Winter 2022

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CS 428
THE MYTHICAL MAN-MONTH
CHAPTERS 4, 5, 7, 11, 14

CH 4: ARISTOCRACY, DEMOCRACY, AND SYSTEM DESIGN

- Brooks: conceptual integrity is *the* most important consideration in system design (I agree)

- Simplicity, straightforwardness, unity of design are necessary

- The design must proceed from one mind or a very small number of agreeing resonant minds

- The conceptual integrity of a system determines its ease of use

- A consistent architecture enhances the creative style of implementers

- A well-thought-out architecture increases the robustness and adaptability of the resulting software system

CH 5: THE SECOND-SYSTEM EFFECT

- Interactive discipline for the architect
  - The architecture is valuable input into estimating the implementation and testing
  - If the schedule is unacceptably long, the architect can look for ways to simplify
  - Big challenge: features that may seem simple to the customer may actually be very difficult to design and implement

- The second-system effect
  - Brooks notes later that true iterative development can diminish this problem, but…
  - The first shipping version usually has many deferred features; there is a strong temptation to throw in "everything but the kitchen sink" into version 1.1 or 2.0

- Real-world issue: incurring 'technical debt' and not handling it

CH 7: WHY DID THE TOWER OF BABEL FAIL?

- What they did have:
    - A clear mission
    - Manpower
    - Materials
    - Time
    - Technology

- What they lacked:
    - Communication
    - And, as a consequence, organization

- Your observations/experience?

CH 7: CONTINUED

- Project workbook: replaced today by online organization (e.g., github, your project wiki, etc.)

- Communication challenge: with n workers on a project, there are $(n^2-n)/2$ possible interfaces and 2^n possible sets of workers

- Solution: Division of labor / specialization of function

- Key: project manager and chief architect need to be different people

  - Their priorities conflict

  - Chief architect will tend to be overly optimistic

CH 11: PLAN TO THROW ONE AWAY

- As with "second system effect", Brooks feels his comments here are superseded by use of iterative/incremental software development

- Still, far too often, "pilot" or "prototype" systems are forced to evolve into production systems

- Only after your first cut do you often see how you should have done it in the first place

- What has been your observation/experience?

CH 11: CONTINUED

- Plan the organization for change
  - Still a very real issue: lack of technical advancement track in most organizations
  - Instead, developers are pushed into management if they want to be promoted

- Two steps forward and one step back
  - Most 'maintenance' work involved adding new features
  - Introduces software entropy (or, if you prefer, software rot)
  - Production systems that are modified become less stable/reliable over time
  - "Less effort is spent on fixing original design flaws; more is spent on fixing flaws introduced by earlier fixes"

- Your observations/experience?

CHAPTER 14: HATCHING A CATASTROPHE

- "How does a project get to be a year late? One day at a time."

- Milestones must be concrete, specific, measurable events

  - The myth of the "Oh, we're about XX% done" statement

  - 90/90 rule: 90% of the project takes the first 90% of the schedule; the remaining 10% of the project takes the other 90% of the schedule.

- The "three weeks before deadline" rule:

  - "*Underestimates* [of project schedule] do not change significantly during the activity until about three weeks before the scheduled completion."

- Need for a critical-path schedule (e.g., PERT) to show the critical path

- Observations?

CH 14: CONTINUED

- Not being willing to pass bad news uphill

  - Webster: The Thermocline of Truth (2008) [Webster #2]

- Not knowing the news is bad

  - Webster: Lies, Damned Lines, and Metrics (parts I through III) (2008) [Webster #3]

  - Project progress metrics need to be objective, repeatable, and informative

  - Weinberg's Law of Metrics: That which gets measured gets fudged.

  - The Metric Law of Least Resistance: "The more human effort required to calculate a metric, the less often (and less accurately) it will be calculated, until it is abandoned or ignored altogether."

- Thoughts and observations?

ASSIGNMENTS FOR NEXT CLASS (01/24/22)

- By midnight this Saturday (01/15)
    - Finalize team membership and refine project definition and scope; update your team's Wiki page appropriately; start talking about scope and roles

- By midnight a week from this Saturday (01/22)
    - Listen to your first podcast (any one of your choosing) and complete the exam on Learning Suite
    - Start actual work on your projects

- By start of class in two weeks (01/24)
    - Read *The Mythical Man-Month* chapters 16-19 and complete the exam in Learning Suite
    - Read Webster #1 readings (online at class website under 'Readings and Podcasts') and complete the exam on Learning Suite