



TSP Symposium 2012

## Why Does Agile Software Development Not Require the TSP Disciplines?

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Next Process Institute (NPI)

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CMU-SEI TSP Strategic Partner since 2010

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- TSP coach training

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- Coaching for software teams
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A CMMI Partner provides

- “Introduction to CMMI for Development” course

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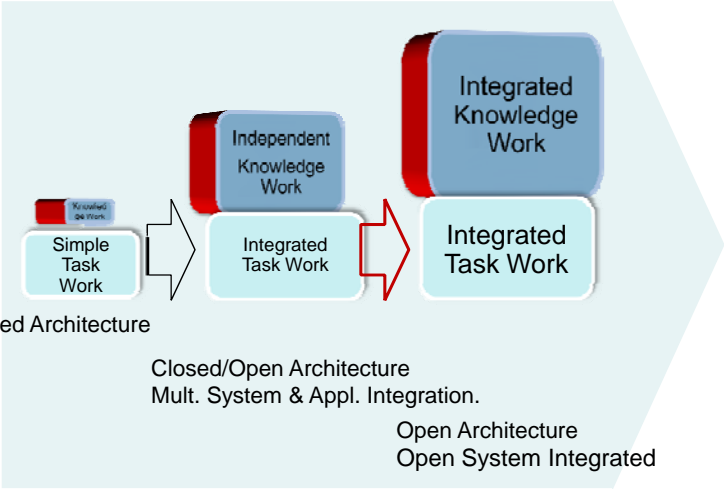
## Contents

1. Why the Agility is Needed
2. Review on Agile Method by Waterloo Univ. and ACM
3. Problems in Agile Methods
4. Two Principles for Making the Agility Meaningful
  - Isolation of “process to develop a solution” from “process to seeking a solution”
  - Prediction capability at any time during project
5. TSP principles and practices for improving the agility
6. Summary



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## Needs for the Agility – Open system Evolution




Closed Architecture  
 Closed/Open Architecture  
 Mult. System & Appl. Integration.  
 Open Architecture  
 Open System Integrated


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## Needs for Agility - Knowledge Work

- “Invisible from outside,” “complex,” and “distributed,”
- Directly related to customer, end-user, and market
- Presented the “goals” with numbers.



**“Man-Month is not equivalent to Calendar-Month.”**  
Ref. The Mythical Man-Month, Frederick P. Brooks, 1974



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## Why “Agile” started


Claimed problems in the current development methodology

Low  
Interaction  
in team

Working  
software at  
the project  
end

Low listening  
to Customer  
Voice

Slow  
Responding to  
Changes



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## Challenges of Migrating to Agile Methodologies

- CACM May 2005

	Traditional	Agile
Functions	Fully specifiable, predictable, extensive planning required	High quality, adaptive software can be developed by small teams by ...testing with rapid feedback and change,
Control	Process centric	People centric
Management style	Command-and-control	Leadership-and-collaboration
Knowledge management	Explicit	Tacit
Role Assignment	Individual-favors specialization	Self-organizing teams – encourages role interchangeability
Communication	Formal	Informal
Customer's role	Important	Critical
Project cycle	Guided by tasks and activities	Guided by product features
Development model	Life cycle model (WF, Spital, or ...)	Evolutionary-delivery model
Technology	No restriction	Favors object-oriented technology


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## Reports by Waterloo Experience

University of Waterloo, Investigation to Agile Methodology, 2009

Canadian Pension Plan Investment Board/Enterprise Data Management (CPPIB/EDM) switched over to the Agile development methodology using Scrum framework from traditional waterfall model.

1. Advantages
  - notable increase in productivity, teamwork, and knowledge sharing
2. Disadvantages
  - more time needed in design discussions/documentation
  - lack of time for thorough testing of the product before deployed
  - difficult to prioritize stories (product owner)
  - the process regarding defects/bugs is not clearly defined
3. Recommendations
  - should have more design stories in their sprints with clear deliverables and the documentation done together
  - invite others for daily standup meetings to show how Agile does and works


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## Agility Impediments

From "Balancing Agility and Disciplines" by James Over 2012

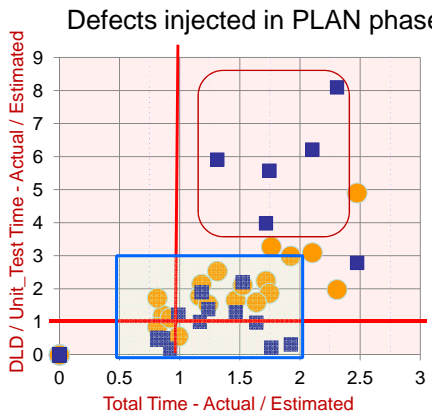
1. Impediments to Agility in Software
  - Lack of "done" at the end of an iteration
  - Lack of teamwork
  - Lack of good design
  - Lack of tolerating defects
2. Avoiding the Impediments
  - Build high-performance teams
  - Plan all development work
  - Use a measured process
  - Design before you build
  - Make quality the top priority.


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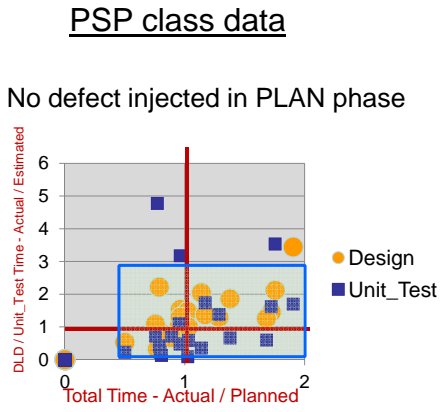
## REQ defects brake on Agility – from PSP

Defects injected in PLAN phase




PSP class data

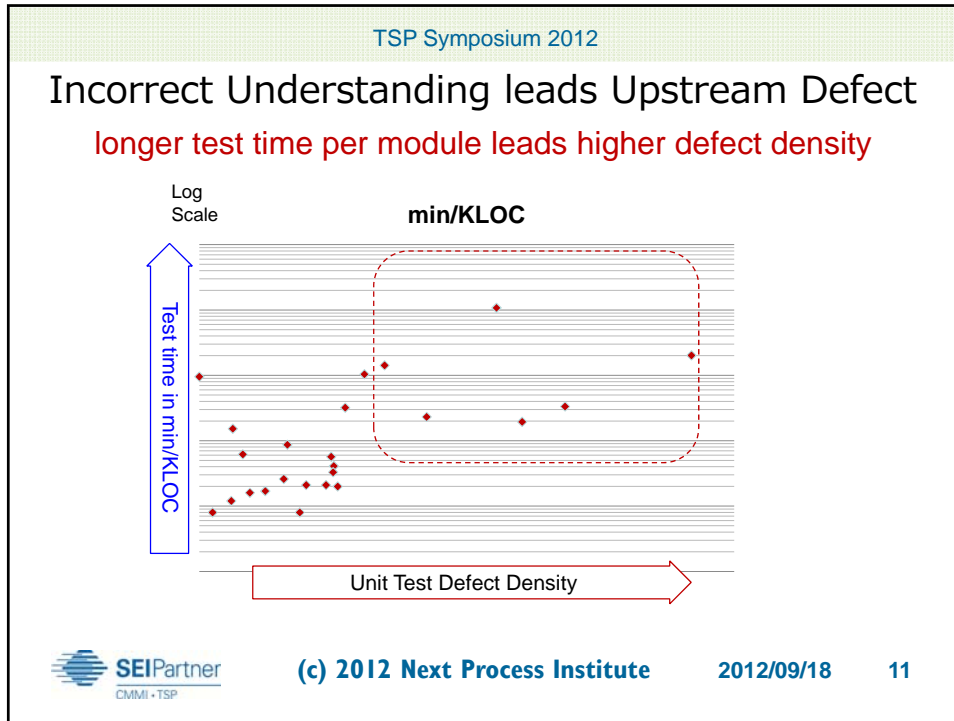
No defect injected in PLAN phase



● Design  
■ Unit\_Test

The design and unit test times are extensively spread respectively if defect is injected during the requirement phase.


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## REQ/HLD Defects Brake on Agility

Assumptions:

$$\text{Actual/Plan(DLD, Code, UT, IT, ST)} = \begin{cases} 1 & \text{when quality work is done} \\ 3, 1.2, 3, 3, 3 & \text{when low quality work is done} \end{cases}$$

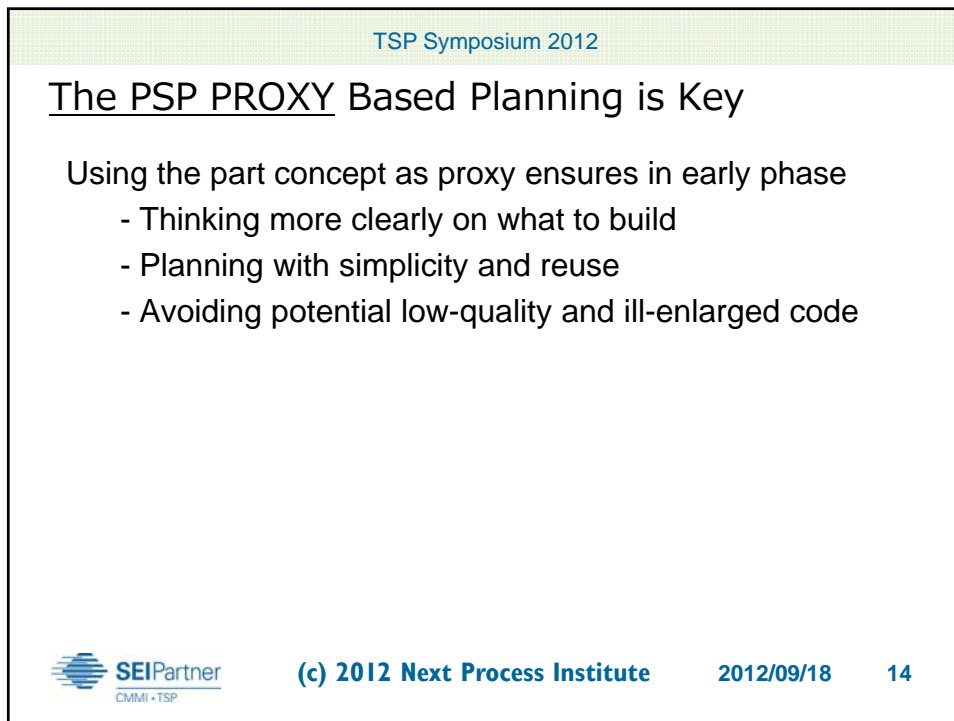
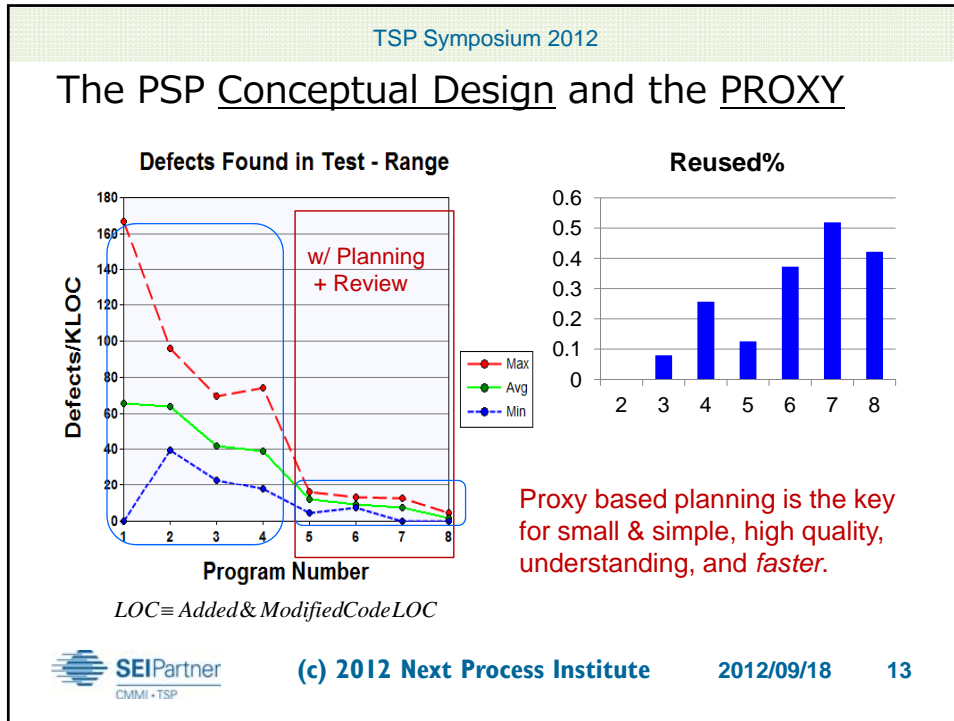
Life Cycle Increase Ratio estimation with a mixture of quality and low quality work

		Case1	Case2	Case3	Case4	Case5
Mixing Ratio	Quality work	0.95	0.9	0.7	0.5	0.3
	Low quality work	0.05	0.1	0.3	0.5	0.7
Increase		1.06	1.12	1.27	1.59	1.82

→ 6 – 82% increase in life cycle is expected for the mixture of 5 – 70% of low quality work.

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## The TSP Solution PROXY Based Planning

1. Creating/searching a new solution may results in
  - Unlimited time required because of the complexity
  - More defects injected in the upper stream
2. Using the solution proxy concept ensures
  - Thinking more clearly on what to build
  - Avoiding potential defect injected in early phases
  - Communicating clearly with clients and team members
  - Estimating for accuracy with simplicity and reuse
  - Being helped with architecture or framework centered



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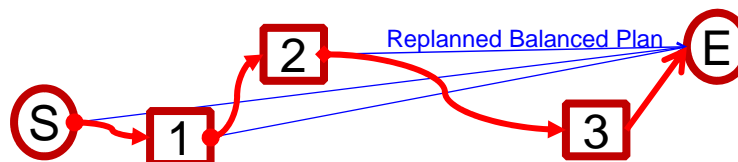
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## TSP Balanced Plan Gives Shortest Cycle Time

TSP gives the shortest life cycle time with

- Estimating with process data
- Tracking daily, weekly, to\_date, Individual, and team
- Ordering tasks properly
- Launch, relaunch, checkpoint, and weekly meeting to
  - maximize utilizing all team talents and resources
  - ask management support properly



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## The TSP Launch Discipline Supports the Agility

**TSP Launch Meeting**


Supports for Agility	M1: Goals by management and customers	M2: Team Goals and Roles	M3: Dev. Strategy, process definition	M4: Top down plans	M5: Quality plan	M6: Individual Plan	M7: Risk Planning	M9: Management Proposal/ approval	
	X								Understand all requirements from management and customer
		X							Define the team goals and roles
			X						Establish strategy with solution and multi cycles
				X					Establish accurate estimate
					X				Establish quality reliable by solution/part
						X			Building balanced plan (shortest life cycle)
							X		Eliminating potential variation
								X	Ensuring management agreement/ approval


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## Conclusions

1. Demanding for the open infrastructure (Internet or TCP/IP) and the knowledge work enabled agility in development,
2. The TSP disciplines ensures the agility for shorter development life cycle because it filters out the “seeking for a solution” complexity during the planning or the launch and the upper stream phases.
3. Also the residual cycle time of a project is “balanced,” i.e., planned for shortest, by fully utilizing the abilities and resources of the team and management.
4. As Agile methods may allow more defects injected during upper stream, the braking is estimated by somewhere 6% to 80% longer than its planned time.


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Thank you for your patience.

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Note: The NPI home page will be opened by Oct. 3<sup>rd</sup>, 2012.

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