



## Overview of **IUCR-CERCS** at The Ohio State University

## CERCS-CETI Project: Collaborative for Enterprise Transformation and Innovation

“Enable enterprise transformation with innovations and dissemination of advanced knowledge for service intensive processes”

Members: Nationwide, City, Ohio Health, OSUMC, OSU-OIT, McGraw Hill

Over Thirty Five Affiliated Companies

CERCS-CETI Co-Directors: Jay Ramanathan, Rajiv Ramnath

## Industry Requirements - What New Skills Are Important?

### Shift from IT technology development to IT technology use

- 80% of OSU, Purdue, CMU and MIT undergraduates are going to technology using companies (e.g. Nationwide) and their service providers (e.g. IBM, and Infosys)

### Services Science

- To support a growing service economy, with 180 topics identified by IBM

### Software as Service (SaaS)

- “This new breed of specialized firms fully embrace SaaS with complementary business and technology consulting, productized intellectual property, and support services via flexible social networks ...”

## Knowledge Silos Related to IT-based Enterprise Transformation and Innovation for Services Delivery

***“...Horizontal silos of disciplinary frameworks, standards and initiatives takes years to bridge...”***

•Service orientation, Business Intelligence, Customer feedback, Compliance (SOX, HIPAA,...)

•Porter’s Five Forces, SWOT, Value Chain, Balanced Score Card, Supply Chain Model, COBIT, Six sigma, Resilience...

•Zachman Framework, TOGAF, BPEL, ...

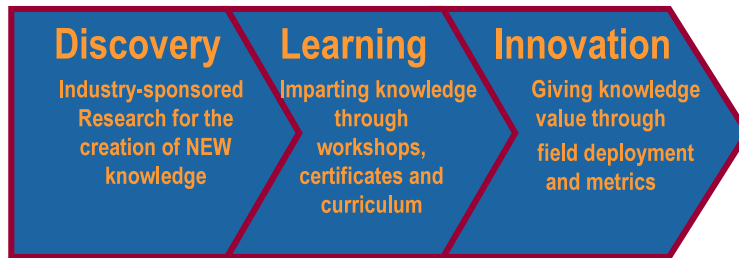
•ITIL - Incident, Problem, Change Management, ...

•Service Oriented Architectures, WSDM, XML,.....

•HPC, Virtualization, Autonomic Computing, RFID

**Goal: Accelerate Knowledge Diffusion for IT users**

**Through Forums For:**



**...CERCS collaboration with Industry**

**Best Practice, Curriculum and Technology Application Research**

**On**

- Topics identified by industry, researched by CETI
- With industry projects as the vehicle for curriculum research at the graduate and undergraduate level
- Integrating computer science, systems engineering and business
- For knowledge consolidation

**Aimed at the domestic workforce**

- For those who want technology management
- Needing skills that are required for emerging architecture roles
- Where globalization is causing a huge impact

**Utilizing work from from Georgia Tech, ITSMF, TOGAF, SEI and others**

## Collaboration to date

### Projects (2006-2007):

- SLA improvement for PC Install (OSUMC)
- Enterprise Server Capacity Management (Nationwide Insurance)
- Enterprise Architecture Pattern Mining (McGraw-Hill)
- An ontology-based framework for business innovation management (Nationwide Insurance, MS Thesis)
- Eclipse-based process-oriented integration tools (MS Thesis)
- Eclipse-based simulation framework for UbiComp applications (MS Thesis)

### Proposals:

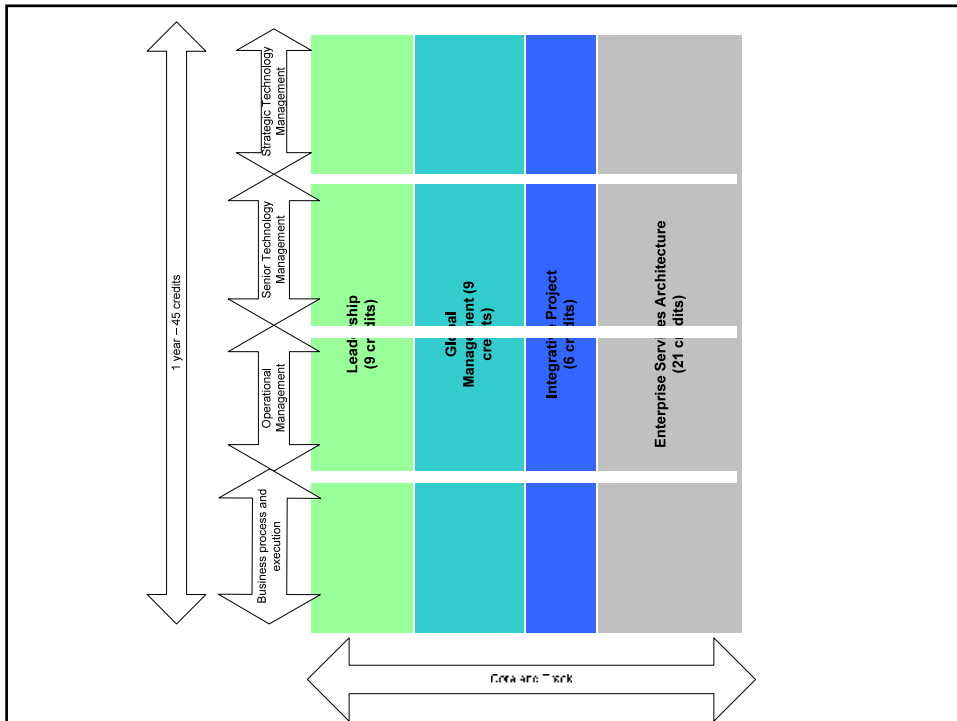
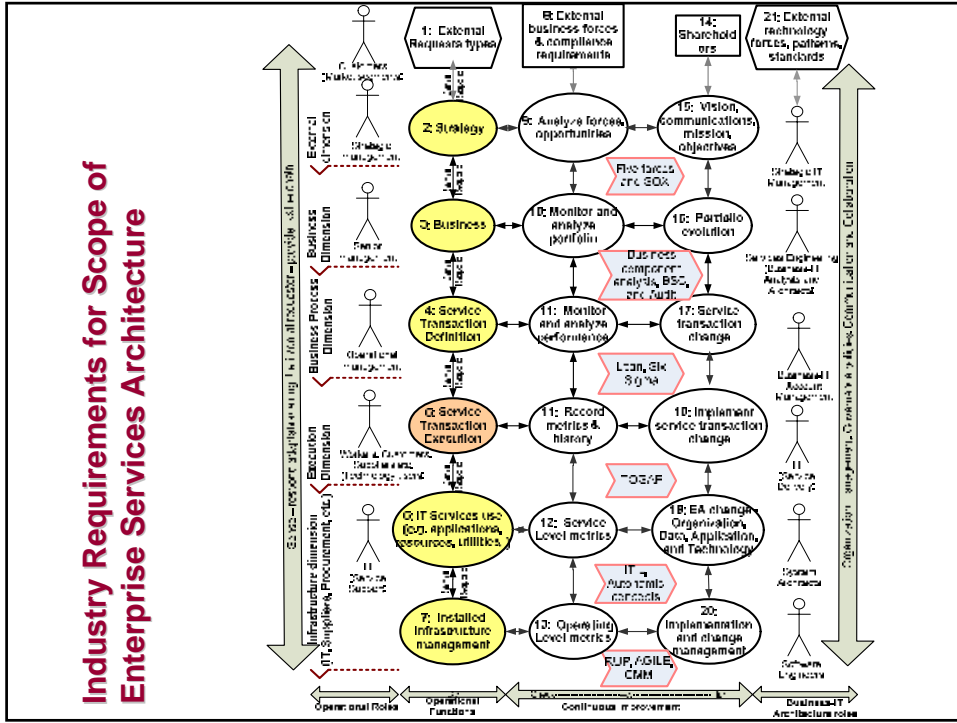
- NSF CPATH
- IBM SUR
- IBM Faculty Innovation Grant
- NSF CCLI (under discussion)

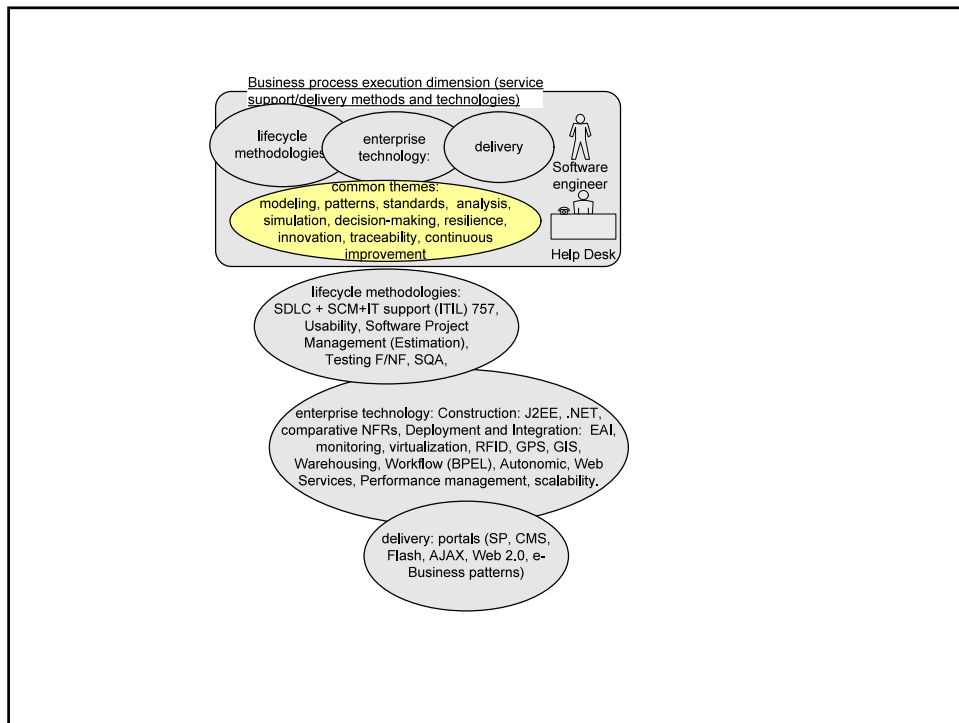
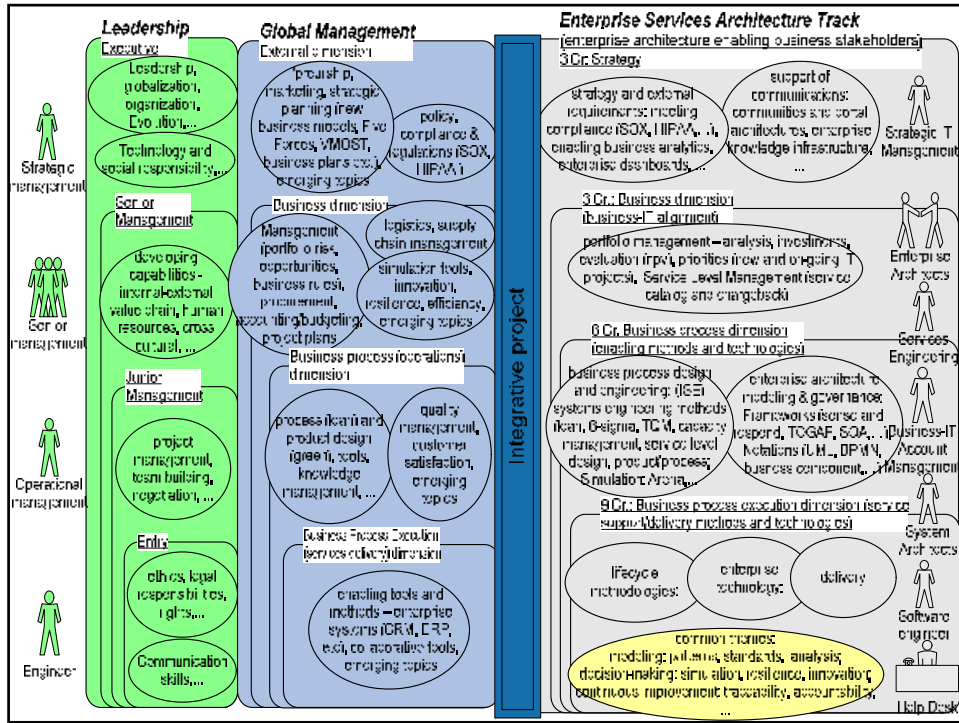
### Masters of Professional Engineering:

- Leveraging OSU's Software Engineering sequence, Georgia Tech's Program on Management of Technology and courses on Enterprise Systems
- Status: Designing assessments, getting industry feedback

# Master's of Professional Engineering

# Industry Requirements for Scope of Enterprise Services Architecture



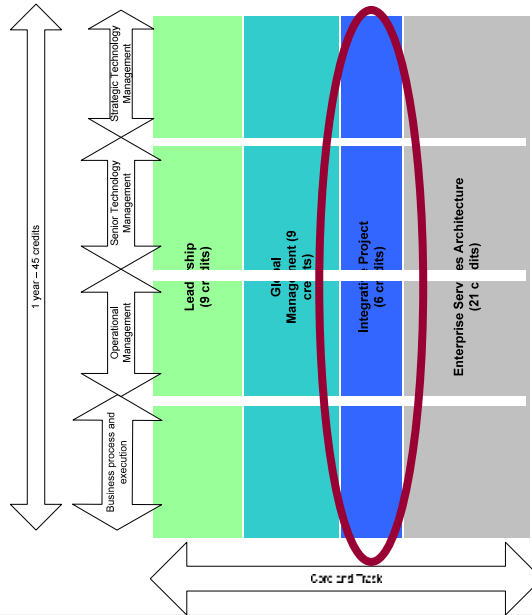


## **Expected Benefits**

- **Agility enabled within the organization**
  - Improve information for decision-making
  - Improve requirements through Business-IT alignment
- **Reduction in years needed to become proficient through experiential learning and peer-based interaction**
- **Reduction in training costs – currently estimated at \$100k per individual (IBM)**

Questions?

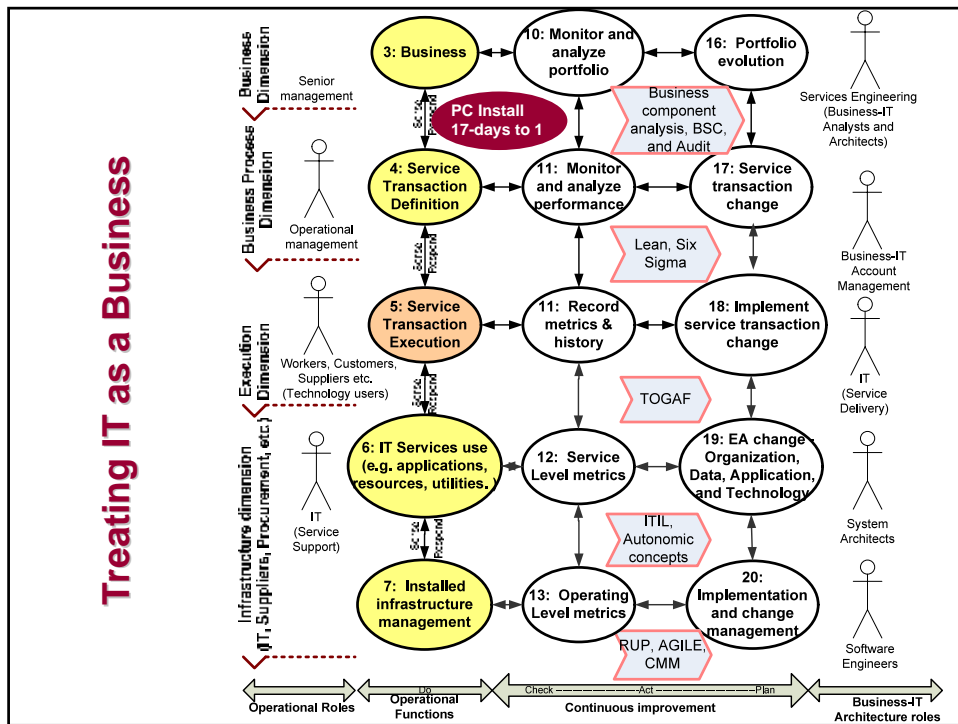
## Next: Knowledge Mining and Consolidation Case Study



## Case Study - Service Improvement Program within an ITIL environment

**OSU Medical Center (OSUMC)**  
**Sponsor: Pete Shelkin, CTO**  
**26-Jan-2007**





## Business Problem and Environment

**PC deployment process takes 17 days**

**Five areas impacted (and ~ 35 resources)**

- Request Management
- Inventory Management
- Imaging/Engineering
- Deployment
- Support

**Systems in place**

- CRM, Imaging, Asset Management, Site Management (not integrated)

**ITIL initiative underway (helpdesk implemented)**

**Large-scale systems integrations were being planned**

## Project Objectives

### Tactical

- Apply process improvement methodologies to OSUMC requirements to improve the PC deployment process

### Strategic (Knowledge Mining )

- Develop a *repeatable* architecture and methodology for other service improvement programs (SIP)

## Background Research

### Industry Practice

- Lean Process Engineering – industrial engineering
- IT Infrastructure Library (ITIL)
  - Service Desk
  - Service Level Agreements
- TOGAF is representation agnostic
- Many common themes within best-practices
  - Customer-driven
  - Product pipeline
  - Acceptable service levels

### Promising Academic Research

- Autonomic systems – technology-oriented

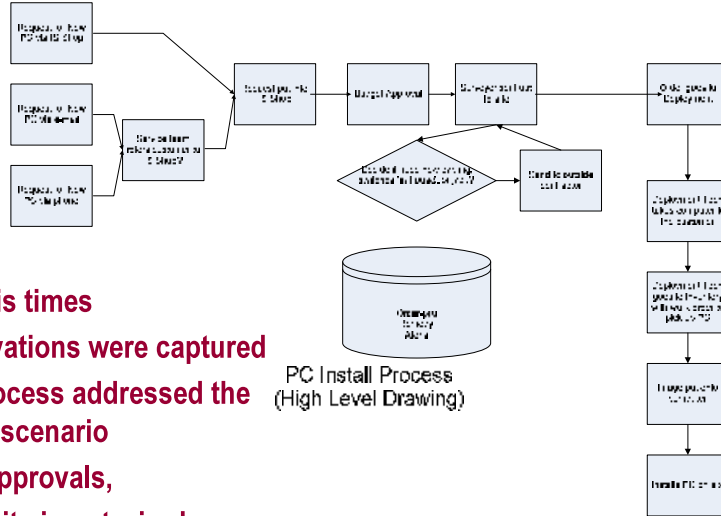
### ITIL Basis of shared knowledge is valuable, but...

- ITIL is not prescriptive
  - No methods for improving SLA performance
  - All or nothing approach to IT service organization as described
  - No explicit method for gradual adoption

### So where do we begin?

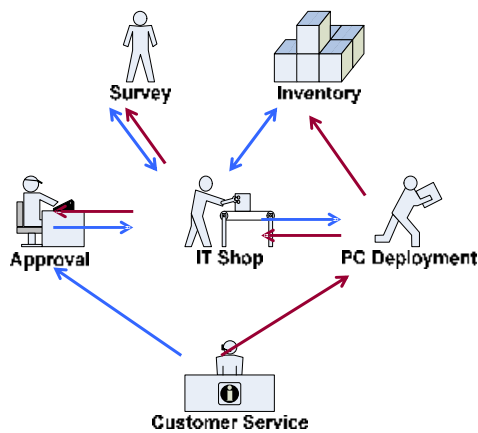
- Define As-is through a time and motion study

## As-Is time and motion study



- ✓ Captured as-is times
- ✓ Broad observations were captured
  - current process addressed the worst case scenario
  - waits for approvals,
  - assumed site is not wired ..

## Changed Push to a Pull (Lean) Process Flow to Define SLA



## Background Research: Lean Process Issues

### Lean has no prescriptive steps for IT use

- Goals are listed as a philosophical ideal
  - Where do we start?
    - Centralization of Information Systems?
    - Cross-training the Deployment techs?
    - What waste should we eliminate?

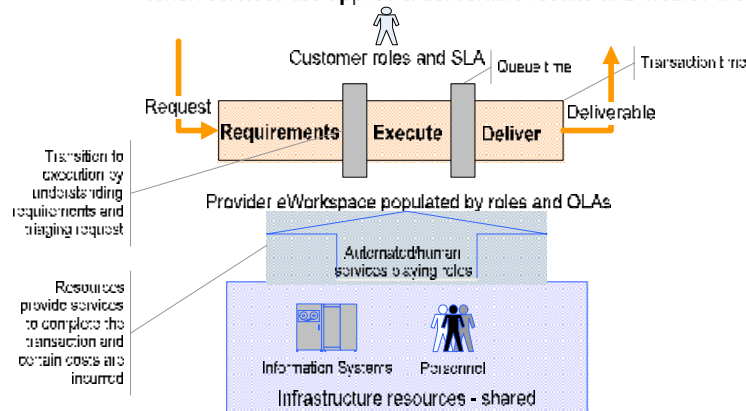
### Lean concepts identify achievable SLA, but...

- How do we go from an as-is to a lean process that involves *people and IT systems*?
- How applied to a job shop environment? The process seemed to be simple, the complexity was in the requests!

### We needed a prescriptive methodology

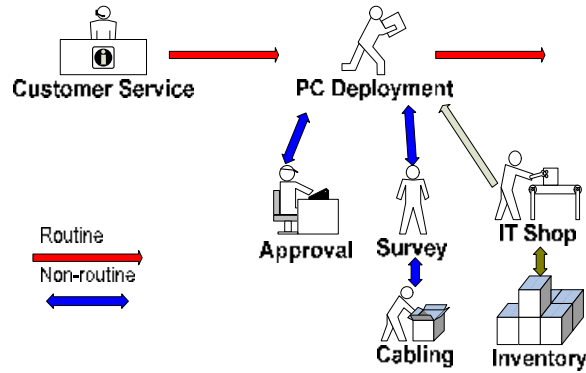
## Customer-Provider 'Red' Transaction and eWorkspace

- A Customer – Provider 'RED' transaction begins with a request and transitions through the use of the services provided by the underlying infrastructure.
- The services are provided by software or humans and made available and applied in an eWorkspace (a **logical concept**).
- When services are applied a deliverable results and metrics are captured.

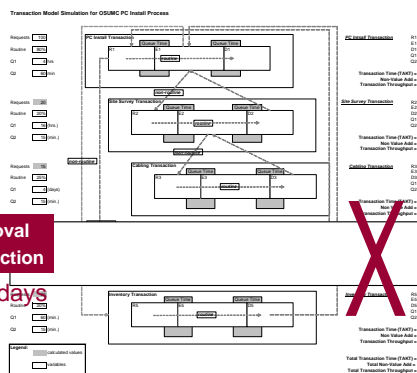


## Triage and Routing to eWorkspaces to Execute Transactions

Step	Activity	Queue	Resource	Priority	Service Level
1	Request	Request	Request	High	15 min
2	Approval	Approval	Approval	High	15 min
3	Survey	Survey	Survey	High	15 min
4	Inventory	Inventory	Inventory	High	15 min
5	Cabling	Cabling	Cabling	High	15 min
6	IT Shop	IT Shop	IT Shop	High	15 min



## Portfolio Prioritization using Metrics and Simulation

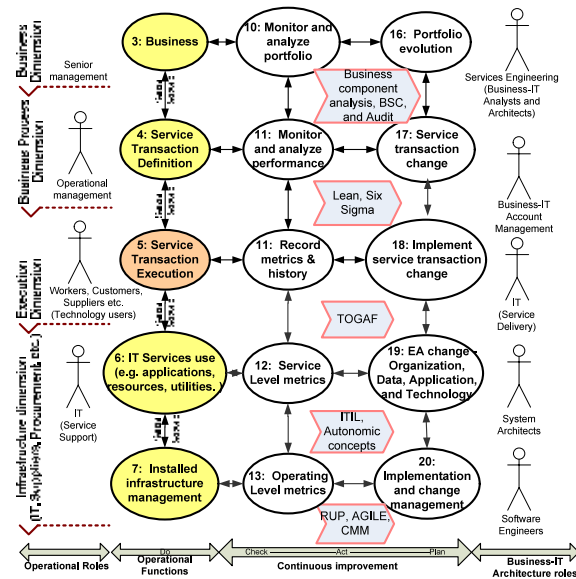


### Portfolio: Prioritized Projects

1: PC Install Several FTE saved	Service desk (remedy) tickets for survey, install, and billing Triage: Level 1: PC Install Queue Level II: Triage to create additional routing if needed
2: Approvals Biggest time saving	Required approval prior to installation
3: IT Shop Reduced inventory	Assemble and maintain a buffer as needed and move to pick up locations

# Knowledge Mining and Consolidation

## Knowledge Consolidation now Feasible Using the RED Representation Scheme



## Curriculum Research Results From This Project

- **Prescriptive evolutionary holistic services improvement methodology (integrating lean, ITIL, TOGAF):**
  - Used local Autonomic and global Lean principles to reduce complexity
  - Provided a framework for mapping from SLAs to OLAs including points of performance measurement
  - Provided an analytic framework for measurement and improvements on a continuous basis
  - Transitioned the enterprise architecture from an as-is to a to-be state by considering priorities and impact
    - Included the improvement of business processes, systems architecture, and organizational issues
    - Impacted the organization and enabling IT systems
  - Provided requirements for the technology environment (e.g. CMDB)
- **Services Science 2007 Publication:**
  - Deriving System Improvement Principles Relating Lean in-the-large and Autonomic in-the-small (submitted).

Questions?

**CERCS-CETI Industry Day: June 7<sup>th</sup>**