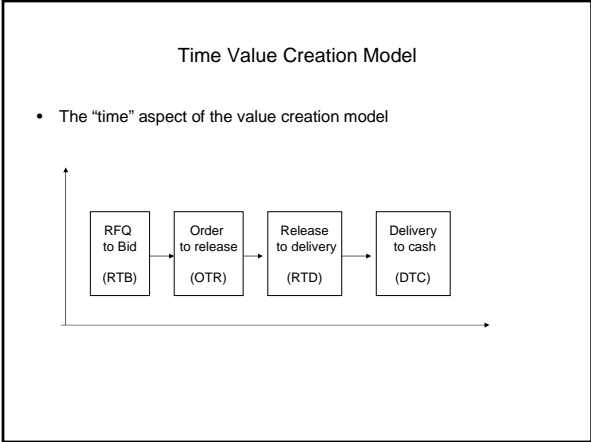
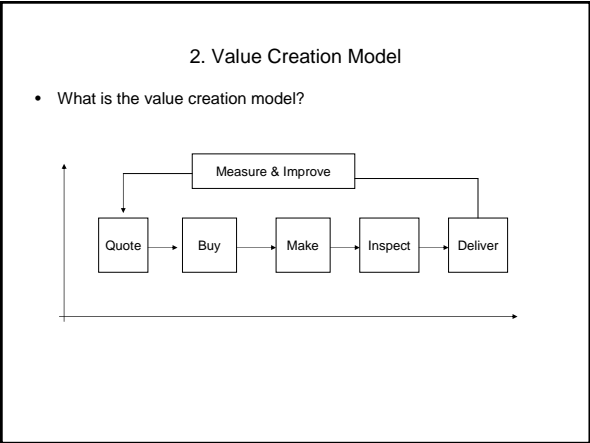


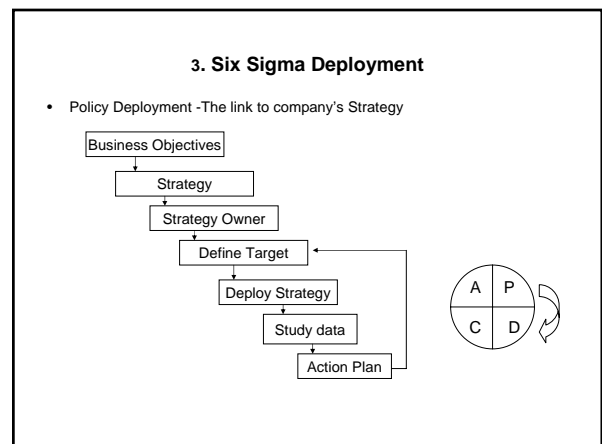
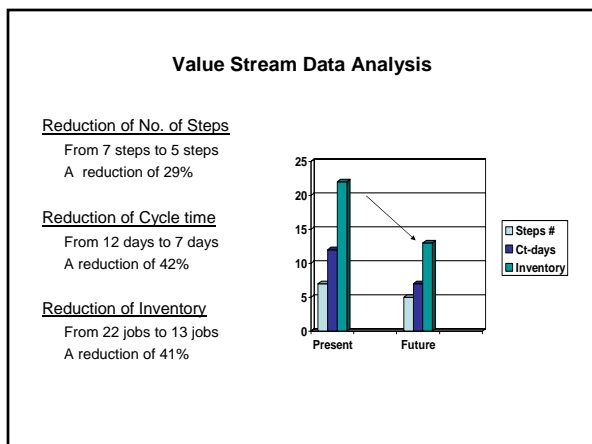
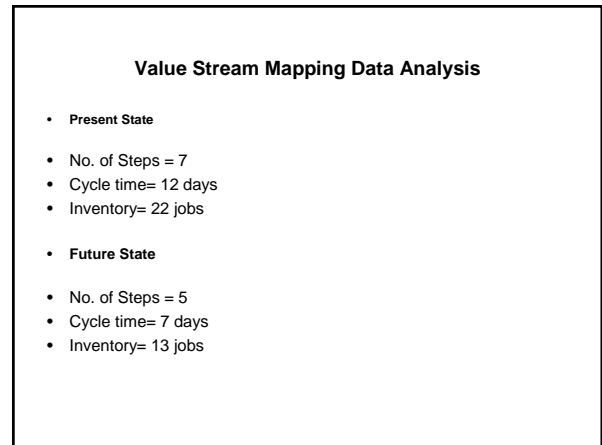
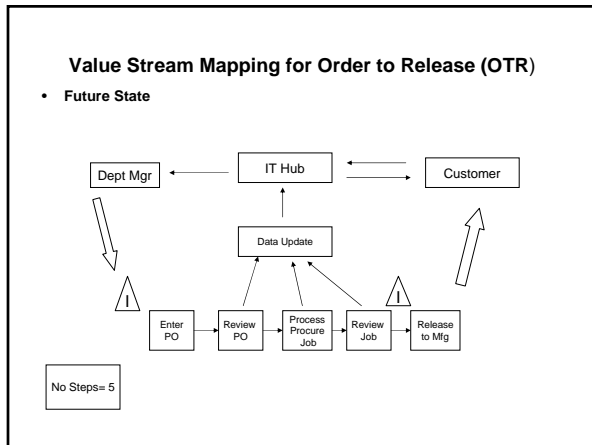
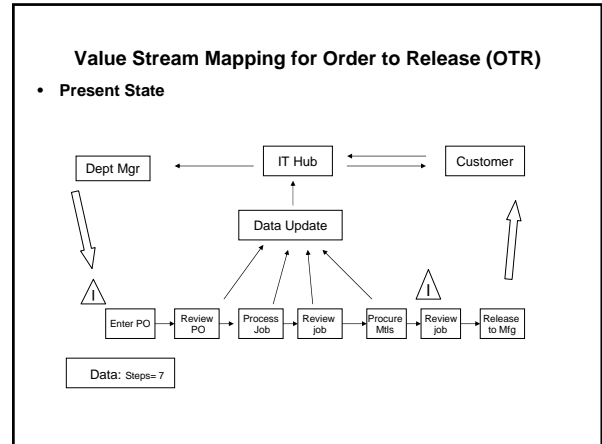
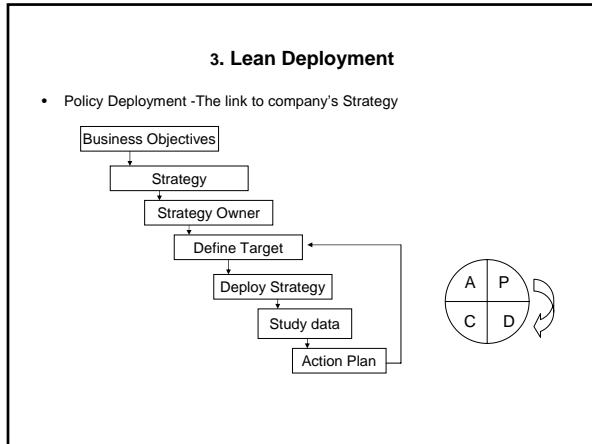
Lean & Six Sigma in a Transactional Environment
 ASQ Monthly Meeting
 January 9, 2007
 By
 George Karayianes
 SMC LLC

1. Presentation Outline
- 1. Market conditions
 - Engineer to Order (ETO)
 - 2. Value Creation Model
 - Time Value
 - 3. Lean Deployment
 - Policy Deployment
 - Value Stream Mapping
 - 4. Six Sigma Deployment
 - DMAIC
 - 5. Lessons Learned

1. Market conditions
- The company serves primarily the aerospace and defense markets.
 - The company operates in an engineering to order (ETO) market environment that continuously demands shorter delivery times of small lot sizes.
 - It is then important for the company to reduce its lead time and take out unnecessary and non value added steps from its value creation process.
 - It is also important to reduce and minimize any errors (variation) that add additional time and cost to the value creation process.



- The Order to Release (OTR) Component
- The order to release (OTR) consists of the following activities:
 - Receive Purchase Order
 - Review Purchase Order
 - Process Job by Engineering
 - Review Job by Engineering
 - Procure materials and/or components
 - Review by Manufacturing
 - Release Job for Manufacturing



4. DMAIC

- **Define**
Reduce the number of errors for jobs released to manufacturing
- **Measure**
Develop a baseline for errors per job (DPU), yield, DPMO & 6σ level
- **Analyze**
Map process, do a pareto analysis and calculate financial impact
- **Improve**
Develop procedures
SPC (p & c) chart
Standardize & deploy new process
- **Control**
Define and train on new procedures
Monitor weekly process results
Report on quarterly management review meetings

Six Sigma-Contract Review Data Analysis

Baseline data

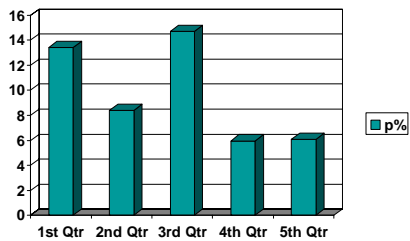
Number of daily jobs = 7 jobs
Number of daily errors = 16
DPU=2.29

Each job has 10 opportunities for errors, so we have a DPO= 0.229
Defects per million opportunities= 228,571
Six sigma level = -2.25

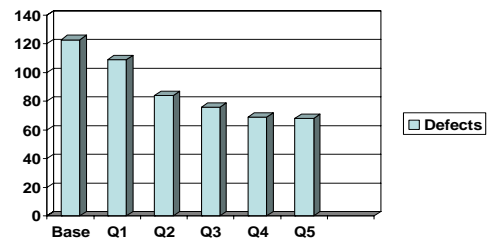
Financial impact

The impact of 1 error per job is equal to the ratio of (1:4) in terms of overhead cost

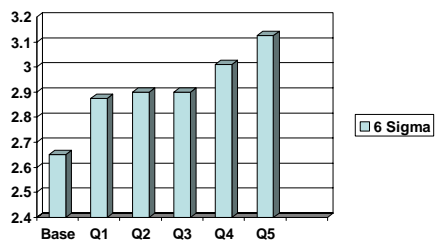
P chart



Six Sigma- Defects Data Analysis



Six Sigma- Six Sigma level



5. Lessons Learned

- Do you really know your business?
- As always change is difficult to do
- Stay focused on the process
- Follow the data
- Understand what the data is telling you