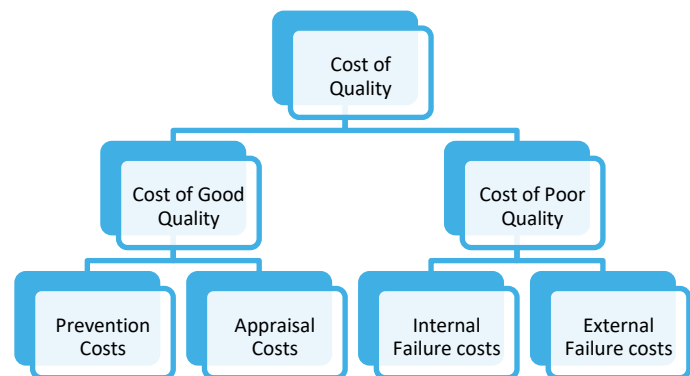# The Impact of a Sequence Deployment on Cost of Quality

*One of the major goals of a Sequence deployment is to reduce the overall Cost of Quality through an investment in a work instruction effort focused on prevention. However, our vast overview of a broad spectrum of industry needs has allowed us to develop a solution that not only helps you build it right the first time, but to also cost-effectively and robustly manage the instances when redlines, nonconformance and rework are required.*

## What is Cost of Quality?

"Cost of quality" is a term that we hear a lot as we work with customers. While often thought of as the cost of creating a quality product, it is more accurately considered as the cost of **NOT** creating a quality product or service. As the figure at right shows, quality costs are the total of the costs incurred investing in prevention, appraisal / inspection and in the worst case, failure.

```
                    Cost of
                    Quality
          ┌────────────┴────────────┐
    Cost of Good              Cost of Poor
      Quality                   Quality
   ┌──────┴──────┐          ┌──────┴──────┐
Prevention   Appraisal   Internal      External
  Costs        Costs    Failure costs  Failure costs
```

## Prevention - The Commonsense Approach

Commonsense dictates that it is much better to avoid defects rather than finding and removing them from products

```
        $1
    Prevention

   $10 Correction

  $100 Failure
```

and, without doubt, abundantly better than having a product fail to meet requirements before or after shipping. Therefore, the area of prevention is where most quality professionals want to focus.

The value of prevention is best understood based on the business concept known as the ***1-10-100 rule***. This rule of thumb states that if it takes one unit of costs or effort to complete a job correctly, it will take 10 times that effort to correct an error before it reaches the customer. Once it has reached the customer, it will take 100 times the cost and effort to correct the situation, not to mention the loss of customer goodwill.

## Goal #1 Maximize the Investment in Sequence for Prevention

Our first goal in working with our customers in addressing Cost of Quality is to assist them in maximizing their investment in Sequence for error *prevention* by giving them access to great work instructions. From on the-floor-authoring for real-time knowledge capture with our integrated camera feature to deploying up-to-date, visually-rich work instructions, a Sequence deployment *gives production personnel the best opportunity to build it right the first time* preventing higher value downstream costs such as:

- **In-process and final appraisal / inspection costs** – These costs are associated with the approach of "inspecting quality in" as opposed to "building it right the first time." These types of activities also don't keep the defects from happening again and are often seen by savvy Quality Managers as an ineffective long-term approach to quality control.
- **Internal Failure Costs -** Internal failure costs are those costs that are incurred to remove defects from the products before shipping them to customers. Examples of internal failure costs include cost of rework including the cost of the lost opportunity to make new product, scrapping of obsolete product including the cost of disposing of scrap, and the additional cost of non-value-added activities such as redundant operations, sorting inspections, etc.
- **External failure costs –** External failure costs are generally the highest of the 4 cost of quality categories since the full value of work and processes had to be performed to get the product to the customer. External failure costs include warranties, replacements, lost sales because of bad reputation, payment for damages arising from the use of defective products etc. The shipment of defective products can eventually dissatisfy customers, damage goodwill, and ultimately reduce sales and profits.

While an "investment" in prevention is required, the benefits of having great work instructions far outweigh these downstream costs.

## Goal #2 Minimize the Impact When Things Inevitably Go Wrong and Prevent Them from Happening Again

No prevention effort is perfect. Mistakes will happen. This is unfortunately a fact of life that manufacturers know all too well. While our #1 goal is to lower the overall Cost of Quality through prevention, just as important perhaps is our ability to help our customers decrease the effort and thus lower the cost of managing the times when things don't go as planned.

While Sequence is a powerful tool for getting the *right* instructions to the shop-floor at the *right* time with the goal of building it *right* the first time, it is also a dynamic portal for managing the flow and capture of information for shop-floor **Redlines, Nonconformances and Rework**.

The Electronic **Redline** capabilities found in WebSequence Enterprise allow authorized personnel to make a change to set of instructions right on the shop floor. These changes are then propagated through to all work in progress for the part that is affected by the Redline. No more red pens and chasing paper. Additionally, the Redline exists as a permanent part of the work instructions for the affected part until it is handled in engineering and a new version of the work instruction published.

The Electronic **Nonconformance** capabilities in WebSequence Enterprise allow authorized personnel to approve a Nonconformance that includes all relevant information and electronic signatures which become part of the permanent "as-built" record for tracking and tracing requirements.

Finally, Sequence Enterprise allows you to either import a **Rework** work-order from your ERP system or generate one internally and then author the specific steps required for the rework effort with no loss of previously captured data. This complete end-to-end accountability again ensures a complete "as-built" record for even the most troublesome builds.

## The Ultimate Goal of Sequence Deployment

While the ultimate goal of a Sequence deployment is to reduce the overall Cost of Quality through an investment in prevention, further cost reduction is achieved by more efficiently managing corrective measures when things don't go as planned. The combined effect of these two cost components amplifies the ROI of a Sequence implementation and typically gives easy financial justification.

## Sequence Enterprise

Designed for the manufacturing enterprise needing work instructions that are collaboratively authored, fully integrated with ERP/PLM/MES and deployed in a real time, interactive paperless environment.