[CS3704] Software Engineering

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2/2/2024

Discussion Presentation

SE Research Overview
Discussion Presentation Details
Example Presentation and Activity

Announcements

- **Sign up for a discussion presentation**
  - Today in class
- **PM0 due tonight by 11:59pm!**

- **HW1 due Monday by 11:59pm**

Project Questions so far

How can we access the list of examples for the project?

https://github.com/shawalkhalid667/C3704-VT/blob/main/Project/Ideas.md

Would a project that primarily supports other work, but is still usable by Software Engineers for Software Engineering work fulfill these requirements? Maybe, it depends

Currently, we have three teammates, is another required? Probably

Software Engineers

A person who applies a systematic engineering approach to the design, development, testing, and maintenance of computer software.

- Also known as developer, programmer,...

Traits of Successful Software Engineers

- Sense of individual responsibility
  - Do what needs to be done in an overriding effort to achieve a successful outcome
- Awareness of stakeholder needs
  - Observe the environment in which people work and adapt his/her behavior
- Honest about design flaws and offer constructive criticism
  - Be realistic and truthful

Traits of Successful Software Engineers

- Resilient under pressure
  - Manage the pressure/chaos which comes in many forms: changing requirements, demanding stakeholders, unrealistic manager
- Attention to details
  - Consider the technical decisions against broader criteria
- Pragmatic
  - SE is a discipline to be adapted based on circumstances

Attributes of Effective SE Teams

- Sense of purpose
  - Everyone agrees on the goal
- Sense of involvement
  - Everyone feels that their skillset and contributions are valued
- Sense of trust
  - Everybody should trust the skills and competence of their peers and their managers
- Sense of improvement
  - Periodically reflect to think about ways for improvement
- Diversity of team members skills, backgrounds,...

Why do we need a team?

- Software is too big and complex to be constructed by a single person.

Possible team crises:

– Team member leaves
– Team member laziness (or incompetence)
– Team member is anti-social
– Machine problems
– Scheduling difficulties…

Make sure to adapt for your course project team!

Avoid Team Toxicity

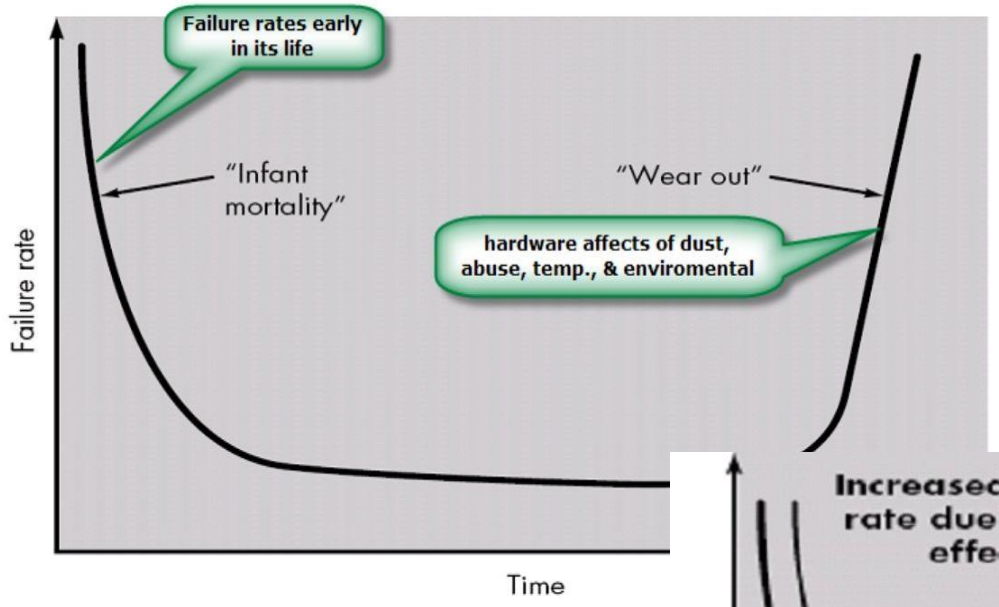
- Frenzied work atmospheres
  - Define goals and objectives
- Frustration that causes friction
  - Make decisions as a team as much as possible
- Fragmentation and poor coordination
  - understanding the tasks to be done, the people doing the work, etc.
- Unclear definition of roles
- Continuous and repeated exposure to failure

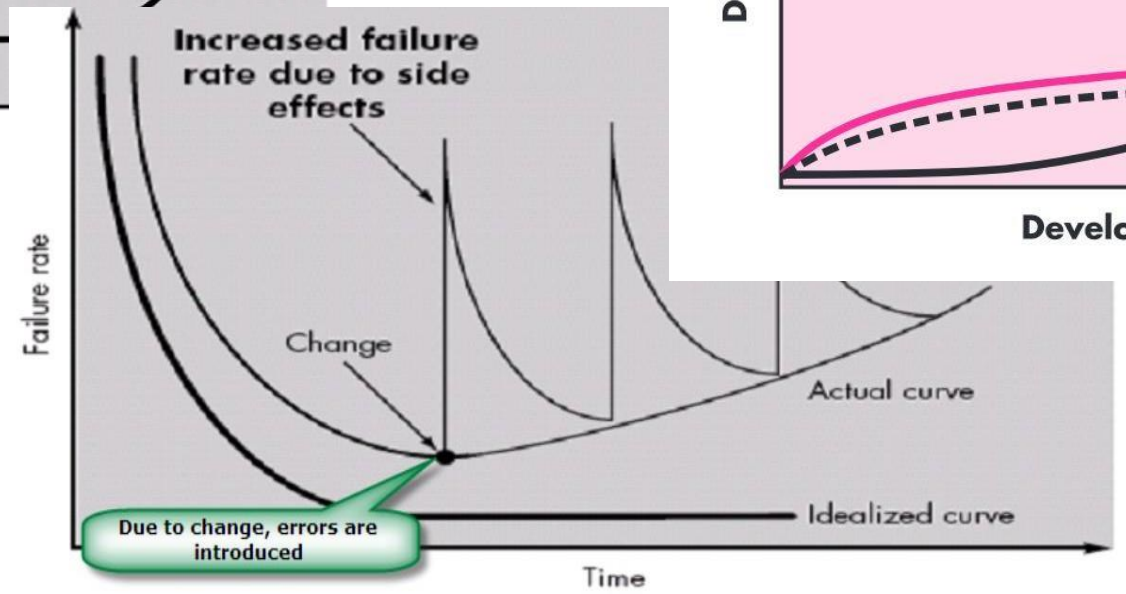
SE Research

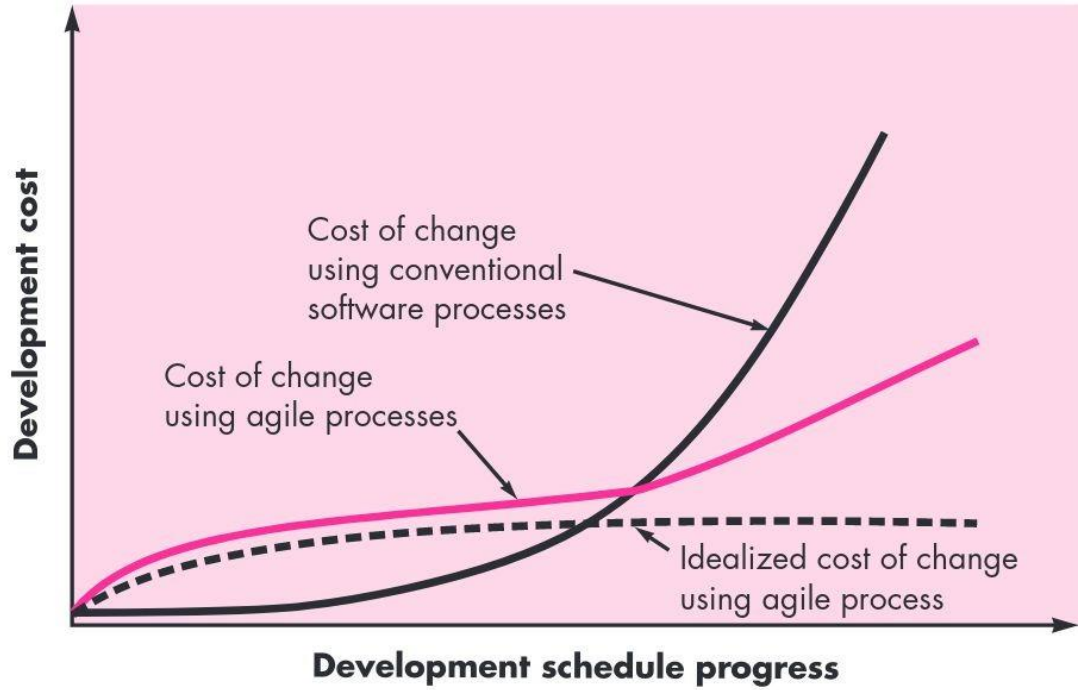
Software engineering research seeks to create, understand, and evaluate the strengths and weaknesses of SE tools and practices, with the goal of improving the lives and evaluating the work of software engineers.

Examples we've seen in class so far include…

SE Research: Costs







SE Research: Project Failure

Top 3 reasons for project failure:

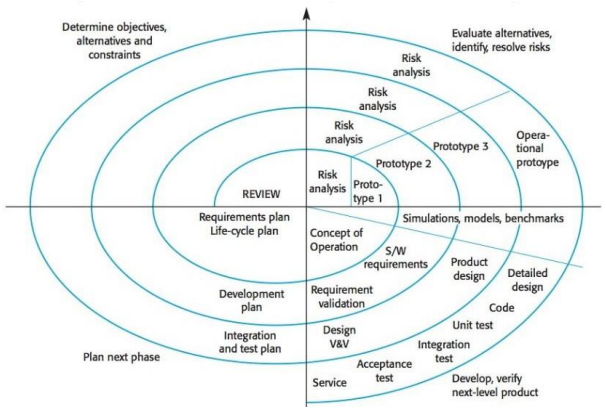
Project Challenged Factors	% of Responses
1. Lack of User Input	12.8%
2. Incomplete Requirements & Specifications	12.3%
3. Changing Requirements & Specifications	11.8%

Top 3 reasons for project success:

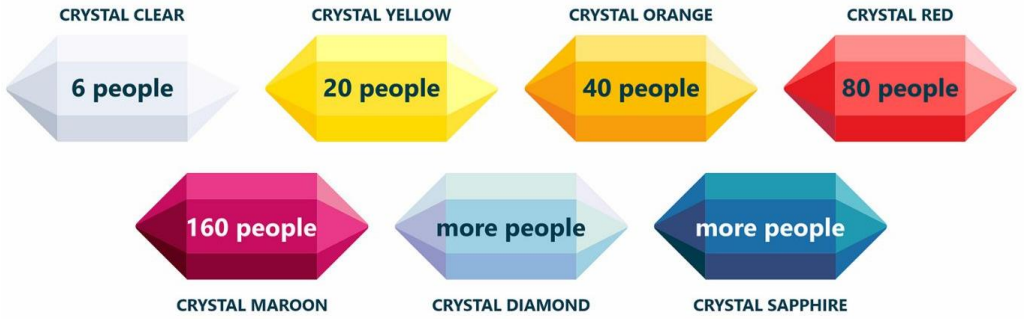
Project Success Factors	% of Responses
1. User Involvement	15.9%
2. Executive Management Support	13.9%
3. Clear Statement of Requirements	13.0%

[Standish group, 1995]

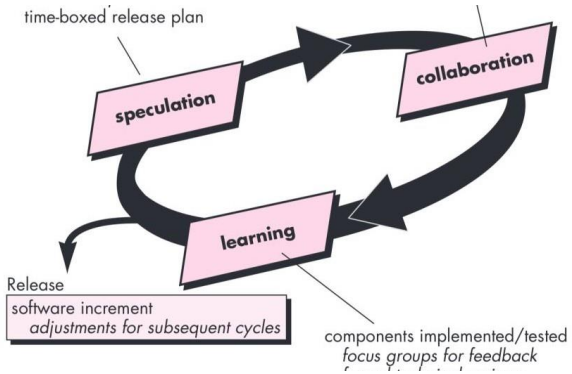
SE Research: Process/Frameworks



"A Spiral Model of Software Development and Enhancement" [Boehm, 1988]



"Crystal clear: A Human-powered methodology for small teams" [Cockburn, 2004]



"Adaptive Software Development: An Evolutionary Approach to Managing Complex Systems [Highsmith, 2000]

SE Research (cont.)

But, SE research can also be irrelevant and useless for actual software engineers and their work…

Do Developers Discover New Tools On The Toilet?

Emerson Murphy-Hill
Google, LLC
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Edward K. Smith*
Bloomberg
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Andrew Trenk
Google, LLC
atrenk@google.com

Steve Gross
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- Yes, they do 💩

Research Discussion

- Each student will present one SE-related research paper or article as a group of five.
  - You may send a replacement to me to be approved *at least one week before your presentation date*.
- All groups (n = 3) presenting on a specific day will lead a discussion/activity for class.

Learning Outcome:

- **Discuss research questions and studies related to software engineering**

Rubric

Group	Points	Individual	Points	Larger Group	
Title slide contains title, original author(s), and presenter names	5	Presenter speaks clearly and makes meaningful contribution to presentation	5	Groups lead a class activity based on the topic	5
Presentation slides are readable	5			Presentations and activity last at least 45 minutes	5
Presenters explain the problem	15			**[Bonus] Class activity is exceptionally creative and engaging**	5
Presenter provides a brief overview of how the paper/article addresses the problem	10				
Advantages and disadvantages of the work are explained	15				
Presenter shares something in the paper they found interesting and/or surprising	15				
Presenter explains how their paper is relevant to this class	10				
Presentation is 10 minutes long, +/- 30 seconds	10				
	85		5		15

Tips

- Read the paper thoroughly, but don’t try to understand all of the details
- Practice your talk ahead of time (Stay on time!)
- Always start with the *problem*
- Be creative in your discussion or activity
- Grade is based on individual presentation, group discussion, and overall class activity
- Your research discussion should go something like this…

Late Warm-Up

- Sign up for a research discussion talk.
- Discuss with a partner/small group why you selected the topic you chose.