The Implementation of Model-based definition in a Manufacturing Environment

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The research is done at the company VDL ETG Almelo. VDL ETG Almelo is located in Almelo in the Netherlands, where were around 800 employees active in 2021. The main responsibilities of VDL ETG Almelo are the integration of mechatronics (sub) systems for all their clients. In addition, design, production, making assemblies of products, and doing quality checks belong to their tasks [1].

Currently, VDL ETG Almelo uses Document-based definition in their manufacturing environment, which means the usage of 3D CAD models in combination with technical drawings. However, the contemporary digitization and some important clients ask VDL ETG to go over to Model-based definition (MBD). This new way of working replaces the technical drawings and puts all the Product and Manufacturing Information (PMI) into the 3D model so that all information is stored in one main source. There has been no roll-out of MBD yet in VDL ETG. Some stakeholders got in touch with MBD, but only to a small extent through pilot programs some years ago. The assignment will focus on the ideal situation where there has been a 100% roll-out of MBD where previous limitations and obstacles are solved. VDL ETG has an interest in knowing how to work more efficiently in the MBD environment, which leads to this exploratory research on possible efficiency improvements.

Therefore, the following research question is defined:

Which efficiency improvements can be realized when implementing Model-based definition in the manufacturing environment of VDL ETG Almelo?

In order to obtain useful information and knowledge for the research, five stakeholders were selected from five different departments: Computer-aided manufacturing, Computer-aided Inspection, Production, Factory Engineering, and Purchasing. With all of them, interviews and field research had been done to provide insight into their function and current way of working. Next, insights had been obtained about the possible application of MBD within their function and their vision of MBD. The next step was to discover possible optimizations that could be done in the future of VDL ETG. The optimizations that were found were separated per department. For each optimization, there was explained what the idea was, and what was needed to test and implement it.

Although for each department several optimizations were found, this can be extended. In the future, more in-depth research can be done within the departments to discover new possible optimizations and the focus can also lie on departments that were not involved yet. In addition, in the upcoming time, there should be done more focused research and testing on each optimization in order to see if the optimization could really have an added value to the manufacturing environment of VDL ETG.

At the final stage of this exploratory research, some recommendations were done to send VDL ETG in a certain direction, based on the findings of the optimizations. The recommendations state the most useful optimizations with an eye on the feasibility within VDL. These insights can help VDL ETG to think about where to improve its efficiency and quality when using MBD in the upcoming years.

References

1. *VDL ETG. (2022). Introductieboekje VDL-medewerkers [E-book].*