

Management of Quality & Higher Education

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Overview

- Background: me, school, students.
- BUSI 3302 Management of Quality.
- Six Sigma quality improvement.
- Other quality courses.
- Quality in a university setting.

- Please ask questions!

My hybrid background

- Education
 - BSc, MBA, PhD.
 - Research in reliability & maintenance.
- Experience
 - Aircraft maintenance (National Defense).
 - Business professor.
- ASQ certifications
 - Reliability Engineering, CRE.
 - Quality Management, CQMgr.

Sprott School of Business

- “Full service” school
 - BCom/BIB, MBA, PhD.
 - Professional development short courses.
 - MDPW: Management Development Program for Women (1 year part-time).
- My students:
 - Undergraduate business program.
 - Have 2 semesters of statistics.

My course objectives

- Avoid:
 - Classic engineering course
 - All numbers: the “how” without the “why”.
 - Classic business course
 - All words: the “why” without the “how”.
- Prefer:
 - A mix of “how” and “why”.
 - Something they can go out and use, but also a base for future learning.
 - Reference an external benchmark.

Six Sigma...Green Belt...Plus

- Six Sigma (8 weeks)
 - Define, Measure, Analyze, Improve, Control.
 - Business context & statistics tools.
 - Not an expert (Black Belt) but competent.
- Other business topics (4 weeks)
 - ISO 9000:2000.
 - Reliability.
 - Software quality.

Course materials

- Gryna FM, *Quality Planning & Analysis: From Product Development Through Use*, 2001.
 - A business text with reasonable statistics.
- MS Excel spreadsheet with tool-pack.
 - Not sophisticated but familiar.
- Beanbags, dice, etc.
 - Learning in action!

Define the problem

- Evaluate symptoms in context of customer needs.
- Make it relevant to decision makers.
 - “Our average response time is too long” (SO?)
 - “Half of the steel parts are 1 mm too short” (SO?)
 - “Eliminating half the component errors would reduce our overtime costs by \$30K per year and the number of client complaints by 60%.” (AH!)
- Assemble a project team.

Measure what is happening

- Document the existing process.
 - Process maps, capability calculations.
- Brainstorm potential causes.
 - Cause & effect diagrams, Pareto plots.
- Collect data
 - What do we have, what do we need?
 - How accurate & precise are our measurements (micrometers, surveys)?

Analyze the information

- Detective work: make the data talk!
- Diagnose the underlying cause(s).
 - Which inputs are causing the problems seen in the outputs?
- Graphical tools
 - Scatter plot, histogram, time series plot.
- Statistical tools
 - Sampling, hypothesis tests, regression.

Improve the process

- What should we change in order to...
 - Correct the existing problem?
 - Prevent future problems?
- Analysis of Variance (ANOVA).
- Design of Experiments (DOE).
- Mistake-proofing (poka yoke).
- Implementation & resistance to change.

Control the improvement

- Keep the process from deteriorating.
- Control charts for key outputs.
 - X-bar charts, R charts, time series plots.
- Empower employees for “self-control”.
 - They know the performance target.
 - They know the current performance.
 - They have the ability & opportunity to adjust the work process towards the target.

Goal: Always Improving

- To improve the quality of the process outputs, we must improve the process and its inputs.
- As opposed to...
 - “Wishful thinking” approach of talking a lot without really changing anything.
 - “Bigger Hammer” approach of throwing more money at the problem.
 - Buying faster computers, hiring more workers, adding another building, etc.

Put a student to work!

- Graduates & summer jobs
 - <http://www.carleton.ca/career>
- Co-op & internships
 - <http://www.carleton.ca/co-op>
- Applied projects
 - My operations management students (BCom & MBA)

Other quality-related courses

- Carleton U
 - SYSC 5105 Software quality engineering
 - Professional development (TBA)
- U Ottawa
 - MBA special topics (intermittent)
- Algonquin
 - Purchasing management (Business)
 - Software quality testing (Technology)

Quality in University Education

- Everyone agrees....in principle.
- Challenges to implementation.
 - Service industry.
 - Public sector.
 - Student (client) *wants* versus *needs*.
 - Some opposition to “corporate” practices.
 - Independence of faculty (academic freedom).

Official end-of-course survey

- 13 standardized questions answered on a scale of 1-5.
- “How do you assess your instructor’s performance in:
 - Making clear the objectives of the course?
 - In speaking audibly and clearly?”.
- Summary scores are used by deans and individual faculty.

My own survey

- Questions tailored to my own course content, process, etc.
 - “What would you like to have had *more* of in this course, either in terms of content or in terms of how it was handled?”
 - “How useful or necessary did you find the textbook for this course?”
- Only seen by me.
 - Feedback for continuous improvement.

Thanks for listening...

- Want to be a special student?
- Questions?



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