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Slide 1: Introduction

Our project focuses on optimizing PCB manufacturing processes using Statistical Quality Control (SQC). PCBs are the backbone of electronic devices, making their efficient production critical. By improving quality and reducing inefficiencies, we aim to enhance manufacturing outcomes while minimizing costs.

Slide 2: importance of SQC

SQC is a systematic approach that uses statistical methods to monitor and improve production processes. Techniques like control charts and process capability analysis help identify variations and maintain consistent quality in PCB manufacturing.

Slide 3: Objectives of the Project

The main goal of this project is to optimize the PCB assembly line by identifying inefficiencies and reducing defect rates. This will lead to better resource utilization, improved productivity, and higher-quality products.

Slide 4: Real-Time Monitoring

Real-time monitoring involves continuously tracking cycle times and defect rates during production. This allows us to detect variations immediately and implement corrective actions, ensuring smooth operations and consistent output.

Slide 5: Integration with Lean Principles

By integrating SQC with lean manufacturing principles, we aim to streamline processes and eliminate non-value-added activities. This combination enhances process efficiency while maintaining high-quality standards.

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Slide 6: Quality Control Methods

We will use advanced quality control techniques such as Automated Optical Inspection (AOI), X-Ray Inspection, and Electrical Testing. These methods ensure accurate defect detection and improve overall product reliability.

Slide 7: Role of Quality Controls

Quality controls play a crucial role in enhancing defect detection rates, reducing waste, and improving product quality. This ensures that the final product meets industry standards and customer expectations.

Slide 8: Methodology Overview

Our methodology begins with selecting the PCB assembly line as the focus area. We will collect data on cycle times, defect rates, and performance metrics to analyze the current process.

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Slide 9: Methodology Continued

Using SQC techniques like control charts, we will analyze stability in the process. Based on this analysis, we will propose solutions to standardize cycle times, reduce variations, and enhance efficiency.

Slide 10: Validation and Assessment

The final step involves validating the proposed improvements by analyzing updated process metrics. This ensures that our solutions are effective in achieving the desired outcomes.

Slide 11: Expected Outcomes

The expected results include optimized processes with improved efficiency, reduced cycle time variations, lower defect rates, and consistent product quality. These improvements will benefit both manufacturers and customers.

Slide 12: Conclusion

In conclusion, implementing SQC techniques can significantly enhance PCB manufacturing processes by improving efficiency, reducing defects, and ensuring high-quality products.