Introduction to Software Engineering
Scrum Best Practices

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Acknowledgements

- Material based largely on Construx sources
- Construx: www.construx.com
- Steve McConnell
  - Author of *Code Complete* (2nd ed.), *Rapid Development*, …

Scrum Best Practices (8 Story Points)

- Learn about Scrum Best Practices
  - As a student of Scrum
  - I need to learn more about Scrum Best Practices
  - So I can more effectively participate in and/or manage software projects

The Definition of Done

- Agile emphasis
  - deliver actual functionality
  - Avoid waste
    - Or: maximize work not done
- Strict definition of progress
  - User stories: Delivered story points
  - Tasks: work remaining in (ideal) working time
- Needed:
  Strict definition of Completion: Definition of Done
  - For user stories
  - For sprint tasks

- Each team creates its own definitions
- Important: Apply Definition of Done consistently

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Definition of Done (Tasks) – Sample Check List

- *Did you build the thing right?*
  (from engineering perspective)

- Code checked into repository (Github)
- Code reviewed for standards compliance
- Code reviewed by team member or Walk-through performed
- External/Public API documented
- Unit test definition complete
- Unit tests run without error
- Non-functional tests (e.g. usability, performance) passed
- Regression tests run without error
- Static code analysis performed and passed
- Test coverage measured and achieved
- …

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Acceptance Criteria (1)

- *Did you build the right thing?*
  (from user/customer perspective)

- Acceptance Criteria
  - Objective criteria to determine whether a user story has been fully and correctly implemented
  - Basis for functional testing of completed user stories
  - Basis for acceptance test before product release
  - Detailed requirements
  - Basis for TDD or BDD
    - TDD: Test Driven Development
    - BDD: Behavior Driven Development

Acceptance Criteria (2)

- User stories in Product Backlog
  - User story: an invitation for a conversation
  - Product backlog: a wish list, shopping list
    - Anyone can add to it
- User stories in Sprint Backlog
  - User story: high-level description of required functionality
  - Sprint backlog: team commitment to deliver software that satisfies the requirements
- Acceptance criteria
  - How to test that the delivered software satisfies a requirement

Acceptance Criteria (3)

- Sprint Planning
- For each user story in Sprint backlog
  - Conversation of Product Owner with team
  - Work out details of user story
  - Agree on acceptance criteria

- Record acceptance criteria for each user story
  - E.g. on back of card/post-it for user story

User story: View "miles"
As a frequent flier
I want to see my current "miles"
so that I can plan for free tickets.

Acceptance Criteria: View "miles"
- ❑ View earned miles as of last statement
- ❑ View pending miles (since last statement)
- ❑ View total miles (earned + pending)
- ❑ View miles within 30 days of expiration
- ❑ …

Definition of Done (User Story) – Sample Check List

- *Did you build the right thing?*
  (from user perspective)

- All tasks for user story are done
- Tests performed and passed for all acceptance criteria
- User documentation/Help functions complete
- Inspected and accepted by Product Owner
- …

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Team Working Agreements

- Logistics
  - Work room
  - Meeting times
  - Project repository
    - Location
    - Organization
  - Communication channels
- Development environment
  - Platform
    - Virtual machines
  - IDE
  - Other tools
- Coding style/standards

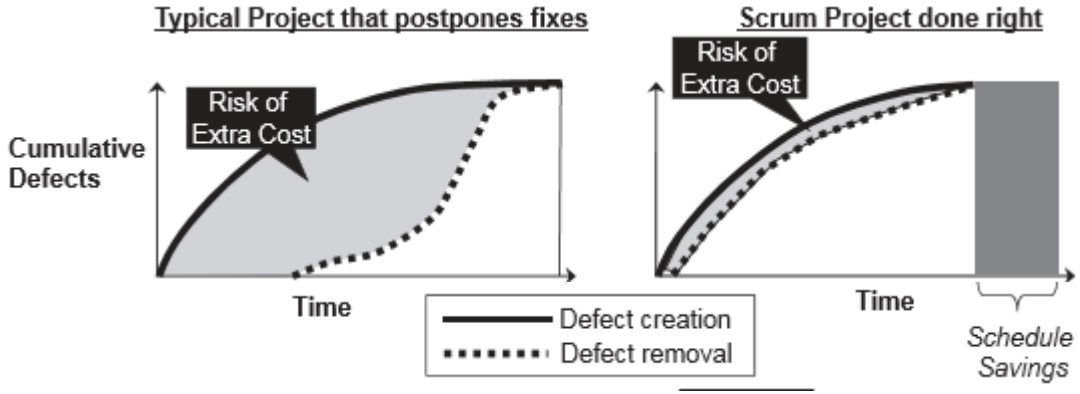
- Work (Process) Patterns
  - Definition(s) of Done
  - Team collaboration
  - Collaboration with experts (SME: subject matter experts)
  - Areas of responsibility
  - Work hand-off/ integration
- Product Design Patterns
  - UI look and feel
  - Product architecture
  - Common approach to common problems
  - Error handling
  - …

What working agreements does your team find useful?

Avoid Waste: Hidden Cost of Defects

- Leaving problems unresolved increases risk of failure
  - Defect build up: risk of extra cost (effort, time, money)
  - Technical debt: steep interest rate; may be hard to pay off

- Minimize time between defect insertion and defect detection and correction
  - Cost increases exponentially with time elapsed



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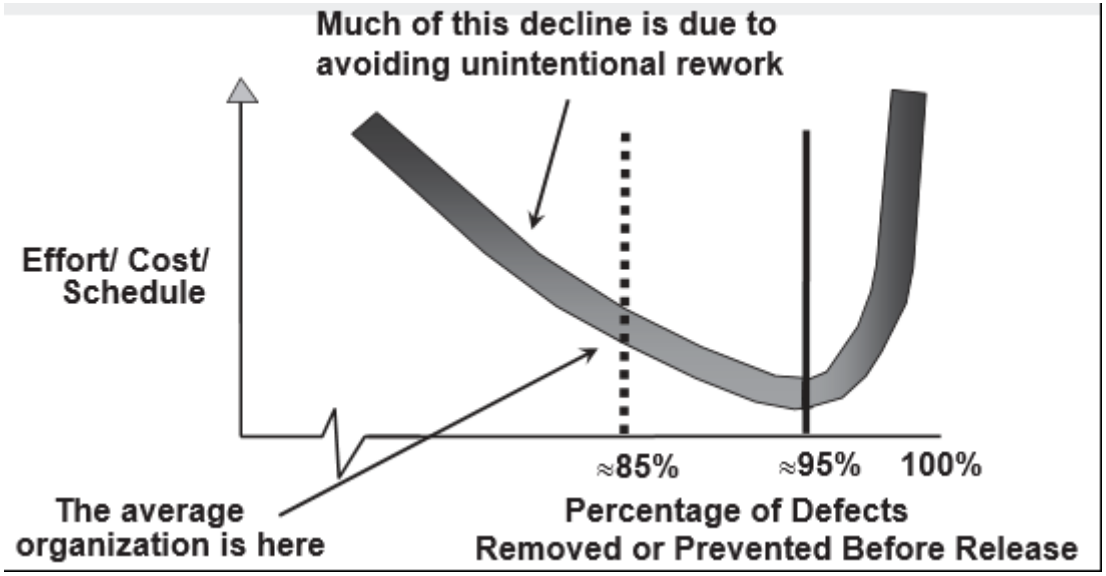
Higher Quality → Faster Development

- Eliminating more defects earlier makes progress faster
  - Reduces effort, schedule, cost
  - Up to a point (about 95%)



Product Increment Strategies

- Layer by layer
  or
- Slice by slice ???
- Conventional approach (not necessarily wrong)
  - Layer by layer
  - Example: Making a pizza
    - Make the dough
    - Spread on tomato sauce
    - Add vegetables
    - Add meats
    - Bake
    - Sprinkle on extra cheese and/or hot pepper flakes

- When will customer know whether she likes it?

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Product Increments: Vertical Slices

- Start with
  - Releasable system
  - Minimal functionality
    - Establishes feasibility
    - Gives a first taste
- Add increments
  - Releasable system
  - Increased functionality
  - All layers expand as needed
- Vertical slice (“Sashimi”) increments
  - practice essential to successful Scrum projects

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More Tips for Effective Scrum

- ✓ Have a defined team room
- ✓ Have Stand-up meeting at the same time and place every time, preferably in the team room
  - Makes regular updating of Scrum Board and Burn chart more likely
- ✓ Enforce working agreements
  - Meeting attendance, task status updating, …
- ✓ Post the Three Questions in BIG LETTERS!
  - Scrum Master should listen for impediments and issues needing follow-up (not ask the three questions)
- ✓ If you use Scrum project management software, use a Scrum Board to track progress anyway.

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Agile Myths and Scrum Smells and Plagues

- Understanding problems when first using Scrum
  - As a beginning practitioner of Scrum,
  - I need to understand what can go wrong when a team is new to Scrum
  - So I can identify and remove obstacles to successful Scrum adoption

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Common Agile Myths (really: Misunderstandings)

- "We're (super) Agile, so we don't need (and don't have) a plan!"
  - Agile planning does not mean no planning
- "We're Agile, so we can follow any process we want, and nobody can tell us otherwise!"
  - Being Agile does not mean lack of discipline or using an ill-defined process
- "We're Agile, so we're just going to get the product out of the door as quickly as possible no matter how!"
  - Being Agile does not mean doing shoddy work or lack of engineering

Scrum is a simple process, but doing it right is not easy

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What are Scrum Smells?

- “Whiffs”, odors that may not seem so bad at first but over time become overwhelming
(so you must get rid of them)

- Easy to ignore at first;
better get rid of it right away.

- Ignore scrum smells at your own peril!

Later: Code smells. Same story.

Common Scrum Smells

- Zero or > 1 Product Owners
- The Scrum Task Master
  - As opposed to Scrum Master: coach, mentor, facilitator, protector
- “Just !#$#$#$%^& do what I say”
- Commitment Phobia
- Self-unmanaged teams
- Burn-ups/downs that don’t
- Urgent things crowd out important things

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Important/Urgent: Covey's Quadrant

- Steven Covey: author of *The seven habits of highly successful people*

	URGENT	NOT URGENT
IMPORTANT	***Quadrant I:*** Urgent & Important	***Quadrant II:*** Not Urgent & Important
NOT IMPORTANT	***Quadrant III:*** Urgent & Not Important	***Quadrant IV:*** Not Urgent & Not Important

- Important:
  contributes to achievement of (important) goals
- Urgent:
  requires immediate attention

- Q1: Finish homework before deadline
- Q2: Improve programming skills
- Q3: Answering phone
- Q4: Playing video game

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The Plague Known as “Scrum-But”

“We use Scrum, but …

- … the team doesn’t follow one or more of the required Scrum practices, e.g.
  - No regular stand-up meetings
  - Stand-up meetings don’t stick to three topics or timebox
  - No permanent Scrum Master or Product Owner
  - Sprint length varies
  - “We’ll fix bugs in the stabilization sprint!”
  - No sprint review
  - No sprint retrospective
    - “What’s the use?”
  - …

What do you do about this?

Engineering Product and Process

- Start with a coherent vision and a realistic plan
  - "Begin with the end in mind"
- Continuous improvement
  - Requires measures for process and product
- Focus on quality to increase productivity
  - "If now is not the time to do it right, when will you find the time to do it again?"

"Engineering is doing for a nickel what any damned fool can do for a dollar."
- Henry Ford

Avoid Flaccid Scrum

- Flaccid Scrum (Martin Fowler)
  - Scrum project management practices
  - Without technical software engineering practices
- Leads to inferior software quality …
  - Technical debt build-up …
- … and diminishing productivity
  - … will slow team over time

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Technical Practices within Scrum

Many borrowed from XP (eXtreme Programming)

- Done Criteria
- Peer review / Pair Programming
- Clean code
- TFD (test-first development)/TDD (test-driven development)
- Continuous integration
- Version Control
- Test coverage criteria
- Static Analysis Tools

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There Is No “I” in TEAM

- Shared product vision
  - Team members need to share a common product vision
- Consensus
  - Product/Release backlog
  - Sprint goal and backlog
  - Level of effort estimation
    - User stories in story points
    - Sprint tasks in ideal working hours
- Joint responsibility
  - Release plan
  - Sprint plan
  - Sprint report
  - Scrum practices (stand-up, planning meetings, sprint post mortem)

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There is nothing but “I”s in TEAM

- “It’s not my job”
  - Only if that job is already done or being done by somebody else
- Each team member responsible for reaching team goal
  - Proactive in committing to tasks
  - Diligent in completing tasks committed to
  - Willing to ask for and accept help when needed
  - Willing to offer and provide help when needed
- There is no task that needs doing that you are not allowed to do

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