

IMPROVEMENT OF A COMPONENT MANUFACTURING PROCESS

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The manufacturing process involves several steps which are necessary to ensure the production of high-quality parts. The process usually starts from the design phase where the part to be manufactured is planned and the information regarding the structure and the functionality of the component is analyzed, followed by the production phase where the material is cut and machined to produce the final product.

Despite the importance of the manufacturing process, many manufacturers still face challenges such as poor quality output, long production time and high production costs.

One of the main limitations of the current manufacturing process is the number of steps involved. Each step increases the time and cost of production and also increases the likelihood of defects. Therefore, the first step in improving the process is to reduce the number of steps involved. To achieve this, the entire manufacturing process will be redesigned to combine some of the steps into a single operation.

Another limitation of the current process is the accuracy of the finished part. The part requires high precision to meet the required specifications. However, the current process can result in variations in the final product due to the use of multiple machines and operators.

To address this issue, a new process will be implemented that uses a single machine to perform all the required operations, thereby eliminating variations caused by multiple machines. Furthermore, the current process

generates a significant amount of waste, particularly in the form of scrap material. This waste can be reduced by implementing a new cutting tool that generates less waste and is more efficient. This will not only reduce waste but also decrease production time and cost.

The proposed new manufacturing process involves reducing the number of steps, improving accuracy, reducing waste, and implementing real-time quality control. The new process involves the following steps:

Step 1: Turning and milling operations will be combined into a single operation, reducing the number of steps involved.

Step 2: A new machine that combines turning, milling, drilling, and grinding operations will be used to perform all the required operations, eliminating variations caused by multiple machines and operators.

Step 3: A new cutting tool that generates less waste and is more efficient will be used to reduce waste and decrease production time and cost.

Step 4: Real-time quality checks will be incorporated during each operation to detect defects early and prevent rework and waste [1].

In conclusion, the improvement of the manufacturing process of the component under consideration is critical to optimizing production efficiency, reducing waste, and increasing overall product quality. The proposed new process addresses the limitations of the current process and incorporates real-time quality control by early detecting of the defects and preventing rework and waste of human costs, raw materials and manufacturing expenses.

References

1. What Is Meant by Lean Manufacturing? [Electronic resource]. – Mode of access: <https://www.deskera.com/blog/lean-manufacturing/>. – Date of access: 14.04.2023.