



Svigruppo

Monga

La Cattedrale

# Sviluppo software in gruppi di lavoro complessi<sup>1</sup>

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## Lezione II: *The Cathedral and the Bazaar* e altri modelli



L'esperienza di Brooks: l'OS/360 (25M\$  $\rightsquigarrow$  125M\$  $\rightsquigarrow$  500M\$, un anno di ritardo)

*Large-system programming has over the past decade been such a tar pit, and many great and powerful beasts have thrashed violently in it. Most have emerged with running systems—few have met goals, schedules, and budgets. **Large and small, massive or wiry, team after team has become entangled in the tar.** No one thing seems to cause the difficulty—any particular paw can be pulled away. But the accumulation of simultaneous and interacting factors brings slower and slower motion. Everyone seems to have been surprised by the stickiness of the problem, and it is hard to discern the nature of it. But **we must try to understand it if we are to solve it.***

— Fred Brooks, *The mythical man-month* (1975)

<https://archive.org/details/MythicalManMonth>

# I problemi identificati da Brooks



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- Le tecniche di stima sono poco sviluppate e si tende ad assumere che tutto andrà bene
- Si confonde “*effort*” con “*progress*”: personale e mesi sono intercambiabili? (il mitico *man-month*)
- Il progredire dello sviluppo viene controllato in maniera molto superficiale
- Si risponde ai ritardi **aggiungendo personale**.



## Brooks' Law

*Adding manpower to a late software project makes it later.*

*Each worker must be trained in the technology, the goals of the effort, the overall strategy, and the plan of work. This training cannot be partitioned, so this part of the added effort varies linearly with the number of workers. Intercommunication is worse. If each part of the task must be separately coordinated with each other part/ the effort increases as  $\frac{n(n-1)}{2}$ . Three workers require three times as much pairwise intercommunication as two; four require six times as much as two. If, moreover, there need to be conferences among three, four, etc., workers to resolve things jointly, matters get worse yet.*

costo del coordinamento  $\propto n^2$



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Secondo Brooks è fondamentale preservare l'**integrità concettuale** di un progetto.

- **La cattedrale** Rigorosa separazione fra lavoro *architettuale* (accentrato) e *implementativo* (distribuito)
- **La sala operatoria** (H. Mills) Un “chirurgo” e un “co-pilota” (scelti fra i “10×”), contornati da una *equipe* con ruoli precisi, ma tutti *giocano* per loro.