Systems Modernization Strategies

August 2017

Presented by:

Select Computing INCORPORATED

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Systems Modernization Strategies

Best Practices

by

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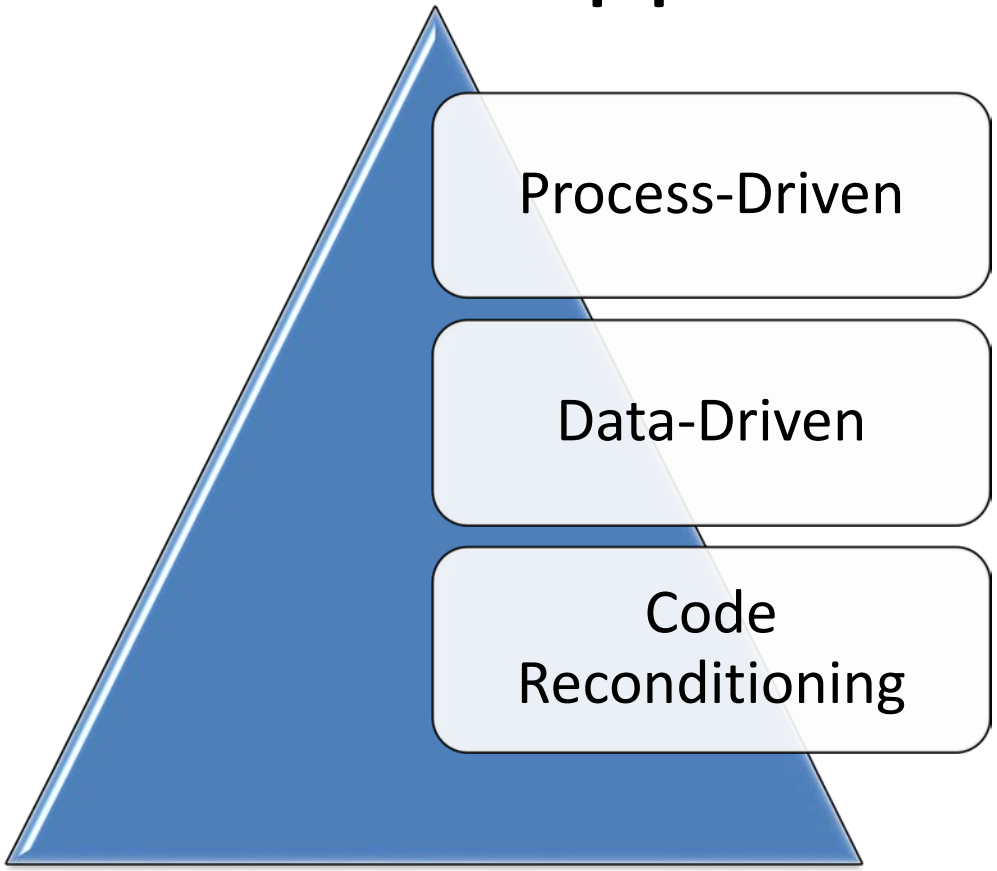
Agenda

- Modernization Approaches
- Agile
- CMMI
- Conclusion
- Q&A

Modernization Approaches



Modernization Approaches

Process Driven

Scope	Define business objectives. Define the business architecture of future state. Identify gaps. Iterate through transitional architectures to achieve future state.
Impact	Revolutionary. Business processes are transformed.
Approach	Top-Down. Business-driven initiative. The transition architectures define the roadmap for all future projects.
Data	Legacy data is migrated.
Operations	No changes to legacy operations until replaced.
IT Organization	Need to develop skills required for target state. Need to support legacy, transition and future states.

Modernization Approaches

Data Driven

Scope	Build a Business Information Repository (BIR). Uses a normalized canonical data model. Is independent from other systems. Is longitudinal. Is immutable.
Impact	Evolutionary. Allows business processes to change at their own pace.
Approach	Bottom-Up. IT driven initiative with business stakeholders to validate BIR using data visualization and reporting. All future projects integrate with BIR to restore Organizational Agility.
Data	No changes to legacy data structures.
Operations	No changes to existing IT operations. New operations to populate and maintain BIR.
IT Organization	Need to develop BIR skills. Need to implement master data management governance practices.

Modernization Approaches

Code Reconditioning

Scope	Refactor the software and streamline the codebase. Refresh documentation. Create test bed.
Impact	No impact to business processes.
Approach	Bottom-Up. IT driven initiative with business stakeholders to verify test bed.
Data	No changes to data structures. Eliminate dead data.
Operations	Retire obsolete software. Remove dead code.
IT Organization	No changes to skills or practices.

Modernization Approaches

Code Reconditioning

Codebase Purification	Identify and remove obsolete and redundant processing to eliminate waste.
Codebase Translation	Converts the code base from one language to another. For example: COBOL ➔ JAVA.
Codebase Porting	Changes the underlying platform of the codebase.
SOA Enablement	Introduces the software infrastructure necessary to implement a service-oriented architecture.
DEVOPS Enablement	Create processes and structures necessary for DEVOPS.

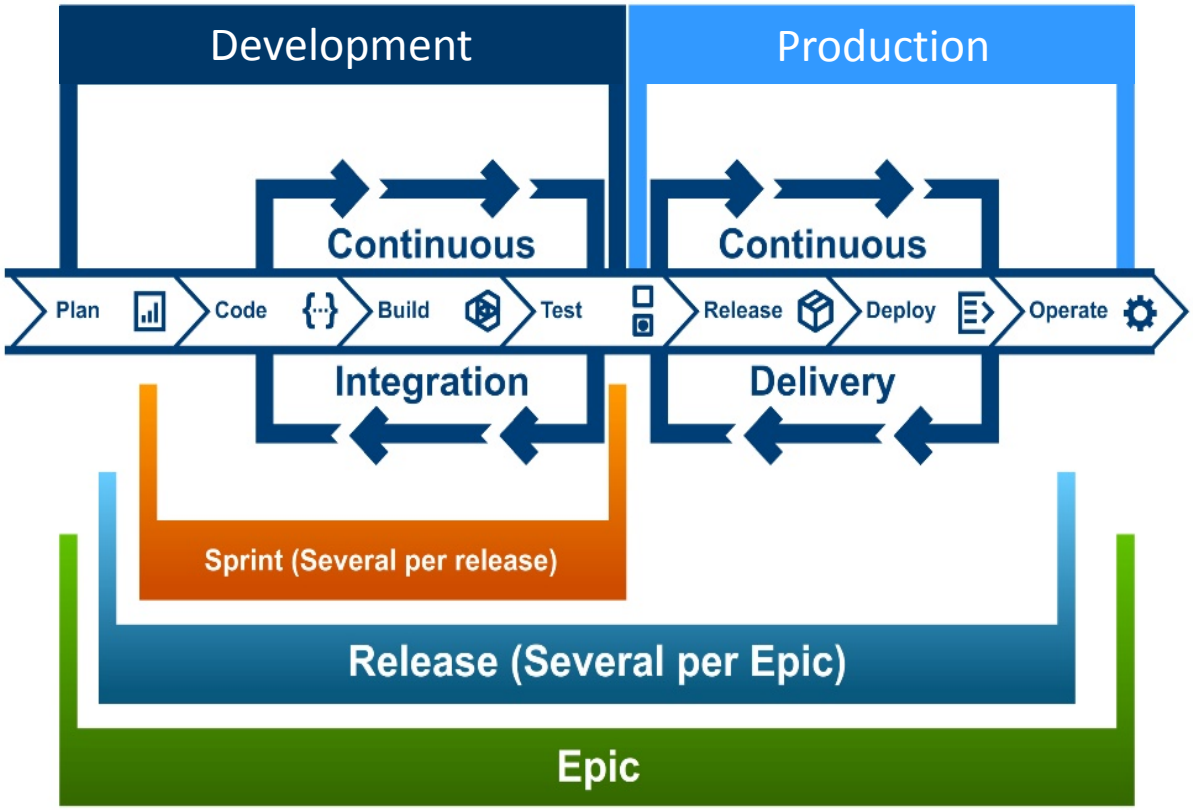

Demo

SCi Modernization Factory

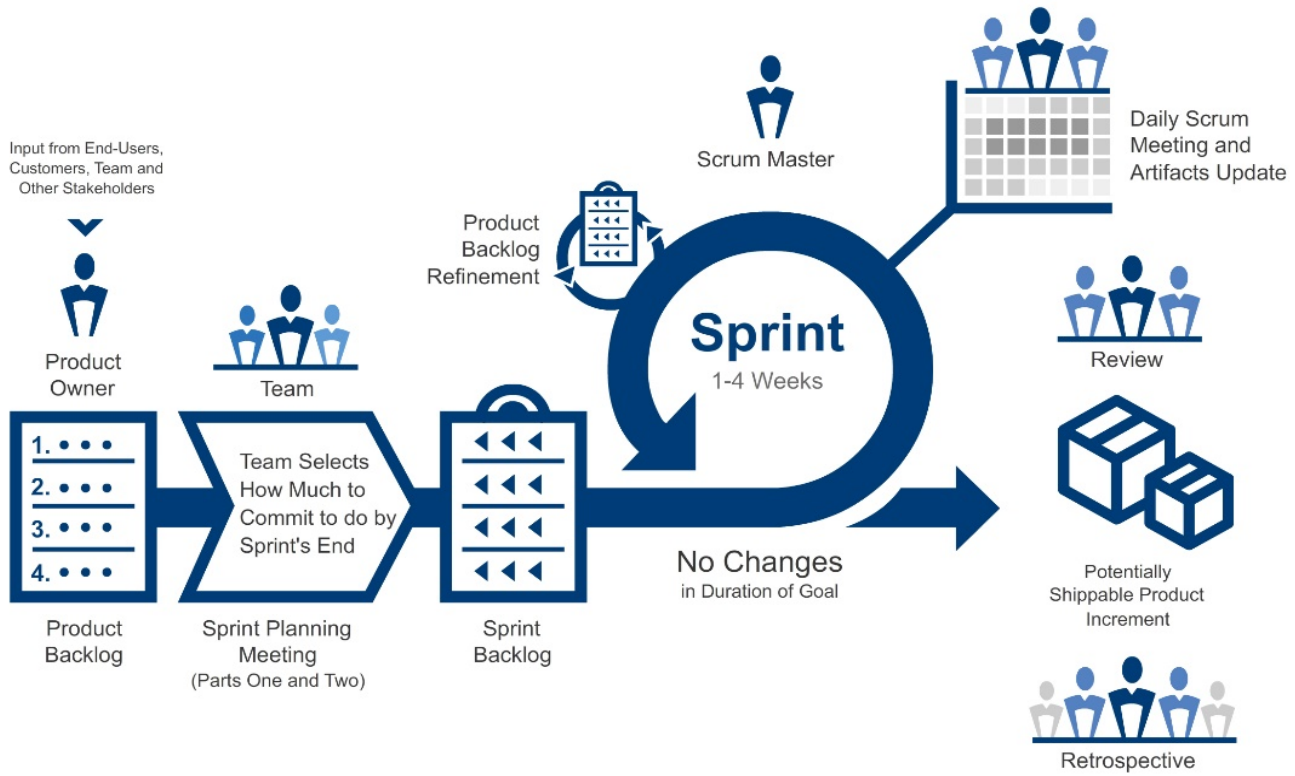
Outsource modernization activities that rely on transitional technologies

SCi set up its Modernization Factory for Agile Modernization

SCi can help you establish a CI/CD environment and implement DEVOPS



Scrum


Input from End-Users, Customers, Team and Other Stakeholders
Product Owner
Team
Scrum Master
Product Backlog Refinement
Daily Scrum Meeting and Artifacts Update
Sprint
1-4 Weeks
Review
1.
2.
3.
4.
Team Selects How Much to Commit to do by Sprint's End
No Changes
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Potentially Shippable Product Increment
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(Parts One and Two)
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Retrospective

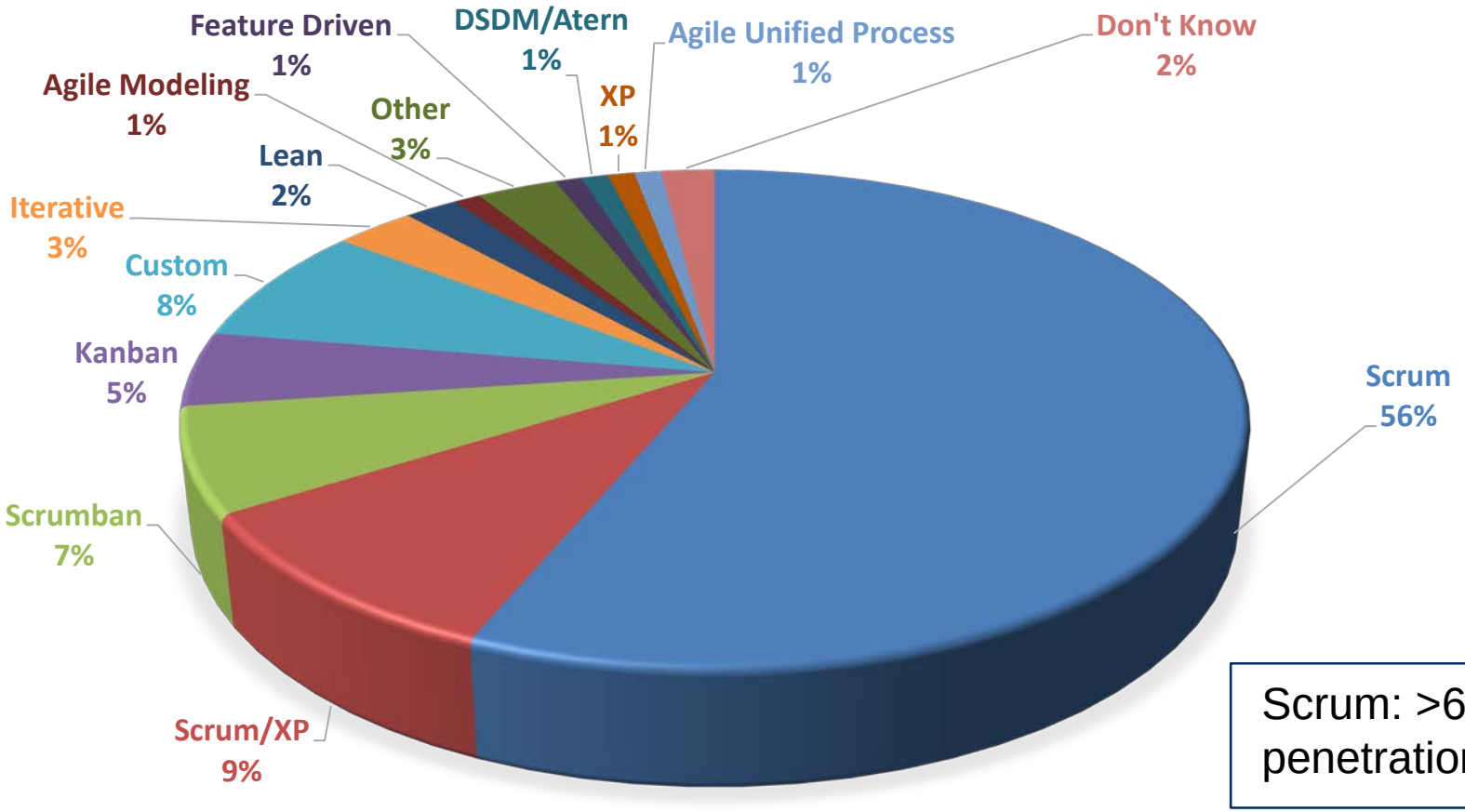
Agile Frameworks

Agile Myths

1. Agile methods are undisciplined and not measurable.
2. Agile methods have no project management.
3. Agile methods apply only to software development.
4. Agile methods have no documentation.
5. Agile methods have no requirements.
6. Agile methods only work with small co-located teams.
7. Agile methods do not include planning.
8. Agile only works for small project teams.
9. Agile development is not predictable.
10. Agile development does not scale.

Agile Frameworks

The frameworks scale Scrum up to enable it for programs.



Scrum: >65% penetration

PROJECT LEVEL METHODOLOGIES

Agile Frameworks

3 Frameworks:

- Scaled Agile Framework **(SAFe)**
  http://scaledagileframework.com/
  by Dean Leffingwell
- Disciplined Agile framework **(DAD)**
  http://www.disciplinedagiledelivery.com/start-here/
  by Scott Ambler
- Large Scale Scrum framework **(LeSS)**
  http://static1.1.sqspcdn.com/static/f/702523/22609354/1367558447003/201305-Larman.pdf
  by Craig Larman and Bas Vodde

CMMI Empowers Agile

Working Together to Solve Common Business Problems

Common Business Problems
Identify types of problems organizations face running projects.

Agile Ceremonies / Techniques
Identify how Agile Scrum addresses the problem.

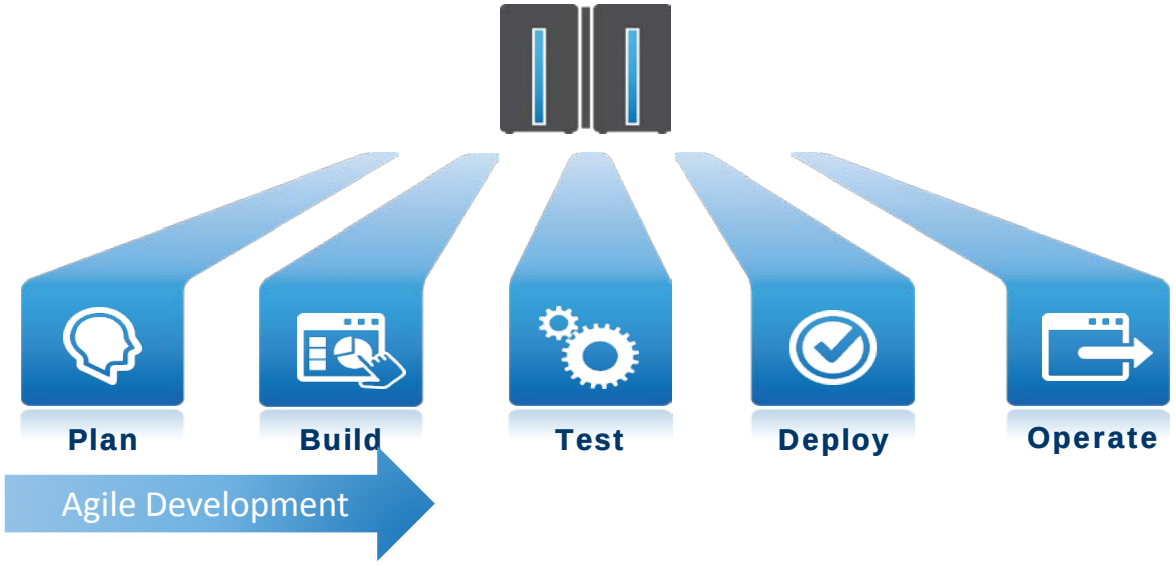
CMMI Process Areas
The CMMI process areas address the necessary capabilities the organization needs to apply the Scrum techniques effectively.

What's DevOps

"DevOps (a clipped compound of "development" and "operations") is a culture, movement or practice that emphasizes the collaboration and communication of both software developers and other information-technology (IT) professionals while automating the process of software delivery and infrastructure changes. It aims at establishing a culture and environment where building, testing, and releasing software, can happen rapidly, frequently, and more reliably."

https://en.wikipedia.org/wiki/DevOps

The Journey to DevOps



Why Consider Agile?

Agile Practice	Business Goal
More frequent release cycles	*Better Time to Market*
Involve customers in the development process	*Boost quality and efficiency* + *Build the right product*
Demonstrate progress through working demos, not slides	*Transparency* + *Instilling Confidence*

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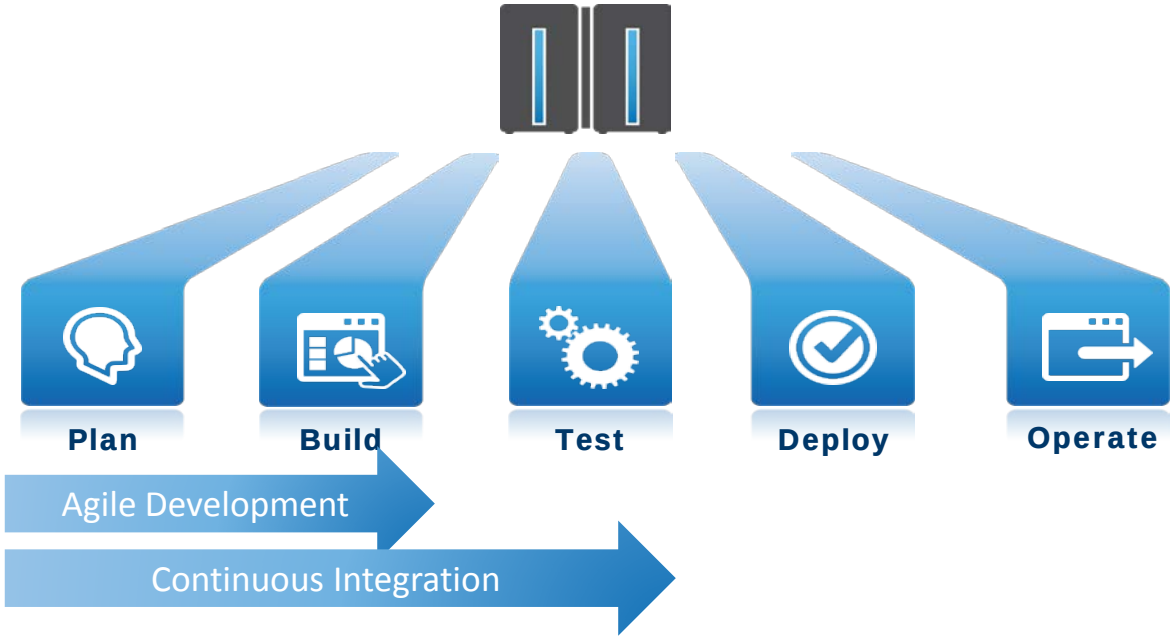
The Journey to DevOps



What is Continuous Integration?

- Continuous integration (CI) is the practice, in software engineering, of merging all developer working copies to a shared mainline several times a day.
- One of the Coding rules of Extreme Programming.
- "pay me now or pay me more later“ concept.
- Intended to be used in combination with test-driven development

Why CI Matters?

- Increases the confidence in delivering working software on every iteration
- Speed up team development by reducing integration issues

"Continuous Integration doesn't get rid of bugs, but it does make them dramatically easier to find and remove."

- Martin Fowler, Chief Scientist, ThoughtWorks

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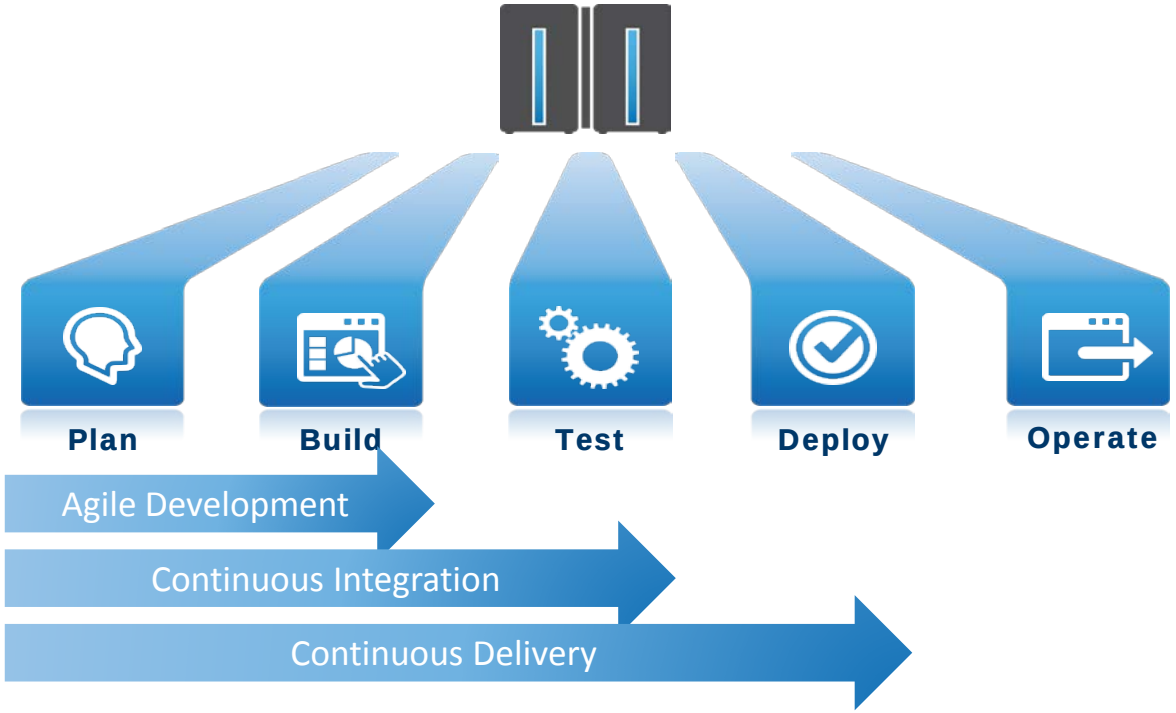
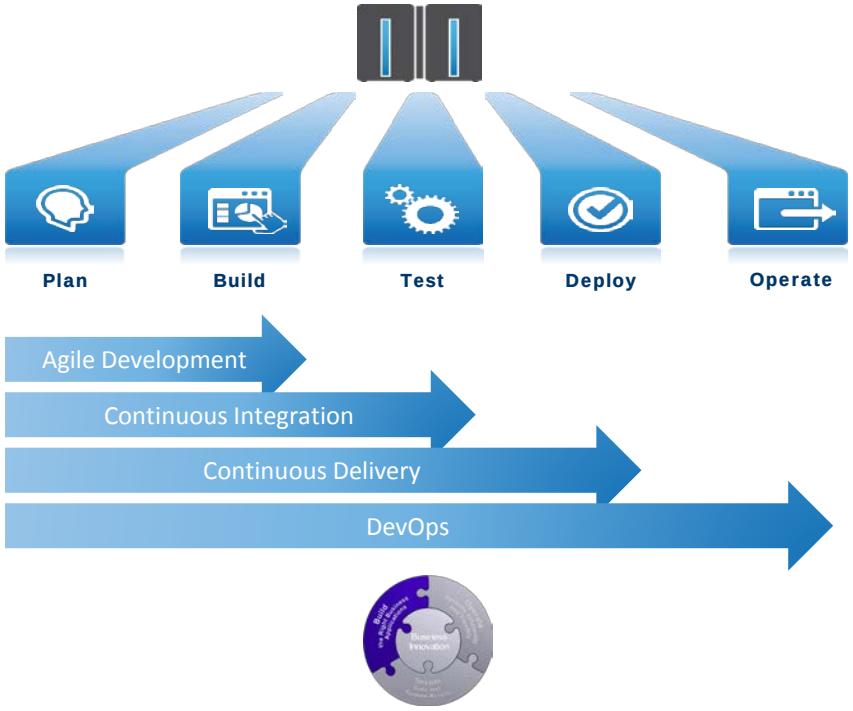
The Journey to DevOps



What is Continuous Delivery?

- Continuous delivery (CD) is a software engineering approach in which teams produce software in short cycles, ensuring that the software can be reliably released at any time.
- Continuous Delivery is not Continuous Deployment
- Relies on 3 foundations:
  - configuration management,
  - continuous integration,
  - continuous testing

DevOps within the Build Portfolio

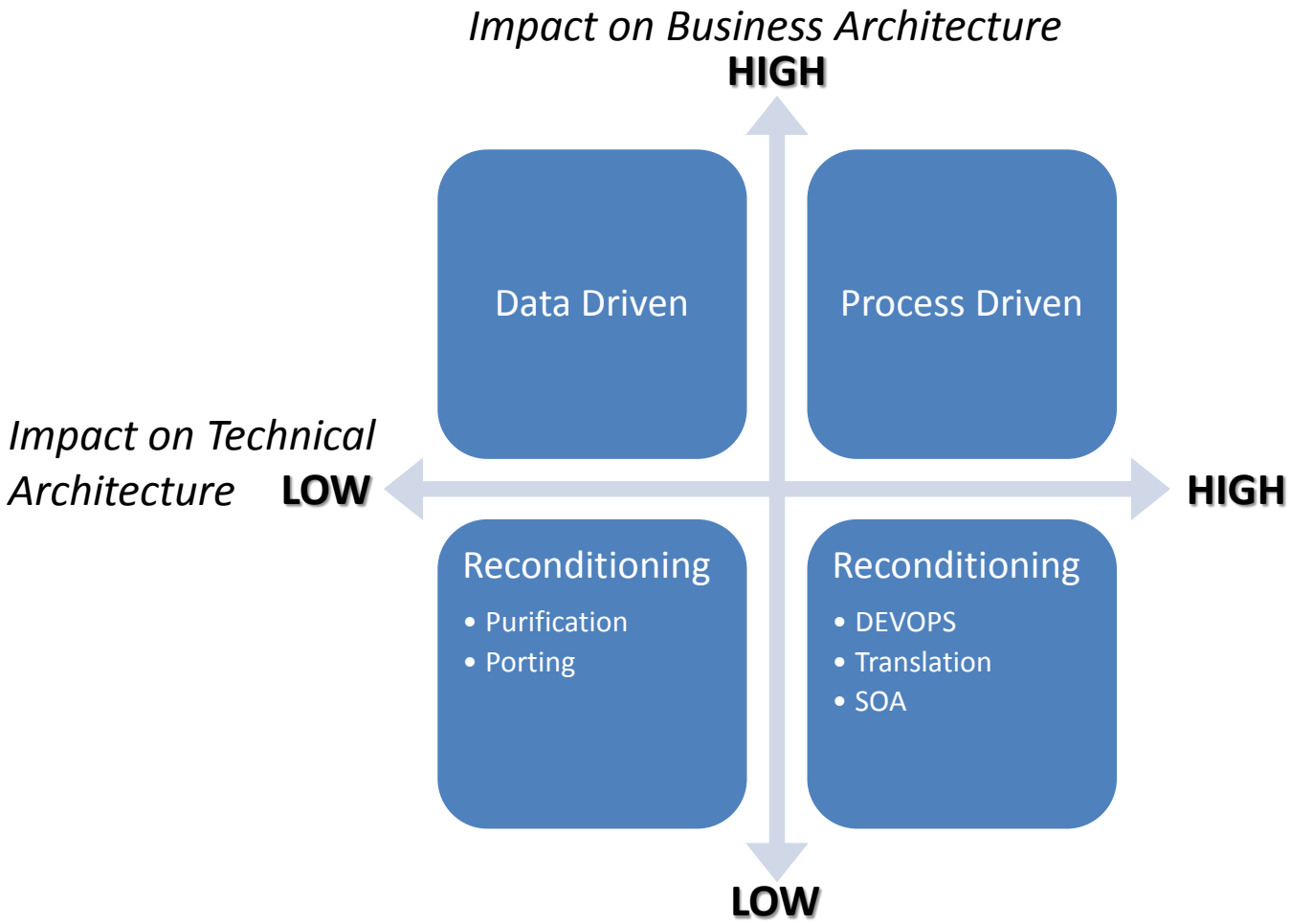


- Micro Focus Atlas
- Micro Focus Agile
- Micro Focus Enterprise Developer
- Micro Focus Enterprise Analyzer
- Micro Focus Enterprise Server
- Micro Focus Visual Cobol
- Micro Focus Test Server
- Micro Focus Silk Central
- Micro Focus Silk Test
- Micro Focus Silk Performer
- Micro Focus DataExpress


Demo

Modernization Approaches

Analysis of Alternatives



CMMI

- To improve maturity of processes by describing characteristics of effective processes (Process Areas)
- To improve organizational control over project execution
- Process areas define improvement path for an organization along five maturity levels (1 – 5)
- Maturity level denotes an organization's process improvement achievement across the process areas

Medicaid Enterprise Systems Conference (MESC) *August 2017*

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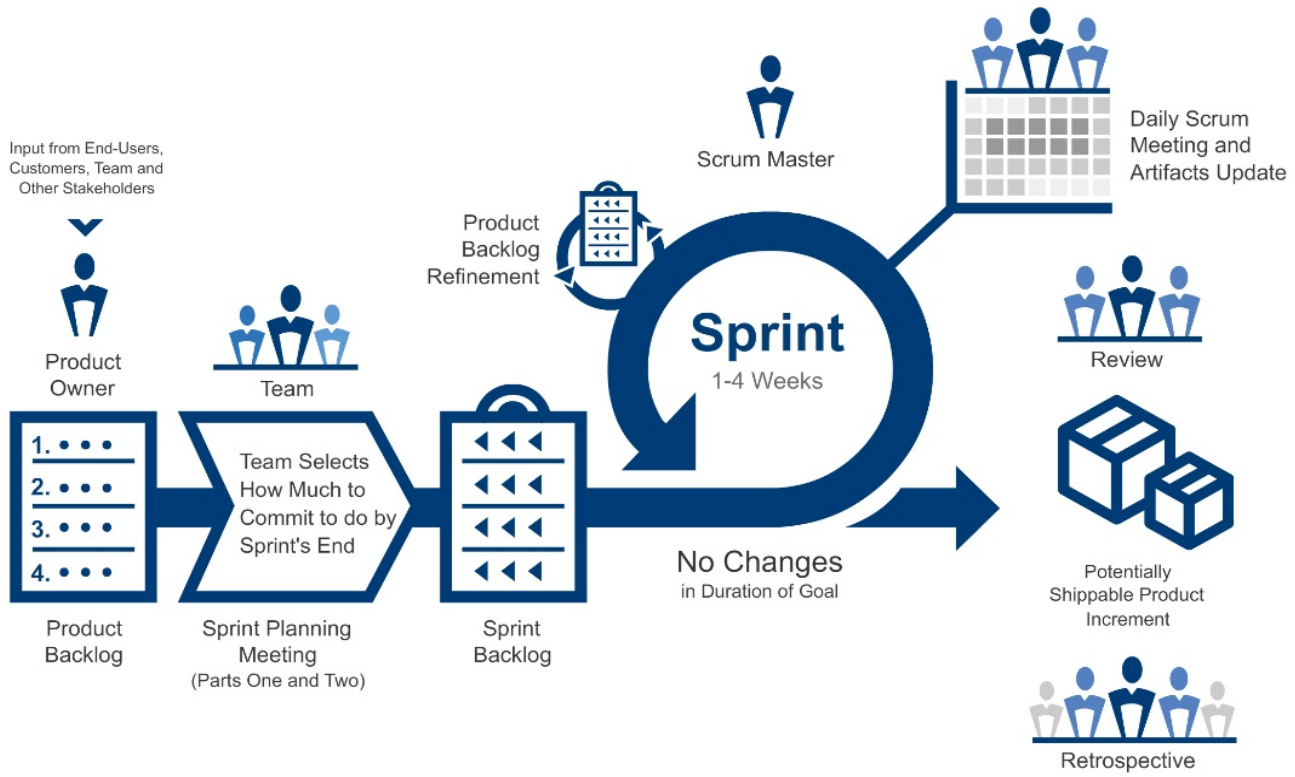
Scrum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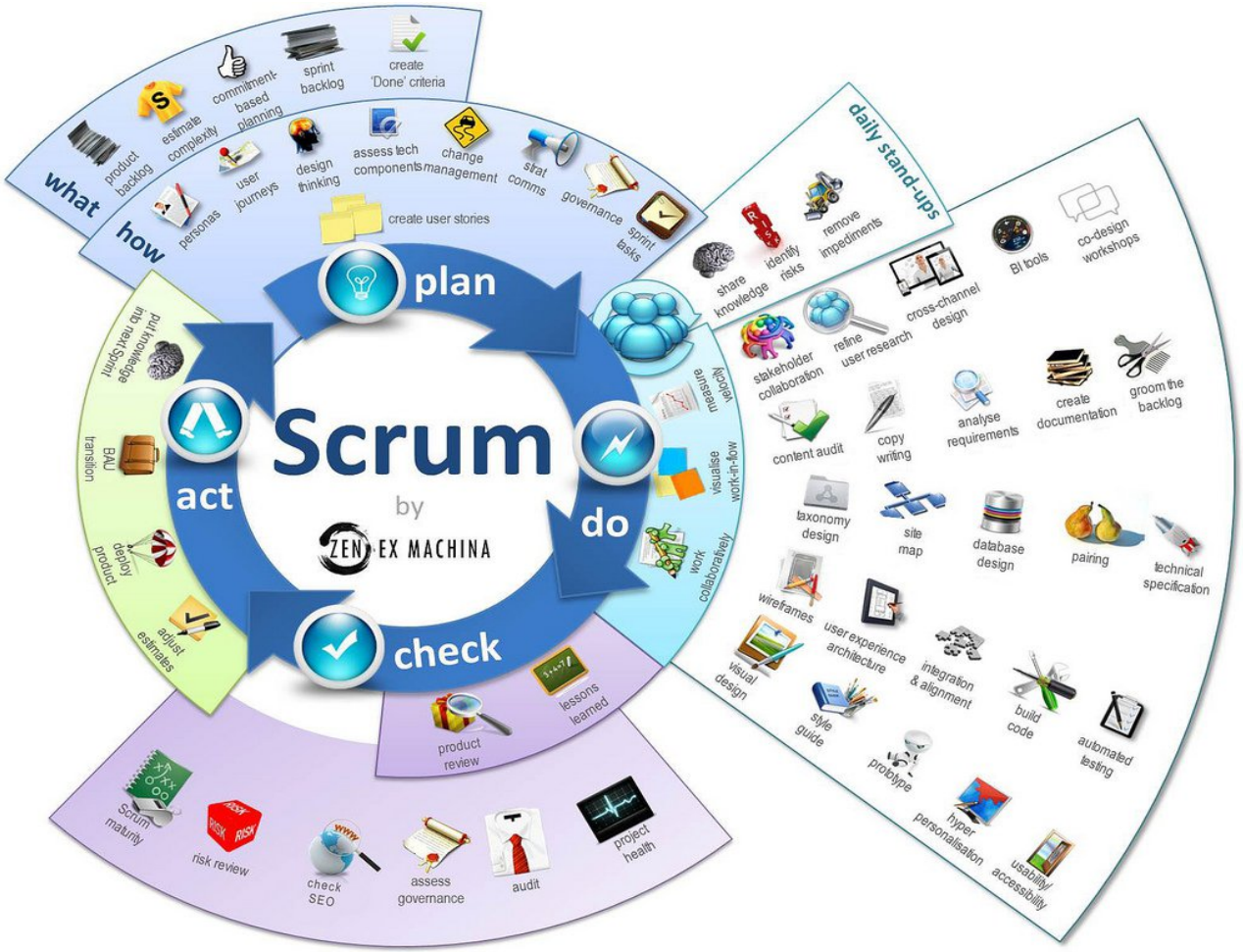
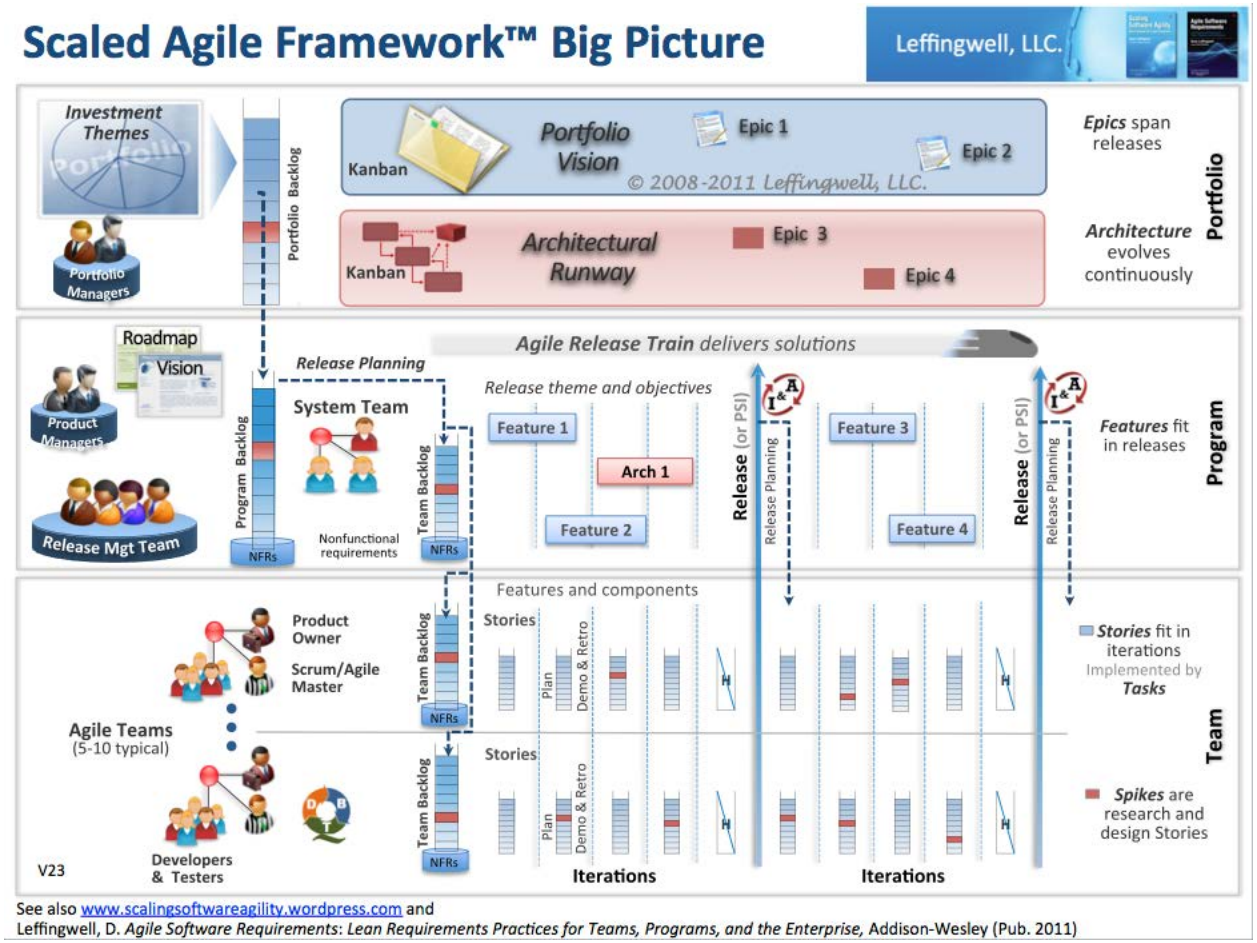

Scrum
by
ZEN EX MACHINA
plan
do
check
act
what
how
product backlog
estimate complexity
commitment-based planning
sprint backlog
create 'Done' criteria
personas
user journeys
design thinking
assess tech components
change management
strat comms
governance
sprint tasks
create user stories
daily stand-ups
share knowledge
identify risks
remove impediments
BI tools
co-design workshops
stakeholder collaboration
refine user research
cross-channel design
content audit
copy writing
analyse requirements
create documentation
groom the backlog
taxonomy design
site map
database design
pairing
technical specification
wireframes
user experience architecture
integration & alignment
visual design
style guide
prototype
build code
automated testing
hyper personalisation
usability/ accessibility
measure velocity
visualise work-in-flow
work collaboratively
product review
lessons learned
Scrum maturity
risk review
check SEO
assess governance
audit
project health
put knowledge into next Sprint
BAU transition
deploy product
adjust estimates

Agile Frameworks

SAFe utilizes Scrum at the team level and scales Agile and Lean across teams at the program and portfolio management level. Portfolio management helps drive Epics from enterprise investment strategies. Program management coordinates team activities to enact shared business direction and architectural vision, determine related groups of work items for cross team dependencies and coordinate with external team representatives.

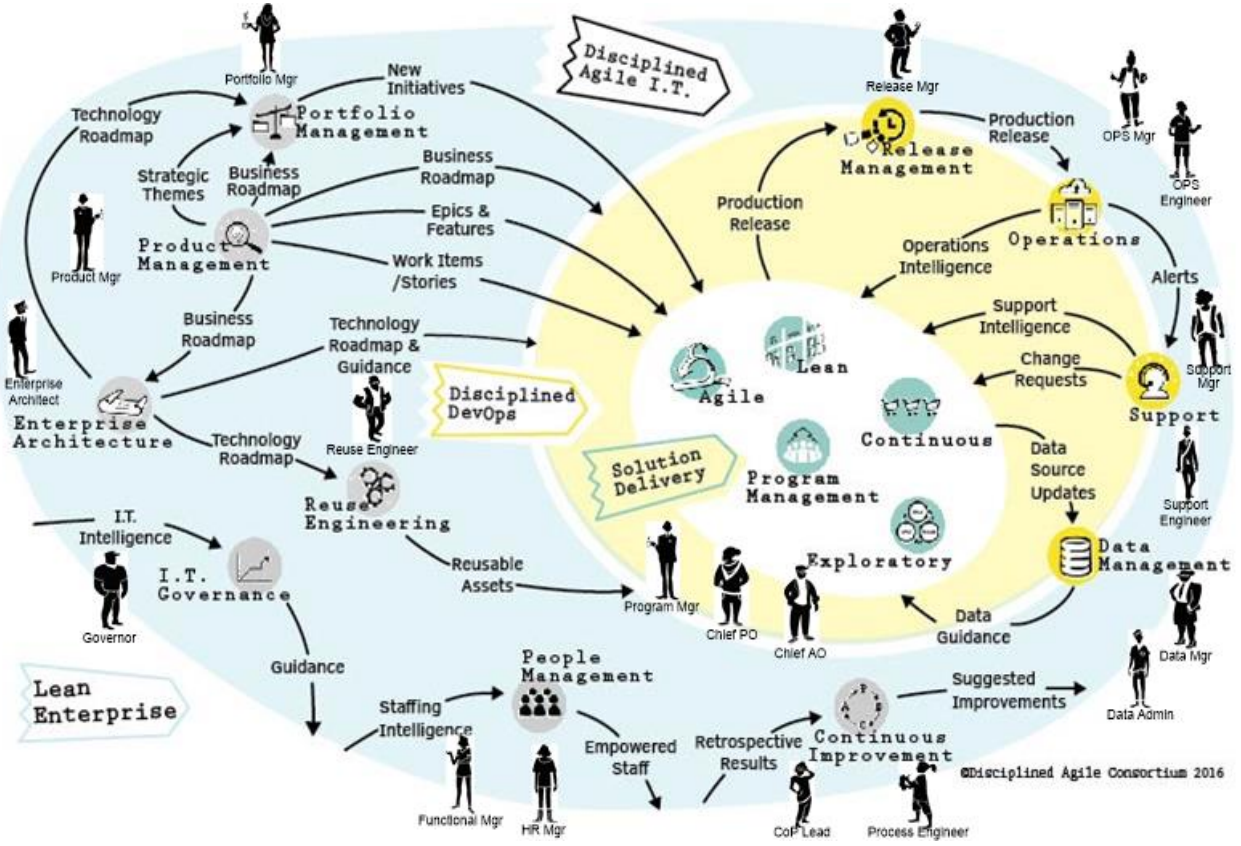


See also www.scalingsoftwareagility.wordpress.com and
Leffingwell, D. *Agile Software Requirements: Lean Requirements Practices for Teams, Programs, and the Enterprise*, Addison-Wesley (Pub. 2011)

Agile Frameworks

The top four priorities in DAD are: (1) People first, (2) Learning-oriented, (3) Agile, and (4) Hybrid. Hybrid means that DAD also draws on other, more traditional sources, especially the versions of Unified Process for governance and life-cycle management. Projects are divided into three phases: Inception, Construction, and Transition.

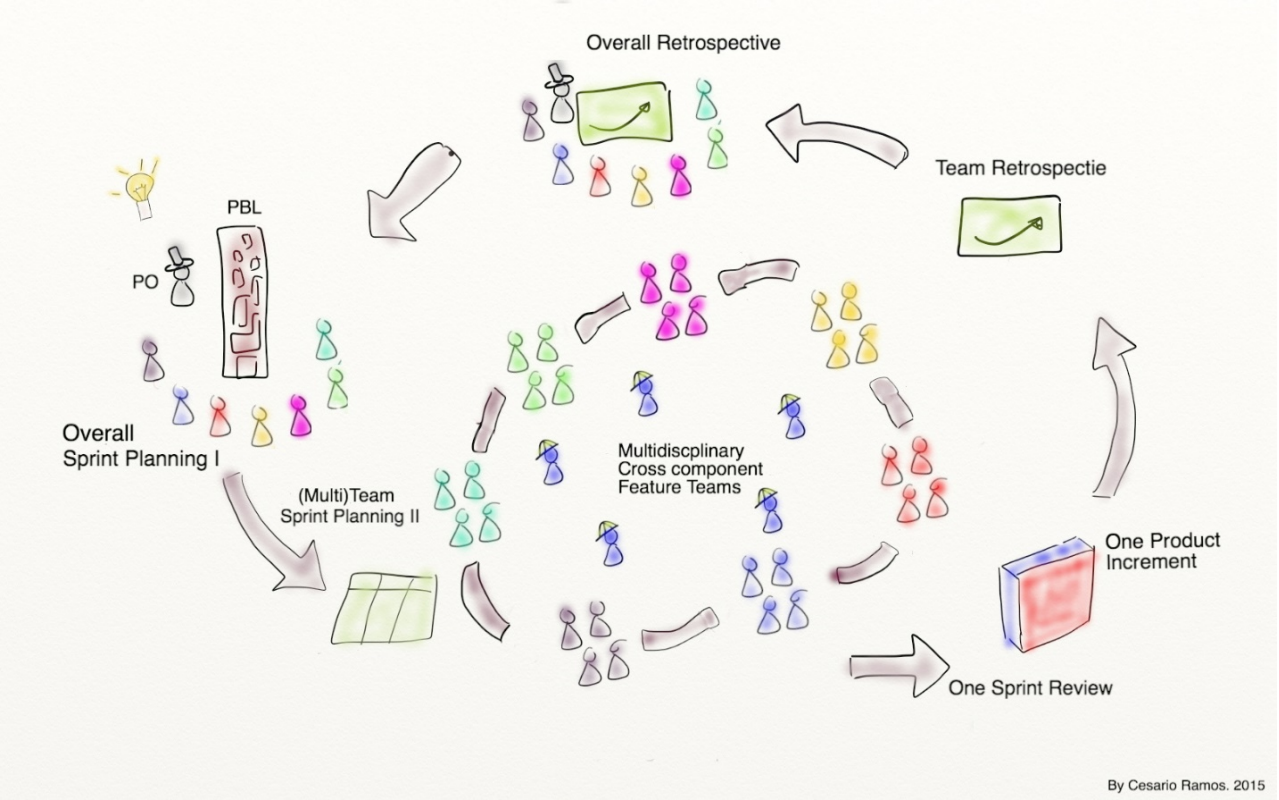
Disciplined Agile Delivery



Agile Frameworks

LeSS adopts Scrum while maintaining the same ceremonies and roles. For example, in the small team Framework, the Sprint Planning ceremony involves a representative from each team instead of all team members. In the large team Framework, a new role, the Area Product Owner, allows for several product owners to perform this role.

Large Scale Scrum

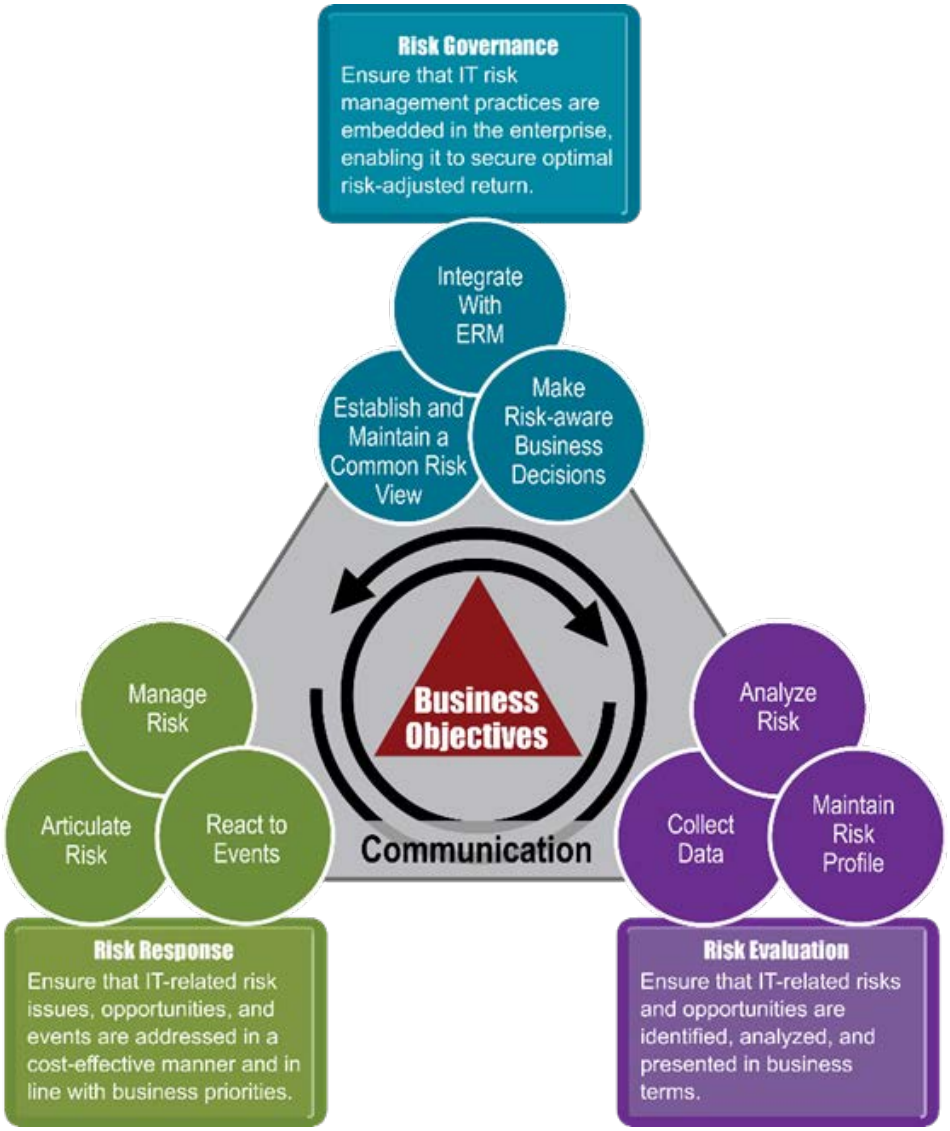


CMMI

Management's responsibility to manage Risk remains unchanged.

Delivery	Program	Technical
Commercial	Acquisition	People
Financial	(Procurement)	Technical Aspects
Political	Funding	Cost
Environmental	Organizational	Schedule
Cultural	Security	Resources
Acquisition	Safety	Operational Support
(Procurement)	Business Continuity	Provider Failure
Business Continuity	Projects	Quality
Growth	Customer Relations	Security
		Infrastructure Failure

CMMI


Risk Governance
Ensure that IT risk management practices are embedded in the enterprise, enabling it to secure optimal risk-adjusted return.
Integrate With ERM
Establish and Maintain a Common Risk View
Make Risk-aware Business Decisions
Business Objectives
Communication
Manage Risk
Articulate Risk
React to Events
Risk Response
Ensure that IT-related risk issues, opportunities, and events are addressed in a cost-effective manner and in line with business priorities.
Analyze Risk
Collect Data
Maintain Risk Profile
Risk Evaluation
Ensure that IT-related risks and opportunities are identified, analyzed, and presented in business terms.

CMMI

Agile frameworks rely on Product Owners to enact Risk Governance within the project or program. Therefore, it is critical that Product Owners follow a common Risk Governance approach that pervades throughout projects and programs to enable portfolio risk management. By applying CMMI, the organization can manage risk.

Maturity Level 4: Risk Governance Capability	
Quantitative Project Management	Organizational Process Performance

Maturity Level 3: Risk Evaluation Capability	
Risk Management	Decision Analysis and Resolution

Maturity Level 2: Risk Response Capability	
Measurement and Analysis	Process and Product Quality Assurance
Project Monitoring and Control	

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CMMI Empowers Agile

01

Project estimates are unrealistic or unknown.

Agile Ceremonies / Techniques:

- Team Estimating Game
- Planning Poker
- Sprint Planning
- Backlog Grooming
- Requirements Development
- Task Estimation
- Release Planning
- Sprint Backlog

CMMI Process Areas: (Maturity Level):

- Project Planning **(ML 2)**
- Integrated Project Management **(ML 3)**
- Requirements Management & Development **(ML 2 and ML 3)**
- Measurement and Analysis **(ML 2)**
- Quantitative Project Management **(ML 4)**

02

Projects do not get delivered on schedule.

Agile Ceremonies / Techniques:

- Daily Standup/ Daily Scrum
- Release Burndown
- Sprint Burndown
- Task Estimation
- Release on Demand
- Incremental Release

CMMI Process Areas (Maturity Level):

- Project Monitoring and Control **(ML 2)**
- Measurement and Analysis **(ML 2)**
- Quantitative Project Management **(ML 4)**

03

Requirements are always changing.

Agile Ceremonies / Techniques:

- Backlog Grooming
- Sprint Planning
- Product Backlog
- User Stories/ Epics
- Definition of Done (for User Stories)
- Top “10” Features
- Release Planning

CMMI Process Areas (Maturity Level):

- Requirements Management **(ML 2)**
- Project Management & Control **(ML 2)**
- Requirements Development **(ML 3)**
- Measurement and Analysis **(ML 2)**
- Verification **(ML 3)**

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CMMI Empowers Agile

04

Customer won't commit to project.

Agile Ceremonies / Techniques:

- Release Planning
- Sprint Planning

CMMI Process Areas (Maturity Level):

- Requirements Management **(ML 2)**
- Project Planning **(ML 2)**

05

Customers are frustrated with progress.

Agile Ceremonies / Techniques:

- Release Planning
- Sprint Planning
- Sprint Demo
- Sprint Retrospective

CMMI Process Areas (Maturity Level):

- Integrated Project Management **(ML 3)**
- Validation **(ML 3)**
- Project Planning **(ML 2)**
- Project Monitoring and Control **(ML 2)**
- Measurement and Analysis **(ML 2)**

06

Customers are not satisfied with the end product.

Agile Ceremonies / Techniques:

- Definition of Done
- User Stories/ Epics
- Test Driven Development
- Sprint Demo

CMMI Process Areas (Maturity Level):

- Validation **(ML 3)**
- Verification **(ML 3)**
- Requirements Development **(ML 3)**
- Requirements Management **(ML 2)**

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CMMI Empowers Agile

07

There are too many bugs during a project or post project.

Agile Ceremonies / Techniques:

- Test Driver Development
- Continuous Build/ Continuous Integration
- Refactoring

CMMI Process Areas (Maturity Level):

- Validation **(ML 3)**
- Verification **(ML 3)**
- Product Integration **(ML 3)**
- Technical Solution **(ML 3)**

08

Unable to secure or retain project resources.

Agile Ceremonies / Techniques:

- Team Agreements
- Release Planning
- Daily Standup
- Vision

CMMI Process Areas (Maturity Level):

- Integrated Project Management **(ML 3)**
- Project Planning **(ML 2)**
- Risk Management **(ML 3)**
- Project Monitoring and Control **(ML 2)**
- Organizational Training **(ML 3)**

09

Lack of internal and external support for project.

Agile Ceremonies / Techniques:

- Team Agreements
- Release Planning
- Sprint Planning
- Daily Standup
- Product Owner Meeting with Customer

CMMI Process Areas (Maturity Level):

- Integrated Project Management **(ML 3)**
- Risk Management **(ML 3)**
- Project Planning **(ML 2)**
- Project Monitoring and Control **(ML 2)**

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CMMI Empowers Agile

10

Poor project communication.

Agile Ceremonies / Techniques:

- Daily Standup
- Release Planning
- Sprint Planning
- Sprint Demo
- Sprint Retrospective
- Product Owner Meeting with Customer

CMMI Process Areas (Maturity Level):

- Project Monitoring and Control **(ML 2)**
- Project Planning **(ML 2)**
- Integrated Project Management **(ML 3)**

11

Requirements are vague or open-ended.

Agile Ceremonies / Techniques:

- User Story/ Epic
- Definition of Done
- Backlog Grooming

CMMI Process Areas (Maturity Level):

- Requirements Management **(ML 2)**
- Requirements Development **(ML 3)**

12

Project team responsibilities are not clear.

Agile Ceremonies / Techniques:

- Team Agreements
- Sprint Planning
- Release Planning
- Incremental Release

CMMI Process Areas (Maturity Level):

- Integrated Project Planning **(ML 2)**
- Project Planning **(ML 2)**

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CMMI Empowers Agile

13

Project team member training is inadequate for the task.

Agile Ceremonies / Techniques:

- Release Planning

CMMI Process Areas (Maturity Level):

- Organizational Training **(ML 3)**
- Project Planning **(ML 2)**

14

Failure to successfully plan the project.

Agile Ceremonies / Techniques:

- Release Planning
- Sprint Planning
- Backlog Grooming

CMMI Process Areas (Maturity Level):

- Project Planning **(ML 2)**
- Integrated Project Planning **(ML 2)**
- Requirements Management **(ML 2)**

15

Failure to foresee potential problems.

Agile Ceremonies / Techniques:

- Daily Standup
- Release Planning
- Sprint Retrospectives

CMMI Process Areas (Maturity Level):

- Project Monitoring and Control **(ML 2)**
- Risk Management **(ML 3)**
- Integrated Project Management
- **(ML 3)**
- Quantitative Project Management **(ML 4)**

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CMMI Empowers Agile

16

Project information isn't available when needed.

Agile Ceremonies / Techniques:

- User Stories/ Epics
- Sprint Planning
- Release Planning
- Daily Standup
- Release Burndown
- Sprint Burndown
- Sprint Demo
- Vision

CMMI Process Areas (Maturity Level):

- Project Monitoring **(ML 2)**
- Integrated Project Management **(ML 3)**
- Risk Management **(ML 3)**
- Measurement and Analysis **(ML 2)**
- Verification **(ML 3)**

17

Code quality is poor.

Agile Ceremonies / Techniques:

- Pair Programming
- Test Driven Development
- Continuous Build/ Integration
- Retrospectives
- Definition of Done

CMMI Process Areas (Maturity Level):

- Technical Solution **(ML 3)**
- Verification **(ML 3)**
- Validation **(ML 3)**
- Integrated Project Management **(ML 3)**
- Process & Product Quality Assurance **(ML 2)**

18

Organizational performance isn't improving.

Agile Ceremonies / Techniques:

- Retrospectives

CMMI Process Areas (Maturity Level):

- Integrated Project Management **(ML 3)**
- Organizational Process Focus **(ML 3)**
- Organizational Process Definition **(ML 3)**
- Organizational Training **(ML 3)**
- Process & Product Quality Assurance **(ML 2)**
- Organizational Process Performance **(ML 4)**
- Quantitative Project Management **(ML 4)**
- Causal Analysis and Resolution **(ML 5)**

Summary

Within Industry, there are **2** well established camps

1. **Agile Camp:**
   - Agile methods provide instructions on how to do software development, purposely absent from CMMI, which works well on co-located projects.
   - Critics of Agile state that it doesn't have enough control and results in undocumented changes and chaos (see Agile Myths).

2. **CMMI Camp:**
   - CMMI provides the systems engineering practices often required on larger, high-risk projects. CMMI also provides the process management and support practices organization regardless of organization or project size.
   - However, to Agile practitioners, CMMI often seems bloated and unimaginative. They complain that it is overly bureaucratic and promotes process of over substance, thus impeding the time-to-market requirements needed today.

Summary

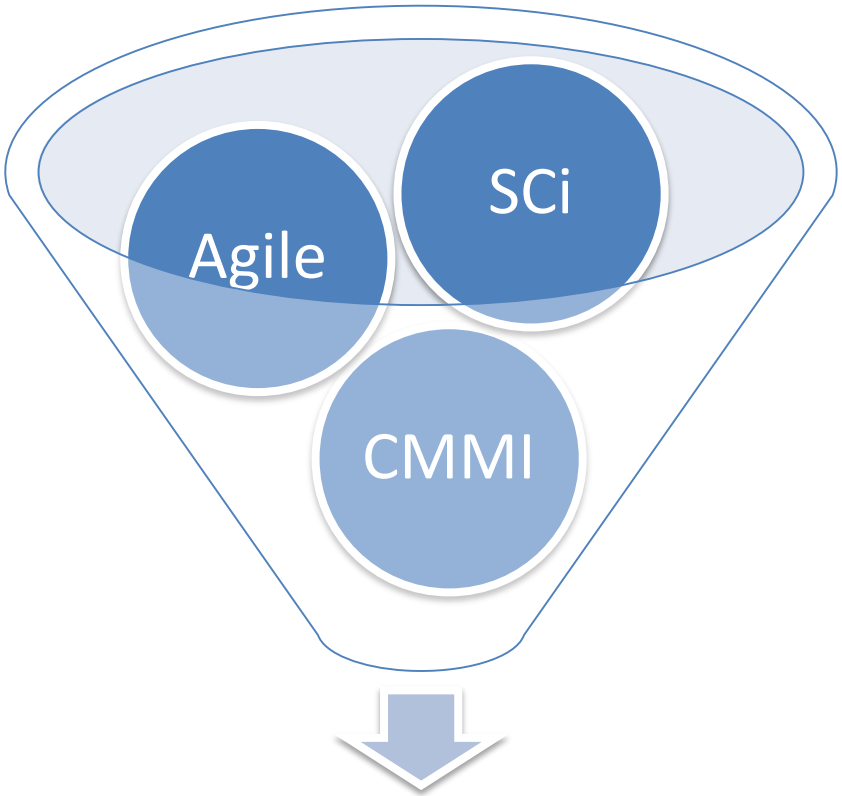
CMMI and **Agile** can coexist and benefit software development. There is a symbiotic relationship between the two.

1. **Agile:**
   - Agile methodologies specify HOW things should be done.
   - Agile methods clearly focus on people and allows people to determine technology and processes.

2. **CMMI:**
   - CMMI specifies WHAT should be done.
   - The CMMI model describes three aspects of development projects as (1) processes, (2) technology, and (3) people. It is well known that CMMI focuses on processes.

An Agile implementation should be tailored to match an organization's actual maturity level.

Conclusion



Produce Best Outcomes by Combining a
CMMI Level 4 appraised Partner, Agile, and CMMI

Thank You

Q & A

White Papers:

http://www.selectcomputing.com/doc/SCi-SystemsModernizationStrategies.pdf

http://www.selectcomputing.com/doc/SCi-CMMIAgileApplyBoth.pdf

http://www.selectcomputing.com/whitepapers.php

Select Computing, Inc. (SCi) is an innovative CMMI level 4 appraised company, for both the development and services models. SCi specializes in blending CMMI level 4 process maturity and Agile methodology to produce successful outcomes. SCi can help an organization make the transition to Agile. Implementing Agile, using a contractor that is at CMMI level 4, can result in less rework and provide significant benefits. Implementing a CMMI compliant software development process that is also Agile will bring the repeatability and predictability offered by CMMI.

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