



# Agile Methodologies Redux

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- Individual modules may be cited as *Speaker, Module Title*, in Software Productivity Track...

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# Outline

- Refining our Epic
- PSIP: Productivity and Sustainability Improvement Planning

# More on Epic, Story, Task

Definition of Done

Refining Issues

Agile Estimation

# Epic, Story, Task Review

- Break down and refine when and as needed
  - Close to when the work will be done
  - Only for work that will take place
  - Can be valuable for estimating
  - There is no “correct” level of granularity
- Epics are very high level objectives
- Stories should represent an increment of value to the customer
  - “Definition of Done” – understandable to user
- Tasks are the steps necessary to complete a story
  - May not individually provide value to the customer

# Definition of Done

- Simplified definition: When all acceptance criteria are met
- Acceptance criteria
  - “Conditions that a software product must satisfy to be accepted by a user, customer or stakeholder.” – Microsoft Press
  - “Pre-established standards or requirements a product or project must meet.” – Google
  - Can include functional, non-functional, and performance requirements.

# Definition of Done

- Important to establish for a story before estimating or beginning a task
- Defined by the team, acceptable to customer
  - Customer language
- Should not specify an implementation unnecessarily

# Refining Our Epic

- Epic: Refactor code for enhanced modularity
  - Description: The heat equation code needs refactoring to improve modularity. Specifically, there are utilities that could be generalized and used with for other applications. Also, the integration function is currently hard-coded. In the future, we want to use alternative integration functions, so we should generalize the interface for this function.
  - Story 1: Separate out utilities
    - Definition of Done
    - Task list
  - Story 2: Separate out integration function
    - Definition of Done
    - Task list

# Refining Our Epic

## – Story 1: Separate out utilities

- Definition of Done
  - Unit tests pass
  - Code review completed
  - Integration/system tests pass
  - Utility performance is at least 95% of pre-separation performance
  - Utility usability demonstrated outside of heat equation application

## – Story 2: Separate out integration function

- Task 1: Add testing for integration function to protect functionality during refactor
  - Needed testing should be specified
- Task 2: Generalize interface to allow alternative implementations
- Task 3: Expose current integration function through the new interface & run tests

# Agile Estimation

- Estimating is hard
  - Requires practice
  - With practice, it is still hard
- Stories are estimated using “story points”
  - Relative estimate
  - Many estimating techniques
  - Should NOT map to hours, days, etc
  - Definition of done needed, tasking not required
- Tasks are estimated in hours
  - Absolute estimate
- Useful for planning schedules

## Key concept:

It is easier to accurately estimate many small tasks than to estimate a large epic.

Epic: Huge refactor effort

## Tasks:

- Add tests
- Generalize interface
- Expose existing interface

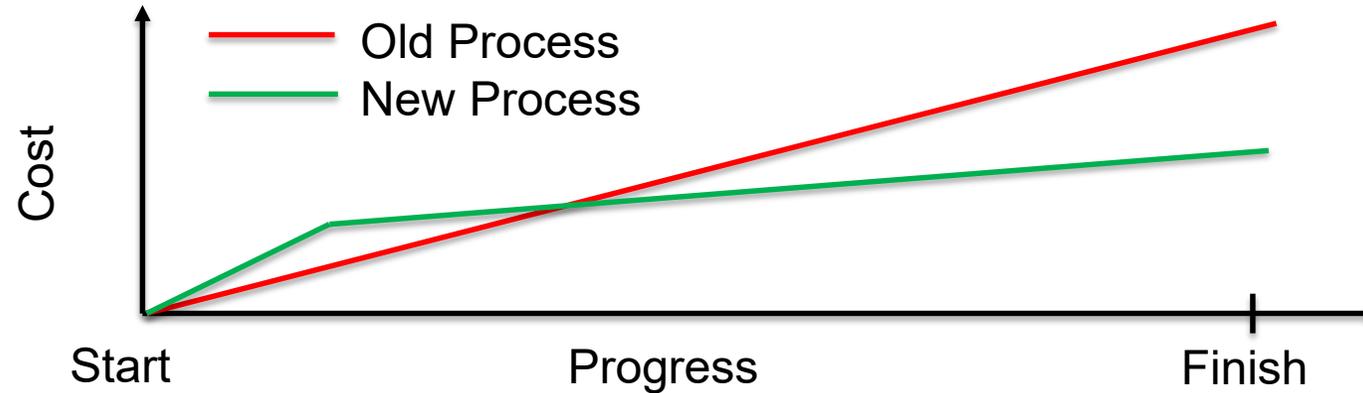
## How To Get Better

*“Use iteration and incrementation only for projects you want to succeed.”*

- *Adaptation of Martin Fowler quote*

# Strategy for Incremental Productivity Improvements

- Identify, analyze, prototype, test, revise, deploy. Repeat.
- Realistic: There is a cost.
  - Startup: Overhead
  - Payoff: Best if soon, clear



- Working model:
  - Reserve acceptable time/effort for improvement.
  - ***Improve how you do your work on the way to getting it done.***
  - Repeat.

# Productivity and Sustainability Improvement Planning (PSIP)

## Examples: EXAALT & MPICH – Add PSIP URL



PSIP workflow helps a team create user stories, identify areas for improvement, select a specific area and topic for a single improvement cycle, and then develop those improvements with specific metrics for success.

### EXAALT PSIP: Continuous integration (CI) testing

BSSw blog article: [Adopting Continuous Integration for Long Timescale Materials Simulation](#), Rick Zamora (Sept 2018)

PSIP Process: Continuous Integration (CI)	PSIP Process: Testing
<p><b>Target:</b> Implement and document a basic CI pipeline to act as the foundation for automated build and functionality testing.</p> <ul style="list-style-type: none"> <li>0. Initial Status. No comprehensive CI framework in place</li> <li>1. Develop a minimal docker image, with EXAALT dependencies</li> <li>2. Implement a minimal 'yaml' script for the CI pipeline</li> <li>3. Update EXAALT docker image to leverage CMake, and create a ParSplice-specific image for build testing</li> <li>4. Generate step-by-step "how-to" Docker-image documentation</li> <li>5. Extend CI to automate build and functionality testing with both CMake and Boost.</li> </ul> <p>Score (0-5): <b>4</b></p>	<p><b>Target:</b> Implement and document practical testing examples for ongoing EXAALT development.</p> <ul style="list-style-type: none"> <li>0. Initial Status. No comprehensive testing framework in place</li> <li>1. Add 1-3 example tests using the existing CMake infrastructure (CTest)</li> <li>2. Add 1-3 example tests using the 'Boost Test' library</li> <li>3. Integrate the CTest infrastructure with the new Boost tests</li> <li>4. Integrate the Boost-enabled CTest framework into the CI pipeline</li> <li>5. Bonus: Work with EXAALT team to add more advanced tests to improve code coverage</li> </ul> <p>Score (0-5): <b>3</b></p>

### MPICH PSIP: Onboarding new team members

Practice: Create Centralized Training Resources		
Score (0 - 4)	Description	Tracking
0	Initial Status : No training process in place.	
1	Understand MPICH requirement for developers and typical challenges for new hires	✓
2	Review and gather specific training materials	✓
3	Design "MPICH Training Base" website	✓
4	Solicit feedback, improve, add and prune content to ensure effectiveness	2019