Ending an Iteration

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Goals

- Review material from Chapter 9 of Pilone & Miles
  - Ending an Iteration
    - System Testing
    - Bug Reports
    - Iteration Review

Ending an Iteration

- Following the agile practices we've covered each iteration will have
  - customer-driven functionality (user stories; feedback)
  - compiling code & monitored builds (continuous integration)
  - solid test coverage and continuously tested code (TDD)
  - reliable progress tracking (burn-down chart)
  - pacing that adapts to the team (iteration plan; velocity)
- and with this you may find yourself with spare time at the end of an iteration

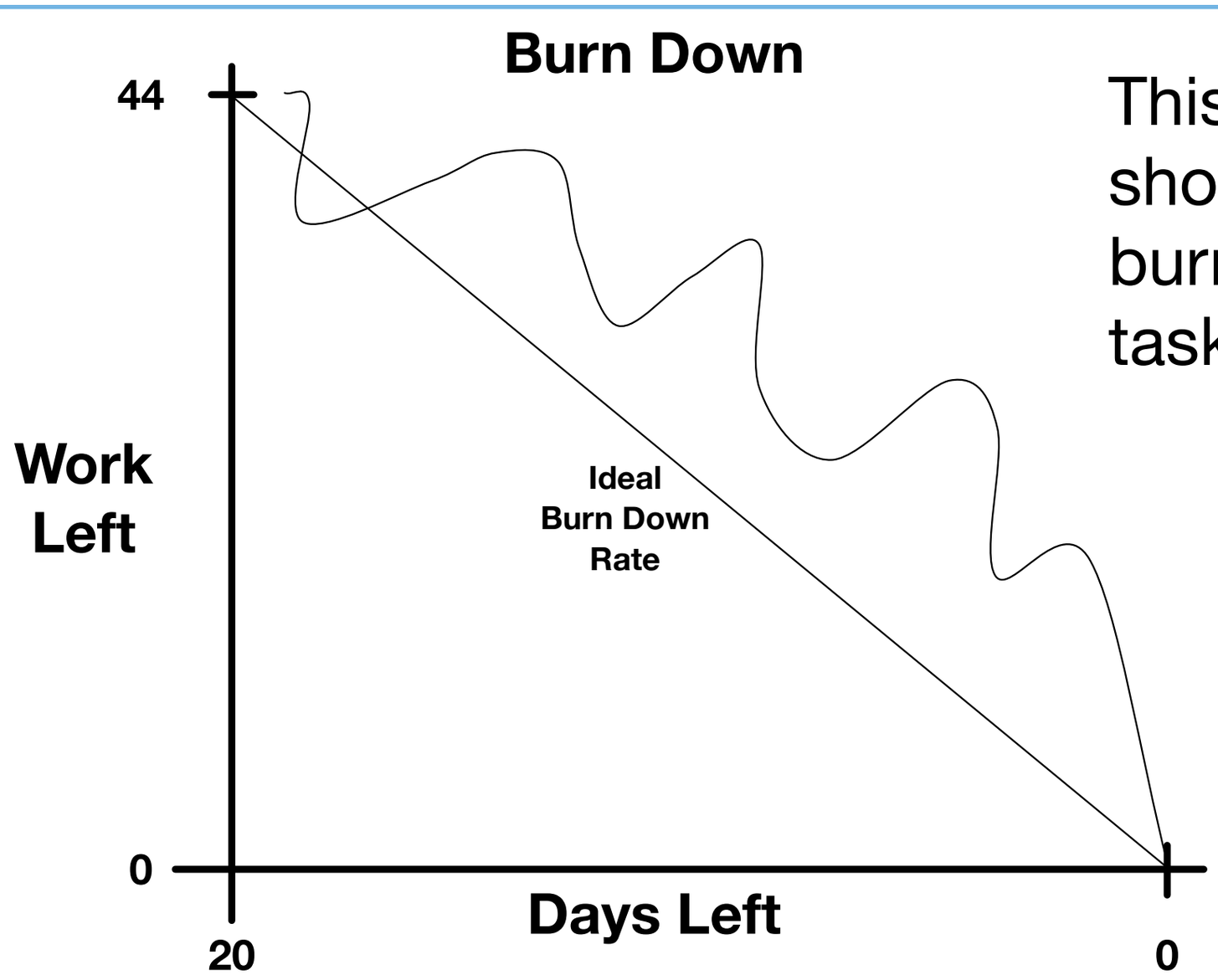
What else can be done?

- At the end of an iteration, you can reflect on things you'd like to add to daily work practice to provide additional benefits
- Such as
  - process improvements (what's not working?)
  - system testing (we've got unit tests and integration tests)
  - refactoring of code based on lessons learned
  - code cleanup and documentation updates
  - design patterns
  - environment updates, R&D, personal development time

Data in Burn Down

- One way to reflect on the iteration is to look at the burn-down chart
  - It can provide insight into the effectiveness of the team
- Were we ahead, were we always behind?
  - Are we good at adapting to change?

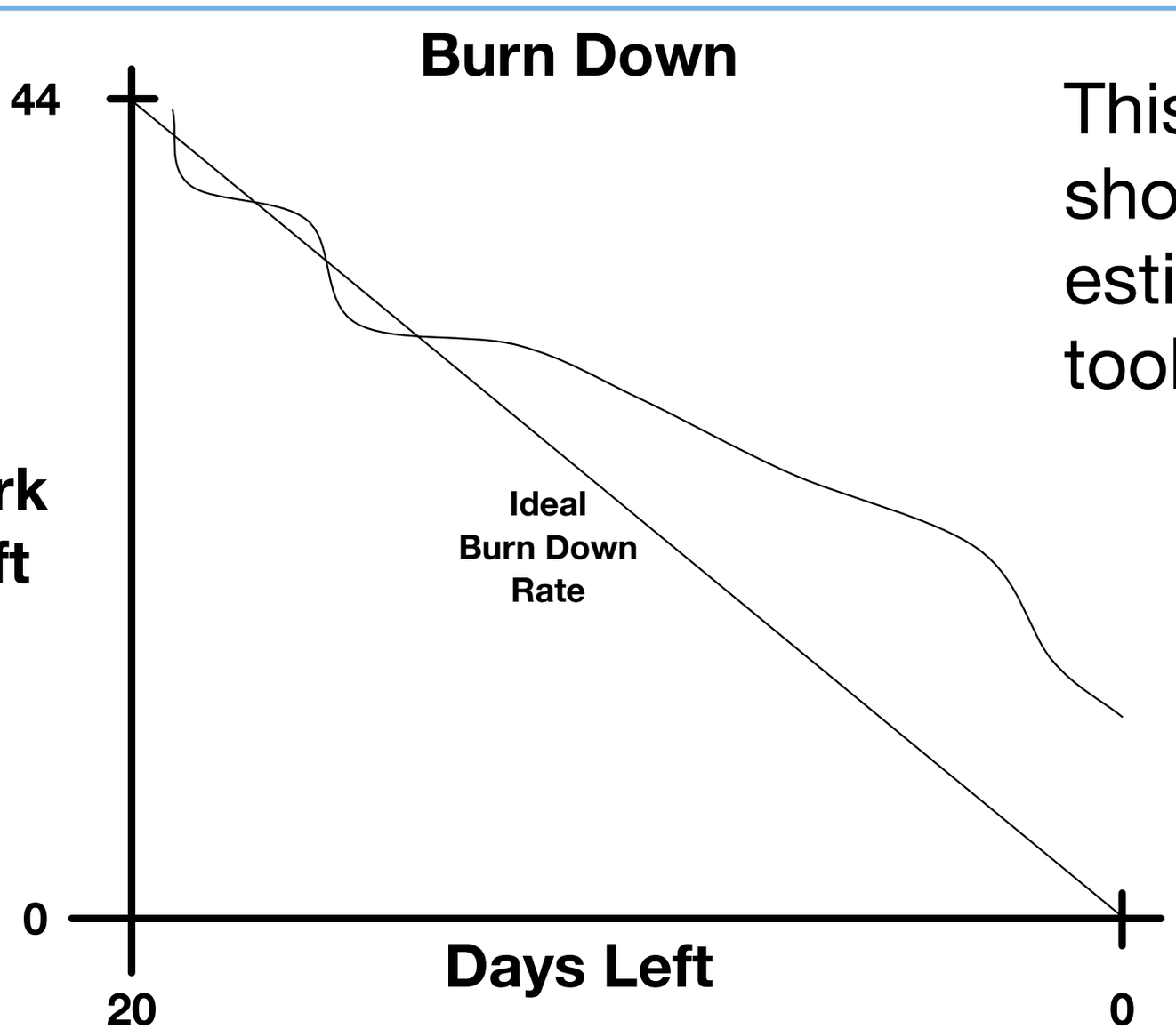
Unplanned Tasks



This burn-down chart shows the team getting burned with unplanned tasks and/or user stories

The drop to zero at the end is NOT the result of some heroic effort on the part of the team; likely it is simply a result of scoping down

Bad Estimates



This burn-down chart shows the team had bad estimates; everything took longer than planned

Not getting to zero means the team needs to learn how to re-scope: delaying tasks and stories to subsequent iterations

Integrating System Tests

- Our techniques do not provide time for system testing
  - A system test exercises the functionality of the system from "front to back" (UI to persistence layer) in real-world black-box scenarios
- Developers are too biased to do system testing, they know the code too well and do not necessarily have access to realistic test data
- Your end users should be the ones performing system tests on real data
  - If that's not possible, you need a testing team!

Off by One

- In each iteration, the developers are concerned with the current set of user stories
  - They test constantly but those are unit/integration tests
- A test team, then, can perform system testing on system *n-1* during iteration *n*
  - During iteration 1, the test team gets ready for iteration 2
    - Reviewing stories, writing tests, installing tools, etc.
- This leads to more being done in each iteration
  - and the book views them as separate iteration cycles
    - that is, more iterations

More iterations, more problems

- Running two iteration cycles means
  - LOTS more coordination which requires LOTS more communication
    - Will require “cross pollination” of standup meetings
  - Forces testing into a “box”: fixed time step
    - May not be able to cover all functionality within a single iteration
  - Bug fixing mixes in with new work
    - If the testing team is finding bugs, guess who has to fix them?
  - Tests are written against a moving target

More problems, more talk

- In order to deal with these problems, you just need
  - MORE communication to enable better coordination
    - and remember, in agile approaches, we value direct communication
  - We do have to worry about this on one level (Mythical Man Month) but remember that agile approaches avoid a lot of the documentation that slow traditional SE approaches down

Effective System Testing

- Good, frequent communication (devs., test team, customer)
- Known starting and ending state of system
- Document your test suites
- Establish clear success criteria (when can we go live?)
- Automate your tests
- Devs and test team work together (avoid fights!)
- Test team understands big picture view of system
- Accurate system documentation

Test results?

- We eventually want to see all tests pass
  - but before we do, the results of testing are bug reports
- Bug life cycle
  - Tester finds bug
  - Creates a bug report and submits it to issue tracking system
  - Developers create a story or task to fix the bug
    - Enters iteration plan and handled as normal
  - Developers fix the bug
  - Tester checks the fix and verifies the bug is gone
  - Tester updates the bug report (sets status to closed/resolved)

Bug Trackers

- Plenty of systems out there to do bug tracking
  - FogBugz, Bugzilla, Mantis, TestTrackPro, ClearQuest
- Important because they
  - let you prioritize bug reports
    - related to success criteria “go live when only priority 4 bugs remain”
  - let you keep track of everything related to a bug fix
  - let you generate important metrics related to life cycle quality
    - bug submission rate? location of bugs? bugs outstanding?

Bug Reports

- Good bug reports contain
  - A summary that describes the bug in 1-2 sentences
  - The steps needed to reproduce the bug (see it in action)
  - Expected Output vs. Actual Output
  - Configuration Information: Platform, version, etc.
  - Severity: how bad is the impact of this bug?
  - Priority: how quickly do we need to fix this bug?
  - Current Status

Iteration Review

- At the end of an iteration, take time to reflect and identify how the process can change to make things run smoothly
- A good iteration review requires that you
  - prepare ahead of time: bring a list of things to discuss
  - be forward-looking: what should we do to improve the next iteration?
  - calculate your metrics: velocity, burn-down rate, etc.
  - review a standard set of questions that helps the team look for opportunities to improve

Review Questions

- Was the quality of our work acceptable?
- Was the pace acceptable?
- Are you comfortable with your current work assignments?
- Are our tools getting in the way? Are there new tools to consider?
- Was our process effective? Does something need to change?
- Performance problems? Bugs to discuss?
- Testing effective? “Bad smells” to get rid of

If you have extra time

- If you have “free” days at the end of an iteration
  - Fix bugs and/or refactor and/or update documentation
  - Tackle a user story from the next iteration
  - Prototype solutions needed in the next iteration
  - Training or Learning Time: Google’s “20% time” practice

Wrapping Up

- The end of an iteration is a time for reflection
  - What should we change to make the next iteration better?
- It is also a time for catching up or getting ahead
- Learn to use iterations well
  - Pay attention to burn-down rates and what they tell you about the team
  - Pace the iteration ; if you have too much to do, scope the iteration down
  - Review each iteration to continuously improve your process

Coming Up

- Lecture 25: The Next Iteration
  - Read Chapter 10 of Head First Software Development
- Lecture 26: Alternate approaches to Concurrency
  - No reading assignment
    - MapReduce
    - Agent model of Concurrency
      - Examples from Erlang and Scala