

IE496

Industrial Engineering Internship

Dr. Barnes

January 28, 2008

Lecture #2

Today – two objectives

- Workshop – find out what's going on with your projects, apply some lecture info to them
- Lecture – convey some project-oriented info to you

What needs to happen in short range

- Establish your work schedule with company/agency/hospital
- Work on “planning sheet”
 - With company supervisor
 - With academic advisor
- I will get academic advisors for your projects once I have project descriptions

Your Projects

- Let's list the projects that you are doing/did

Projects for IE496, Spring 2008

Student

Chang

Bednowitz, Jackson

Hyde

Awad, Dooling, Mohd Yusof, Prok

Markin

Lyke

Company

BOC Edward

Buffalo – Niagara Airport

PCB Piezotronics

Curbell

Del Monte

Fisher Price

Projects for IE496, Spring 2008 continued

Student

Company

Snyder

General Mills

Anipindi, Cheng, Devendorf, Luo

Greatbatch

Piecuch, Szalkowski, Worthy

GM Powertrain

Brown

ITT Heat Transfer

Stange

Nanodynamics

Pedicone

Reichert

Projects for IE496, Spring 2008 continued

Student

Company

Myers

Rome Air Force Base

Frank, Indraputa, Strovers

SAMCO

Henchey

USPS

Chung, Davis

Sisters Hospital

Chandra, Willis

We Care

Broad Categories of IE Work

- Human Factors
- Operations Research
- Production Engineering

- Other technical work – e.g., Web Design

Projects by Broad Categories

- Human Factors
 - Decision Analysis
 - Work Station/Task Improvement
- Operations Research
 - Networks
 - Queuing
 - Simulation

Projects by Broad Categories, continued

- Production Engineering
 - Failure Mode Effect Analysis
 - Inventory, Supply Chain Management
 - ISO, etc.
 - Lean Manufacturing
 - Line Design
 - Material Flow
 - Quality, Six Sigma, Statistical Quality Control

Criteria

- What are criteria?
- What evidence will you accept as to whether or not your project has accomplished its purpose?

Criteria Development by Broad Categories

■ Human Factors

- Time
- % defective (decision-making)
- Range of motion
- Size: height, width, depth
- Weight of items handled

Criteria Development by Broad Categories

- Operations Research
 - Location
 - Time
- Production Engineering
 - % defective
 - Distance of travel
 - Relative place of sequential operations in space
 - Scrap
 - Time

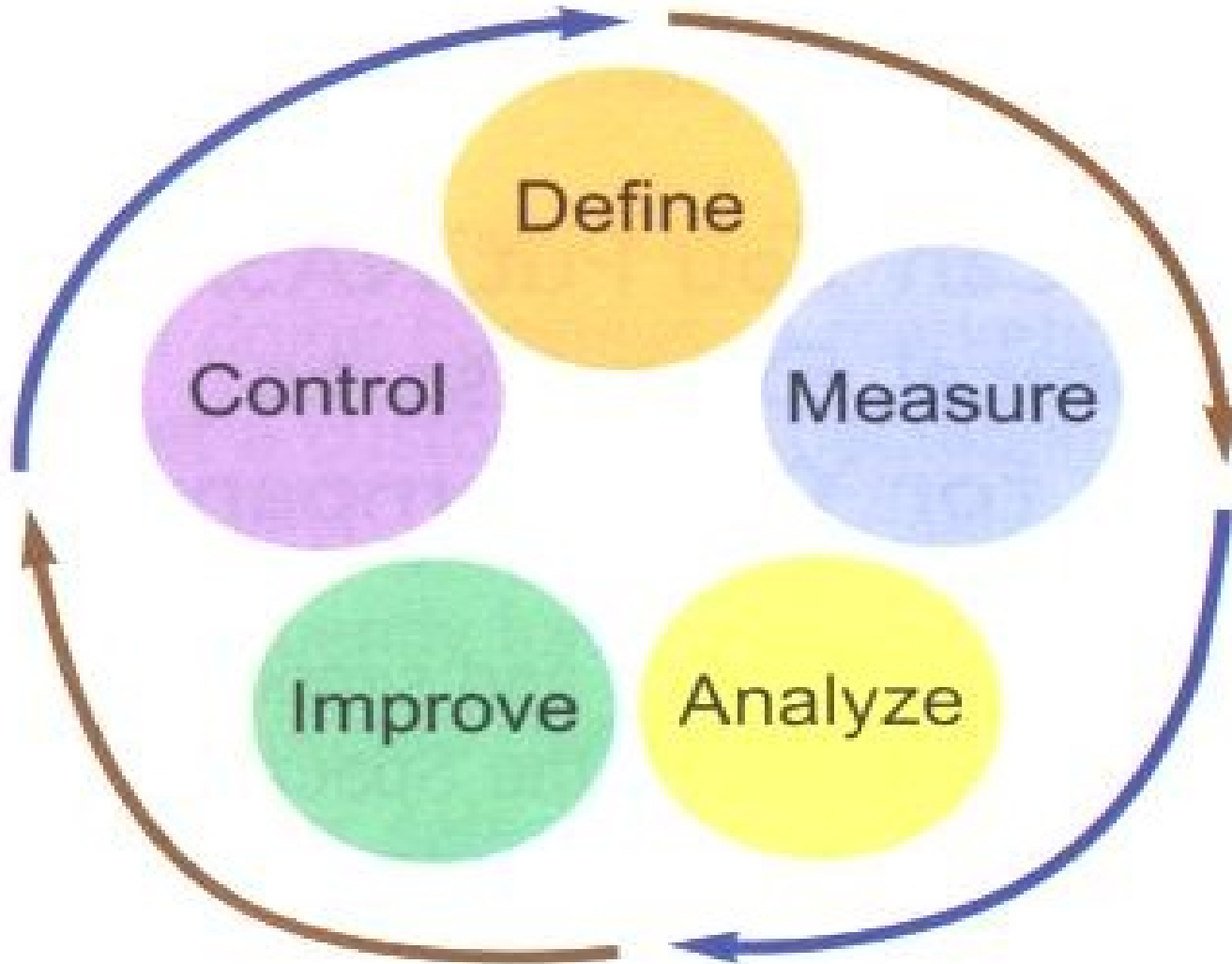
Your Projects

- What are your projects' objectives?
- What criteria are you using?

Some Measurement Tools

- Brain Storming
- Cause – Effect Diagrams (Fish Bone)
- Data Collection
- Flow Diagrams
- Graphs and Charts
- Histograms
- Pareto Analysis
- Scatter Diagrams
- Surveys

Six Sigma - DMAIC



Six Sigma

	Project Phase	Definition / Activities	Example of Tools for Use
Practical Problem	Define	<ul style="list-style-type: none"> • Prioritize opportunities for improvement • Select appropriate project(s) based on company goals, objectives, & strategy • Select proper team • Develop statement of problem to be solved 	<ul style="list-style-type: none"> • Project Charter • Financials • Business Strategic Plan • Ghant Chart
Practical Problem	Measure	<ul style="list-style-type: none"> • Describe the total process in an effort to identify response(s) & how to measure those identified • Determine acceptable performance criteria • Gather data on current process 	<ul style="list-style-type: none"> • Process Map • C&E Matrix • C&E Diagram • MSA • Value Stream Map, Current State
Statistical Problem	Analyze	<ul style="list-style-type: none"> • Assess current data & establish a baseline performance • Confirm relationship between inputs & outputs • Begin identification of root causes for issue 	<ul style="list-style-type: none"> • Failure Modes & Effects Analysis • Multi-Vari Studies • Screening DOE's • Control Charts • Setup Reduction
Statistical Solution	Improve	<ul style="list-style-type: none"> • Implement process controls • Optimize the process • Multiple iterations may be needed 	<ul style="list-style-type: none"> • DOE, Characterization Studies • Value Stream Map, Future State • Cell Design • Regression
Practical Solution	Control	<ul style="list-style-type: none"> • Monitor process & implemented improvements • Determine capability • Document effort & results 	<ul style="list-style-type: none"> • Optimization Studies • Control Plan • 5S • Kanban • SPC / Capability Studies

Your Report

Expected report information

- Title Page
- Table of Contents
- Executive Summary
- Introduction
- Problem/Objective
- Methodology
- Results
- Recommendations
- Conclusions
- Appendix

Next Week

- Mr. William Grunert – information on:
 - Written report
 - Oral report