INTEGRATION OF NESTING PROCESSES THROUGH DIGITALISATION

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ABSTRACT

An increasing number of companies are investing heavily in automation in their manufacturing facilities. The aim is to generate flow in their production system, generate a higher throughput, secure quality, and reduce repetitive work and human labour. Automation projects are often very expensive, involving many resources throughout the company. The focus of this project is the pitfall of not taking coupling and integration into account when investing in automation projects, leading to separate automated isles within the company, which are not able to communicate with each other efficiently. The value stream, the flow of information and materials, is hindered by a lack of integration of processes or missing interfaces between the automated isles.

The project takes offset in a nesting process, where parts, prior to being laser cut, are positioned in strategic patterns in order to better utilise the sheet metal and thereby reduce waste. However, in a production setup, the flow of incoming orders needs to be considered, when planning the parts to be nested. This requires vast amounts of resources, both when scheduling what parts to nest and in the nesting process itself. This usually happens across different departments within a company, as shown in Figure 1, which can lead to a loss of information. Furthermore, a department might require the information in another format than the one delivered by the previous department, thus needing to manually convert the information in order to process the order. In order to optimise the efficiency of the nesting process and reduce the loss of information between departments, this project will investigate machine learning as a tool in the nesting process, aiming at scheduling, digitalisation and integration of processes.



Figure 1: Schematic overview of a part of a hypothetical production, from sales to laser cutting.

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