The Software Engineering Laboratory (SEL)

Consortium of

NASA/GSFC
Computer Sciences Corporation
University of Maryland

Established in 1976

Goals

- better understand software development
- improve the process and product quality

at Goddard, formerly in the Flight Dynamics Division, now at the Information Systems Center

using observation, experimentation, learning, and model building


Observation, Feedback, Learning, Packaging

Used the **SEL** as a **laboratory to build models, test hypotheses**,

Observation played a key role

Feedback loops provided an environment for **learning**

Generated **lessons learned** that were **packaged** into process, product and organizational structure

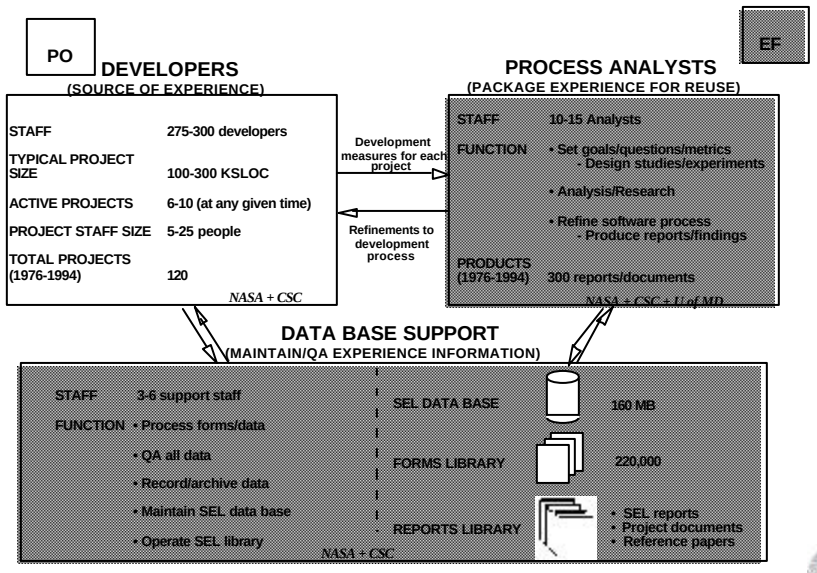
Used the **University** to **test high risk ideas**

Developed technologies, methods and theories when necessary

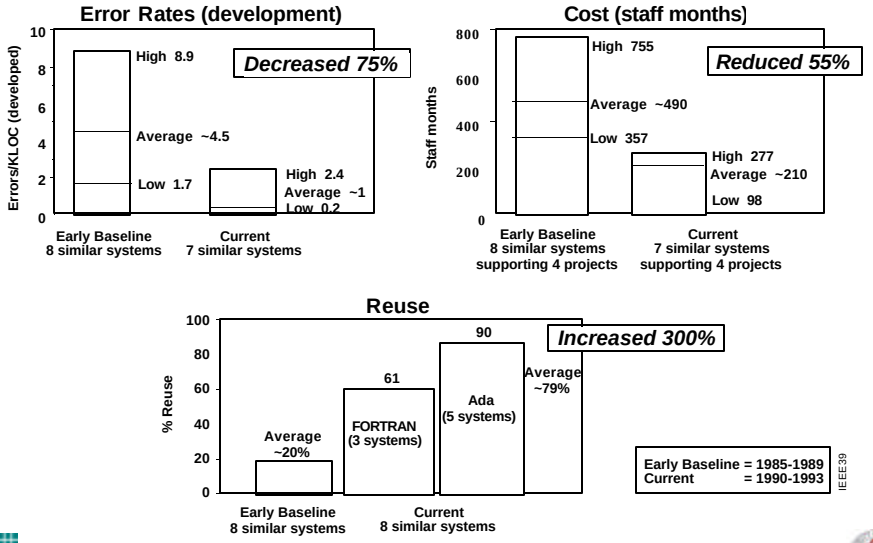
Learned what worked and didn't work, applied ideas when applicable

Kept the business going with an aim at improvement, learning


SEL Experience Factory Structure



Using Baselines to Show Improvement 1987 vs. 1991



Using Baselines to Show Improvement

Continuous Improvement in the SEL

Decreased **Development Defect rates** by
75% (87 - 91) **37%**(91 - 95)
Reduced **Cost** by
55% (87 - 91) **42%** (91 - 95)
Improved **Reuse** by
300% (87 - 91) **8%** (91 - 95)
Increased **Functionality** five-fold (76 - 92)

CSC

officially assessed as CMM level 5 and ISO certified (1998),
starting with SEL organizational elements and activities

Fraunhofer Center

for Experimental Software Engineering
was created in Maryland in 1998