

MFE4213: Quality and Reliability Engineering

Lecture 4: Six Sigma

Blended Learning: Workshop

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Example 2:

Transforming Quality at MetalCrafters Ltd

On the island of Malta, there is a sheet metal fabrication company bearing the name MetalCrafters Ltd. For a considerable span of time, they had made a name for themselves of being a reliable supplier of precision sheet metal components catering to diverse industries. Yet, in recent times, a formidable challenge had loomed over the company, one that tested their resolve: a discernible decline in the quality of their production.

The Challenge Unveiled:

The managers at MetalCrafters Ltd. had highlighted several deficiencies within their manufacturing processes:

- The sheet metal cutting process had a high reject rate of around 15%.
- The bending process wasn't faring much better, with a reject rate of 12%.
- In the welding process, 6% of the components were deemed defective.
- Even the surface finish process had its share of issues, with a reject rate of 9%.

These quality issues are causing a cascade of problems;

- Extensive rework became the norm, as teams scrambled to salvage rejected components, inevitably leading to substantial material wastage.
- Capacity issues started to show as production schedules were continually disrupted by the need for rework, causing delays that rippled through the entire production chain.
- Perhaps most disheartening of all, the collective morale of MetalCrafters' employees hit rock bottom. The workforce was caught in a cycle of frustration and confusion. They strongly wish to rectify the quality issues, but they lacked a clear understanding of what's going wrong. This lack of clarity began to erode their job satisfaction and overall enthusiasm.

In the face of these mounting challenges, MetalCrafters Ltd. knows that a comprehensive and structured approach is needed. Thus, the decision was made to embark on a Six Sigma journey, a methodology that would not only pinpoint the root causes of their quality problems but also empower their teams to revitalize their processes, regain control, and rekindle the spirit of excellence within their organization.



The Quest for Improvement:

Faced with this predicament, the management at MetalCrafters Ltd. decided it was time for a change. They wanted to identify the root causes of these quality issues and improve the overall manufacturing process. And so, they embarked on a journey of transformation, choosing the Six Sigma methodology as their guiding light.

As a team, your mission is to identify the most suitable Six Sigma methodology and construct a comprehensive plan complete with general timelines that outlines how you intend to tackle the quality issues prevailing at MetalCrafters Ltd, including tools & techniques that will be deployed and general tasks that need to be undertaken. Your task is to chart out this plan on the provided sheet of paper or PowerPoint slide using the selected Six Sigma methodology, which you will collectively present to the class at the conclusion of the workshop.

