

Fred Brooks Quotes

*Design, Programming, Thinking, Important, Order, Data, Two, Learning,
Requirements, Software, Men, Believe, Essence, Maintenance, Discipline,
Media, Integrity, Jobs, Effort, Plans*

The Waterfall Model is wrong and harmful; we must outgrow it.

~Fred Brooks

How does a project get to be a year behind schedule? One day at a time.

~Fred Brooks

Nine people can't make a baby in a month.

~Fred Brooks

Show me your flowcharts and conceal your tables, and I shall continue to be mystified. Show me your tables, and I won't usually need your flowcharts; they'll be obvious.

~Fred Brooks

The fundamental problem with program maintenance is that fixing a defect has a substantial (20-50 percent) chance of introducing another. So the whole process is two steps forward and one step back.

~Fred Brooks

System debugging has always been a graveyard-shift occupation, like astronomy.

~Fred Brooks

A scientist builds in order to learn; an engineer learns in order to build.

~Fred Brooks

The hardest single part of building a software system is deciding precisely what to build.

~Fred Brooks

Mediocre design provably wastes the world's resources, corrupts the environment, affects international competitiveness. Design is important.

~Fred Brooks

Adding manpower to a late software project makes it later

~Fred Brooks

System debugging, like astronomy, has always been done chiefly at night.

~Fred Brooks

The bearing of a child takes nine months, no matter how many women are assigned.

~Fred Brooks

The hardest part of the software task is arriving at a complete and consistent specification, and much of the essence of building a program is in fact the debugging of the specification.

~Fred Brooks

An ancient adage warns, "Never go to sea with two chronometers; take one or three."

~Fred Brooks

I am more convinced than ever. Conceptual integrity is central to product quality.

~Fred Brooks

Present to inform, not to impress. If you inform, you will impress.

~Fred Brooks

Einstein repeatedly argued that there must be simplified explanations of nature, because God is not capricious or arbitrary. No such faith comforts the software engineer.

~Fred Brooks

I have never seen an experienced programmer who routinely made detailed flow charts before beginning to write programs.

~Fred Brooks

Originality is no excuse for ignorance.

~Fred Brooks

The brain alone is intricate beyond mapping, powerful beyond imitation, rich in diversity, self-protecting, and self-renewing. The secret is that it is grown, not built.

~Fred Brooks

But I will argue that knowing complete product requirements up front is a quite rare exception, not the norm.

~Fred Brooks

A computer program is a message from a man to a machine. The rigidly marshaled syntax and the scrupulous definitions all exist to make intention clear to the dumb engine.

~Fred Brooks

Systematically identify top designers as early as possible. The best are often not the most experienced.

~Fred Brooks

Consensus processes starve innovative design by eating the resource.

~Fred Brooks

Conceptual integrity is the most important consideration in system design.

~Fred Brooks

More software projects have gone awry for lack of calendar time than for all other causes combined.

~Fred Brooks

Software and hardware design is less different than software designers think, but more different than hardware designers think.

~Fred Brooks

Successful software always gets changed.

~Fred Brooks

Adjusting to the requirement for perfection is, I think, the most difficult part of learning to program.

~Fred Brooks

The complexity of software is an essential property, not an accidental one. Hence, descriptions of a software entity that abstract away its complexity often abstracts away its essence.

~Fred Brooks

A design style is defined by a set of microdecisions. A clear style reflects a consistent set. A clear style may not be a good style; a muddled one never is.

~Fred Brooks

To only a fraction of the human race does God give the privilege of earning one's bread doing what one would have gladly pursued free, for passion.

~Fred Brooks

Scientists build to learn; Engineers learn to build.

~Fred Brooks

Predictability and great design are not friends.

~Fred Brooks

Even the best planning is not so omniscient as to get it right the first time.

~Fred Brooks

Improving your process won't move you from good to great design. It'll move you from bad to average.

~Fred Brooks

The management question, therefore, is not whether to build a pilot system and throw it away. You will do that. Hence plan to throw one away; you will, anyhow.

~Fred Brooks

Process improvement is most valuable in raising the floor of a community's practice.

~Fred Brooks

We tend to blame the physical media for most of our implementation difficulties; for the media are not "ours" in the way the ideas are, and our pride colors our judgement.

~Fred Brooks

Plan to throw one (implementation) away; you will, anyhow.

~Fred Brooks

Job Control Language is the worst programming language ever designed anywhere by anybody for any purpose.

~Fred Brooks

...when fits of creativity run strong, more than one programmer or writer has been known to abandon the desktop for the more spacious floor.

~Fred Brooks

The programmer's primary weapon in the never-ending battle against

slow system is to change the intramodular structure. Our first response should be to reorganize the modules' data structures.

~Fred Brooks

Dissertations are not finished; they are abandoned.

~Fred Brooks

Product procedure...must securely protect the crown jewels, but, equally important, it must eschew building high fences around the garbage cans.

~Fred Brooks

Men and months are interchangeable commodities only when a task can be partitioned among many workers with no communication among them.

~Fred Brooks

Software work is the most complex that humanity has ever undertaken.

~Fred Brooks

A basic principle of data processing teaches the folly of trying to maintain independent files in synchronism.

~Fred Brooks

Design work doesn't just satisfy requirements, it elicits them.

~Fred Brooks

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