

Enhancing Validations in Injection Molding Through the Application of Statistical Tools

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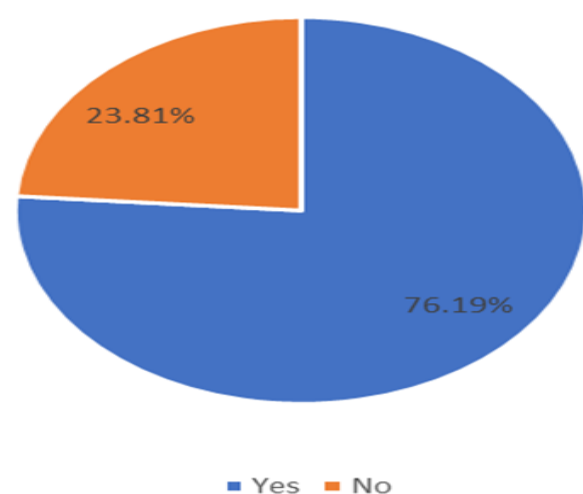
Aim of the Project

The aim of this dissertation to highlight the transformative role of statistical tools in enhancing validations within injection molding.

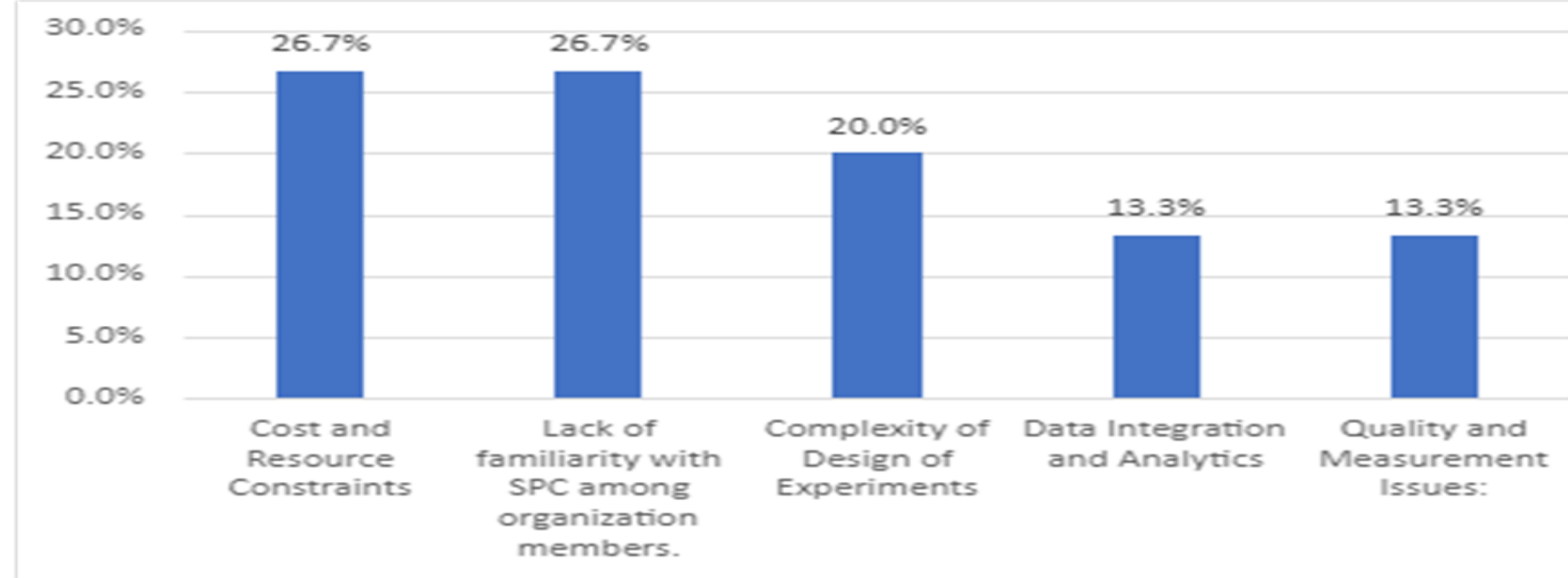
Objectives

1. Evaluate current process validation methods in injection molding industry
2. Identify key challenges faced by manufacturers
3. Assess effectiveness of statistical tools like DOE and SPC
4. Provide applied case study demonstrating improvements in quality and efficiency
5. Investigate impact of varying process parameters on product quality using statistical analyses
6. Propose recommendations for optimizing use of statistical tools in process validation, considering technology advancements, best practices, and regulatory requirements..

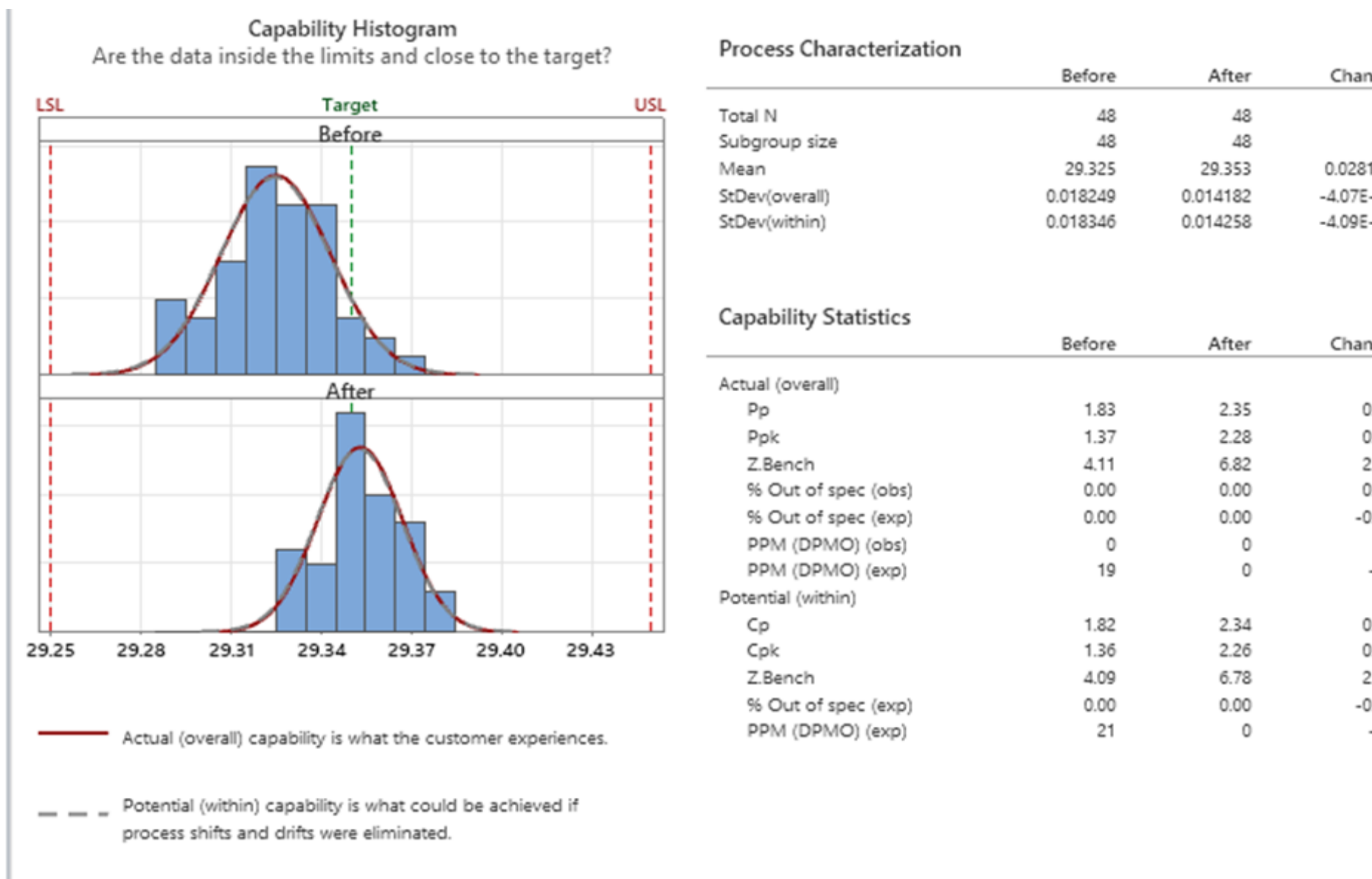
Employees that received training in statistical tools for validations within Injection Molding



Challenges of Implementing Statistical Tools in Injection Molding Validation Processes



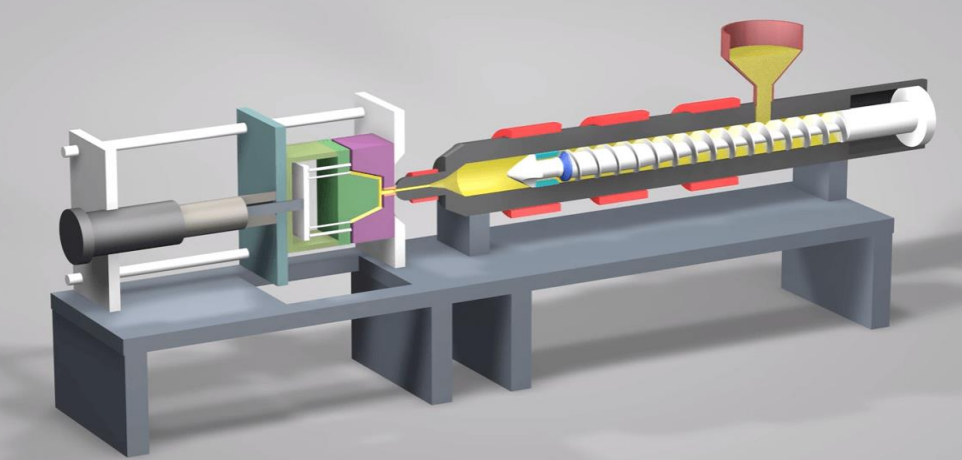
Results of Applied Case Study



The above figure shows Process Capability results after statistical tools and methodologies were used on a mold that never had been validated. This was completed by identifying the critical factors, using statistical data analysis and finally optimizing process parameters

Steps for Implementing DOE in Injection Molding

1. Problem Definition
2. Identification of Critical Parameters
3. Selection of Experimental Factors
4. Determination of Factor Levels
5. Design of Experimental Layout
6. Execution of Experiments
7. Statistical Data Analysis
8. Optimization of Process Parameters
9. Verification and Validation
10. Continuous Improvement



Conclusion

In conclusion

- ☐ All objectives were achieved by carrying out online research of journals, surveys and interviews completed by industry professionals
- ☐ Implementing Statistical Tools can also create challenges
- ☐ The findings were taken from each section and a list of essential strategies was developed.