# Brooks Law and the Mythic Man Month

Benjamin Roberts

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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*

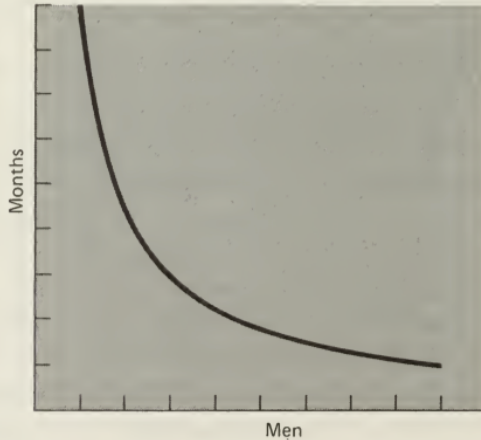*"Adding manpower to a late project makes it later"* - Fred Brooks

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
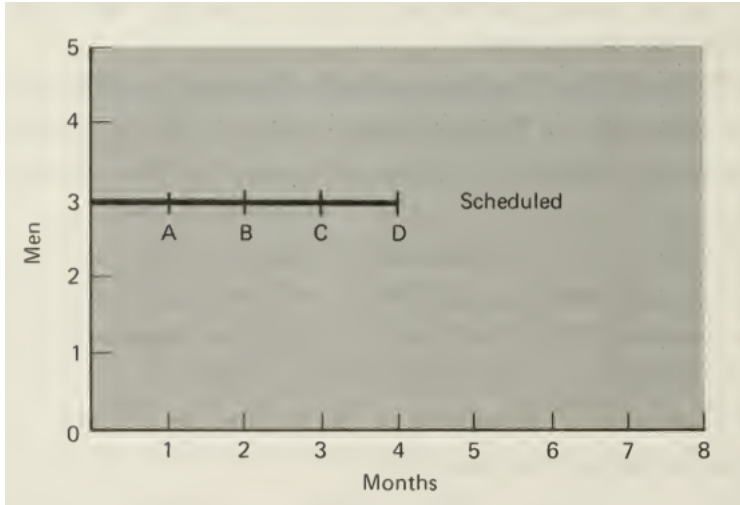- First working modification: 4 weeks into project
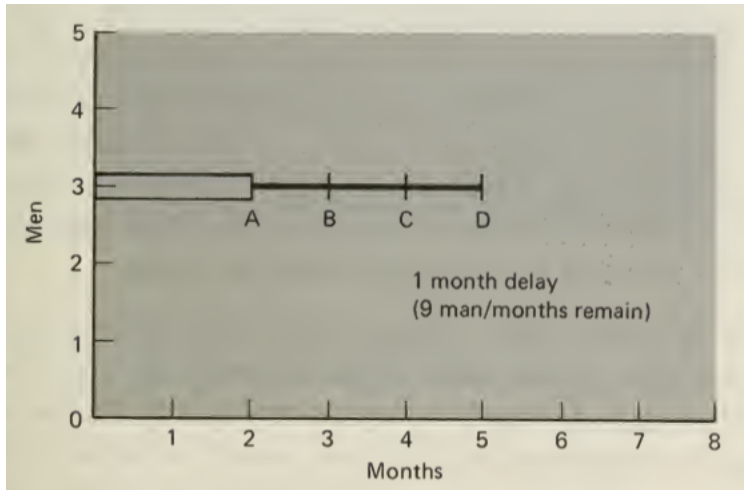
Figure: Initial Milestones
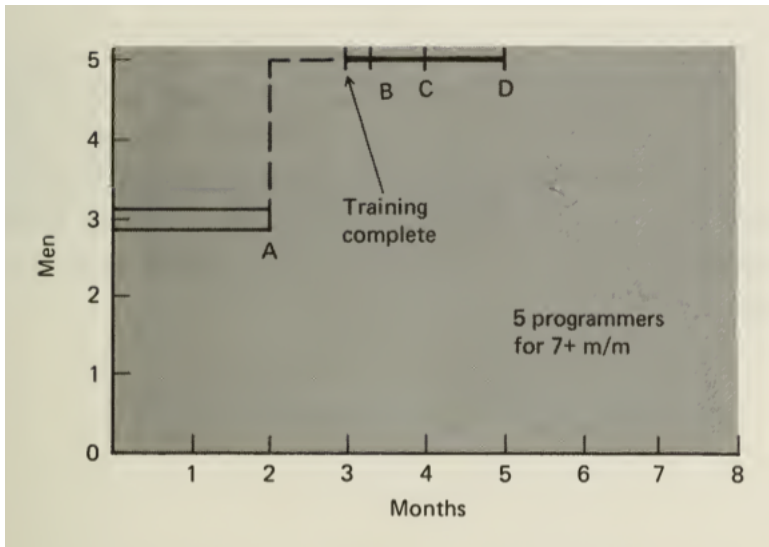
Figure: Delay Incurred

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

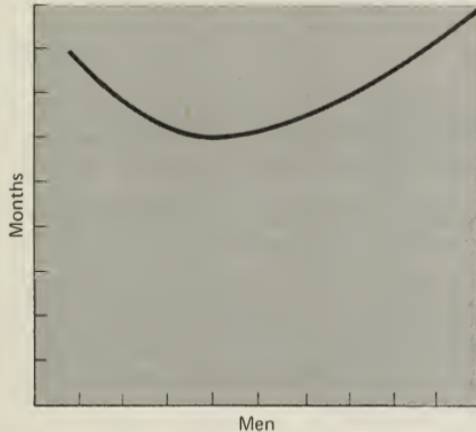**Fig. 2.4** Time versus number of workers—task with complex interrelationships

Figure: Complex Intercommunications

# Solutions

- In source documentation helps comprehension of code
- Project documentation covering management and structure decreases lead time
- Consistent 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

# References

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