Agenda

- Sponsor and Problem Statement
- IPRO 306: Goals and Structure
- Machine Scheduling in SAP
- Six Sigma Training
- Results and Conclusion
- Questions
Introduction

- Started in 1906 by William E. Sloan the inventor of the flush valve
- 80% of domestic market share for flush valves
- Opportunity: Need for new manufacturing practices
Problem Statement

Manufacturing Process

1. Machine Shop
2. Polishing
3. Plating
4. Assembly
5. Distribution Center
Problem Statement

- No formal production schedule
- Inventory shortages or overstock
- Poor inventory integrity
- Promise inaccurate shipping dates to customers
Objectives of this IPRO

- Create a scheduling protocol using SAP
  - Eliminate overstocks and inventory shortages
  - Minimize obsolescence through better planning
  - Increase accuracy of shipping dates

- College level Six Sigma training package
  - Six Sigma approach to inventory integrity
  - Green belt certificate
  - Help with the delivery of the training
Team Mission and Values

- **Mission:**
  Improve Sloan Valve’s global supply chain

- **Values:**
  - Quality, on-time, high tech project
  - Use every team member skills
  - Team work
Team Organization

Steve Rodgers
John Caltagirone
Steering Committee

J C
Team Leader

Management Committee (all of us)

J C
Scheduling Project Manager

Scheduling Team

Néstor
Mauricio
A A
A C
Scott

Vibhor
Six Sigma Project Manager

Six Sigma Team

Varsha
Fernando
Stephen

A A: Avanessian, Aris
A C: Mari Carrió, Aris
Fernando: Rodriguez, Fernando
J C: Espinosa, Juan Carlos
Mauricio: Medina Rivera, Mauricio
Néstor: Carbayo Casado, Néstor
Scott: Gherardini, Scott
Stephen: Schreiner, Stephen
Varsha: Panjwani, Varsha
Vibhor: Verma, Vibhor

iGROUPS manager: Néstor
Facilitator: A C
Minute taker: Weekly rotating position
Agenda maker: Vibhor & J C
Weekly timesheet collector/summarizer: Néstor
Time keeper & master schedule manager: Vibhor
Team Work Management

- Tuesdays: General meeting at IIT
- Wednesdays: Scheduling team
- Fridays: Six Sigma team
How did we manage to develop an accurate scheduling process?
Methodology

1. Interviewed employees + visited the plant + understood the process

2. Determined needed data and formulas to develop a production schedule in SAP

3. Implemented and tested the new scheduling procedure + determined performance metrics
1. Interviewed employees, visited the plant, and understand the process

- Understand the process
- Understand the current scheduling process and its problems
- Decided to use SAP for scheduling purposes
What is SAP?

- SAP is an ERP software capable of integrating multiple business applications.

- An ERP system integrates and automates all sides of business operations.
  - Planning
  - Manufacturing
  - Sales
  - Others
What is SAP?

- SAP is categorized into 3 core functional areas:
  - Financial
  - Human resources
  - Logistics
    - Sales and Distribution (SD)
    - Material Management (MM)
    - Production Planning (PP)
    - Others
Step 2: Data and Formulas

- Used innovative ideas and brainstorming to overcome obstacles calculating:
  - Safety stock
  - Reorder point
  - In-house production time
  - Lot size
  - Raw material lead time
  - Total lead time
Step 2: Data and Formulas

Total lead time: $\max(RMLTD+IHPTB, RMLTC)+IHPTA$
Total lead time: $\text{MAX (5+3, 4) + 2 = 10}$
Step 2: Data and Formulas

- Stock
- Lead Time
- Reorder point
- Lot size
- Safety Stock
- Stock on hand
- Available Stock
- LT
3. Implement and test the new scheduling procedure

- Development of the policy and procedures
- Tested in a simulation program
- Implementation line by line while fixing bugs
3. Determine performance metrics

- **Build to Schedule Compliance**
  - Old compliance
  - New compliance

- No deviation will mean:
  - No overstock
  - No shortages
How did we manage to give SLOAN a Six Sigma approach?
Methodology

1. Understand the Six Sigma Methodology

2. Analyze the Materials Movements Problem

3. Create a Complete Training Package
Step 1: Understanding Six Sigma

- The Sigma Value

\[ f(x) = \frac{1}{\sigma \sqrt{2\pi}} e^{-\frac{x^2}{2\sigma^2}} \]
Step 1: Understanding Six Sigma

- The DMAIC Cycle

DMAIC Cycle

- Define
- Measure
- Analyze
- Improve
- Control
Step 2: Material Movement Problem

- Visit the plant and understand the processes
- Discussed Quality Goals and brainstormed Six Sigma initiatives
- Spoke with floor supervisors
Step 2: Material Movement Problem

- Discrepancies between department counts
- Errors are passed forward
- Entry mistakes
Discussed possible sources of error

Looked at historical SAP records of the problem

Composed a draft project charter
Step 3: Create the Training

- Devise the syllabus
- Divide the material into component modules
- Research the material and compile it
- College style lecture structure
- Review material
Step 3: Package Structure

- Primary resource are powerpoint slides
- Summary handouts
- References
- Comprehensive review
Training Example

Focus on main aspects

Simple Charts and Graphics

Easy to follow
CONCLUSIONS
Challenges

- Finding proper resources
- Coordination – Six Sigma team
- Not enough time to observe the impacts
Expected Achievements

- Reduce shortages of manufactured parts by 50%
- Reduce WIP inventory by 50%
- Increase inventory turns of WIP by 100%
- Increase perfect order performance by 10%
- Increase BTS compliance from 60% to 95%
Expected Achievements

- Complete Training Package
  - 200 slides of training material
  - Numerous handouts and glossaries
  - Syllabus based off the ASQ Six Sigma Green Belt Body of Knowledge

- Acted as a trigger to the Six Sigma approach to resolve quality problems

- Savings of $2000-$5000 per employee trained
Impact on the Sponsor

- Cultural change for employees
- New person responsible for scheduling
- New approach to quality problems
- More knowledgeable work-force
Some of the IPRO members will stay in contact with the company if any implementation problems come out:

- Nestor Carbayo (Scheduling team member)
- Vibhor Verma (Six Sigma team member)
- John Caltagirone (Faculty advisor)
Next Steps & Recommendations

- Fine-tune parameters
- Demand forecast and lean manufacturing
- Train employees in Six Sigma
- Resolve quality issues with a Six Sigma approach
Team Ethics

- Access to SAP and to confidential company information

- Aware of the harm we can cause to the company

- The entire team has signed a Confidentiality Agreement with SLOAN
Results for the IPRO Team

- Gained real world business experience
- Learned how to deal with an actual client
- Allowed us to apply our skills to a real world problem
Results for the Company

- Fulfilled expectations
- Impressed with team commitment
- Very Satisfied with the IPRO Team

Happy Customer = Successful IPRO
Acknowledgements

- Steve Rodgers
- Jane Klink
- Darrell Jones
- Eugene Short
- Robert Briggs
- Pat Catapano
- Tim Schiffbauer
- All other Sloan Valve’s personnel
Thank You For Your Attention

Any questions?