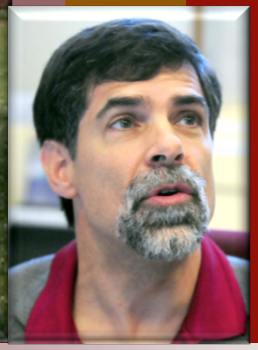

CSSE 372 Software Project Management:
Software Project Failures Case Study

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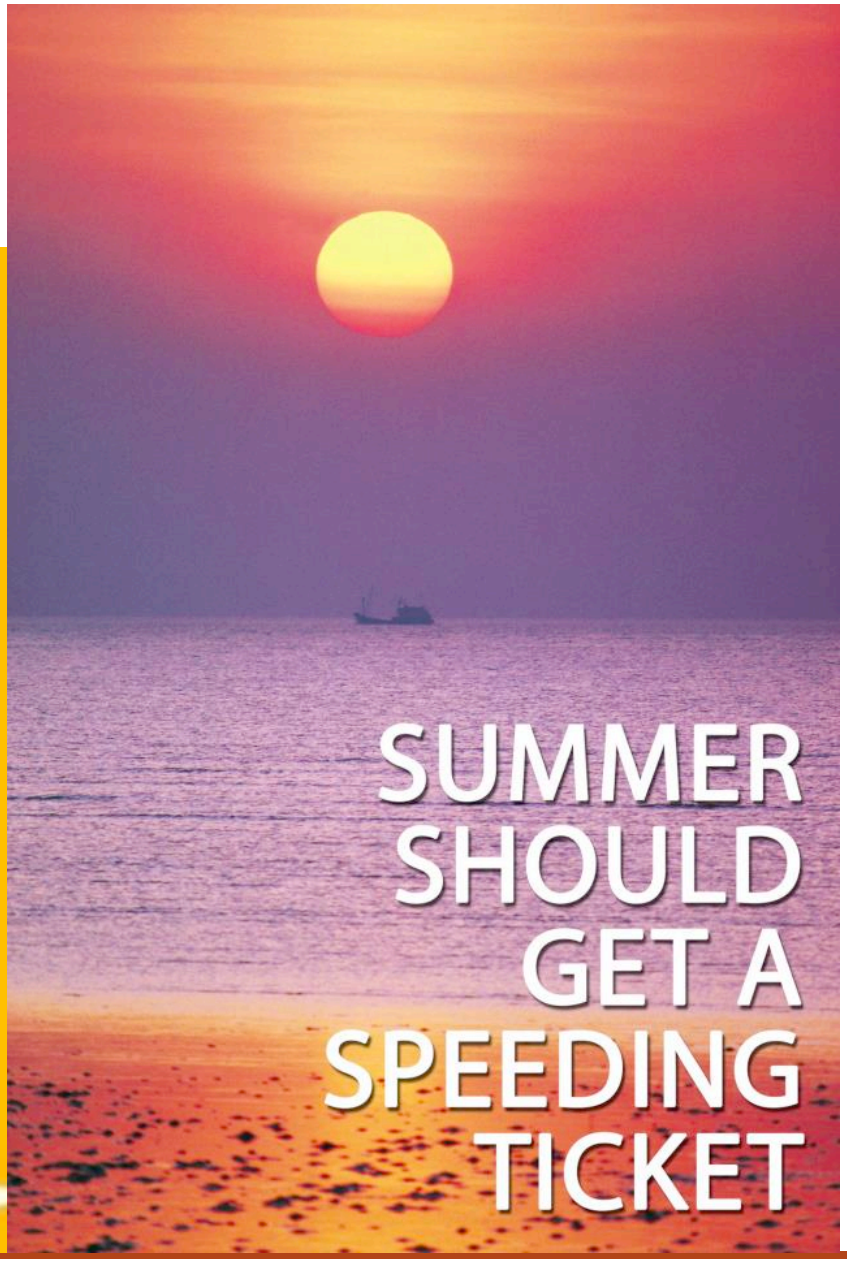
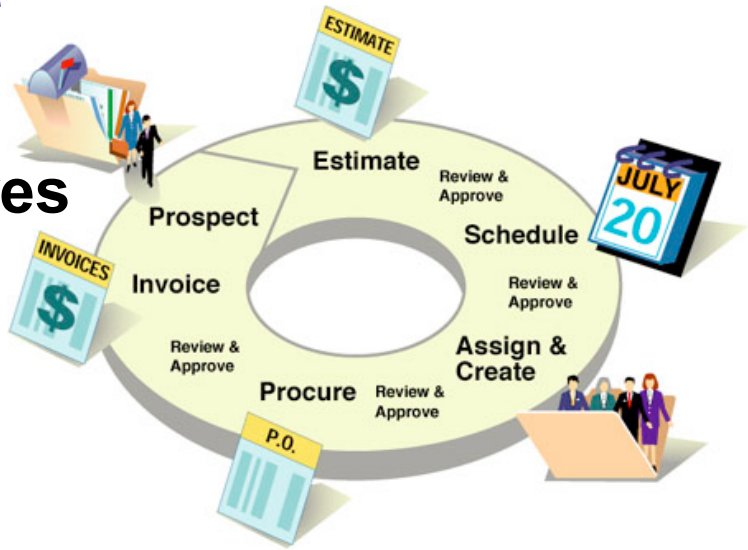
As we enter Day 4 at Rose…



Objectives: Fundamental Elements

Identify fundamental elements of Software Project Management

- Finish up examining common causes of software project failures
- Outline some software project failures from literature
- Examine causes of software project failures
- Consider what works and what doesn't



How can software projects succeed?

- Make sure all decisions are based on openly shared information
- Don’t second-guess your team members’ expertise
- Introduce software quality from the very beginning of the project
- Don’t impose an artificial hierarchy on the project team
- Remember that the fastest way through the project is to use good engineering practices

Recall: Epic Software Failures

- European Space Agency's Ariane 5 Explosion
- Hospital Radiation Incident
- London Ambulance Service
- Denver Airport Baggage Handler
- East Coast Blackout
  (cascading power plant failures)
- AT&T Switch Failure -$Billion bug
- FAA's Advanced Automation System
- NASA Mars Lander, Pathfinder, and Spirit
- Wait, there's more… click Bob!

Software Project Wall of Shame... 1/2

YEAR	COMPANY	OUTCOME (COSTS IN US $)
2005	Hudson Bay Co. [Canada]	Problems with inventory system contribute to $33.3 million* loss.
2004–05	UK Inland Revenue	Software errors contribute to $3.45 billion* tax-credit overpayment.
2004	Avis Europe PLC [UK]	Enterprise resource planning (ERP) system canceled after $54.5 million† is spent.
2004	Ford Motor Co.	Purchasing system abandoned after deployment costing approximately $400 million.
2004	J Sainsbury PLC [UK]	Supply-chain management system abandoned after deployment costing $527 million.†
2004	Hewlett-Packard Co.	Problems with ERP system contribute to $160 million loss.
2003–04	AT&T Wireless	Customer relations management (CRM) upgrade problems lead to revenue loss of $100 million.
2002	McDonald's Corp.	The Innovate information-purchasing system canceled after $170 million is spent.
2002	Sydney Water Corp. [Australia]	Billing system canceled after $33.2 million† is spent.
2002	CIGNA Corp.	Problems with CRM system contribute to $445 million loss.
2001	Nike Inc.	Problems with supply-chain management system contribute to $100 million loss.
2001	Kmart Corp.	Supply-chain management system canceled after $130 million is spent.
2000	Washington, D.C.	City payroll system abandoned after deployment costing $25 million.
1999	United Way	Administrative processing system canceled after $12 million is spent.
1999	State of Mississippi	Tax system canceled after $11.2 million is spent; state receives $185 million damages.
1999	Hershey Foods Corp.	Problems with ERP system contribute to $151 million loss.
1998	Snap-on Inc.	Problems with order-entry system contribute to revenue loss of $50 million.

Software Project Wall of Shame... 2/2

1997	U.S. Internal Revenue Service	Tax modernization effort canceled after $4 billion is spent.
1997	State of Washington	Department of Motor Vehicle (DMV) system canceled after $40 million is spent.
1997	Oxford Health Plans Inc.	Billing and claims system problems contribute to quarterly loss; stock plummets, leading to $3.4 billion loss in corporate value.
1996	Arianespace [France]	Software specification and design errors cause $350 million Ariane 5 rocket to explode.
1996	FoxMeyer Drug Co.	$40 million ERP system abandoned after deployment, forcing company into bankruptcy.
1995	Toronto Stock Exchange [Canada]	Electronic trading system canceled after $25.5 million** is spent.
1994	U.S. Federal Aviation Administration	Advanced Automation System canceled after $2.6 billion is spent.
1994	State of California	DMV system canceled after $44 million is spent.
1994	Chemical Bank	Software error causes a total of $15 million to be deducted from 100 000 customer accounts.
1993	London Stock Exchange [UK]	Taurus stock settlement system canceled after $600 million** is spent.
1993	Allstate Insurance Co.	Office automation system abandoned after deployment, costing $130 million.
1993	London Ambulance Service [UK]	Dispatch system canceled in 1990 at $11.25 million**; second attempt abandoned after deployment, costing $15 million.**
1993	Greyhound Lines Inc.	Bus reservation system crashes repeatedly upon introduction, contributing to revenue loss of $61 million.
1992	Budget Rent-A-Car, Hilton Hotels, Marriott International, and AMR [American Airlines]	Travel reservation system canceled after $165 million is spent.

Recall: Why Software Projects Fail?

1. Unrealistic or unarticulated project goals
2. Inaccurate estimates of needed resources
3. Badly defined system requirements
4. Poor reporting of the project's status
5. Unmanaged risks
6. Poor communication: clients, developers, & users
7. Use of immature technology
8. Inability to handle the project's complexity
9. Sloppy development practices
10. Poor project management
11. Stakeholder politics
12. Commercial pressures

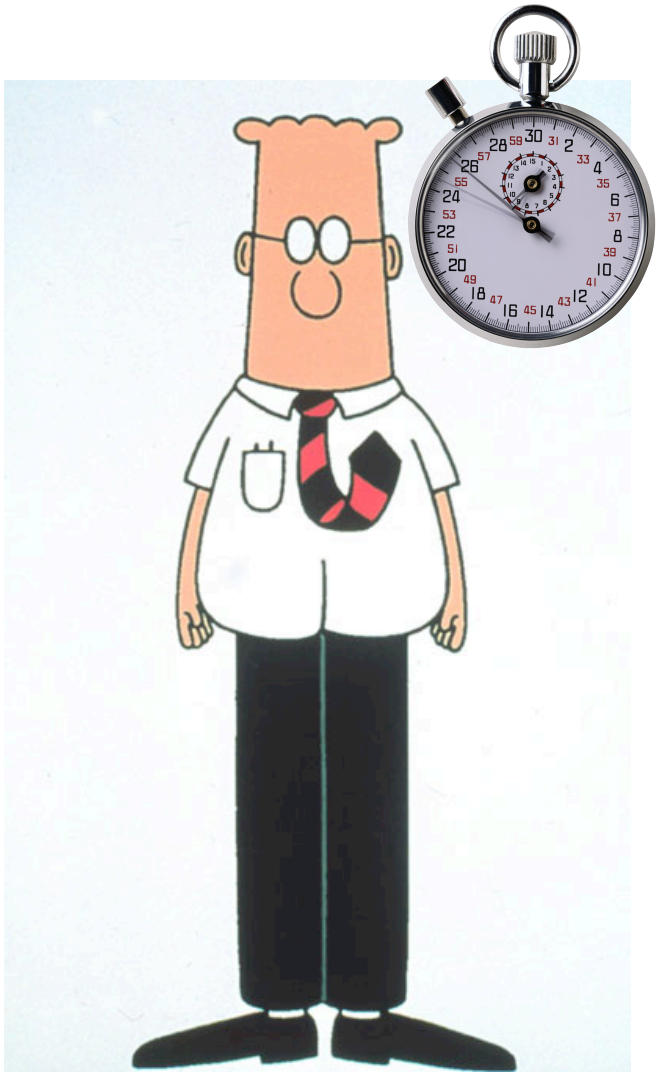
Source: Robert Charette Article

Paper: Why Large Projects Fail by Robert Britcher

- What were two technical problems with AAS?
- Name two interesting non-technical project management issues that contributed to the failure of the FAA AAS project/program?
- What did Britcher mean by a Psychological Problem dressed up like a Technical one?
- What common factors for software project failures cited by Robert Charette's article (Why Software Fails) did the FAA AAS project/ program exhibit??

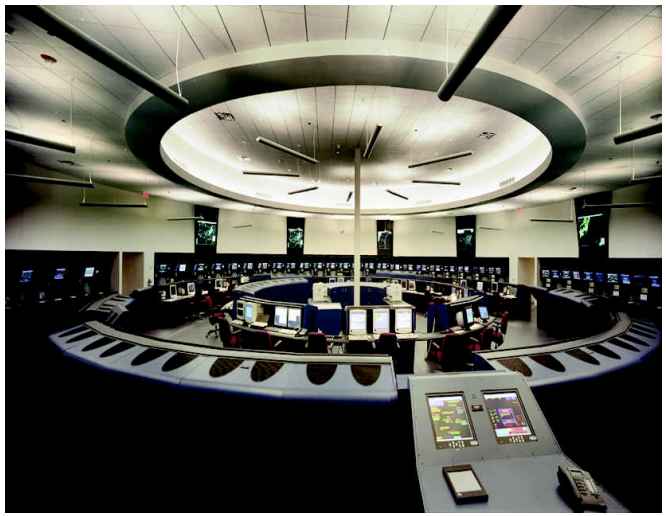
So, what does our friend Dilbert do in the face of a failing software project?

… errr, after his in-depth discussion with his friend ☺

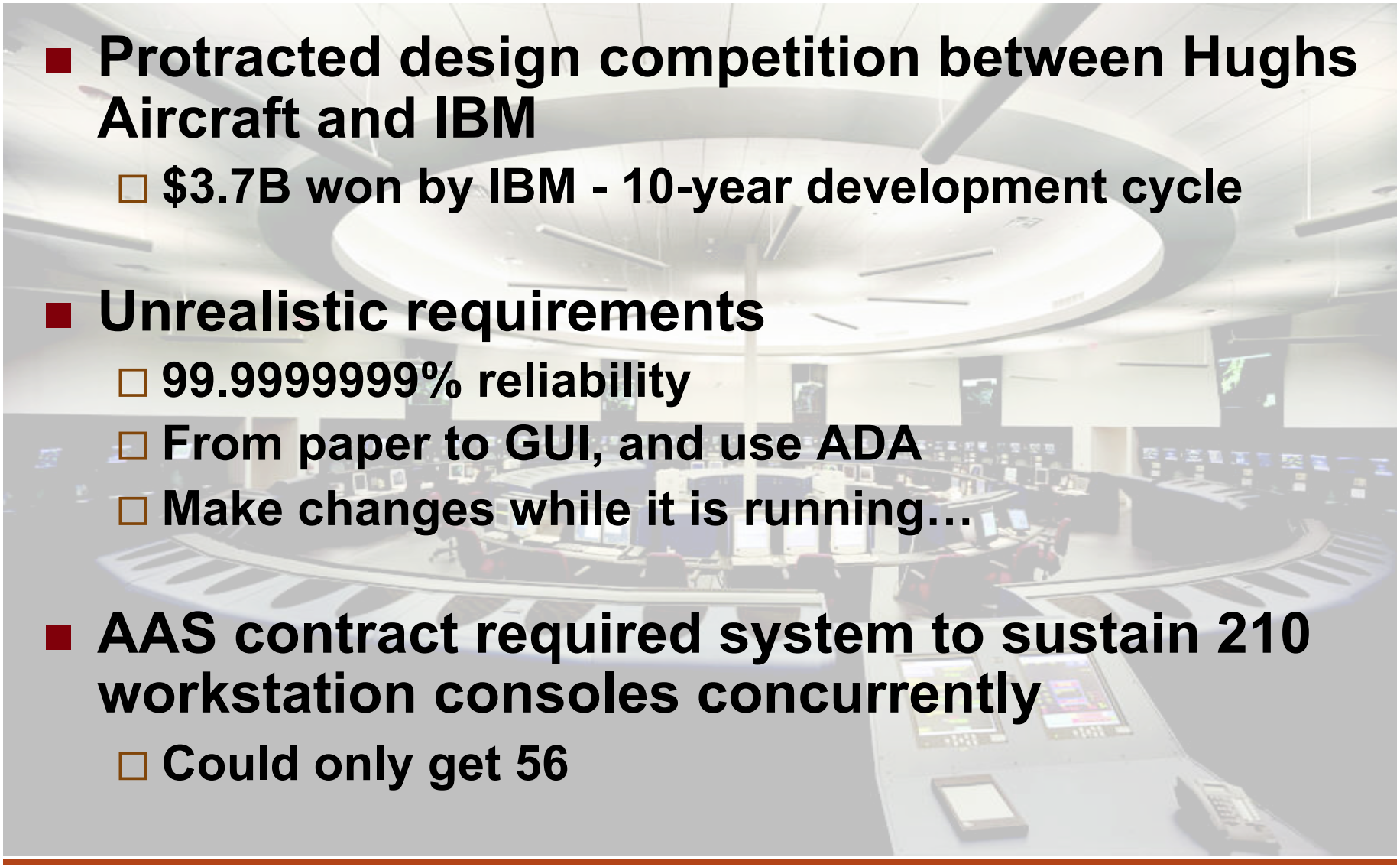


FAA Advanced Automation System (1 of 3)

- TRACON - Terminal radar-approach control
  - Control aircraft 35-40 miles from an airport
- Enroute facilities
  - Guide aircraft between airports along air highways at 18,000-40,000 ft.
- Goal: Replace 220 TRACON facilities with 23 enroute facilities



FAA Advanced Automation System (2 of 3)



- Protracted design competition between Hughs Aircraft and IBM
  - $3.7B won by IBM - 10-year development cycle
- Unrealistic requirements
  - 99.9999999% reliability
  - From paper to GUI, and use ADA
  - Make changes while it is running…
- AAS contract required system to sustain 210 workstation consoles concurrently
  - Could only get 56

FAA Advanced Automation System (3 of 3)

- Summer 1992: 9th and final build
  - Flawed testing procedures
  - Testing of key ISSS functions was deferred
  - Testing milestones skipped or short-cutted

- Project Stopped - TOO LATE!
  - Late 1993: A new FAA administrator is appointed.
  - March 1994: IBM Federal Systems Division sold to Loral
  - June 1994: The new FAA administrator throws out major portions of the AAS
  - Not all TRACONs would be eliminated (170 to remain)

Result: $1.3 billion of Tax Payers money lost

State of the Art vs. of the Practice

"The gap between the best software engineering practice and the average practice is very wide– perhaps wider than in any other engineering discipline."

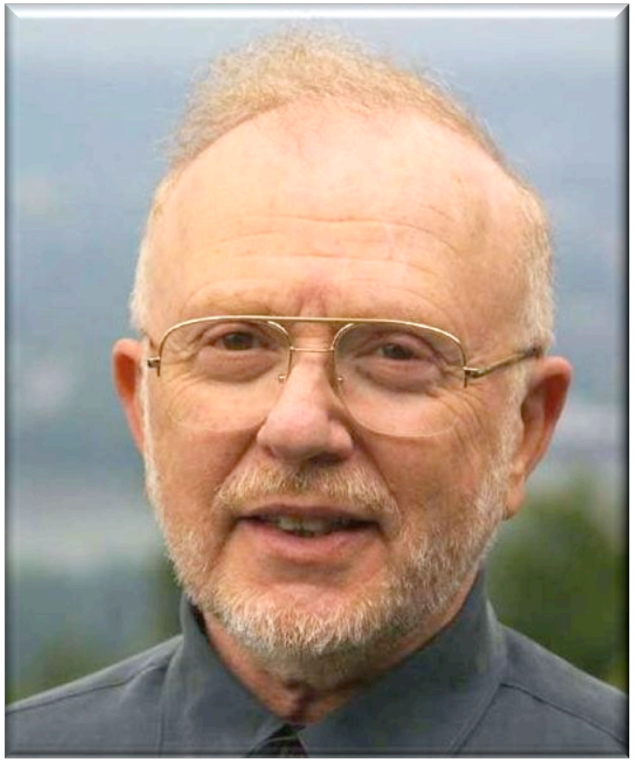
– Fred Brooks

What are Some Keys to Success?

Q: What are the most exciting/ promising software engineering ideas or techniques on the horizon?

A: I don't think that the most promising ideas are on the horizon. They are already here and have been here for years but are not being used properly.

— David L. Parnas



What's Parnas Talking About?

- Project planning and management practices
  - Automated estimation tools (1973)
  - Evolutionary delivery (1988)
  - Measurement (1977)
  - Productivity environments (1984)
  - Risk management planning (1981)
- Requirements engineering practices
  - Change board (1979)
  - Throwaway user interface prototyping (1975)
  - JAD sessions (1985)
  - Requirements scrubbing (1989)

Ever-Important Question - SO WHAT?

- Software Projects are about RISK
- Over 95% of all project failures can be avoided by commonly known, but not so commonly practiced Software Project Management Principles and Practices

A Business Case is a good start!

Homework and Reading Reminders

- Complete HW1: Preliminary Task Schedule
  - Due Today by 5pm in Angel Dropbox
- Read "Hard Choices Game Explained"
- Come prepared to play the game…