

ECE444: Software Engineering

Case Study

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Learning goal

- Review a specific case study to understand the requirements issues more clearly

Virtual Case File

What is the virtual case file?

Goal: to automate the FBI's paper-based work environment, allow agents and intelligence analysts to share vital investigative information, and replace the obsolete Automated Case Support (ACS) system.

Deliverables:

- 700 lines of code (LOC)
- bug-ridden and functionally off target
- US \$170 million project, including \$105 million worth of unusable code

State of the FBI, c. 2000

- FBI has 23 divisions responsible for counterintelligence, criminal investigation, cybercrime, etc.
- Each division had its own IT budget with 40-50 total investigative databases, e.g., Automated Case Support (ACS), with lots of duplicate functions
- FBI relies on forms to document every step
 - Informant meetings, marriage, divorce, overseas travel
 - Approvals required at multiple levels

State of the FBI IT, c. 2000

- The FBI IT infrastructure was outdated:
 - 13,000 computers could not run modern software
 - 400 resident agency offices connected via 56kbps modems
 - Many network components no longer manufactured
 - Agents typically faxed or courier documents
- In Sep. 2000, Congress approves \$379.8M for a three year upgrade, called the Trilogy
 - Awarded in 2001, scheduled for delivery in 2004

How was the VCF project managed?



VCF Project Management

- How was the VCF project managed?
 - Sherry Higgins coordinated the Trilogy for the FBI
 - Larry Depew led the VCF JAD sessions
 - SAIC employed Spiral development model
 - SAIC conducted code reviews with FBI agents
 - FBI agents made requests directly, or submitted formal change requests to change control board
 - Bread-crumbs feature

Requirement Elicitation

- How were Joint Application Development (JAD) (*define*)sessions organized?



Requirement Elicitation

- How were Joint Application Development (JAD) (*define*) sessions organized?
 - 2-week “existing and future” process specification session
 - Agents proposed “Web-page designs”
 - Depew acted as facilitator and scope-decider
 - After 2 weeks, feedback cycle begins

What were the warning signs?



What were the warning signs?

- No transition plan or enterprise architecture
- SAIC and FBI agreed to redesign ACS in 22 months with flash cutover
- 2002 contracts had no schedule or milestones
- Sherry Higgins appointed Depew to VCF Project Manager
- 800-page requirements document was not limited to “what”
- Over 400 changes requests, despite original goal

Where happened to the VCF?



Where happened to the VCF?

- 2003, SAIC delivers 750,000 lines of code
 - FBI identifies 17 deficiencies
- Azmi tested the VCF electronic workflow, called the IOC field trial Initial Operating Capability (IOC)
- Sentinel (the new VCF) planned in four phases
- 2008 policy change on complaint management led to a \$3.1M change request
- 2010 SEI report shows FBI seeks Agile process, will it help?

Factors that contribute to the Failure

- poorly defined and slowly evolving design requirements;
- overly ambitious schedules;
- the lack of a plan to guide hardware purchases, network deployments, and software development for the bureau