

# Improving the information flows

## between the shop floor and office in a steel construction environment

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Voortman Steel Machinery is specialised in making high-end steel machinery tools integrated with company software, which automates and optimises steel production processes. Digi-Steel, a sister company of Voortman, is dedicated to engineering cloud-based software applications for the Voortman machines. These applications vary from machine operating systems to data collection and management. At this point, almost all actions in and around the machines have been digitised. 3D-models of entire projects can be made, materials can be automatically purchased based on those models, nesting plans can be generated, the inventory can be managed, and the machines can be controlled to produce the steel parts. However, after the parts have been produced by the machines, they still need to be assembled. This is mostly done manually in a shop floor by the Voortman clients, and there is currently no system provided by Voortman which can manage the assembly process, nor collect any data from it. Still, lots of valuable information can be obtained and analysed from the assembly process, which can be used to make better project plannings and create more streamlined processes to make the part manufacturing process seamlessly merge into the manual assembly process.

The greatest challenge however lies in how to communicate information between the shop floor and the office, as the employees are not machines which can simply be managed by software. For instance, if the office needs to know how long it takes to assemble a certain assembly, they will need to ask the employee working on it to keep track of time. This seems rather simple and straightforward, however in practice it is more complicated as the employees are often wearing heavy gear while working in multidisciplinary teams in a rough environment on sometimes multiple assemblies at once. This means that they cannot just be given a notebook, a pen, and the instructions to write down when they start and finish the assembly. They need a simple and structured communication system which can easily be implemented in their current workflow.



The goal of this assignment is to improve the information flows between the shop floor and office in a steel construction environment. Currently, most of the information flows are using verbal or paper communication mediums, and there is no clear structure or overview of all the information. Therefore, it is attempted to digitalise the information flows. A software system will analyse and process all the information, meaning that the information flows can be clearly structured. The registration of the assembly durations and making employees activities traceable are the main focus during the development of the solution. However, it is also attempted to enable shop floor employees to give feedback and send them some basic work instructions.

How to use the information to make improvements is out of the scope of this assignment. Rather, the focus will be on how to communicate the required information. As the shop floor employees are working in a tough work environment, which brings along lots of complications, a well thought out system which seamlessly blends into their current workflow is needed. A prototype for a mobile device with barcode scanning capabilities is created and tested at a steel construction company. The employees can use the device to register how long they have been working on each assembly and give feedback about them. They can also see the assembly drawings in the application.

The test results are quite positive, and the prototype has a lot of potential. However, more development and testing is required to finally come up with a working product. This assignment can therefore be seen as an analysis with an early concept, which can be used as a basis for developing a final fully functioning solution.