The ACME Climate Project Learning Initiative: A Cheatsheet

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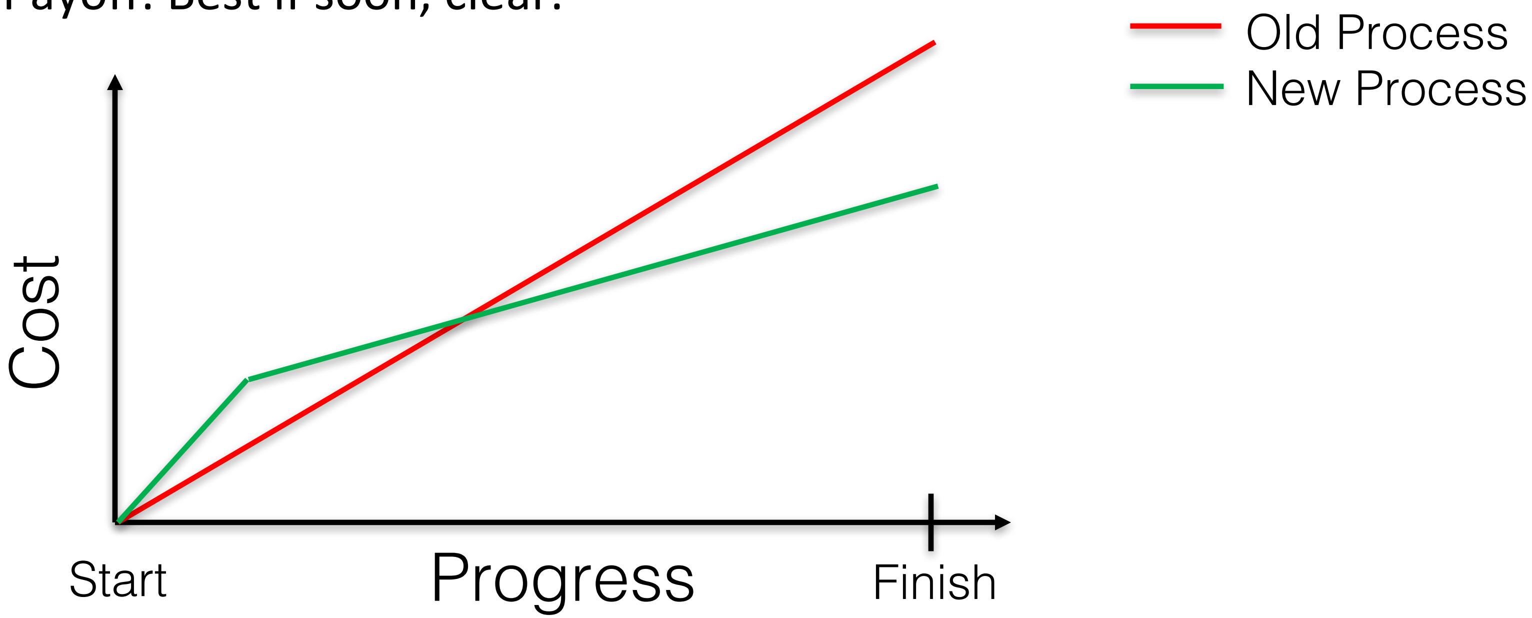
General Strategy

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



7 Initial ACME Interviews: Emerging themes

Diverse cross-section: Lab, Component, Proximity to SE Group, Experience.

- **Software challenges compete with other high priority demands.**
  - Urgency of science challenges is paramount.
  - Software improvement must be introduced carefully, with timely and highly probable payoff.
- **Challenge working with Git, especially:**
  - Efficient management of simultaneous development of shared code.
  - Uncertainty with uncommon but essential processes.
  - Uncertain understanding of how Git really works.
- **Testing concerns mentioned often:**
  - Testing process not uniform.
  - No standard test harness.
  - Groups evolve own testing approaches.
- **Unit testing often mentioned:**
  - Desire for quicker, more localized testing, i.e., unit testing.
  - Concern about feasibility of unit testing.
- **Shorten the development cycle:**
  - More features with less work.
  - Fewer merge conflicts.
  - Lower barriers for scientist-developers.
- **Desire for better, more uniform developer training and minimal skill levels.**
  - Basic developer workflows.
  - Coding standards; readable, sustainable source code.
  - Effective commit log messages.
  - Tempered by concerns of too much emphasis.
- **Tools and processes should be kept simple, easy-to-use:**
  - ACME team is diverse, simplicity is important.
  - External collaborators can more easily contribute to ACME and use product.
- **Learning opportunities should be varied:**
  - New team member orientation.
  - Face-to-face, webinars, individual learning plans.
  - On-demand access to software experts.
- **Programming for performance:**
  - Basic performance concepts.
  - Performance portability.
- **Challenges using JIRA effectively, especially in the presence of GitHub issues.**
  - GitHub issues used daily, considered essential.
  - JIRA used less frequently, often an afterthought.

ACME Learning Strategies

Exploring various approaches:

- Real-time, face-to-face? Software Carpentry.
- Real-time, webinar? Coordinate with LCFs.
- Recorded, webinar? By-product of real time.
- MOOC, SPOC? Udacity, etc. Plus local expert.
- Individualized?
  - Slack, On-demand?
  - Github-based?
  - Audible (my favorite way to learn).

Clear learning subject: Git

- Powerful, challenging.
- “Defensive” Git Training
- Teach basic worflows: yes.
- Teach also:
  - Prepare to avoid disaster.
  - Prepare for disaster.
- Practice disaster recovery:
  - Create disaster.
  - Recover.
  - In safe setting.
- How to deliver? To whom?

> *With Git as your source management tool, everyone feels stupid.*
>
> *John Cary*

Summary

- I have experienced the “help” of SW Engineering Experts.
  - Cray circa 1990, ASCI circa 2000
  - Ignored their own process:
    - Failed to elicit, analyze requirements.
    - Slapped on pre-defined solutions.
    - Failed.
- Hopefully realistic: This will not be easy.
- Goals:
  - ID biggest opportunities.
  - Create content and delivery strategies.
  - Work with ACME developers.