



Business Performance Improvement

Performance

**An Introduction to
Cost of Poor Quality**



- Background
- What is Waste?
- What is COPOQ?
- Why is it important?
- Examples in Real Life
- COPOQ Process
- Conclusion

“Studies of Cost of Quality data collected over the past 50 years shows a consistent pattern. Enterprises that **do not** make a significant connection between their quality systems and their financial performance waste a significant sum of money every year. Average estimates for this waste are 25% of sales in a manufacturing environment and 40-50% of operating expenses in a service environment”

-Philip Crosby and Assoc.



What is Waste?

Waste is an activity that is non-value added, an activity that the customer would not be willing to pay for, if they knew about it

Seven Forms of Waste

Overproduction

Inventory

Waiting

Transportation

Motion

Extra Processes

Defects



Seven Forms of Waste

Overproduction – production of service outputs or products beyond what is needed for immediate use

Inventory – keeping money wrapped up in materials that are not needed right away and cannot earn interest, or any work-in-process that is in excess of what is required to produce for the customer

Waiting – items sitting in queue or in process that are not being worked on, or any delay between when one process step/activity ends and the next step/activity begins

Transportation – unnecessary movement of materials, products or information

Motion - Needless movement of people, or information between computer systems

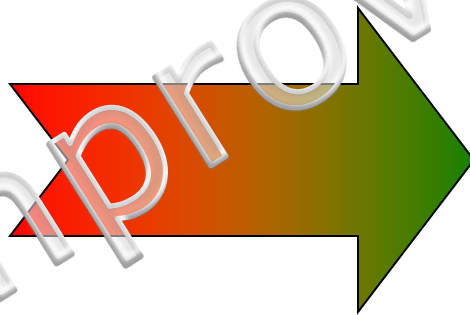
Over-processing - Adding more value to a service or product than customers want or are willing to pay for

Defects – any item that is not done correctly the first time, and must be redone in order to meet the customer needs

What is the **Cost of Poor Quality**?

- The financial cost estimate of these “wastes” and how they impact the company

• **Waste**



• **Dollars**
• \$\$\$



Why focus on COPQ?

When we reduce or eliminate COPQ, it results in:

- Job Security through increased sales and orders from the satisfied customers
- Improved company performance
 - stock investments, pay raises, bonuses, cost savings and avoidances
- Higher job satisfaction
- Reduced cycle time from order to delivery
- Freed up resources to focus on other areas in need



Why is COPQ so powerful?

- Speaks the language of management!
 - Money gets mgmt attention, not yield rates and defect quantities
- Justifies need for upfront planning and design and development spending
- Helps identify opportunities for improvement
 - helps prioritize resources in the right areas
- Helps with ROI calculations and cost-benefit analysis
- Keeps people priority-focused on biggest issues, not chasing minor problems



Only the tip of the iceberg!

Total COPQ = Measurable + Unmeasurable

Measurable

Unmeasurable

- Revising Documentation
- Modifications
- Scrap
- Obsolete Parts
- Pricing or Billing Errors
- Paperwork Errors
- Failed Product Developments
- Excessive Customer Audits and Presentations
- Excess Work In Process
- Rework
- Missed Deliveries
- Penalty Payments
- Unused Capacity
- Time Spent Handling Complaints
- Consignments to Customers
- Overnight Shipping
- Testing Costs
- Recalls
- Warranty
- Redesigning Products
- Expediting Costs
- Excess Inventory
- Loss of Customer Goodwill
- Excessive Employee Turnover

Manufacturing COPQ
Unmeasurable = Measurable X 3

Service COPQ
Unmeasurable = Measurable X 6

Improvement

- **Estimates only! Not a financial tracking tool**
- Finance owns report and numbers
- Is cost of collecting data more than impact to business?
- Who is responsible to improve each category?
- CoPQ cannot be zero, but you should set it as the stretch goal
- Normalize data (% of sales or output)
- Don't compare groups to one another, each business will have different levels of CoPQ



COPQ Example

DEFECTS FOUND AT EACH PROCESS STEP

	Receiving Inspection	Automated Assembly	Sub Test	Manual Assembly	Final Test	Total Defects
Product A	2	0	2	0	3	7
Product B	0	1	4	2	1	8
Product C	3	3	1	3	0	10
Product D	1	2	0	4	2	9



COPQ Example

DEFECTS FOUND AT EACH PROCESS STEP

	\$12 Receiving Inspection	\$25 Automated Assembly	\$60 Sub Test	\$40 Manual Assembly	\$120 Final Test	Total Defects
Product A	2	0	2	0	3	7
Product B	0	1	4	2	1	8
Product C	3	3	1	3	0	10
Product D	1	2	0	4	2	9



COPQ Example

DEFECTS FOUND AT EACH PROCESS STEP

	\$12	\$25	\$60	\$40	\$120	COPQ
	Receiving Inspection	Automated Assembly	Sub Test	Manual Assembly	Final Test	
Product A	2	0	2	0	3	\$504
Product B	0	1	4	2	1	\$465
Product C	3	3	1	3	0	\$291
Product D	1	2	0	4	2	\$462

The following reactions should be expected:

- Denial (just cost of doing business...)
- Anger (numbers are wrong!)
- Rage (why are we wasting so much money?)
- Disagreement (numbers are estimated incorrectly for my area!)
- Fear (someone will be fired for the numbers)
- Acceptance (numbers are good estimates)
- Hope (numbers can be improved!)
- Excitement (numbers have been improved!)



Purchasing a new MP3 player online

Cost = \$300

Shipping/Tax = \$20

Total Cost = \$320



But it doesn't work...

Customer COPQ	Manufacturer COPQ	Total COPQ
\$0	\$0	\$0



MP3 Player Example

Action	Time to Complete (Min)	COPQ
Customer troubleshoots and tests out MP3 player with friend, verifying that the player is actually bad	60	\$30
Customer sends email to website, requesting return information	10	\$5
Manufacturer reads email, enters info into database, and replies to customer with address and instructions	10	\$10

Customer COPQ	Manufacturer COPQ	Total COPQ
\$35	\$10	\$45



MP3 Player Example

Action	Time to Complete (Min)	COPQ
Customer reads reply, fills out return form with explanation of problem, re-labels and re-packages player into box	60	\$30
Customer drives to post office to mail the player back	20	\$10
Manufacturer pays for shipping costs via COD	0	\$10

Customer COPQ	Manufacturer COPQ	Total COPQ
\$75	\$20	\$95



MP3 Player Example

Action	Time to Complete (Min)	COPQ
Manufacturer receives package, enters info into database, troubleshoots player, retests, refurbishes player	60	\$60
Manufacturer replaces unit with brand new player, confirms new product into database, and packages and labels new player for shipment	15	\$15
Manufacturer resells the repaired player on an auction site at 50% less profit than if it was new	0	\$75

Customer COPQ	Manufacturer COPQ	Total COPQ
\$75	\$170	\$245



MP3 Player Example

Action	Time to Complete (Min)	COPQ
Manufacturer ships player back to customer overnight	0	\$15
Customer receives package, opens it, retests the player, and confirms that it is working	20	\$10
Manufacturer calls customer to confirm that new player is working fine, then closes out entry in database	20	\$20

Customer COPQ	Manufacturer COPQ	Total COPQ
\$85	\$205	\$290



MP3 Player Example

Customer COPQ	Manufacturer COPQ	Total COPQ
\$85	\$205	\$290



Player Cost = \$320
COPQ = \$85

**Customer actually paid
\$405 for this product**


Sale of Player = \$300
Cost to Build Player = \$200
COPQ = \$205

**Customer was going to make \$200
profit on the sale, but instead lost
\$105**

• That's not all the COPQ!



- Product Recall
- Lost Competitive Advantage
- Word of Mouth
- Reputation
- Engineering Support for Design Change
- Customer Reimbursement
- Potential Litigation and Lawsuits

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- A large black arrow originates from the left side of the slide, pointing towards the first item in the list.
- 1. Help identify waste in your area**
 - 2. Estimate the costs spent dealing with the problem**
 - 3. Collect data over time if necessary**
 - 4. Determine root cause of problem**
 - 5. Brainstorm and cost-justify solution**
 - 6. Quantify actual savings after implementation**
 - 7. Look for new opportunities**



How do we get started?

- **Brainstorm types of waste in your company**
- **Calculate rough estimates of each type of waste**
- **Prioritize wastes from largest to smallest**
- **Determine which wastes can be easily measured (not exact costs)**
 - **Detailed investigation into databases/systems**
- **Begin data collection of obtainable wastes**
- **Determine plan for addressing difficult/hard to measure items with high dollar impact**
- **Begin monthly CoPQ report by wastes, with normalizing numbers**
- **Create teams to improve biggest contributing wastes**
 - **By product, process or area**



Why aren't these costs looked at?

- **Estimates may seem too difficult or too complicated to obtain**
- **Estimating figures takes a long time, and attempts try to be too precise**
- **Costs are "hidden" and not easily defined or obtainable**
- **Customers don't realize they are paying for these costs, or they would charge us for them**
- **Costs are often considered "part of doing business"**

You learned:

- Why Cost of Poor Quality is important
- How CoPOQ relates to your company
- What to expect with a CoPOQ report

Business
Performance
Improvement



Additional Resources

Business Performance Improvement

<http://www.biz-pi.com>