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

Fall 2022

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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- As with “second system effect”, Brooks feels his comments here are superseded by use of iterative/incremental software development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 (09/19/22)

- By midnight this Saturday (09/17)
  - Finalize team membership and refine project definition and scope; update your team's Wiki page appropriately; start talking about scope and roles
  - Listen to your first podcast (any one of your choosing) and complete the exam on Learning Suite
  - Start actual work on your projects (first prototype demo in 6 weeks)
- By start of class next week (09/24)
  - 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