JWI 550: Operational Excellence

Week Seven Lecture Notes

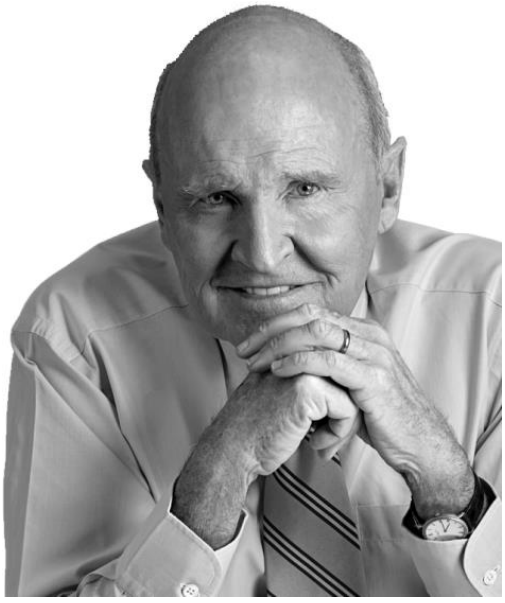
WHY QUALITY MATTERS: ERRORS COST MONEY

What It Means

Errors come in all shapes and sizes. Common examples include: (1) processes that don't meet requirements, (2) products that fail in your customers' hands, (3) services that don't deliver what you promised, and (4) late deliveries. Not doing it right the first time is wasteful and negatively impacts both cost and revenue. The time and resources you devote to fixing errors add no value for your customers. These are costs you either have to absorb or try to pass along, reducing your profitability and competitiveness. Worse, your errors become your customers' "errors" as the problem you created cascades down through the supply chain.

Why It Matters

- Anything that disappoints your customers is an error. If you're not currently defining an error that way, then you may be missing key opportunities to improve your operations.
- If you think you make errors infrequently or you fix your errors promptly, that doesn't necessarily mean your customers are satisfied. You are being compared to your competitors and their ability to deliver error-free goods and services all the time.
- The errors you create end up impacting the entire supply chain, affecting the profitability and competitiveness of your partners. No one in the supply chain should be forced to pay for your mistakes.
- People don't forget errors. Even if you fix the operations and turn matters around, your reputation or brand image will take much longer to recuperate – if it ever does.



"*In the end, what you're trying to get to are processes that operate more efficiently.*"

Jack Welch

THE CHALLENGE AND OPPORTUNITY FOR MANAGERS

If the observation in this week's title sounds obvious enough, it follows that the obvious objective is to eliminate errors and save money. But how can you do that if everyone involved in every operation doesn't agree about what constitutes an error or what those errors could lead to? And how can you achieve this objective without a systematic way to set goals, measure costs, and monitor and sustain progress?

Understanding how a business ensures the quality of its products, services, and processes is important to managers. You must determine not only how to eliminate errors, but also how to prevent them from occurring in the first place, and how to do so on a sustainable basis.

The challenge for managers is not just to understand that errors and quality failures cost money, but to:

- Enable the organization to perform error-free work routinely as it meets customer needs and expectations.
- Communicate the strategic importance of ensuring the quality of processes, products, and services because of their impact on costs, competitive advantage, and revenue.
- Work with stakeholders to drive the importance of quality practices in delivering defect-free products and services to customers.

Increasing your understanding of how quality can be planned, controlled, and improved will make you a better and more effective manager.

This week, we will explore proven models for managing quality, distinguish between performance quality and conformance quality, and learn how to identify and reduce the costs of poor quality. Delivering defect-free products and services with the right features improves the company's competitive strength.

YOUR STARTING POINT

1. How do you define an "error" in your organization? This may not be a formal definition, but something implied by you and your colleagues' reactions and behaviors.

2. Do you understand the costs of your errors? How would you validate this? Beyond simply fixing errors, what else would you consider to be the "hidden" costs of errors?

3. What steps or activities within your operations are focused on avoiding errors? Are they effective? Do you measure the costs of these steps to see if they also lead to greater efficiencies?

4. Do you formally and regularly measure your outputs to see if they are meeting your promised standards? If not, why not?

5. Do you feel you understand your customers' opinions about your ability to deliver products and services that meet their expectations? If not, how would you collect this information in a way that could address their concerns?

6. How do you set quality goals? How do you measure your progress towards these goals? Do you think your current processes to do so are adequate? Why?

QUALITY MANAGEMENT

Definition of Quality

Broadly speaking, quality is the degree to which a product or service meets or exceeds customers' needs and expectations. The late quality guru Dr. Joseph M. Juran defined quality as "**fitness for use**." Quality or "fitness for use" can be translated into two manageable dimensions – right features and freedom from deficiencies.

Providing the **right features** that customer prefer and are willing to pay for will increase market share and revenue. If an organization creates the right features to meet the needs and expectations of customers, customer satisfaction results. Providing the right features is also called **performance quality**.

Freedom from deficiencies means a product or service functions as it was designed. This is also called **conformance quality**. When it lacks conformance, quality failures and customer dissatisfaction occur. This is costly because errors must be corrected to reduce or eliminate the dissatisfaction. And deficiencies in the product, service, or process result in longer cycle times and higher costs. If deficiencies are reduced or eliminated, companies improve their cost, quality, and time performance.

Cost of Poor Quality (COPQ)

The **Cost of Poor Quality (COPQ)** are costs that would disappear if there were no deficiencies. There are 3 categories of COPQ:

- **Appraisal** activities are processes designed to monitor outputs or other processes to see if they are meeting standards or creating errors like variation in output. These could include processes like quality testing, field testing, employee skills testing, and audits.
- **Internal Failure** activities are processes that take place when an error is detected before a good or service is delivered to the customer. This could include work to correct the error, such as re-manufacturing or rework. It could also include the waste created by the error, such as scrap.
- **External Failure** activities include processes that take place when an error is detected or reported once a good or service has been provided to the customer. This could include work to correct the error for the customer, such as warranty work. But this is a broad category - it also includes any process or resource needed to compensate the customer for the consequences of the error. Most importantly, external failure costs include the lost profitability on future sales if the error has led to the loss of a customer or a negative impact on your brand or reputation.

Cost of Quality (COQ)

Unlike COPQ, the Cost of Quality (COQ) is more comprehensive. COQ includes all 3 categories of COPQ, plus Prevention costs. **Prevention** activities are processes designed to avoid making errors in the first place. These could include processes like quality design, pre-testing a product or service before moving to full-scale operations, training employees to avoid errors, and creating standards for suppliers.

COQ can be confusing for quantifying the total cost of errors, because COQ includes prevention costs. Companies should invest in prevention costs so as to reduce errors and failures, thus reducing COPQ.

Managing for Quality

The Quality Trilogy, also called the Juran Trilogy, was developed by Dr. Juran as a means to manage for quality. It consists of three universal processes: quality planning, control, and improvement.

- **Quality planning** is the process for creating, designing, and planning for products and services that meet or exceed customer expectations.
- **Quality control** is the process for maintaining performance goals during operations.
- **Quality improvement** is the process for breakthroughs to unprecedented levels of performance by eliminating variation, waste, and poor quality.

Quality planning will be addressed in more detail when we cover "Customer-Focused Design." Tools used in quality planning include Voice of the Customer (VOC), Quality Function Deployment (QFD), Design for Six Sigma (DMADV), and Design Thinking. Quality planning is essential for achieving performance quality.

Quality control includes all those ongoing practices and procedures to ensure that performance meets specified requirements day in and day out. Tools include process control plans, statistical process control (SPC) charts, and standard operating procedures (SOP), as well as standard work to ensure that processes, products, and services meet specifications on a routine and sustainable basis. Quality control is essential for achieving conformance quality.

"All improvement takes place project by project" is a famous quotation from Dr. Juran. Quality improvement is carried out with projects, such as Work-Outs and Kaizen events for quick wins, and Six Sigma (DMAIC) projects if rigorous data analysis is required. It also includes tools such as process mapping and analysis, cause-effect diagrams, root cause analysis, statistical hypothesis tests, failure modes and effects analysis (FMEA), mistake-proofing or error-proofing, Design of Experiments (DOE), process control plans, SPC charts, and standard operating procedures (SOP). We will cover Six Sigma next week.

All three processes – quality planning, control, and improvement – provide organizations with the means to manage for quality, whether for:

1. Designing or re-designing services, products, or processes
2. Ensuring that routine processes and daily work are done correctly as designed or planned
3. Diagnosing chronic problems and addressing root causes to improve performance

Traditionally, quality was achieved by relying on inspection and detection. That is too costly and no longer competitive. Quality has to be managed by focusing on prevention and control. Quality planning, improvement, and control, when executed correctly, will enable organizations to excel in quality and gain a competitive advantage.

SUCCEEDING BEYOND THE COURSE

As you read the materials and participate in class activities, stay focused on the key learning outcomes for the week and how they can be applied to your job.

- **Define quality and explore proven methods to manage it**

  Consider how quality is managed in your organization. What approaches are used? Are they based on prevention and control? If they are based on inspection and detection, what can be done to migrate them from detection to prevention and control? Consider how the Juran Trilogy (quality planning, improvement, and control) can be operationalized so that, going forward, it becomes the model of managing and sustaining quality.

- **Distinguish between performance quality and conformance quality**

  Conformance quality is the degree to which a product or service conforms to the specifications of its design and achieves the specified performance. A process with low conformance quality generates numerous or severe defects. A process with high conformance quality can only be as good as the product's design specifications. Lack of conformance quality results in higher costs.

  When a consumer buys a product, they buy that product's bundle of attributes. Performance quality refers to the ability of a product or service to excel along one or more performance dimensions or attributes. Lack of performance quality results in loss of market share and revenue.

  To summarize: quality is fitness for use – providing the right features, free from deficiencies. Make sure you deliver both performance quality and conformance quality.

- **Evaluate costs of poor quality (COPQ) and how to address them**

  COPQ in most companies typically accounts for 20 to 40% of the cost of goods sold. Quantify the costs of poor quality in your organization. Analyze them, using Pareto charts, to identify the vital few categories or areas which account for the majority of the costs. Then, select and launch quality improvement projects, such as Six Sigma DMAIC projects or Lean/Kaizen events, to reduce the COPQ in those vital few areas.

ACTION PLAN

To apply what I have learned this week in my course to my job, I will…

Action Item(s)
Resources and Tools Needed (from this course and in my workplace)
Timeline and Milestones
Success Metrics