VDL ETG Almelo is in the start-up phase of a new production department. The department will produce different types of machines for a new client. The assembly times of these machines is in the order of several months and the production numbers are low.

To strive for improvement in the future, VDL focuses on key performance indicators (KPI's). The production leader wants a KPI dashboard to make it easier to steer the production process on a daily basis. This easier steering should result in to a higher productivity and quality over time in the end.

VDL strives for a bottom up management approach; the mechanics are the people who are actually making the products, so they should give the most input. However, the mechanics do not have an overview of everything that is going on. They are focussing on short term improvement only instead of long term improvement. The mechanics should be able to get a better insight in the production process with the dashboard. They should steer on it themselves.

The main question for this research is:

How can a KPI dashboard be designed in a way that the mechanics are able to use the presented data to steer the process and reach the company goals?

The research conducted for the bachelor assignment thesis led to a prototype of the dashboard. It is a digital mock-up which shows how the dashboard works. The prototype can be found <u>here</u>. This dashboard gives the mechanics an overview of the entire production process. It includes information from different systems, so the information of the most important aspects is visible. The mechanics can provide more input to steer the production process themselves with this dashboard. This is in line with VDL's bottom up management strategy.

Starting from the lean management principles it became clear it was most important that the bottom up strategy could be better implemented. VDL wants to strive for improvement in the production process by using lean management. This seems more incorporated with the people working at the office than the people at the work floor. It is really important that the mechanics are motivated themselves to improve the production process with the use of this dashboard. Otherwise they will never deliver much input to the meetings which the production leader and other mechanics can steer on. To achieve this motivation the dashboard should not focus on competition but on striving for excellence. The drive for improvement should come from intrinsic motivation of the mechanics.

The mechanics did not ask for the dashboard themselves. The stakeholder analysis showed as most important concern that the dashboard would not be useful for the mechanics. They should be the main users of the dashboard. This is a concern from both the mechanics and the production leader. The production leader will use the dashboard together with the mechanics during stand-up meetings. Because of this concern the design process started from a user oriented view.

The indicators which could become visible on the dashboard are explored on basis of the (S)QLTC areas: safety, quality, logistics, technique and costs. These are not the final areas presented on the dashboard. The indicators which followed from the areas were discussed with the mechanics. Their views could be implemented in the dashboard. This way the dashboard becomes more useful for them. The ideas of the mechanics increase the user experience and make it more likely the mechanics will use the dashboard in the end. Although the specific KPI's were not selected after the sessions, a lot of information and background stories could be gathered. Since all of the mechanics have different experiences in their work, different views could be incorporated. This took the design to a higher level and made it more valuable for everyone.

The indicators which should be on the dashboard are:

- Production time
- Change requests and manco's
- Complaints
- Safety problems
- Machine comparison

These indicators became the subpages of the dashboard. The data is presented in a visual way in graphs and tables. Data can easily be interpreted by choosing the best representation. Stored data goes from abstract numbers to being more visual. This makes the data easier to understand, so the mechanics can actually steer on it. The gestalt theory and general colour conventions are implemented to achieve the right visualisation.

In the end, although the dashboard could not be tested in use, the dashboard seems nice and useful for the mechanics. Future research in the working environment should be conducted to affirm this. This can only be executed once the production process is getting out of the start-up phase.

Ultimately this designed dashboard does fit the goal of the assignment: the mechanics are able to use the presented data on the dashboard to steer the production process and reach the company goals. The requirements found during the research are met.

To conclude: the mechanics are able to steer on more different areas than before. This KPI dashboard is a valuable addition to the production process.