

## **MFE4213: Quality and Reliability Engineering**

### **Lecture 4: Six Sigma**

#### **Blended Learning: Workshop**

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#### **Example 1:**

##### **Vertical integration of Injection Moulding Process**

At Hal Far industrial estate on the island of Malta, there stood a company known as MetalTech. For years, they had been renowned for their expertise in sheet metal fabrication and product assembly, serving a wide array of industries. However, in recent times, a pressing issue had disrupted their steady course – the quality of plastic components.

##### ***The Quality Dilemma:***

Over the past year, MetalTech had been grappling with a series of challenges related to plastic components supplied by an external vendor. These problems ranged from

- short-injected parts,
- brittle components,
- burnt marks,
- discolouration, and
- broken clipping features.

The list of quality concerns seemed endless, and it was taking a toll on both the company's reputation and its bottom line.

To aggravate matters, during negotiations to address these quality issues with the supplier, an unexpected demand was made - a staggering 25% price markup. This request was nothing short of unacceptable to MetalTech's management. Faced with these challenges of quality concerns and untenable cost increases, the company had a pivotal decision to make.

##### ***The Path to Self-Reliance:***

After much deliberation, the management made a bold decision to bring the injection moulding process in-house. No longer would they be beholden to a third-party supplier for their plastic components. This decision involved a twofold approach:

- Investing in In-House Capabilities: MetalTech committed to investing in state-of-the-art injection moulding machines. This was a significant financial undertaking, but it would enable them to have full control over the manufacturing process.

- Recalling Injection Moulds: Once injection moulding machines are up and running all injection moulds would be recalled from the external supplier. This was a crucial step to regain control over the quality and production process.

### ***The Quest for Improvement:***

As the company ventured into the unfamiliar territory of injection moulding, they recognized the need to minimize risks and disruptions. The management decided to leverage the power of the Six Sigma. By doing so, they aimed to identify and mitigate potential issues right from the project's inception.

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 vertical integration of the new manufacturing process at MetalTech 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.