

## **Abstract:**

Six Sigma is a highly disciplined process that helps us focus on developing and delivering near-perfect products and services. The word is a statistical term that measures how far a given process deviates from perfection. Using Six Sigma reduces the number of defective products manufactured or services provided, resulting in increased revenue and greater customer satisfaction.

Garment manufacturing faces its fair share of challenges like other sectors. Such as reducing the number of defectives, rework problems, wastes, low productivity, poor line balancing, variation, rejection of the product and lead time in the garment industry is an important function. At this critical juncture, manufacturers need to reduce defectives in their products and become more competitive.

This project is carried out in the “Adi” workshop located in Nablus, it was established in 1995, with 20 workers and an area of 190 square meters. They perform a sequence of operations such as “stitching, checking, ironing, and packaging” and produce around 20,000 units per month. The workshop suffers from many problems and needs to develop and raise production efficiency, this can be done through the application of six sigma.

Actually, in our project, we will apply Six Sigma at the workshop to increase productivity, and decrease lead time and rejection rate. Thus, produce defect-free manufacturing products that satisfy customer requirements with higher quality, efficiency, and lowest possible costs.

In other words, the production of the workshop should strive towards operating at Six Sigma which aims to minimize the defect percentage and efficiency by using the DMAIC approach. Which is an acronym for five interconnected phases: Define, Measure, Analyze, Improve, and Control. DMAIC is a problem-solving method that refers to a data-driven quality strategy used to analyze the process data, and finally, the root causes behind the defects produced in the product are identified. First, we will define and study all the problems that the production line suffers from in the workshop. Then measure the information about process performance in the workshop, develop a problem statement and analyze the causes of the problem and verify the suspected root cause in the process. Then we will identify actions to reduce defects and variation caused by root causes and implement selected actions.