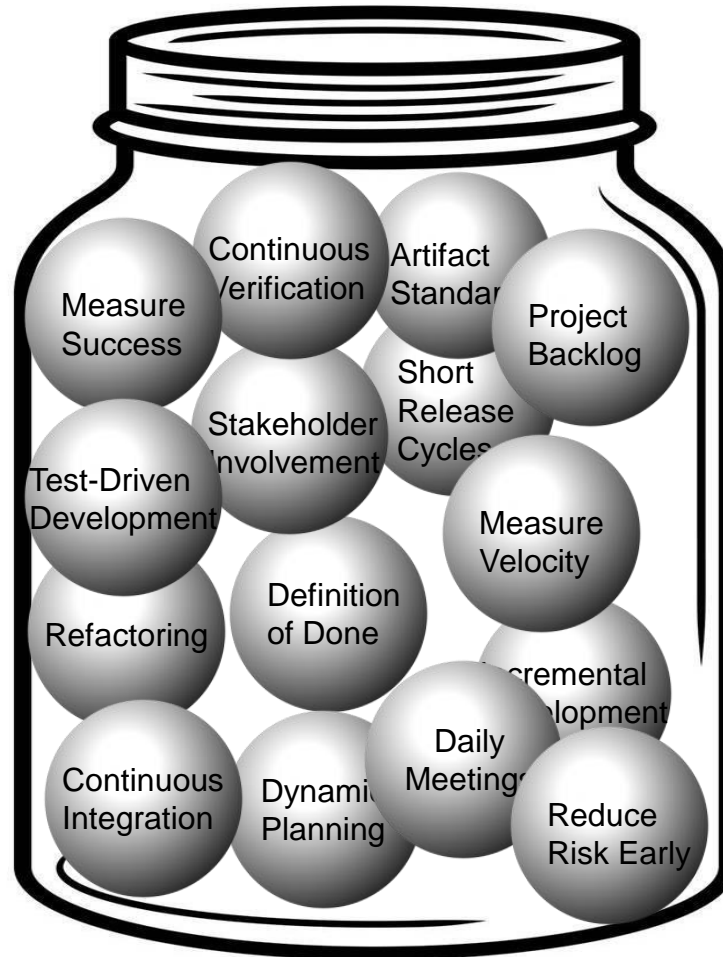


Agile Practices



Maintain and burn down a prioritized list of things to do, including features to incorporate, design to include, and risks to reduce

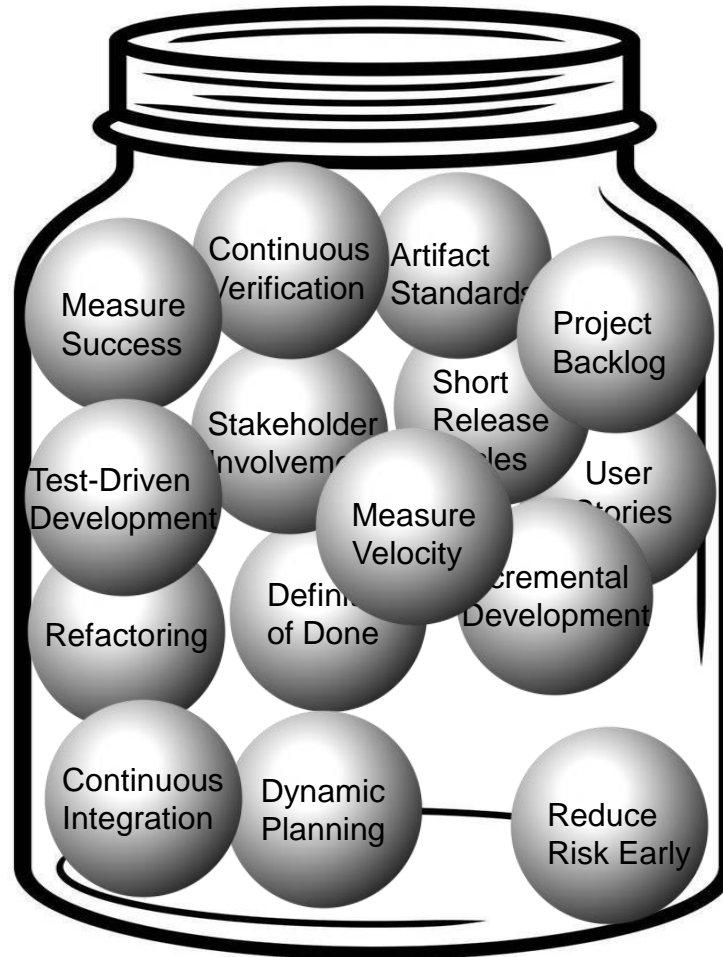
Agile Practices



Use Cases or User Stories aid in the capture and analysis of requirements

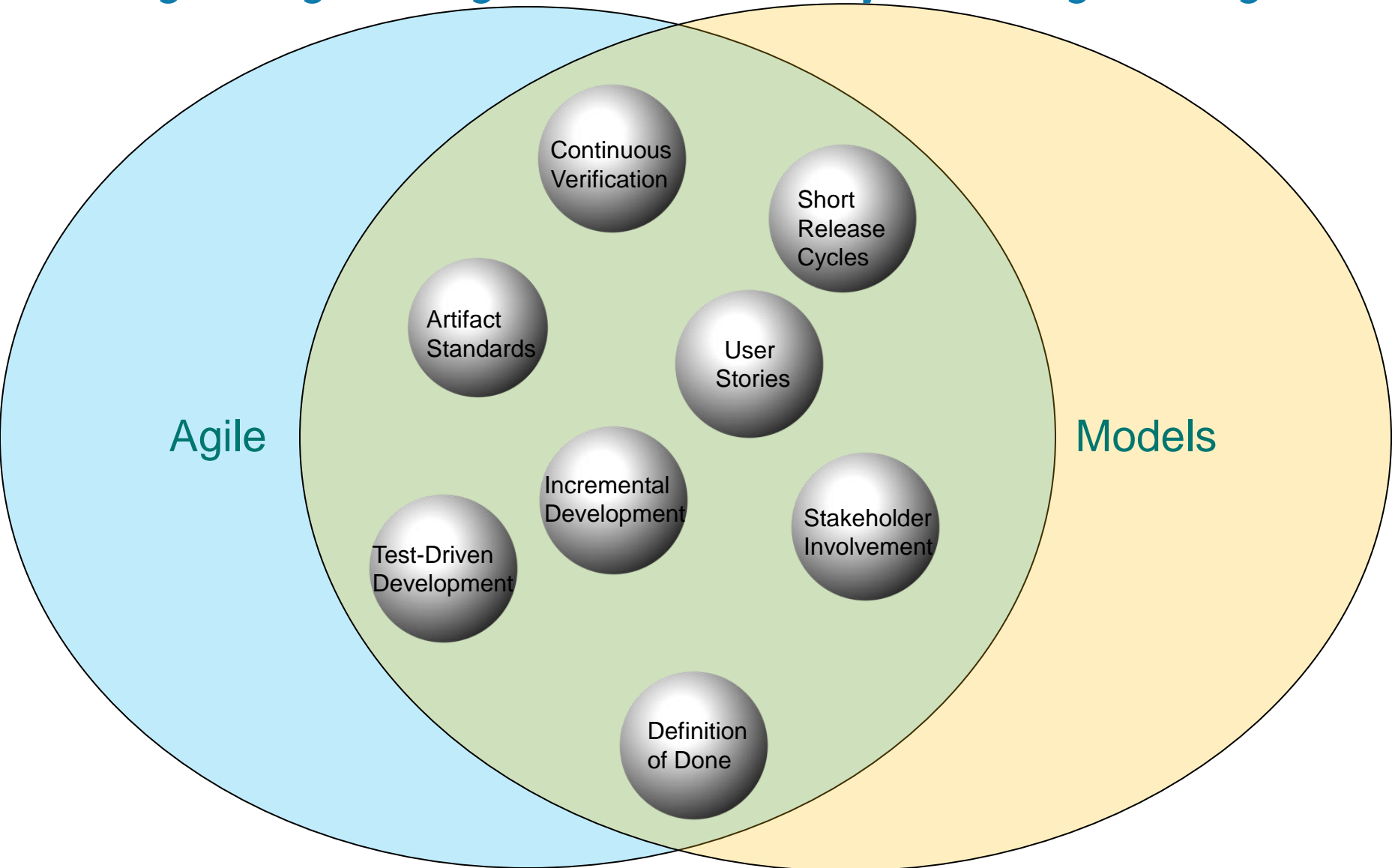


Agile Practices



Each day, have a short meeting in which team members identify where they are and their “blockers”

Putting the Agile in Agile Model-Based Systems Engineering



Harmony Agile MBSE Delivery Process

Rational

Method Composer

Team (IBM)

Welcome to the Rational Harmony Agile Model-Based Systems Engineering

Getting Started

Delivery Processes

Practices

Roles Sets

Tasks

Work Products

Guidance

Tools

Release Info

Search this Site:

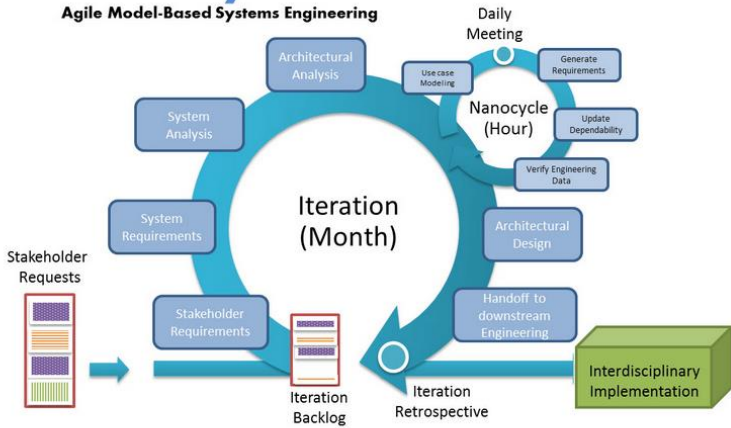
Welcome to the Rational Harmony Agile Model-Based Systems Engineering

The Rational Harmony Agile Model-Based Systems Engineering (aMBSE) process is a delivery process for the development of systems engineering data and work product using both model-based systems techniques with UML and SysML but is at the same time agile and incorporates agile practices for improved quality and engineering efficiency.

Main Description


Harmony aMBSE

Agile Model-Based Systems Engineering



With the initial release of the UML in 1995, systems engineers had a standard language in which they could express requirements, architectures, designs, and other kinds of engineering data. However, there was widespread belief that the Unified Modeling Language (UML) itself was too "software oriented" for general use in systems engineering which led to the development and release of the Systems Modeling Language (SysML). UML and SysML provide a number of key advantages for the development of system engineering data:

- Precision of engineering data
- Data consistency across work products and engineering activities
- A common source for engineering truth
- Improved visualization and comprehension of engineering data
- Ease of integration of disparate engineering data
- Improved management and maintenance of engineering data



21 Internet of Things

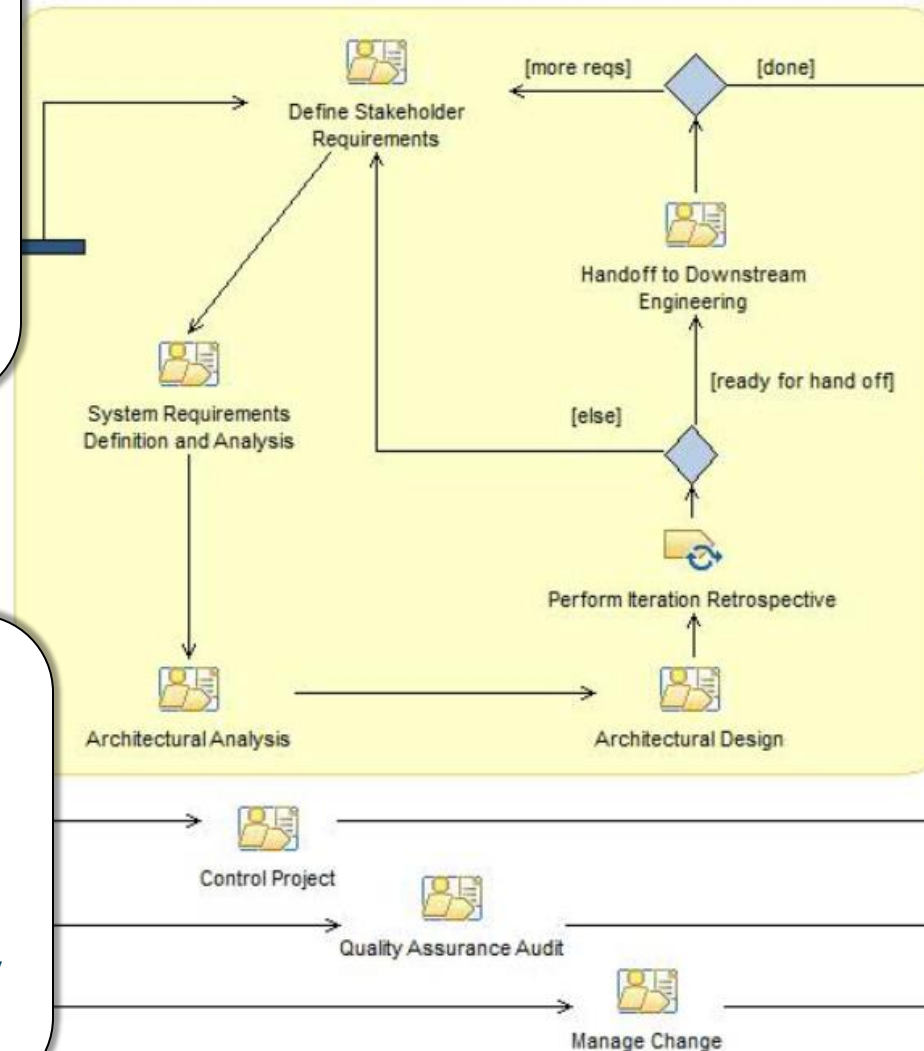
© 2018 IBM Corporation

Harmony aMBSE Practices: Incremental Development

Harmony aMBSE Delivery Process

The Harmony aMBSE process highly recommends computable models to facilitate verification

Each important work product is developed in short nanocycles – 20-60 minute long – with continual verification of correctness, accuracy and completeness



MBSE work products include requirements, functional analysis, architecture, interface specifications, logical data model, trace matrices, physical data model, and hand off

The Harmony *Microcycle* defines one increment cycle, normally 1-4 weeks in duration

Download Papers, Presentations, Models, & Profiles for Free

www.bruce-douglass.com

Bruce Powel Douglass, Ph.D.

Resources Blog Events Forum Contact About Comments Members

Real-Time Agile Systems and Software Development



面向软件的
Harmony系统
高端

REAL-TIME
The HarmonyESD Method
and Embedded Systems

入式的“代
AGILE SYS
ENGINEER

主持人:
Bruce Powel Douglass, 博士

设计、UML、SysML、DOD
计方面是全行业公认的专家。

本次培训侧重于:
可靠性建模, 系统架构
的交付, 嵌入式软件开发

(一) 培训阶段
主要内容: 面向软件的
顶层思想
培训时间: 5月16日上

REAL-TIME UML
WORKSHOP FOR
EMBEDDED SYSTEMS

Harmony aMBSE Deskbook Version 1.00

Agile Model-Based Systems Engineering Best Practices with IBM Rhapsody

Bruce Powel Douglass, Ph.D.
Chief Evangelist
Global Technology Ambassador
IBM Internet of Things
bruce.douglass@us.ibm.com

Black Edition: Rhapsody Only

和

© Copyright IBM Corporation 2017. All Rights Reserved
Harmony aMBSE Deskbook 1



REAL-TIME UML
WORKSHOP FOR
EMBEDDED SYSTEMS

Second Edition
Bruce Powel Douglass



AGILE SYSTEMS
ENGINEERING

The Harmony Method for Real-Time
and Embedded Systems Development

BRUCE POWEL DOUGLASS



REAL-TIME AGILITY

The Harmony Method for Real-Time
and Embedded Systems Development

BRUCE POWEL DOUGLASS



REAL TIME UML
THIRD EDITION

ADVANCES IN THE UML FOR
REAL-TIME SYSTEMS

BRUCE POWEL DOUGLASS



DOING HARD TIME

DEVELOPING REAL-TIME
SYSTEMS WITH UML, OBJECTS,
FRAMEWORKS, AND PATTERNS

BRUCE POWEL DOUGLASS

Foreword by Grady Booch



Compliments of IBM
IBM Limited Edition

Agile Product
Development
FOR
DUMMIES

A Wiley Brand

Learn:
Why agile product development
is critical for building the "things"
of the Internet of Things
How to develop for implementing
agile product development
How to develop for implementing
agile product development

Jonathan Chard
Bruce Powel Douglass



DESIGN PATTERNS FOR
EMBEDDED SYSTEMS IN C

An Embedded Software Engineering Toolkit

BRUCE POWEL DOUGLASS



REAL-TIME DESIGN
PATTERNS

ROBUST SCALABLE ARCHITECTURE
FOR REAL-TIME SYSTEMS

BRUCE POWEL DOUGLASS