Social Security Administration

Using CMMI to Determine Development Constraints at the Social Security Administration

November 2002

SSA Mission

To promote the economic security of the nation's people through compassionate and vigilant leadership in shaping and managing America's social security programs.

Resources

Employees

- SSA workforce ~64,000
- Systems 2,900
  (4% of SSA total)
- By Systems Components
  - ODCS - 58
  - OTSO - 1,072
  - OESAE - 446
  - ORSIS - 407
  - ODSSIS - 427
  - OEEAS - 387
  - OSES - 103

Budget

- SSA budget ~$ 9,000,000,000
- Systems ~$ 737,000,000
  (8.1 % of total SSA admin. budget)

Workloads

- 348 ITS projects directly supporting SSA programmatic applications
- 109 other projects supporting infrastructure

- 41 million CICS transactions per day
- 65 million database calls per day
- 4,000 batch jobs per night
- 50 million benefit payments per month

- 35 million Lines of Code
- 44.5 million active master file records

- 4,400 MIPS
- 23 terabytes of mainframe storage
- 15 terabytes of distributed storage
- Largest telephone network in the world

Systems Process Improvement (SPI) Mission

Improve Systems ability to develop quality systems products and to deliver those products to the customer as promised

SPI Goals

- Improve predictability of system delivery
- Increase productivity of staff
- Improve quality (reduce number of defects)

SSA and the CMM

- SSA's Office of Systems Customer Targeted Work Program Management organization achieved maturity level 2 in November 2001
- Internet projects were excluded from the evaluation (not enough history for an evaluation)
- Evaluated method to conduct separate evaluation of Internet projects

CMMI-Based Constraint Identification Description

- A CMMI-Based Constraint Identification (CCI) is a defined *process* for creating a *baseline* of constraints to the successful achievement of the system's objectives.

- The process:
  - establishes the constraint-baseline collaboratively by engaging the interviewer and interviewee
- The baseline:
  - captures a list of constraints for the system
  - evaluates them
  - explores their interrelationships

Scope/Sponsorship

- Sponsored by the Deputy Commissioner for Systems
- Scope to include Electronic Service delivery initiatives, focusing on Internet application development projects

CMMI-Based Constraint Identification Process

The CCI is conducted in two parts:

- Constraint Investigation & and Analysis -- the organization identifies constraints or risks to success and analyzes and groups the constraint statements

- Improvement Planning -- the team develops a mitigation plan and seeks approval to activate the plan and continue to measure the organization against it

SSA ESD Goals

SSA ESD Vision:

Well-defined and well-planned Electronic Service Delivery projects assist SSA in achieving its service principle for customer choice. Under this service principle customers have expanded options for services that are broad in terms of the time, place, mode of access and language.[1]

SSA ESD Mission:

Electronic Service Delivery initiatives that are scheduled and defined based upon Agency priorities are selected because they support the Agency's mission to promote the economic security of the nation's people.[2]

[1] *SSA Service Vision*, Service Vision Team, September 2000

[2] *SSA Mission Statement*

Why conduct a CCI at SSA?[1]

- SSA uses the Software Engineering Institute's (SEI) IDEAL and CMM models as basis for improvement.
- CMMI-based Constraint Identification (CCI) provides non-threatening method of initiating improvement.
- SEI and GAO are transitioning to Integrated CMM (CMMI) for evaluating organization's application development, contracting, acquisition and project interrelationship.
- CMMI will be used for CCI
- DCS wanted to access gaps in Internet development prior to the next SCE

Participants

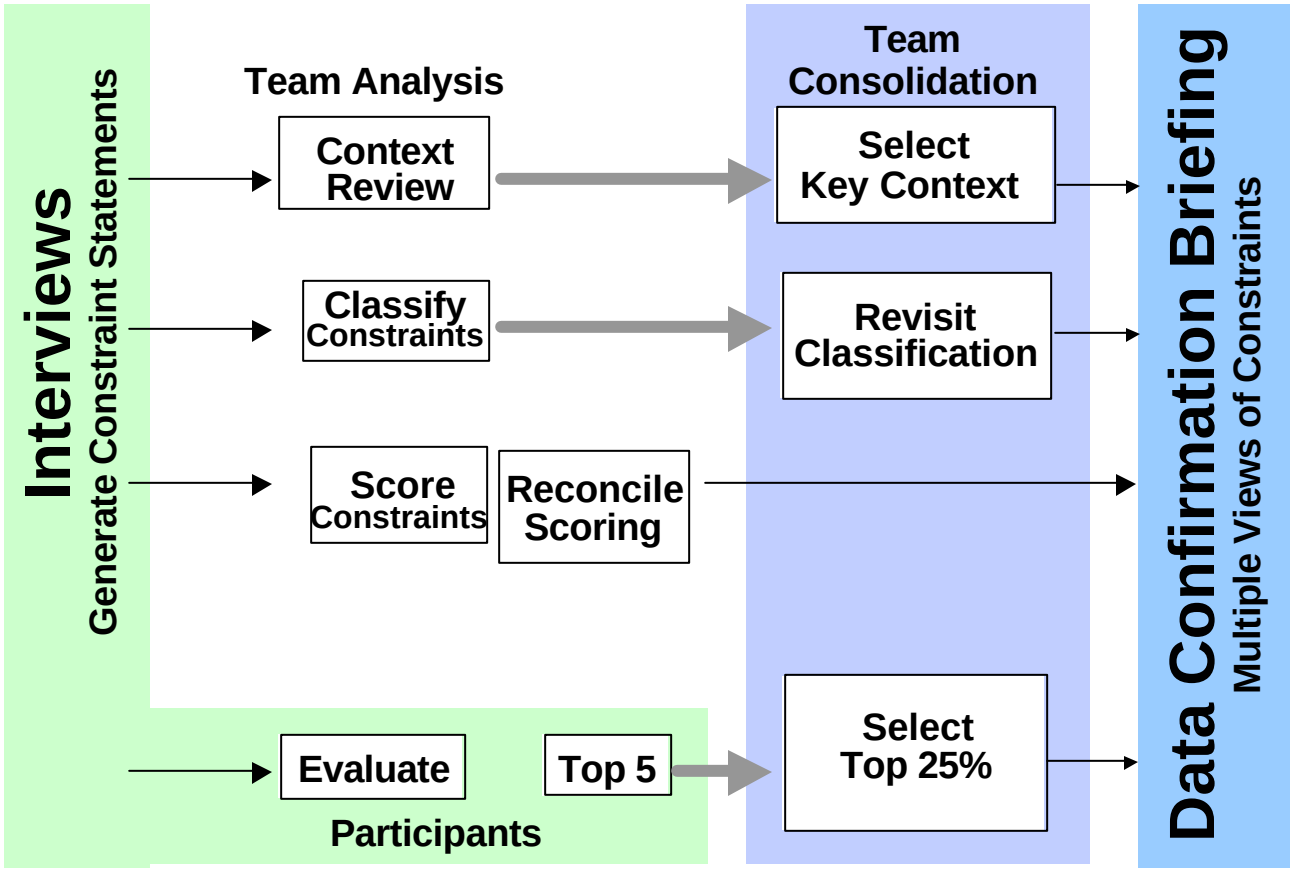
- Constraint Identification and Analysis activities included participants from various levels of personnel (executives, management, technical personnel)
- Represented cross-organizational components (program manager organization, development organization, sponsoring organizations)
- Project sponsor (business unit) representatives act a project managers for Internet projects (contrast to legacy development)

Picture of Success

acted as a framework to keep interviewees on track

"Electronic Service Delivery initiatives are scheduled and defined based upon Agency priorities and the availability of resources from all involved components, and, the application releases that support those initiatives are planned, developed and implemented within established timeframes using established procedures to produce quality systems."

CCI Overview



Constraint Identification and Analysis Activities

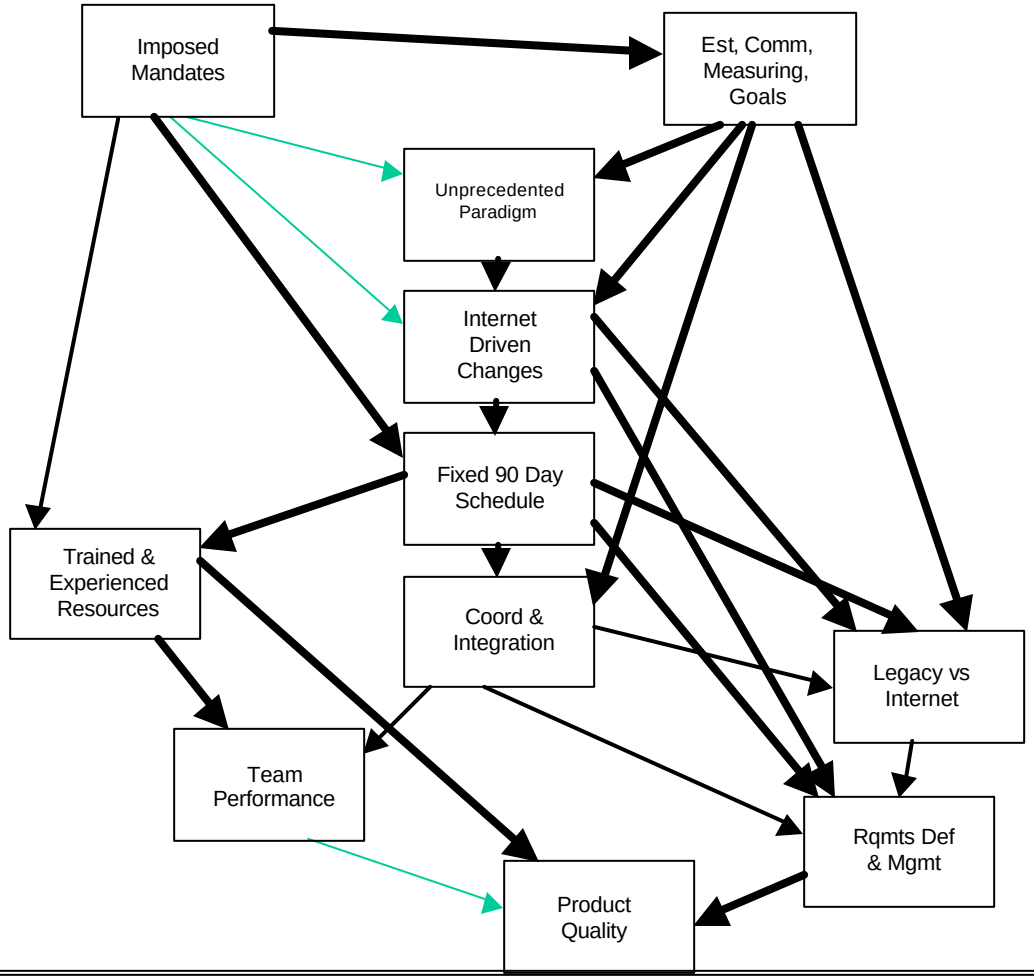
- 6 interview sessions
- 37 people participated
- 103 constraint statements captured
- 39 constraint statements (38%) rated as top risks by the CCI team
- 40 constraint statements (39%) rated as “#1” and “#2” by the people who were interviewed (“participants”)
- 11 constraint areas defined

Constraint Identification and Analysis Results

Constraint statements classified into eleven “constraint areas”.

- Establishing, Communicating, & Measuring Agency Goals
- Legacy vs. Internet
- Lack of Trained and Experienced Resources
- Lack of Coordination & Integration
- Internet-Driven Change
- Product Quality & Integrity
- Team Performance
- Imposed Standards & Mandates
- Requirements Definition & Management
- Unprecedented Delivery Paradigm
- Fixed 90-day Schedule

Hierarchical IR Digraph



Improvement Planning

- The DCS focused Improvement Planning efforts in four constraint areas --
  - "Establishing, Communicating, & Measuring Agency Goals"
  - "Legacy vs. Internet" and "Lack of Coordination & Integration" (examined together)
  - "Internet-Driven Change".

Establishing Communicating & Measuring Agency Goals

"Executives don't share a common picture of success"

"Why are we playing in the Internet world? We don't sell widgets"

"Why are we doing this in the first place?"

Legacy vs. Internet

"If we're not in-synch, we sink"

Lack of Coordination & Integration

"Projects have cross cutting aspects but no one is in charge"

"No one is looking at the big picture"

"A camel is a horse created by committee"

Internet-Driven Change

"Building houses before developing the land"

"Pay now or we pay later"

"Develop systems on the fly"

Planning Overview

Possible Solution Space

Improvement Planning Activities

- For each Constraint Area, the Improvement Planning team identified:
  - a Goal
  - Root Causes
  - Barriers and Enablers
  - Strategies
  - Objectives
  - Activities

Recommendations

- Sponsor champion implementation of strategies for "*Establishing, Measuring, and Communicating Goals*"

- Sponsor charter empowered teams to address other constraint areas that are technical in nature:
  - Institutionalize a holistic approach to ISD
  - Define and develop a stable infrastructure and capacity planning process
  - Define and use a robust development environment
  - Define and implement adaptable internet development practices

Issues

- Most of the constraints were not technical, but communication and program management related
- CCI Sponsor was concerned that activities identified were outside his realm of control

Executive Summary

- To address the Sponsor's concerns, an Executive Summary was created
- Put the activities in context of true owner
- Gave Sponsor guidance on using his influence on activities outside of his control

Current Activities

- CCI results used as input in ESD strategic planning sessions
- Program management component has taken ownership of several strategies/activities
- Executive steering committee has taken ownership of several strategies/activities
- Both groups look to SPI for guidance on completing the activities

Successes (so far)

- Implemented a policy for Internet development (June 2002)
- Implemented a procedure for managing change to the Internet Lifecycle (August 2002)
- Stabilized development environment
- Formed team to determine roles and responsibilities (expected due date - December 2003)

Next Steps

- Role and responsibility descriptions will be incorporated into the Policy statement and Project Management Directive
- Process Quality activities will be identified for the planning and analysis phase to ensure good requirements
- The electronic service delivery project prioritization process will be fully integrated into the Agency planning process