

Brooks Law and the Mythic Man Month

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"Adding manpower to a late project makes it later" - Fred Brooks

- Ph.D from Harvard in 1953.
- Joined IBM in 1956.
- Managed the development of System/360 mainframe and OS/360 system.
- 1999 winner of the Turing Award.

"We called this project, 'You bet your company.'" - Robert Evans (Head of Engineering, S/360) 1966

The Mythic Man Month

- Lessons learnt from the OS/360 project.
- Collection of software management and construction essays.
- Still relevant today.
- Available at archive.org.

*“Some people have called the book the” bible of software engineering”
[...] everybody quotes it, some people read it, and a few people go by
it.” - Fred Brooks 2005*

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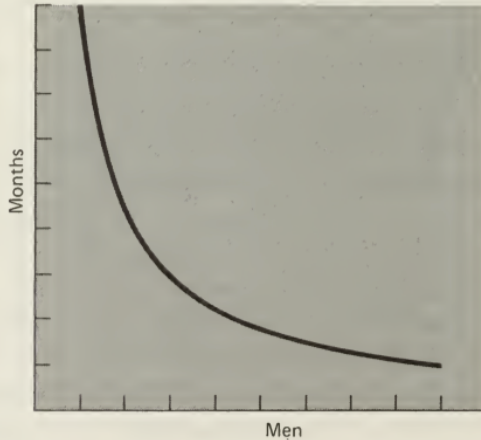


Fig. 2.1 Time versus number of workers—perfectly partitionable task

Figure: Perfectly Partitionable Task

- Just because your job will take “*6 person months*” doesn't mean it will take 3 people 2 months.

“Nine women can't make a baby in one month.” - Fred Brooks

- Ramp-Up time
- Communication overheads

Ramp-up time

- Jumping into an unfamiliar project is difficult.
- Must learn structure, management, build process and style.
- The sudden addition of multiple persons incurs a training or ramp-up time

Example: HipHop-VM

- Build process: 2 days
- Find relevant code: 3 days
- Understand relevant code: 1 week
- First working modification: 4 weeks into project

Brooks' Example:

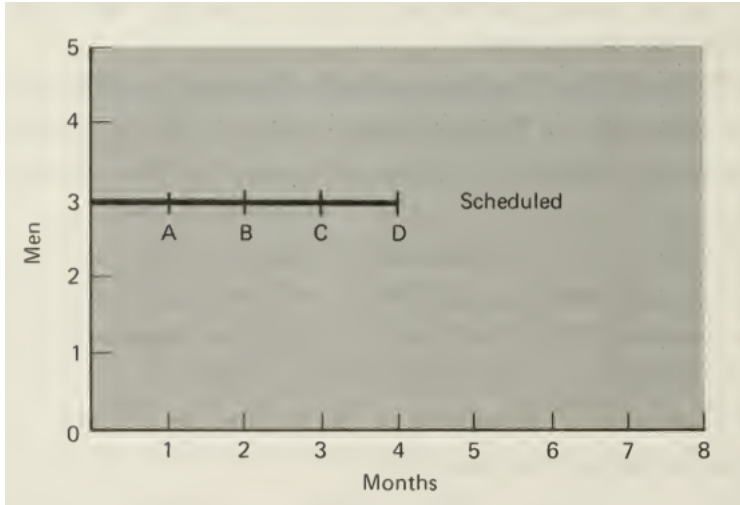


Figure: Initial Milestones

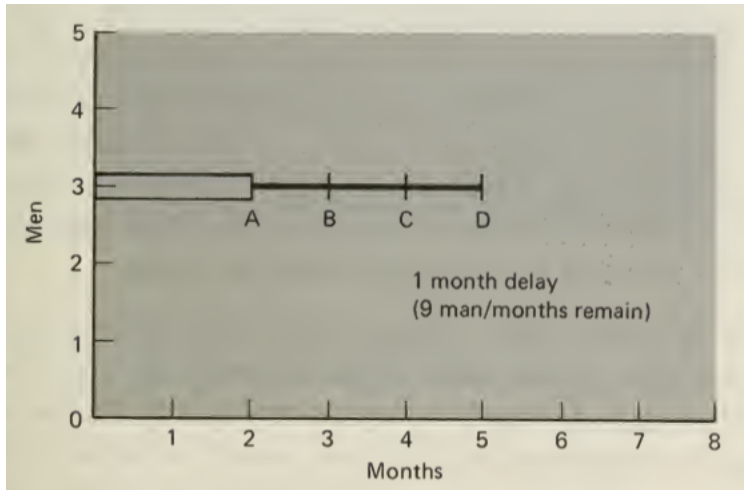


Figure: Delay Incurred

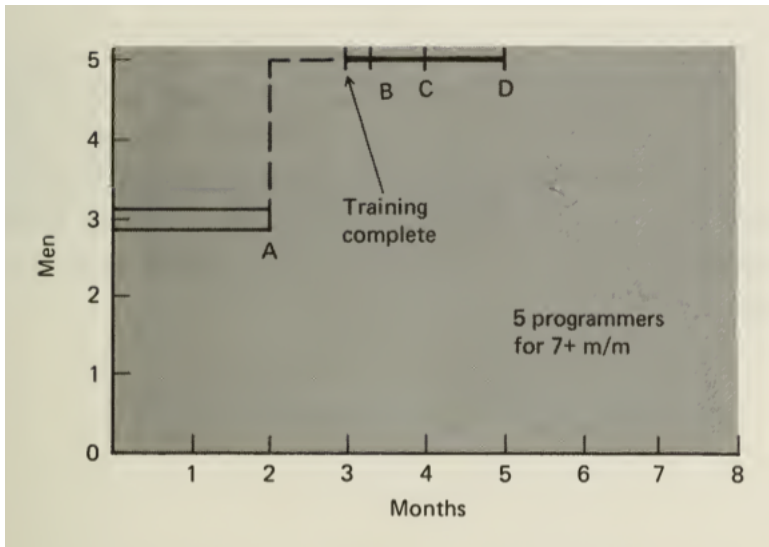


Figure: Man power added



Figure: Oops

Communication overheads

- Tasks which can be partitioned require communication.
- As the number of partitions/developers increases communication begins to dominate the development effort.
- Communication effort can be approximated as $n(n-1)/2$

“Three workers require three times as much pairwise intercommunication as two; four require six times as much as two.” - Fred Brooks

Brooks' Example

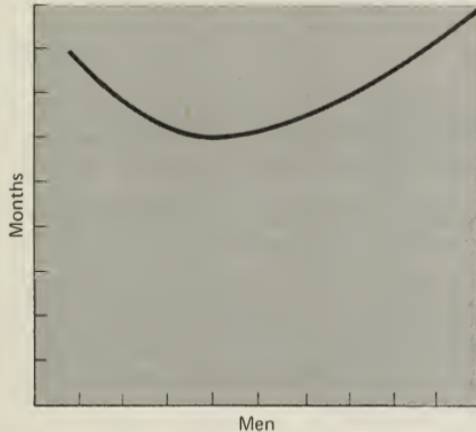


Fig. 2.4 Time versus number of workers—task with complex interrelationships

Figure: Complex Intercommunications

- In source documentation helps comprehension of code
- Project documentation covering management and structure decreases lead time
- Consistant build environments.
- Can help decrease ramp-up time of added persons but cannot remove it.

- Consistent interfaces to implementation reduces communication requirement
- Adding persons to support roles (documentation/quality assurance) can be added with reduced ramp-up time
- There is no silver bullet.

“More software projects have gone awry for lack of calendar time than for all other causes combined.” - Fred Brooks

- IBM Archives: Frederick P. Brooks, Jr
- IBM 100: System 360
- The Mythical Man Month (Essays on Software Engineering) - Fred Brooks 1975